THE STATE OF SOUTH CAROLINA
In The Court of Appeals

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APPEAL FROM SPARTANBURG COUNTY
Court of Common Pleas

Jean H. Toal, Circuit Court Judge

Appellate Case No. 2017-002611
Case No. 2016-CP-42-1592

Beverly Dale Jolly and Brenda Rice Jolly,..... Respondents,

v.

General Electric Company, et al., ... Defendants,

Of whom Fisher Controls International LLC and Crosby Valve, LLC are the ..... Appellants.

RECORD ON APPEAL
VOLUME VIII

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Certificate of Counsel

Table of Automotive Industry Funded Studies of Friction Materials

Publication	Cost/Source	Consultant	Topic
Paustenbach (2003)	$78,036.00 Schlenker Dep. (8/28/14) 45:7-1	Exponent	Brake Exposure levels
Paustenbach (2004)	$469,953.00 Schlenker Dep. (8/28/14) 45:1-6	Exponent	State of the Art
Hessel (2004)	$56,662.00 Schlenker Dep. (8/28/14) 24:19-22	Exponent	Spirtas Reanalysis
Goodman (2004)	$105,635.00 Schlenker Dep. (8/28/14) 45:13-1	Exponent	Meta-analysis of brakes
Teta (2004)	$4,048.50 Schlenker Dep. (Allen) 8/28/14 26:3-6, 8-11	Exponent	Letter to the editor re Lemen (2004)
Paustenbach (2005)	$198,946.51 Paustenbach Dep. ((6/17/15) 244:7-11	Chemrisk	Muffler Study
Paustenbach (2006)	$4,815.00 Schlenker Dep. (Allen) 8/28/14 44:16-24	Exponent	Letter to editor responding to Atkinson et al. (2006)
Finley (2007)	$28,000.00/$84,403.00 Paustenbach Dep. ((6/17/15) 193:3-12; 193:24-194:10 /Schlenker Dep. (8/28/14) 44:11-15	Chemrisk/ Exponent	Cumulative brake exposures
Kelsh (2007)	$113,821.90 Schlenker Dep. (8/28/14) 46:7-11	Exponent	Re-analysis of Leigh et al. (2003)
Teta (2007)	$27,998.00 Schlenker Dep. (8/28/14) 45:18-22	Exponent	Therapeutic radiation as a cause of mesothelioma.
Pierce (2008)	$78,770.00 Paustenbach Dep. ((6/17/15) 72:13-15; 73:7-9	Chemrisk	"No effect level"
Madl (2008)	$121,740.49 Paustenbach Dep. ((6/17/15) 200:22-201:5; 202:16-23	Chemrisk	Brake Box opening Study
Jiang (2008)	Unknown	Chemrisk	Clutch Box opening study.
Richter (2009)	$62,615.00/? Schlenker Dep. (8/28/14) 29:22-30:4	Exponent/ Chemrisk	Short term truck brake exposures

381. Many of the publications routinely cited by experts for the auto industry were written at the request of various manufacturers of asbestos-containing auto parts and/or written to support testimony in the courtroom. For example, Ford Motor Company (along with GM and Daimler Chrysler) funded Hessel et al. (2004) and Hessel has been paid $1,359,190.70 by Ford Motor Co. as a litigation consultant since leaving Exponent, Inc.[694] Dr. Victor Roggli, author of two error-filled publications that erroneously claim that the lungs of brake mechanics do not contain above-background levels of asbestos from brakes, has been paid at least $258,816.08 by Honeywell, Inc.[695] and at least $130,111.61 by Ford Motor Company.[696] David Garabrant, another regular witness for asbestos brake manufacturers and co-author of Goodman et al. (2004), has been paid at least $691,979.39 by Honeywell, Inc.[697] and at least $234,261.92 by Ford Motor Company. Charles Blake and Francis Weir both published litigation support studies that were secretly funded by Honeywell, Inc. Lawyers for Honeywell, Inc. hired Mr. Blake over 408 times[698] and paid more than $1,576,860.00[699] for Charles Blake's services in litigation. Honeywell lawyers have hired Dr. James Crapo more than 150 times and paid Dr. Crapo more than $759,046.65.[700]

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[694] *Id.*

[695] Dr. Roggli has admitted he was asked to add his name to Marsh et al. (2011) by an asbestos defense lawyer for Honeywell, Inc. Roggli Deposition in *Parrott v. ArvinMeritor, Inc.*, May 4, 2016 at 43: 23 – 44: 2. Roggli has also travelled to California to work with Exponent employees and brake company lawyers to create PowerPoints for litigation purposes. Roggli Trial Transcript, *Stockton v. Ford Motor Co.*, August 18, 2015 at 1857:5 – 1858: 14.

[696] Ford Motor Company's Responses to Plaintiff's Third Set of Interrogatories and Requests for Production to Ford Motor Co., John C. Lewis v. Ford Motor Company et al., Cause No. 3:15-cv-0304REP, In the United States District Court For the Eastern District of Virginia (Richmond Division) (September 9, 2015).

[697] Honeywell's Notice of Serving Answers to Plaintiffs' First Set of Interrogatories, Judy Ramazetti v. Borg Warner Corporation, Honeywell International, Inc. et al., Cause No. 10-021138-Z, In the Circuit Court of the 13th Judicial District in and for Hillsborough County, Florida (February 15, 2012).

[698] Honeywell International Inc.'s Amended Responses to Plaintiff's Expert Witness Interrogatories, *Patricia Buntz v. Borg Warner Corporation, et al,*. Cause No. 12-34662, In the Circuit Court of the 17th Judicial Circuit in and for Broward County, Florida (March 24, 2014).

[699] Honeywell's Notice of Serving Amended Answer to Plaintiff's Second Set of Interrogatories, *Lori Ferrell v. Borg-Warner Corporation et al.*, In the Circuit Court of the 11th Judicial District in and for Miami-Dade County, Florida (January 8, 2010).

[700] Honeywell International Inc.'s Amended Responses to Plaintiff's Expert Witness Interrogatories, *Patricia Buntz v. Borg Warner Corporation, et al,*. Cause No. 12-34662, In the Circuit Court of the 17th Judicial Circuit in and for Broward County, Florida (March 24, 2014).

Expert	Ford Payments	Honeywell Payments	Total Payments
Patrick Hessel/EpiLung	$1,359,190.70	Unknown	$1,359,190.70+
Victor Roggli	$130,111.61	$258,816.08	$388,927.69+
David Garabrant	$234,261.92	$691,979.39	$926,241.31+
Charles Blake	Unknown	$1,576,860.00	$1,576,860.00+
James Crapo	Unknown	$759,046.65	$759,046.65+

Many of the auto industry defense articles listed in the Table of Automotive Industry Funded Studies of Friction Materials are unreliable. For example, as pointed out by Finkelstein (2013):

> It is my opinion that the analysis of Finley and colleagues is fatally flawed and that their results and conclusion are not credible. The fundamental epidemiologic error is that the "cases" and "controls" were not derived from the same sampling frame and are thus not comparable. The "cases" were derived from reports in the medical literature of mesothelioma among automotive mechanics; the person-years at risk (PYR), from which the expected number of cases was calculated, were computed from a population based sample of all automotive mechanics working in the United States. The authors have thus compared the experience of that (unknown) fraction of mechanics whose disease was reported in the literature to an expectation based upon the entire population of US mechanics. To provide a valid comparison, the authors should have compared the total number of cases of mesothelioma among US auto mechanics (unknown) to the expectation computed from the PYR of all US auto mechanics, or, compared the number of cases of mesothelioma reported in the literature to the expectation computed from the PYR of those auto mechanics described in the literature. There are enormous challenges to both these approaches, but the authors have failed in their attempt to compute a credible estimate from the hybrid approach.

It will be clear to all physicians and epidemiologists that the number of cases of any condition reported in the literature represent only a small fraction of those actually occurring.[701]

[701] Finkelstein, *Letter concerning the paper by Finley and colleagues: dx.doi.org/10.1016/j.yrtph 2012.05.015*, Regul Toxicol Pharmacol. 65(1):178-9 (2013).

382. The fact that Ford, General Motors and Chrysler stopped using asbestos in their brakes years before paying Exponent and Chemrisk millions of dollars also raises the questions of the credibility of the science. This is especially true given that these companies long ago admitted internally that work with asbestos brakes and clutches puts people exposed to those products at risk of diseases including mesothelioma:

> The health hazard [of asbestos] increases as the number of inhaled fibers increases (concentration of fibers in inhaled air x length of exposures x number of times exposures have occurred = inhaled dose; i.e., increased dose = increased risk).[702]

383. More recently, Georgia Pacific, LLC and other companies that made and sold asbestos-containing joint compounds have funded a series of articles, orchestrated and controlled by lawyers, in an effort to assist with product defense. The role of lawyers and the legal department in creating these product defense articles was not disclosed and the failure to disclose these potential conflicts of interest was improper. In 2013, The New York Supreme Court Appellate Division described the studies as follows:

> GP funded these studies in 2005 to aid in its defense of asbestos-related lawsuits. The studies were performed by experts from various organizations, who, among other things, recreated GP's historical joint compound product for the purpose of testing its biopersistence and pathogenicity. To facilitate the endeavor, GP entered into a special employment relationship with Stewart Holm, its Director of Toxicology and Chemical Management, to perform expert consulting services under the auspices of its in-house counsel, who also was significantly involved in the pre-publication review process.
>
> . . .
>
> Holm co-authorized nearly all of the studies, which were intended to cast doubt on the capability of chrysotile asbestos to cause cancer. On the two articles that he did not coauthor, he and GP's counsel participated in lengthy "WebEx conferences" in which they discussed the manuscripts and suggested revisions. Despite this extensive participation, none of the articles disclosed that GP's in-house counsel had reviewed the manuscripts before they were submitted for publication. Two articles falsely stated that "[GP] did not participate in the design of the study, analysis of the data, or preparation of the manuscript." For articles lead-authored by David M. Bernstein, Ph.D., and co-authored by Holm, the only disclosure was that the research was "sponsored" or "supported" by a grant from GP. The articles did not disclose that Holm was

[702] Ford Motor Company, *Industrial Relations Bulletin 4 Industrial Hygiene - Asbestos*, (October 14, 1986); Ford Motor Company, *Industrial Relations Bulletin 4 Industrial Hygiene - Asbestos*, (February 22, 1995).

> specially employed by GP for the asbestos litigation or that he reported to GP's in-house counsel. Furthermore, there were no grant proposals, and Dr. Bernstein was hired by GP on an hourly basis. Nor did the articles reveal that Dr. Bernstein has been disclosed as a GP expert witness in NYCAL since 2009, that he had testified as a defense expert for Union Carbide Corporation in asbestos litigation, or that he had been paid by, and spoken on behalf of the Chrysotile Institute, the lobbying arm of the Quebec chrysotile mining industry. Although GP belatedly endeavored to address the inadequacies of certain of its disclosures, its corrections failed to acknowledge its in-house counsel's participation and did not make clear that Dr. Bernstein's testimony as an expert witness preceded the publication of the first GP reformulated joint compound article in 2008.
>
> The foregoing constitutes a sufficient factual basis for a finding that the relevant communications could have been in furtherance of a fraud, and the motion court properly confirmed the recommendation directing in camera review of the internal documents. As the court remarked, it is of concern that GP's in-house counsel would be so intimately involved in supposedly objective scientific studies, especially in light of GP's disclosures denying such participation . . ..[703]

The New York court described the consultants' work as "seeding of the scientific literature with GP-funded studies."[704] A list of the GP-funded studies follows:

- Brorby, Sheehan, Berman, Greene and Holm, *Re-Creation of Historical Chrysotile-Containing Joint Compounds*, INHALATION TOXICOLOGY, 20:1043-1053 (2008);
- Bernstein, Donaldson, Decker, Gaering, Kunzendorf, Chevalier and Holm, *A Biopersistence Study following Exposure to Chrysotile Asbestos Alone or in Combination with Fine Particles*, INHALATION TOXICOLOGY, 20: 1009-1028 (2008);
- Bernstein, Rogers, Sepulveda, Donaldson, Schuler, Gaering, Kunzendorf, Chevalier and Holm, *The Pathological Response and Fate in the Lung and Pleura of Chrysotile in Combination with Fine Particles Compared to Amosite Asbestos Following Short-Term Inhalation Exposure: Interim Results*, INHALATION TOXICOLOGY, 22 (11): 937-962 (2010);
- Bernstein, Rogers, Sepulveda, Donaldson, Schuler, Gaering, Kunzendorf, Chevalier and Holm, *Quantification of the Pathological Response and Fate in*

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[703] *Matter of New York City Asbestos Litigation*, 2013 NY Slip Op 04127 (First Judicial Department, Decided June 6, 2013) (legal citations omitted).

[704] *Matter of New York City Asbestos Litigation*, 2013 NY Slip Op 04127 (First Judicial Department, Decided June 6, 2013).

the Lung and Pleura of Chrysotile in Combination with Fine Particles Compared to Amosite-Asbestos Following Short-Term Inhalation Exposure, INHALATION TOXICOLOGY, 23(7): 372-391 (2011);

- Brorby, Sheehan, Berman, Bogen and Holm, *Potential Artifacts Associated with Historical Preparation of Joint Compound Samples and Reported Airborne Asbestos Concentrations*, J. OCCUP. AND ENVIRON. HYG., 8: 271-278 (2011);
- Sheehan, Brorby, Berman, Bogen and Holm, *Chamber for Testing Asbestos-Containing Products: Validation and Testing of a Re-Created Chrysotile-Containing Joint Compound*, ANN. OCCUP. HYG., 55(7) 797- 809 (2011);
- Simmons, Jones and Boelter, *Factors Influencing Dust Exposure: Finishing Activities in Drywall Construction*, J. OCCUP. AND ENVIRON. HYG., 8: 324-336 (2011);
- Jones, Simmons and Boelter, *Development and Evaluation of a Semi-Empirical Two Zone Dust Exposure Model for a Dusty Construction Trade*, J. OCCUP. AND ENVIRON. HYG., 8: 337-348 (2011);
- Jones, Simmons & Boelter, *Comparing Two-Zone Models of Dust Exposure*, J. OCCUP. AND ENVIRON. HYG., 8: 513-519 (2011);
- Berman, Brorby, Sheehan, Bogen and Holm, *More on the Dynamics of Dust Generation: The Effects of Mixing and Sanding Chrysotile, Calcium Carbonate, and Other Components on the Characteristics of Joint-Compound Dusts*, ANN. OCCUP. HYG., 56(7):852-867 (2012);
- Brorby, Sheehan, Berman, Bogen and Holm, *Exposures from Chrysotile-Containing Joint Compound: Evaluation of New Model Relating Respirable Dust to Fiber Concentrations*, RISK ANALYSIS (2012).

Testimony of Mr. Holm, the in-house Georgia Pacific, LLC scientist working for the legal department, confirmed that the product defense consultants who authored the above-mentioned articles were paid in excess of $7,800,000.[705] It appears that there were no "grants" and that the payments were fee-for-service arrangements.

384. Recently, it has come to light that two other articles by David Bernstein – also claiming to have been financed by a purported "grant" from asbestos litigation defendant Union Carbide nearly two decades after Union Carbide exited the asbestos mining and milling business – were the subject of extensive, secret lawyer communications between lawyers

[705] Holm Dep. (June 6, 2011) at 196:1 – 199:25.

for Union Carbide and Bernstein.[706] Union Carbide, through its attorneys, paid Dr. Bernstein and his co-authors "approximately $400,623.20."[707]

385. Phelka & Finley, *Potential health hazards associated with exposures to asbestos-containing drywall accessory products: A state-of-the-science assessment*, CRITICAL REVIEWS IN TOXICOLOGY, 42(1): 1-27 (2012) was funded by Kaiser Gypsum, another asbestos defendant.

386. McCoy et al, *Mesothelioma in Drywall Finishing Workers*, Journal of ASTM Intern. Vol. 8 No.1 (2011) was written by Kim Anderson, a consultant to asbestos defendants who made and/or sold asbestos joint compounds, but the conflict was not disclosed. John Dement -- whose data were used by McCoy et al. -- wrote that McCoy et al. used his data in an "unscientific and misleading manner."[708] Furthermore, Dement and Lipscomb wrote that the McCoy et al. summary "is totally misleading, and their interpretation of our study is scientifically inappropriate."[709] In conclusion, Dement and Lipscomb wrote "[t]he public health and environmental literature are increasingly inundated with publications whose major purpose is to create doubt and uncertainty in an effort to oppose regulations or support tort litigation. While honest scientific disagreement and debate are useful, the McCoy et al. publication and the response by Anderson appear more directed at manufacturing uncertainty [in the minds of judges and juries in the courtroom] rather than a balanced review and presentation of the scientific literature."[710]

387. Recently, David Bernstein and others published another Doubt Science piece that misleadingly claims it was supported by a "grant" from an industry trade organization.[711] This article contains several unsupported conclusions and errors which, given the

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[706] Union Carbide Privilege Log, *In re New York City Asbestos Litigation All Weitz & Luxenberg Cases in which Union Carbide Corporation is a Defendant*, Supreme Court of the State of New York (before the Hon. Sherry Klein Heitler) Index No. 40000/8 (2013). There are dozens of entries indicating the Dr. Bernstein discussed the published papers on Union Carbide's asbestos with lawyers for Union Carbide prior to publication.

[707] Union Carbide Corporation's Response to Plaintiff's Interrogatories, *Legault v. Bayer Cropscience, Inc. et al.*, In the Circuit Court of the 13th Judicial Circuit in and for Hillsborough County, Florida (May 9, 2012).

[708] Dement et al., *Discussion on "Mesothelioma in Drywall Finishing Workers,"* by McCoy, M. J., Wolter, M. E., and Anderson, K. E. [Journal of ASTM International Vol. 8, No. 1 (2011), Paper ID JAI102786] (May, 2012).

[709] Dement et al., *Discussion on "Mesothelioma in Drywall Finishing Workers,"* by McCoy, M. J., Wolter, M. E., and Anderson, K. E. [Journal of ASTM International Vol. 8, No. 1 (2011), Paper ID JAI102786] (May, 2012).

[710] Dement et al., *Discussion on "Mesothelioma in Drywall Finishing Workers,"* by McCoy, M. J., Wolter, M. E., and Anderson, K. E. [Journal of ASTM International Vol. 8, No. 1 (2011), Paper ID JAI102786] (May, 2012) (citing Michaels et al., *Manufacturing Uncertainty: Contested Science and the Protection of the Public's Health and Environment*. J. Public Health, Vol. 95, pp. S39–S48 (2005)).

[711] Bernstein et al., *Health risk of chrysotile revisited*. Crit. Rev. Toxicol. 43(2) 154–183 (2013).

misleading funding disclosure, suggest that bias may have played a role in shaping the conclusions. Additionally, documents disclosed in litigation indicate that the article was written completely by Dr. Bernstein and Dr. Dunnigan and that they were planning to recruit additional "prospective co-authors worldwide" to add their names and "acceptance of co-authorship." One of the co-authors, Allen Gibbs, added his name after "several (6) drafts" mentioned below and testified as follows:

> Q. How many hours did you spend working on this paper?
> A. It's quite a long paper, so there was quite a lot to read. Probably five or six hours.

Dr. Gibbs claims to have contributed to the section on asbestos exposure at the GARCO facility in South Carolina, but admitted that section contained serious errors. Essentially, Dr. Bernstein and Dr. Gibbs attempt to blame the mesothelioma cases in workers from an asbestos textile facility on asbestos wafting over from the local Navy Yards. Specifically, Gibbs admitted there is a "major problem with [his] theory." When questioned on the inaccuracies, Dr. Gibbs appeared to be unwilling to commit to correcting the serious errors:

> Q. Sir, don't you think that the misrepresentations in the paper should be corrected for the record?
> A. Possibly, yes.

To date, I am unaware of any such corrections being made.

388. Recently, another case of undisclosed conflicts of interest in favor of industry has been widely discussed in scientific circles. Specifically, two Italian researchers published an article that blatantly misrepresented the sources of funding, falsely claiming the article was funded by "the Italian Association for Cancer Research (AIRC)" and falsely claimed the authors had "no conflicts of interest."[712] One of the researchers, Carlo La Vecchia, was an associate editor for the journal that published the offending paper. A group of more than one hundred (100) physicians, scientists and organizations and I signed a joint letter to the European Cancer Prevention Organization (in whose official journal the offending article appeared) pointing out the false and misleading statements in La Vecchia and Boffetta (2012). According to the complaint letter, La Vecchia and Boffetta (2012) cherry-picked data to support the desired conclusion of their patrons and explained other concerns as follows:

> Dr. La Vecchia's consulting company has published articles, financed by toxic industries, which come up with distorted conclusions, favourable to the industry that financed the article, and which deny harm caused by substances that have been recognized by IARC and the reputable scientific community as

[712] La Vecchia et al., *Role of stopping exposure and recent exposure to asbestos in the risk of mesothelioma*, Eur. J. Cancer Prevention 21(3):227-30 (2012).

> known carcinogens, such as diesel fumes. We believe that Dr. La Vecchia's conduct, as documented above, is incompatible with holding the position of Associate Editor of the European Cancer Prevention Organisation's official European Journal of Cancer Prevention and is incompatible with being a member of your organisation's International Advisory Board.
>
> - We therefore request that you terminate Dr. La Vecchia's position as Associate Editor of your journal and his position as a member of your International Advisory Board.
> - We furthermore urge you to publish a correction of the inaccurate information that was put forward in the article by Drs. La Vecchia and Boffetta.

La Vecchia and Boffetta ultimately admitted their false claims and requested the European Journal of Cancer Prevention publish the following:

> The authors would like to bring the reader's attention the conflicts of interest for their review paper (La Vecchia and Boffetta, 2012), and subsequent correspondence (La Vecchia and Boffetta, 2014). La Vecchia has acted as expert witness for the defendants or the judge in criminal trials involving occasional exposure to asbestos, on behalf of ENEL (Rome, Italy), Edison (Milan, Italy), Pirelli Tyres (Milan, Italy) and the Ordinary Tribunal of Turin (Italy). Boffetta has acted as expert witness for the defendants in a criminal trial involving exposure to asbestos in the manufacture of synthetic polymers and risk of mesothelioma (Edison, Milan, Italy).

This work was not conducted with the contribution of the Italian Association for Cancer Research as stated on page 229 and the authors withdraw this statement on the acknowledgement of funding.[713]

389. Another prime example of industry efforts to mislead the legitimate scientific community about the safety of chrysotile asbestos can be found in Ilgren et al. (2015).[714] Ilgren et al. (2015) falsely suggests that "[t]here is good evidence that crocidolite, amosite and tremolite are responsible for the alleged mesothelioma cases at Balangero. Myriad sources of naturally occurring and commercial amphibole asbestos exist in the region to account for the alleged cases." This paper clearly is an effort by asbestos industry consultants to cast doubt on the ability of chrysotile asbestos to cause mesothelioma. The lead author, Dr. Edward Ilgren, has consulted and testified for Union Carbide Corporation, a company that mined chrysotile asbestos that is claimed to be amphibole-

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[713] La Vecchia et al., *Role of stopping exposure and recent exposure to asbestos in the risk of mesothelioma: Erratum*, European Journal of Cancer Prevention 24:68 (2015).

[714] Ilgren et al., *Critical reappraisal of Balangero chrysotile and mesothelioma risk*, Epidemiology, Biostatistics and Public Health Vol. 12, Number 1 (2015).

free. Dr. Ilgren has been paid in excess of $78,035.34 by four different law firms that represent Union Carbide in asbestos litigation.[715]

390. In response to the, error-riddled article by Ilgren et al. (2015) discussing asbestos disease in Balangero, Italy, several criticisms have pointed out serious problems of the industry-sponsored, industry-aligned publication. Magnani et al. (2015)[716] pointed out the following problems:

a. Ilgren et al.'s attempt to blame tremolite was incorrect because tremolite is not present in Balangero and "[e]xamination of several samples of chrysotile from the mine ruled out the presence of contamination with fibrous amphibole at detectable concentrations;
b. Ilgren et al.'s claim that Balangero miners were exposed to crocidolite was unsupported and contrary to geologic evidence from the region;
c. Ilgren et al.'s claim that recycled jute bags that previously contained crocidolite were used at Balangero was not supported by the reference in Ilgren et al.'s paper;
d. Ilgren et al.'s claim that lung burden studies of Balangero miners showed high levels of amphibole was false. The referenced samples, as Ilgren's co-author Dr. Fred Pooley knew because he performed the analysis, were of "unnamed lung samples sent for analytical comparison" and not Balangero miners.

These authors properly concluded, "[i]n summary, [the] Ilgren et al. paper is an example of a poor quality paper, with no scientific content, that a scientific journal should never publish."

391. On July 17, 2015, I joined more than twenty (20) scientists and physicians in raising important, undisclosed conflicts of interest in an article by several asbestos industry consultants and lobbyists that was published in Epidemiology, Biostatistics and Public Health.[717] Specifically, we pointed out that:

- In July 2014, Pooley testified as an expert witness on behalf of Union Carbide Company in asbestos litigation regarding harm caused by chrysotile asbestos. In this court case Pooley confirmed that he has testified in asbestos-related personal injury litigation on behalf of Lorillard, U.S. Gypsum, Bethlehem Steel and other companies that he could not remember and that over a 30 to 40 year period, he has testified on behalf of defendant companies a hundred to two hundred times.

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[715] Union Carbide Corporation's Supplemental Objections And Responses To Plaintiff's Second Set Of Interrogatories Dated August 9, 2007 in *Nicollela v. Banner Supply Co. et al.*, In the Circuit Court the 11th Judicial Circuit in and for Miami-Dada County, Florida (September 21, 2007).

[716] Magnani et al., *Letter to the Editors [re Ilgren et al. (2015)]*, Epidem. Biostatistics and Public Health, 12(3) (2015).

[717] Ilgren et al., *Critical reappraisal of Balangero chrysotile and mesothelioma risk*, Epidemiology, Biostatistics and Public Health Vol. 12, Number 1 (2015).

- Hoskins receives financing from asbestos industry organizations to travel the world promoting the use of chrysotile asbestos and carries out political lobbying activities on behalf of the asbestos industry.

- Ilgren, Hoskins and Kumiya, together with the consulting company RJ Lee Group, were involved in a project claiming that high levels of exposure to crocidolite asbestos caused no harm to workers in Bolivia.

In addition, we alerted the editors of Epidemiology, Biostatistics and Public Health that Carlo La Vecchia, one of the Editors-in-Chief of the journal had failed to disclose his own serious conflicts of interest. All the more troubling was the statement in the article expressing "extreme thanks" to La Vecchia and others for data used in the publication. We also urged the Italian Society of Medical Statistics and Clinical Epidemiology, the owner of Epidemiology, Biostatistics and Public Health, to adopt more rigorous policies regarding disclosure of conflicts of interest.

392. In response to the, error-riddled article by Ilgren et al. (2015)[718] discussing asbestos disease due to Bolivian chrysotile, Magnani, et al (2016)[719] have pointed out serious problems of the industry-sponsored, industry-aligned publication:

- Ilgren et al. (2015) referenced three publications (by Ilgren's co-authors) "that are referenced as 'On line first' but cannot be accessed as that scientific journal does not exist."
- "Ilgren et al stated that mesothelioma occurrence is low in Cochabamba and suggests a probable explanation in "...fibre width and/or a threshold exposure limit...". The conclusion is not supported by reliable data."
- "Ilgren et al claimed alternative explanations for the figures presented by Maule et al (7) on mesothelioma in Casale, with no reference. We requested the supporting data, obtaining five Google maps regarding 5 cases, while 103 were included in Maule study. As the weakness was not demonstrated, the statement should be retracted."
- "Ilgren et al stated that the paper was written within a judicial case. That might explain the rationale of such a weak and inconsistent document, targeted to an extra-scientific setting. It also explains the use of unclear statements difficult to understand and to contradict. In conclusion, this paper reports seriously misleading information and the journal should consider its retraction."

393. Ilgren et al.'s reliance on publications, purportedly by co-authors of the Ilgren et al (2016) publication, in a phony journal raises serious questions about scientific ethics and

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[718] Ilgren et al., *Further studies of Bolivian crocidolite-Part IV: Fibre width, fibre drift and their relation to mesothelioma induction: Preliminary findings*. Epidemiology Biostatistics and Public Health 12 (2), e11167 (2015).

[719] Magnani et al., *Comments on: Further studies of Bolivian crocidolite-Part IV: Fibre width, fibre drift and their relation to mesothelioma induction: Preliminary findings, by Ilgren EB, van Order DR, Lee RJ, Kamiya YM, Hoskins JA Epidemiology Biostatistics and Public Health 2015; 12 (2), e11167*, Epidem. Biostatistics and Public Health 13(1) (2016).

calls those authors' (and the authors of the phony publications) other published work into question. Ilgren, RJ Lee, Drew Van Orden and John Hoskins have a long history of acting as consultants in asbestos litigation, primarily, if not exclusively, for asbestos companies.

394. In one of Van Orden and RJ Lee's fake journal articles, the article was submitted to the phony journal, the Annals of Respiratory Medicine, on April 18, 2012 and accepted for "publication" on April 30, 2012.[720] This short timeframe between submission and acceptance suggests there was little or no meaningful peer review. Despite the fact that Drew Van Orden and RJ Lee are aware their publications appear in a phony journal, they continued to list these unpublished papers on the R.J. Lee Group, Inc. website as of April 26, 2016.

395. Other industry-aligned consulting companies have also turned to pay-to-publish, open-access journals that allow anyone to publish for a fee, with little or no peer review. For example, a recent article by Allen et al. (2016)[721] on the dangers of flavorings used in electronic cigarettes was criticized by Pierce et al. (2016).[722] Pierce et al. cited two of their own industry-sponsored publications from a journal called "Toxicology Reports."[723] In response to the Cardno-Chemrisk/industry-sponsored criticisms, Allen et al. (2016) observed:

> We further note that Pierce et al. (2015) and Gaffney et al. (2014) appear not to have been peer reviewed, based on the short time between submission and publication (received, revised and accepted all in 3 and 1 days, respectively). Also, the 2 papers are on the same topic, were received by the same journal within 2 days of each other, and contain 6 identical and 12 nearly identical sentences, although only 1 discloses the funding source as being from two companies involved in diacetyl litigation. Furthermore, the exposure data reported in Pierce et al. (2015) were collected not in a coffee shop but in a small kitchen with a very low

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[720] Van Orden et al., *The Size Distribution of Airborne Crocidolite Bolivian Fibers*, Annals of Respiratory Medicine AoRM 000:(000) Month 2012. The website listed for the journal, www.slm-respiratory.com was listed as for sale as of June 16, 2016.

[721] Allen et al., *Flavoring Chemicals in E-Cigarettes: Diacetyl, 2,3-Pentanedione, and Acetoin in a Sample of 51 Products, Including Fruit-, Candy-, and Cocktail-Flavored E-Cigarettes*, Environ. Health Perspectives 124(6) 733-739 (2016).

[722] Pierce et al., *Comment on "Flavoring Chemicals in E-Cigarettes: Diacetyl, 2,3-Pentanedione, and Acetoin in a Sample of 51 Products, Including Fruit-, Candy-, and Cocktail- Flavored E-Cigarettes"*, Environ. Health Perspectives 124(6) A100-A101 (2016).

[723] Gaffney et al., *Naturally occurring diacetyl and 2,3-pentanedione concentrations associated with roasting and grinding unflavored coffee beans in a commercial setting*, Toxicol Rep 2:1171–1181, doi:10.1016/j. toxrep.2015.08.003 (2015) and Pierce et al., *Characterization of naturally occurring airborne diacetyl concentrations associated with the preparation and consumption of unflavored coffee*, Toxicol Rep 2:1200–1208, doi:10.1016/j.toxrep.2015.08.006. (2015).

> ventilation rate that we calculate to be well below the ASHRAE minimum ventilation rates for cafeterias/fast food dining of 19 ft3/min/person (ASHRAE 2013).
>
> Pierce et al. attempt to minimize risks by comparing flavored e-cigarettes and coffee beans, commenting, "Unless one assumes that unflavored coffee beans pose a serious risk of 'popcorn lung,' a rare and oftentimes lethal disease, then one should agree that exposures to airborne diketone levels above the NIOSH and ACGIH OELs are not necessarily indicative of respiratory risk." They do not seem to be aware that, in fact, several workers at a coffee processing workplace were recently diagnosed with bronchiolitis obliterans ("popcorn lung"), and NIOSH's investigation found a 2.7-fold elevated standard mortality ratio for obstruction for workers at this site (Bailey et al. 2015). The NIOSH investigation concluded that, "The exposure group working in both coffee flavoring and grinding/packaging of unflavored coffee areas had significantly lower mean ratio of forced expiratory volume in 1 s to forced vital capacity and percent predicted mid-expiratory flow than workers without such exposure," and "Current workers have occupational lung morbidity associated with high diacetyl and 2,3-pentanedione exposures, which were not limited to flavoring areas."

The authors of Pierce, et al (2015) (Jennifer Pierce, Anders Abelmann, Jason Lotter, Chris Comerford, Kara Keeton, and Brent Finley) and Gaffney et al. (2014) (Shannon Gaffney, Anders Abelmann, Jennifer Pierce, Meghan Glynn, John Henshaw, Lauren McCarthy, Jason Lotter, Monty Liong and Brent Finley) include numerous authors of asbestos-industry sponsored publications, including some of those funded by Ford Motor Company as part of its litigation strategy.

396. Industry-favoring Doubt Science is not limited to purportedly peer reviewed publications. Numerous industry-aligned researchers have published textbooks repeating the authors' industry favoring views. For example, Dr. John Craighead and Dr. Allan Gibbs have published a textbook repeating their litigation views on the causes of asbestos disease in the guise of a mainstream textbook. As one reviewer of Craighead and Gibbs textbook explained:

> The highly personalized approach also has its disadvantages, since most contributors take a narrative approach to presenting their opinions and conclusions. Given the many thousands of articles available on almost any topic in the asbestos debate, key issues must be derived from a systematic review of the available literature, such as the differences in carcinogenicity among fiber types, the derivation of safe occupational exposure levels, and the risk to public health posed by typical levels of environmental

> exposure. It is sometimes difficult to disentangle the rigid scientific conclusions from the personal viewpoints in discussions of controversial issues. In some chapters, strong convictions are presented as scientific facts, most notably in statements such as this one, from chapter 8, which asserts that mesotheliomas "occur rarely among persons exclusively exposed to 'chrysotile' and it is currently believed that 'pure' chrysotile does not cause the neoplasm," and this one, from chapter 13, which states that malignant mesothelioma "is developing in septuagenarians and octogenarians, whose only recognized consequential documented exposure to amphibole asbestos occurred during or shortly after World War II."
>
> Overall, this book is a rich source of historical facts and studies on asbestos and its diseases, yet highly personalized with strong individual viewpoints. It is less authoritative as a source for risk assessment and litigation issues.[724]

Textbooks are not always peer reviewed and therefore are more likely to contain the authors' beliefs based on the authors' experiences and perspectives. The potential for biases of the authors, along with the lack of peer review process for some medical textbooks, lead me to rely preferentially on peer reviewed original research and peer-reviewed review articles. Of course I will consider the opinions offered in textbooks, but I evaluate textbook opinions in light of the totality of the evidence available at the time I evaluate a medical or scientific position from a textbook.

397. Another, example of litigation biases adversely affecting the validity of scientific literature recently came to my attention: a World Health Organization monograph recently published gratuitously includes the litigation opinions of several of the industry-aligned authors on issues such as the ability of chrysotile to cause mesothelioma and the relative potency. Travis et al. (eds.), WHO Classification of Tumours of the Lung, Pleura, Thymus and Heart (4th edition), IARC: Lyon (2015). This text is not an official WHO position documents and the text specifically disclaims that the document represents the viewpoint of WHO, stating "the authors alone are responsible for the views expressed in this publication." *Id.* Inclusion of these authors' unsupported litigation positions about chrysotile asbestos is all the more unfortunate because WHO itself clearly takes the contrary position, officially concluding that chrysotile asbestos can cause mesothelioma of the pleura and peritoneum.[725] WHO's official position, in contrast to the corporate-aligned authors of the WHO Classification of Tumours monograph, is that "[m]esotheliomas have been observed after occupational exposure to crocidolite, amosite, tremolite and chrysotile, as well as among the general population living in the neighbourhood of asbestos factories and mines and in people living with asbestos

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[724] Burdorf, Book Review of *Asbestos and its Diseases*, N. Engl. J. Med. 359;5, 544-45 (2008).
[725] World Health Organization, *Chrysotile Asbestos*, available as of June 2, 2016 at http://apps.who.int/iris/bitstream/10665/143649/1/9789241564816_eng.pdf?ua=1 (2014).

workers . . . and [n]o threshold has been identified for the carcinogenic risk of asbestos, including chrysotile." *Id.*

398. Some authors have made efforts to expose Doubt Science. For example, Dr. David Egilman's papers, including *Exposing the "Myth" of ABC, "Anything But Chrysotile": A Critique of the Canadian Asbestos Mining Industry and McGill University Chrysotile Studies*, Am. J. Ind. Med. 44:540-557 (2003) and *Abuse of Epidemiology: Automobile Manufacturers Manufacture a Defense to Asbestos Liability*, Int. J. Occup. Environ. Med. 11:4 360-71 (2005) are reliable, peer-reviewed analyses that expose the weaknesses of industry-funded Doubt Science. While I may not agree with every sentence in Dr. Egilman's publications, his publications regarding asbestos and disease that I have reviewed, including the two mentioned in this paragraph, are the type reasonably relied upon by scientists such as myself when considering and evaluating the weight of the scientific evidence regarding asbestos and disease, including particularly chrysotile asbestos and disease.

XVII. Summary and Conclusions.

399. I agree with Stayner, et al (1996) that "review of both the toxicologic and epidemiologic literature strongly supports the view that occupational exposure to chrysotile asbestos is associated with an increased risk of both lung cancer and mesothelioma. . . . and the currently available scientific literature does not provide persuasive evidence for the hypothesis that tremolite contamination explains the mesothelioma excesses observed in the studies of chrysotile-exposed workers."[726] The evidence has only gotten stronger since 1996, when it was already overwhelming.

400. I believe that there is a background/ambient level of asbestos exposure that exists in the environment and I do not believe that background/ambient levels of exposure can be proven to cause mesothelioma by the method of comparative epidemiology. This is because there is no unexposed control group. However, if a person sustains asbestos exposures above background/ambient levels of exposure and develops mesothelioma it is my opinion that all of the exposures above those that the individual received from their "background" exposures contribute to the development of the mesothelioma as well as the "background" exposures, at much lower levels, make up part of the cumulative exposure.

401. While epidemiology can tell us what happens in a population of people with similar characteristics, it cannot tell us what happens within each individual within that population. Many potent environmental carcinogens only produce about 10% cancer in exposed individuals (i.e. cigarette smokers), which is similar for asbestos induced mesothelioma in the most heavily exposed population (i.e. insulators).[727] Various factors may affect this; one of the more important factors may be genetic or individual susceptibility.[728] Because of the nature of asbestos, the fact that epidemiology has detected an excess risk of mesothelioma at levels of exposure that can be reached in a few days of exposure, and that any occupational, para-occupational or domestic exposure to asbestos is by definition an exposure that is thousands of times greater than the minute levels of asbestos seen in the background ambient air, it is not necessary to numerically quantify an occupational or para-occupational exposure to asbestos before concluding that it caused or contributed to cause a mesothelioma. Rather, it is generally accepted that qualitative evaluation of the exposure as compared to background is sufficient.

402. In January of 1997, a group of nineteen experts from eight different countries met in Helsinki, Finland "to discuss disorders of the lung and pleura in association with asbestos and to agree upon state-of-the-art criteria for their diagnosis and attribution with respect to asbestos." These experts included pathologists, radiologists, occupational and pulmonary physicians, epidemiologists, toxicologists, industrial hygienists, and clinical

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[726] Stayner et al., *Occupational Exposure to Chrysotile Asbestos and Cancer Risk: A Review of the Amphibole Hypothesis,* Am. J. Public Health 86(2) (1996).
[727] Tomatis et al., *The role of asbestos fiber dimensions in the prevention of mesothelioma.* 13(1) Int'l J. Occup. Environ. Health. 64 (2007).
[728] *Id.*

and laboratory scientists specializing in tissue fiber analysis. Collectively, the group had "published over 1,000 articles on asbestos and associated disorders."[729]

403. In rendering criteria on the attribution of mesothelioma to asbestos exposure, the Consensus Panel considered the following generally accepted concepts regarding mesothelioma:

- The great majority of mesotheliomas are due to asbestos exposure.
- Mesothelioma can occur in cases with low asbestos exposure. However, very low background environmental exposures carry only an extremely low risk.
- About 80% of mesothelioma patients have had some occupational exposure to asbestos, and therefore a careful occupational and environmental history should be taken.
- An occupational history of brief or low-level exposure should be considered sufficient for mesothelioma to be designated as occupationally related.
- A minimum of 10 years from the first exposure is required to attribute the mesothelioma to asbestos exposure, though in most cases the latency interval is longer (e.g., on the order of 30 to 40 years).
- Smoking has no influence on the risk of mesothelioma.

Consensus Report, at p. 313. Relying on these medical facts, the Consensus Panel concluded that "all types of malignant mesothelioma can be induced by asbestos,"[730] and that "a history of significant occupational, domestic, or environmental exposure to asbestos will suffice for attribution." *Id.* Significantly, the Helsinki Criteria does not require a quantitative estimate of a patient's asbestos "dose" exceeding some undefined level in order to attribute mesothelioma to a given asbestos exposure. The Helsinki Consensus conclusion is that chrysotile asbestos causes mesothelioma.

404. Given the high likelihood that all or nearly all mesotheliomas are related to asbestos exposure, it is no surprise that the Helsinki criteria stated: "very low background environmental exposures carry only an extremely low risk."[731] Low risk is not zero risk and therefore any addition to the background exposure is medically significant.

405. As set forth in Welch et al. (2007), the mainstream approach to causation in individual is as follows:

> Examining the question of causation of disease in an individual generally involves four questions: 1) was the individual exposed to

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[729] Consensus Report: *Asbestos, asbestosis, and cancer: the Helsinki criteria for diagnosis and attribution*, Scand. J. Work Environ. Health. 23:311-6 (1997) ("Consensus Report").

[730] The Consensus Report also states that "amphiboles show[] greater carcinogenic potency than chrysotile," a statement that I do not believe is adequately supported by the weight of the reliable evidence.

[731] Consensus Report, *Asbestos, asbestosis and cancer: The Helsinki criteria for diagnosis and attribution*. Scand. J. Work Environ. Health. 1997; 23:311-316.

> a toxic agent 2) does the agent cause the disease present in the individual; 3) was the individual exposed to this substance at a level where disease has occurred in other settings; and 4) have other competing explanations for the disease been excluded?
>
> There is no reasonable dispute regarding Question 2—asbestos causes mesothelioma. Additionally, there are no well-accepted competing explanations in North America regarding mesothelioma that must be excluded, resolving Question 4. As a result, when considering the issue of causation of a mesothelioma, once an occupational or para-occupational exposure to asbestos has been established (Question 1), the sole question remaining for examination is whether the exposure or set of exposures of that individual is similar to exposures that have been documented to cause mesothelioma in others— Question 3. The mainstream scientific community is in consensus regarding the resolution of Question 3. As discussed above, there is no safe level of exposure to asbestos. Even exposure at current regulatory levels results in excess mesotheliomas. Accordingly, the consensus of the scientific community is that any occupational or para-occupational exposure to asbestos— even "brief or low-level exposures"—must be considered causal in an individual with a mesothelioma.[732]

406. I do not believe that exposure to a *single* asbestos fiber or a *single breath* of air containing asbestos fibers has ever caused a mesothelioma or any other asbestos related cancer or any non-malignant asbestos disease. Moreover, the concept that someone might be occupationally, para-occupationally or domestically exposed to a single fiber of asbestos or a single breath of asbestos contaminated air is nonsensical. As discussed above, a single day of exposure at the current OSHA legal limit of exposure results in hundreds of thousands of fibers being inhaled in a single eight hour day.

407. I believe that every occupational, para-occupational, environmental or domestic exposure contributes to the risk of developing mesothelioma. ***From a medical and scientific perspective, in a person with mesothelioma, it is my opinion that the cumulative exposure to asbestos contributes to the total dose of asbestos. The total cumulative exposure combines to raise the risk of disease and ultimately, in someone with the disease, to cause a patient's mesothelioma.*** Cumulative exposure is the scientifically accepted rubric for consideration of exposure levels and causation of mesothelioma and other asbestos related diseases. All of the numerous epidemiological studies cited in this affidavit utilize cumulative exposure when discussing risk – whether qualitatively or quantitatively. These are my medical and scientific opinions. I am not offering *legal* opinions about whether an exposure is "significant" or "substantial" within the meaning

[732] Welch et al., *Asbestos exposure causes mesothelioma, but not this asbestos exposure: an amicus brief to the Michigan Supreme Court.* Int. J. Occup. Environ. Health. 13:318–327 (2007).

of the law. I can only offer opinions about the *medical* and *scientific* significance of an exposure. Again, it must be remembered that an "exposure" is never a single fiber; as discussed throughout this affidavit, when someone breathes visible dust from an asbestos product, there may be millions or billions of asbestos fibers present.

408. Lung cancer and mesothelioma occur when asbestos fibers such as those described above cause genetic errors in epithelial cells lining the airways, or in mesothelial cells that form the lining of the pleural and peritoneal cavities. All the types of asbestos fibers, including chrysotile, have been shown to cause the chromosomal rearrangements and aneuploid condition that can lead to neoplastic transformation of epithelial and mesothelial cells. Asbestos damages DNA and causes cancers in both animal models and humans.

409. It is clear that multiple errors take place before cells are committed to developing cancerous clones. The damage to DNA may occur as soon as the fibers reach the target cells. In the case of mesothelioma, fibers that are transported to the pleura within hours or days after each exposure are taken up by the mesothelial cells and can rapidly cause genetic errors. If those errors are in genes that control cell growth, the door to the development of cancer has opened. The complete mechanism by which asbestos causes various types of cancer is still not fully known.

410. In an individual who has been diagnosed with a cancer, multiple mesothelial cells have accumulated a series of genetic errors over years until one of those cells, with the required set of mutations for that individual, loses control of normal growth and grows out as a clone into a deadly malignant mesothelioma. Cells with genetic errors are routinely removed from the body by natural defense mechanisms, but it may take only one epithelial or mesothelial cell with sufficient errors to escape detection and form the clone that brings the individual to the clinic, usually two to six decades after the first asbestos exposure, although exposures beginning as recently as ten years prior to diagnosis have been recognized by the consensus position of the scientific community to cause mesothelioma. Some mesotheliomas have been shown to develop quickly after asbestos exposures, most likely because of an increased susceptibility to developing genetic errors, or because of a reduced capacity to repair genetic damage, or, perhaps very high levels of exposure. All exposures to asbestos contribute to the development of the disease process, be it lung scarring, lung cancer, or mesothelioma. A few cases of mesothelioma have been reported with ten years of latency or on rare occasions less.[733] While deaths usually occur in months to three years, a few cases, for reasons not entirely known, show longer survival times.

411. Asbestos exposure often involves extremely small fibers released and inhaled in large amounts. But these enormously large amounts look, on paper, deceptively small. Even at a so-called "low" exposure rate – e.g., 0.01 fibers per cubic centimeter (f/cc), ten times lower than the current OSHA permissible exposure limit (PEL) of 0.1 f/cc – an unprotected person may inhale as many as 80 fibers per minute, 4,800 fibers per hour, 38,400 fibers per day, and 9,600,000 fibers in a 250 day working year. At the current

[733] Selikoff et al., Asbestos and Disease. Academic Press p. 265 (1978).

OSHA PEL of 0.1 f/cc, each of these numbers would be magnified by a factor of ten resulting in 800 fibers per minute, 48,000 fibers per hour, 384,000 fibers per day, and 96,000,000 fibers in a 250 day working year. Furthermore, it is recognized by OSHA that exposures at a level of 0.1 f/cc-y, the current PEL in the United States, excess cancer deaths will occur.[734]

412. A seemingly tiny measured amount of asbestos is actually a large number of individual asbestos fibers. As NIOSH has pointed out, the fibers are so small that "[y]ou can't see these fibers in the air – some asbestos particles are so small that nearly 200 of them would have to be bundled together to equal the diameter of one human hair."[735]

413. As Lemen documents, what some people consider "low level exposures" actually involve surprisingly high numbers of fibers: "Studies conducted by General Motors researchers of brake wear debris demonstrate that 90,000 asbestos fibers per ng remain in that dust [Williams and Muhlbaier, 1980]. Fibers less than 5 microns in length outnumber fibers greater than 5 microns in length by a ratio of 300:1. This translates to approximately 300 billion asbestos fibers greater than 5 mm per g of wear debris and 90 trillion asbestos fibers less than 5 mm."[736] An Exponent consultant, Jay Turim, disputed Lemen's interpretation of the General Motors data, concluding that the data "translates to approximately 87 million asbestos fibers greater than 5 μm/g of airborne wear debris and 26 billion fibers less than 5 μm."[737] I agree with Dr. Lemen's response to Mr. Turim:

> While I feel that I read the article correctly, only Muhlbaier and Williams know for sure, and, if I didn't read it correctly, I stand corrected. However, in either case, the true meaning of my article is not diminished, as with either reading, dust from brake wear debris contains millions of potentially respirable asbestos fibers even based on air samples evaluated by standard OSHA procedure counting fibers 5 μm in length [NIOSH 7400 method]. It is well recognized that the light microscopic examination of air or any other sample essentially cannot detect the majority of the chrysotile fibers in the sample due restrictions of the counting scheme.[738]

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[734] *See* Federal Register, Vol. 51, No. 119, June 20, 1986, Table 6, p. 22644.

[735] DHHS (NIOSH) Publication 97-162, pages 179-80, *DANGER asbestos – Working on brakes? Think about this . . .* (1990).

[736] Lemen, *Asbestos in brakes: exposure and risk of disease*. Am. J. Ind. Med. 45(3):229-237 (2004).

[737] Turim J., Letter to Editor – Correction to R. Lemen's Review Article, 'Asbestos in Brakes: Exposure and Risk of Disease'. Am. J. of Industr. Med. (2008).

[738] Lemen, Letter to the Editor: Re: *Reply to Jay Turim, PhD Letter of July 9, 2007 to the Editor Concerning 'Asbestos in Brakes'*, Am. J. of Industr. Med. (2008).

414. In cases of pleural mesothelioma, the predominant fiber found in the pleura is chrysotile fibers shorter than 5 microns.[739] Numerous studies have demonstrated mechanics who worked with asbestos-containing brakes without dust control measures were exposed to asbestos dust at levels thousands of times higher than what is seen in the ambient air -- particularly when compressed air or dry brushing is used to clean out the wear dust from old asbestos brakes.[740] In addition, the EPA, OSHA and other regulatory agencies throughout the country have issued guidance documents to reduce the risk of disease from asbestos exposure during brake work.[741]

415. In determining the relative contribution of any exposures to asbestos above background levels, it is important to consider a number of factors, including: the nature of exposure, the level of exposure and the duration of exposure, whether a product gives off respirable asbestos fibers, the level of exposure, whether a person was close to or far from the source of fiber release, how frequently the exposure took place and how long the exposure lasted, whether engineering or other methods of dust control were in place, and whether respiratory protection was used.

416. I utilize a linear dose-response model for risk assessment that has been used by OSHA, NIOSH and other governmental entities for more than two decades, to reach my opinion that a patient's mesothelioma was caused by the patient's total and cumulative exposure to asbestos. The linear dose-response model is a conservative model and some risk assessments show a supralinear dose response (i.e. there is a greater per unit risk at lower doses).[742] As discussed above, I rely upon the *methodology* of attribution espoused in the

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[739] Suzuki et al., *Asbestos Fibers Contributing to the Induction of Human Malignant Mesothelioma.* Ann. N.Y. Acad. Sci. 982:160-176 (2002).

[740] Sakai et al., *Asbestos Exposures During Reprocessing of Automobile Brakes and Clutches.* 12(2) Int. J. Occup. & Environ. Health 95,95-105 (2006); Lorimer et al., *Asbestos exposure of brake repair workers in the United States.* 43(3) Mt. Sinai J. Med. 207, 207-18 (1976); Rohl et al., *Asbestos Exposure During Brake Lining Maintenance and Repair.* 12 Environ. Res. 110, 110-28 (Aug. 1976); Hickish et al., *Exposure to Asbestos During Brake Maintenance.* 13(1) Ann. of Occup. Hyg. 17, 17- 21(1970).

[741] *See e.g., Occupational Exposure to Asbestos, supra* note 7; Environmental Protection Agency ("EPA"), *Current Best Practices for Preventing Asbestos Exposure Among Brake and Clutch Repair Workers,* EPA 747-F-04-004 (Mar. 2007); OSHA, *Asbestos-Automotive Brake and Clutch Repair Work. 2006;* SHIB 07-26-2006; Wash. State Department of Labor & Indus., *Working Safely with Asbestos in Clutch and Brake Linings.* F41 3-049-000, Olympia WA, Wash. State Department of Labor & Indus. (2001); N.H. Pollution Prevention Program, *Pitstops Manual: Best Management Practices for Automobile Service Facilities* (2001); Worksafe Alberta, *Control of asbestos during brake maintenance and repair,* Department of Human Res. & Emp't, Gov't of Alberta (2004); Minnesota Pollution Control Agency, *Facts About Controlling Brake Dust to Protect Your Health, What Every Mechanic Should Know* (1998).

[742] Berman et al., *Update of Potency Factors for Asbestos-Related Lung Cancer and Mesothelioma,* Crit. Rev. Toxicol. 38: (Suppl 1)1–47 (2008). These authors recognized "if the true exposure response for mesothelioma is supralinear, this would have important implications for efforts to estimate risk from low exposures." *Id.* at 13.

Consensus Report, Asbestos, Asbestosis, and Cancer: The Helsinki criteria for diagnosis and attribution, commonly known as the "Helsinki Criteria", as applied to the factual evidence of a patient's exposures.[743] The Helsinki Criteria is well-recognized as a reliable approach to attributing mesothelioma to specific asbestos exposures, as illustrated by the recent statement on the issue by 58 Scientists Brief:

> Internationally respected asbestos disease specialists reached a scientific and medical consensus, originally in 1997[744] and reaffirmed in 2014,[745] on the requirements for experts to attribute a given mesothelioma to asbestos exposure. The original 1997 committee consisted of 19 participants of various disciplines from eight (8) countries not producing asbestos, with over 1000 articles published between them. The resulting "Helsinki Consensus" agreed with the traditional generally accepted approach in occupational medicine that "a history of significant occupational, domestic or environmental exposure will suffice for attribution."[746]

417. It is my opinion that mesothelioma is a dose-response disease and that the resulting disease is the cumulative result of all of the exposures to asbestos that a person receives. The cumulative exposure that a mesothelioma patient has received in their lifetime has caused impact to the lungs, has overwhelmed the body's defense mechanisms, brought about genetic changes, and has caused mesothelioma or other cancers at whatever site it develops.

418. This process takes place as fibers inhaled into the lungs are transported to the pleura or other tissue and cause injury there, including injury to the mesothelial cells, regeneration of mesothelial cells, and genetic changes to mesothelial cells caused by interaction between the asbestos fibers and the chromosomes of those individual cells. In a person who develops a mesothelioma, there will eventually be a conversion of one or more of those mesothelial cells to a malignant phenotype, which then eventually grows into a tumor that presents clinically as a mesothelioma.

419. The more asbestos fibers inhaled into the lung, the more likely it is that more of them will be translocated to the pleura. Of course, some of the fibers inhaled may be removed by the mucociliary escalator, some fibers will be deposited in the alveolar spaces and some

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[743] Consensus Report, *Asbestos, Asbestosis, and Cancer: The Helsinki criteria for diagnosis and attribution.* Scan J. Work Environ Health, 23:311-6 (1997). While I do not agree with every sentence of the Helsinki Criteria, I do agree with the approach to attribution of causation set forth therein.

[744] Consensus Report, *Asbestos, Asbestosis, and Cancer: The Helsinki criteria for diagnosis and attribution.* Scan J. Work Environ Health, 23:311-6 (1997).

[745] Wolff et al., *Consensus Report: Asbestos, Asbestosis, and cancer, the Helsinki Criteria for Diagnosis and Attribution 2014: Recommendations*, 41(1) Scand. J. Work Environ. Health 5 (2015).

[746] 58 Scientists p. 8.

may be taken up by macrophages. Other fibers may work their way into the interstitium or make their way to the lymph nodes. But there are fibers from each exposure that may make their way to the pleura, which is comprised of mesothelial cells – the target cells for mesothelioma. Additionally, asbestos fibers that do not reach the tumor site can and do release cytokines that may affect cell division. Because at its simplest definition, cancer is uncontrolled cell divisions, even asbestos fibers that do not reach the tumor site may play a role in causing or accelerating cancer. There is evidence that exposure to asbestos increases the rate of cell division, and so can be considered both an initiator and a promoter.

420. If a person is exposed to fewer asbestos fibers, then there will be fewer fibers that ultimately make their way to the pleura. Conversely, if a person is exposed to more asbestos fibers, there will be more fibers that make their way to the pleura. This is the nature of the dose-response relationship between asbestos exposure and mesothelioma: the more asbestos exposure a person has, the greater the chance of developing mesothelioma. In a person who develops mesothelioma, that disease is the result of the cumulative amount of asbestos and the risk of getting the disease increases with each exposure.

421. This affidavit represents a summary of my opinions based on my education, training, and experience and on the literature and documents cited. While I do not agree with every sentence of every document cited herein, these publications are authoritative for the propositions for which I cited them. Many of these articles, publications, and documents are cited by myself and other authors in published, peer-reviewed publications. I believe these publications are generally reliable, although I may not agree with every sentence in a publication, and are of the type relied upon by legitimate experts in asbestos and asbestos-related disease.

Arthur L. Frank MD

SWORN TO AND SUBSCRIBED
before me this 20th day of Dec, 2016.

Tiffany M. Cooper
NOTARY PUBLIC

My commission expires: July 28, 2018

(SEAL)

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CG 4/3/80

14637

VIA SHIP COLLECT
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MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0001	1D5604000B2 KN 50001500 LOC EE17-12-6 ++ TAG 202-220083	VRC PLUG,VALVE 1/4 IN S30400/17G14 3484	1		
0002	1E391746172 KN 07006670 LOC EE10-01-6 ++ TAG 202-220093	VRC PLUG,VALVE 1/4 IN METAL SEAT S41600,HT 3584	3		
0003	1E398146172 KN 07008290 LOC EE10-08-6 ++ TAG 202-220103	VRC PLUG,VALVE 3/4-1 IN METAL SEAT S41600,HT 3584	1		
0004	1P696235072 KN NS LOC ++ TAG 202-220113	VRC PLUG TIP 3/4-2 IN,3/4 ORF S31600,20B20 3557	1		
0005	1U288746172 KN 15016985 LOC AA20-38-6 ++ TAG 202-563773	VRC PLUG,M-FORM 1/2-2 IN VSC 1L3750 1/2 ORIF S41600,HT 3584	1		
0006	1U844235072 KN 15000854 LOC AA20-38-3 ++ TAG 202-564113	VRC PLUG,3 FLUTE 1/2-2 IN VSC 1L3750 1/2 ORIF S31600,20B20 3557	2		

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ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 1			
0007 1V657346172 KN 15073320 LOC AA18-32-7 ++ TAG 202-220123	VRC PLUG,BAL 1 1/2 IN 1 7/8 ORIF VSC 1L375 S41600,HT 3584	1		
0008 1V657546172 KN 15116112 LOC AA24-47-6 ++ TAG 202-563813	VRC PLUG,BAL 2 IN 2 5/16 ORIF VSC 1L5000 S41600,HT 3584	2		
0009 1V658146172 KN 16104410 LOC AA17-48-5 ++ TAG 202-563993	VRC PLUG,BAL 4 IN 4 3/8 ORIF VSC 1L5000 S41600,HT 3584	1		
0010 2U4891X0012 KN NS LOC ++ TAG 202-220163	VRC PLUG/STEM,M-FORM 1 IN 1/4 ORF FOR STD BNT 316/#6-316SST	1		
0011 2U7537X0012 KN NS LOC ++ TAG 202-220173	VRC PLUG/STEM,M-FORM 2 IN 1/2 ORF 3/4 DIA X 15 3/8 316 #6 S&G-316	1		
0012 2U9452X0012 KN NS LOC ++ TAG 202-220183	VRC PLUG/STEM ASSY 1 IN M-FORM 3/8 ORIF 1/2 STEM 316 & #6/316	2		

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ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
0013	2U868446422 VRC PLUG,M-FLUTE,3F KN 15021550 1/2-2 1/4 ORF 1L3750 COCR-A T LOC AA20-38-5 S31600/COCR-A 3434 ++ TAG 202-220193	1		
0014	11A5239X012 VRC PLUG,VALVE KN 16104219 4 3/8 ORIF VSC 1L7500 LOC AA18-45-5 S41600,HT 3584 ++ TAG 202-220203	1		
0015	14A2839X0A2 VRC PLUG/STEM/RING ASSY KN NS 2 IN,1 ORF 1L7500X17 ACT LOC 440C HT/316 ++ TAG 202-220223	2		
0016	20A2641X012 VRC PLUG,BAL KN 17097005 6,4 3/8 ORIFICE 1L5000 VSC LOC AA29-34-4 S41600,HT 3584 ++ TAG 202-564073	2		
0017	20A2642X012 VRC PLUG,BAL KN 17097007 6 IN,7 IN ORF,VSC 1L7500 LOC AA16-36-7 S41600,HT 3584 ++ TAG 202-564133	5		
0018	20A4103X012 VRC PLUG,VALVE KN NS 3 IN VSC 1L3750 1 5/16 ORIFIC LOC S41600,HT 3584 ++ TAG 202-220233	1		

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ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0019	20A9533X012 KN 17091012 LOC AA29-34-2	VRC PLUG,VALVE 3 IN VSC1L5000 2 7/8 ORIFICE S41600,HT 3584	2		
	++ TAG 202-564193				
0020	21A5356X012 KN 17163011 LOC AA21-23-5	VRC PLUG,VALVE 8 ORIF VSC 1L7500 S41600,HT 3584	1		
	++ TAG 202-220243				
0021	24A1141X022 KN NS LOC	VRC PLUG/STEM ASSY 7 ORF 6 TRAV VSC1L7500 24 5/8 420 HT49-52/316	1		
	++ TAG 202-220263				
0022	1K587635162 KN 15130087 LOC AA25-43-6	VRC STEM,PLUG VSC 1L7500 15 1/4 S31600,B,G&P 3516	1		
	++ TAG 202-220273				
0023	1K588035162 KN 17165050 LOC AA25-42-2*	VRC STEM,PLUG VSC 1L7500 X 19 3/8 S31600,B,G&P 3516	1		
	++ TAG 202-220283				
0024	1R288535162 KN 15131755 LOC AA27-38-8	VRC STEM,PLUG 3/8 IN X 8 3/4 VSC 1L3750 S31600,B,G&P 3516	1		
	++ TAG 202-569273				

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TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 4			
0025 1U223635162 VRC STEM,PLUG KN 15131760 3/8 IN X 9 3/8 VSC 1L3750 LOC AA27-38-7* S31600,B,G&P 3516 ++ TAG 202-569593		1		
0026 1U226335162 VRC STEM,PLUG KN 16137910 1/2 IN X 16 1/4 VSC 1L5000 LOC AA27-36-4 S31600,B,G&P 3516 ++ TAG 202-569173		1		
0027 1U294135162 VRC STEM,PLUG KN 04016248 3/4 X 17 IN,VSC 1L7500 LOC 482152 S31600,B,G&P 3516 ++ TAG 202-220303		2		
0028 1U531035162 VRC STEM,PLUG KN 15133010 1/2 X 15 5/8 VSC 1L5001 LOC AA27-36-7 S31600,B,G&P 3516 ++ TAG 202-569313		1		
0029 1U928235162 VRC STEM,PLUG KN NS 3/4IN 21IN ACT 1L7500 4-1/4-I LOC S31600,B,G&P 3516 ++ TAG 202-220373		1		
0030 1V430535072 VRC STEM,PLUG KN 15146038 1/2-1 1/2 3/8 STEM 1/4 ORIF LOC AA27-35-4 S31600,20B20 3557 ++ TAG 202-22033		1		

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ITEM			QUANTITY ORDERED	QUANTITY SHIPPED
		CONTINUED FROM PAGE 5		
0031	1V431335072 VRC STEM,PLUG KN 15146052 1/2-1 1/2 3/8 STEM 3/4 ORIF LOC AA27-35-8 S31600,20B20 3557 ++ TAG 202-220343		1	
0032	1QA3641X012 VRC STEM,PLUG KN 01115520 1/2 X 11 7/8 VSC 115003 LOC AA25-25-2 S31600,8,G&P 3516 ++ TAG 202-220353		1	
0033	1B561235072 VRC PIN,GROOVE,TYPE B KN 04115050 3/32X1/4 LOC LB08-05-5 S31600 3507 ++ TAG 202-220393		2	
0034	1D269635072 VRC PIN,GROOVE KN 17165155 3/16 X 1 3/4 LOC AA27-45-6 S31600,20B20 3557 ++ TAG 202-568973		1	
0035	1K249838992 VRC PIN,GROOVE KN 17151585 LOC AA27-45-5 S31600,20B20 3557 ++ TAG 202-220473		1	
0036	1V322635072 VRC PIN,GROOVE KN 15139990 3/32 X 13/16 LOC AA27-41-5 S31600,20B20 3557 ++ TAG 202-220523		2	

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ITEM			QUANTITY ORDERED	QUANTITY BACK ORDERED	QUANTITY SHIPPED
		CONTINUED FROM PAGE 6			
0040	1H937906892 KN 04020240 LOC AA12-29-1*	VRC BOOT 30-60 NEOPRENE-BLACK	3		
	++ TAG 202-220553	0531			
0041	1P585899012 KN 04051760 LOC LB02-10-5	VRC BEARING,NEEDLE 5/8X13/16X3/4 CARBON STEEL	1		
	++ TAG 202-220643	2899			
0042	1P594299012 KN 04052860 LOC LB05-01-5	VRC BEARING,NEEDLE 1 3/8X1 5/8X1 CARBON STEEL	1		
	++ TAG 202-220653	2899			
0043	1P571999012 KN 04050840 LOC LB06-14-4	VRC BEARING,NEEDLE 1X1 1/4X1 CARBON STEEL	1		
	++ TAG 202-220663	2899			
0044	1P930699012 KN 04085700 LOC LB05-12-5	VRC BEARING,NEEDLE 1 3/4X2 1/8X1 1/2 CARBON STEEL	1		
	++ TAG 202-567753	2899			
0045	1R446200GA2 KN 04012122 LOC LB04-11-4	VRC BEARING ASSY 5/8 SST-STL	1		
	++ TAG 202-220683				

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ITEM			QUANTITY ORDERED	BALK ORDERED	SHIPPED
	CONTINUED FROM PAGE 7				
0046	1R591947812 KN 04117750 LOC LB10-07-2 ++ TAG 202-220703	VRC BEARING BEARING S31600/30B5 35BN	1		
0047	1R593247812 KN 04117840 LOC LB09-13-3 ++ TAG 202-220713	VRC BEARING 8 & 10-150 LB S31600/30B5 35BN	1		
0048	1R595547812 KN 04117950 LOC LB09-01-4 ++ TAG 202-220723	VRC BEARING 4-150 LB S31600/30B5 35BN	1		
0049	1R663028992 KN 04119560 LOC LB08-03-2 ++ TAG 202-220743	VRC BEARING,NEEDLE 1 1/16X1 5/16X5/8 CARBON STEEL 2899	1		
0050	2R4404000A2 KN 04012115 LOC LB05-14-4 ++ TAG 202-220763	VRC BEARING ASSY 3/4 STL CD PL-SST	1		
0051	10A2909X012 KN 15130213 LOC AA29-42-6* ++ TAG 202-568513	VRC BAFFLE,STEM GUIDE 1-2 IN 1/2 STEM STL G10180 2449	1		

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SHIP COLLECT
VIA ROADWAY
MARK E-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BALC. BACKORD.	SHIPPED
	CONTINUED FROM PAGE 8				
0052	10A2910X012 VRC BAFFLE,STEM GUIDE KN 15180113 1-1 1/2 IN 3/8 STEM LOC AA29-42-7* STL G10180 2449 ++ TAG 202-220783		1		
0053	1R872332012 VRC BOURDON TUBE ASSY KN 09005510 600 PSIG/ 4,000 KPA LOC PP10-14-6 STL G41300 3201 ++ TAG 202-220793		1		
0054	10A0618X012 VRC BOURDON TUBE ASSY KN 09005435 60 PSIG/ 400 KPA LOC PP10-18-6 STL G41300 3201 ++ TAG 202-220803		1		
0041	1P871947812 VRC GUIDE POST BUSHING KN 04091420 7/8 X 1 1/4 X 3/4 LOC 482047 S31600/3085 358N ++ TAG 202-220883		1		
0042	1R883247812 VRC GUIDE POST BUSHING KN 04091960 1 1/4 X 1 5/8 X 1 1/4 LOC 482045* S31600/3085 358N ++ TAG 202-220903		1		
0043	1R664447812 VRC GUIDE POST BUSHING KN 04119660 12-150 LB LOC 482044 S31600/3085 358N ++ TAG 202-220913		1		

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	TAG QUOTED	SHIPPED
	CONTINUED FROM PAGE 9				
0064 1R659147812 KN 04119210 LOC LB08-06-5	VRC BUSHING 5/8 X 7/8 X 1 7/16 S31600/30B5	35BN	2		
++ TAG 202-220923					
0065 1U105847812 KN 04055085 LOC LB05-15-3	VRC BUSHING 2 1/8 X 2 13/16 X 3 3/8 S31600/30B5	35BN	2		
++ TAG 202-563533					
0066 T10546X00A2 KN NS LOC	VRC DIAPHRAGM ASSY STL/TFE/316/NIT		1		
++ TAG 202-220943					
0067 0W019902192 KN 53015920 LOC EE07-01-5*	VRC DIAPHRAGM HIGH PRESSURE NEOPRENE 17E43	0219	1		
++ TAG 202-220953					
0068 1D387036012 KN 53019800 LOC EE16-03-5*	VRC DIAPHRAGM S30200,SPG T	3601	5		
++ TAG 202-220983					
0069 1E390536012 KN 07008180 LOC EE10-09-4	VRC DIAPHRAGM 3/4-1 IN S30200,SPG T	3601	2		
++ TAG 202-220993					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 10				
0070	1E393936012 KN 07006570 LOC EE10-03-6 ++ TAG 202-221003	VRC DIAPHRAGM 1/4 IN S30200, SPG T 3601	6		
0071	1E399902112 KN 07008040 LOC EE10-09-6 ++ TAG 202-221013	VRC DIAPHRAGM 3/4-1 IN NEOPRENE 17E42 0211	2		
0072	1F581424102 KN 06008630 LOC AA12-50-4 ++ TAG 202-221023	VRC DIAPHRAGM ROD SIZE A - 60 1/2 IN STEM STL G12144/PL 2414	1		
0073	1F725102192 KN 06008800 LOC AA13-40-8 ++ TAG 202-221033	VRC DIAPHRAGM SIZE 3A & 4A NEOPRENE 17E43 0219	1		
0074	1R637502202 KN 05002595 LOC AA05-49-7 ++ TAG 202-221073	VRC DIAPHRAGM SIZE 80 NITRILE 17E44 0220	1		
0075	2E791902202 KN 05008310 LOC AA13-50-1 ++ TAG 202-221133	VRC DIAPHRAGM SIZE 30 NITRILE 17E44 0220	3		

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO.CATAWBA NUCL STA *****
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	PRICE ORDERED	SHIPPED
	CONTINUED FROM PAGE 11				
0076	2E859802202 KN 05009185 LOC AA13-43-4 ++ TAG 202-221183	VRC DIAPHRAGM SIZE 60 NITRILE 17E44 0220	1		
0077	2N130902202 KN 05000780 LOC AA04-41-6 ++ TAG 202-221203	VRC DIAPHRAGM SIZE 70 & 87 NITRILE 17E44 0220	2		
0078	10A0507X012 KN 53012581 LOC EE08-10-5 ++ TAG 202-221223	VRC DIAPHRAGM 3/4-1 IN NEOPRENE 17E42 0211	1		
0079	1C186000B2 KN 53014000 LOC EE07-05-6 ++ TAG 202-221233	VRC DISC HOLDER ASSY SST-NYLON	1		
0080	1C424800B2 KN 51008050 LOC EE31-08-2* ++ TAG 202-221243	VRC DISC HOLDER ASSY 3/4-1 1/4 IN ALUM/FMS 17G3	1		
0081	1D4684000B2 KN 53021240 LOC EE16-01-4* ++ TAG 202-221253	VRC DISC,VALVE ASSY 303/TFE	3		

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA *****
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BALK ORDERED	SHIPPED
	CONTINUED FROM PAGE 12				
0082	1D4684000C2 KN 53021260 LOC EE16-02-6	VRC DISC,VALVE ASSY 303-NYLON	2		
	++ TAG 202-221263				
0083	1E3996000B2 KN 07008510 LOC EE10-09-6	VRC DISC/HOLDER ASSY 3/4-1 IN COMP SEAT 416SS/FMS 17G10	2		
	++ TAG 202-221273				
0084	1P696103152 KN NS LOC	VRC DISC 3/4- 2 IN 3/4 ORIFICE NYLON FMS 17F6	1		
	++ TAG 202-221283	0315			
0085	1P729435072 KN 01009562 LOC AA12-08-5	VRC DISC RETAINER 1/2-2 IN 1/4 ORIF S31600,20B20	1		
	++ TAG 202-221293	3557			
0086	1V711533092 KN 16113732 LOC AA17-44-2	VRC DISC RETAINER 4 IN 316 SA-351-CF8M	1		
	++ TAG 202-567653	3309			
0087	1V711606242 KN 16113733 LOC AA17-45-8	VRC DISC 4 IN TFE FMS 17F3	1		
	++ TAG 202-568093	0624			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 13				
0088	1V711833092 KN 17139212 LOC AA16-46-8	VRC	DISC RETAINER 6 IN 316 SA-351-CF8M	1		
	++ TAG 202-221313		3309			
0089	1V711906242 KN 17139213 LOC AA16-45-8	VRC	DISC 6 IN TFE FMS 17F3	1		
	++ TAG 202-221323		0624			
0094	1E391646172 KN 07006650 LOC EE10-01-7	VRC	ORIFICE 1/4 IN METAL SEAT S41600,HT	3		
	++ TAG 202-221413		3584			
0095	1E398046172 KN 07008270 LOC EE10-08-7	VRC	ORIFICE 3/4-1 IN METAL SEAT S41600,HT	1		
	++ TAG 202-221423		3584			
0096	1E399535132 KN 07008450 LOC EE10-09-6	VRC	ORIFICE 3/4-1 IN COMP SEAT S41600-20B22	2		
	++ TAG 202-221433		3513			
0097	1C631238982 KN 04115080 LOC LB09-14-4	VRC	SCREW,CAP,HEX HD 5/16-18X5/8 18-8 SST	9		
	++ TAG 202-221453		3898			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 14					
0098	1H286206992	VRC	SEAL,OIL	1		
	KN 14022520		1 X 1 1/2 X 1/4			
	LOC EE18-11-4*		VENDOR			
			9998			
	++ TAG 202-221463					
0099	1P928141122	VRC	SEAL,SHIM	10		
	KN 04055320		10 IN 300LB			
	LOC LB05-13-4*		N04400MONEL19B3			
			4112			
	++ TAG 202-221473					
0100	1R592041122	VRC	SEAL,SHIM	8		
	KN 04117760		10-150 LB			
	LOC LB09-16-4*		N04400MONEL19B3			
			4112			
	++ TAG 202-221483					
0101	1R594541122	VRC	SHIN SEAL	8		
	KN 04117910		12-150 LB			
	LOC LB10-08-4		N04400MONEL19B3			
			4112			
	++ TAG 202-221493					
0102	1R662541122	VRC	SEAL,SHIM	6		
	KN 04119500		4-150 LB			
	LOC LB09-01-5*		N04400MONEL19B3			
			4112			
	++ TAG 202-221503					
0103	1R970736142	VRC	SEAL,BALL	1		
	KN 04055385		10 IN 150 & 300 LB			
	LOC LB05-11-5		S31600,SPG T			
			3614			
	++ TAG 202-221533					

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	DATE ORDERED	SHIPPED
	CONTINUED FROM PAGE 15				
0104	1V627805302 VRC SEAL,BALL KN 04095000 2 IN 150 LB-600 LB LOC LB10-11-6 RULON FMS 17F25 0530 ++ TAG 202-221553		2		
0105	1V628405302 VRC SEAL,BALL KN 04095010 4 IN 150 & 300 LB LOC LB03-12-5 RULON FMS 17F25 0530 ++ TAG 202-221563		1		
0106	1V628605302 VRC SEAL,BALL KN 04095015 6 IN 150 & 300 LB LOC LB04-15-3 RULON FMS 17F25 0530 ++ TAG 202-221573		1		
0107	1V629105302 VRC SEAL,BALL KN 04095025 10 IN 150 & 300 LB LOC LB05-17-6 RULON FMS 17F25 0530 ++ TAG 202-221583		2		
0108	1V629505302 VRC SEAL,BALL KN 04095030 12 IN 150 & 300 LB LOC LB06-10-6 RULON FMS 17F25 0530 ++ TAG 202-221593		1		
0109	1V629805302 VRC SEAL,BALL KN 04095040 16 IN 150 LB & 300 LB LOC LB06-08-6 RULON FMS 17F25 0530 ++ TAG 202-221603		1		

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ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 16					
0110	1V723941122 KN 04137710 LOC LB10-10-5*	VRC	SEAL,SHIM 2 IN 150 LB N04400MONEL19B3	13		
	++ TAG 202-221613		4112			
0111	1J872606332 KN 11008090 LOC AA28-50-3*	VRC	WIPER,UPPER 3/8 STEM FELT SAE F3	1		
	++ TAG 202-563233		0633			
0112	1J872706332 KN 11008100 LOC AA28-49-3*	VRC	WIPER,UPPER 1/2 STEM FELT SAE F3	1		
	++ TAG 202-563213		0633			
0113	1L487035402 KN 04010930 LOC LB05-07-4	VRC	WASHER 10 IN & 12 IN S17400,HT	1		
	++ TAG 202-221693		3540			
0114	1R664535402 KN 04119690 LOC LB10-17-4	VRC	WASHER 12-150 LB S17400,HT	1		
	++ TAG 202-221703		3540			
0115	1R672606412 KN 04119830 LOC LB08-05-5	VRC	WASHER 49/64X13/16X1/16 ARMALON 17F13	3		
	++ TAG 202-221713		0641			

WILL SHIP WEEK OF

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232.

SHIP TO: DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE.
TAG

ITEM			QUANTITY ORDERED	WEEK ORDERED	SHIPPED
	CONTINUED FROM PAGE 17				
0116 1U103606412	VRC WASHER		1		
KN 04051515	13/16X1 3/16X1/16				
LOC. LB02-09-3	ARMALON 17F13	0641			
++ TAG 202-221723					
0117 1U104806412	VRC WASHER		1		
KN 04053915	1 17/64X15/16X1/16				
LOC. LB04-13-4	ARMALON 17F13	0641			
++ TAG 202-221743					
0118 1U105406412	VRC WASHER		1		
KN 04052535	1 45/64X2 3/8X1/16				
LOC. LB05-01-5	ARMALON 17F13	0641			
++ TAG 202-221753					
0119 1U106006412	VRC WASHER		2		
KN 04055095	2 17/64X2 11/16X1/16				
LOC. LB05-11-3	ARMALON 17F13	0641			
++ TAG 202-567913					
0120 0W018404022	VRC GASKET		2		
KN 53014340	61/64X1 23/64X1/32				
LOC. EE07-06-6*	ASB-17A2/17A4	0442			
++ TAG 202-221793					
0121 0W018704022	VRC GASKET		1		
KN 53014300	1 25/64X1 7/8X1/32				
LOC. EE07-05-6*	ASB-NIT 17A4	0430			
++ TAG 202-221803					

WILL SHIP WEEK OF

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	CO. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE PWR CO.CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 18				
0122	1A832504032 VRC GASKET KN 51010940 1 3/8X1 39/64X1/16 LOC EE06-05-6* ASBESTOS 17A3 ++ TAG 202-221813	0403	1		
0123	1D372904122 VRC GASKET KN 53021200 2 1/4X3 1/4X1/32 LOC EE16-04-7 VITON FMS 17G33 ++ TAG 202-221873	0420	5		
0124	1D373004122 VRC GASKET KN 53021220 5/16X1 1/4X1/32 LOC EE16-04-7 VITON ++ TAG 202-221883	0638	5		
0125	1E390404022 VRC GASKET KN 07008170 8X8 63/64X1/32 LOC EE10-09-3 ASB-17A2/17A4 ++ TAG 202-221913	0442	1		
0126	1E394004022 VRC GASKET KN 07006580 3 3/4X4 15/64X1/32 LOC EE10-03-6 ASB-17A2/17A4 ++ TAG 202-227923	0442	3		
0129	1H281304012 VRC GASKET,TERM BOX KN 14022120 LOC EE18-12-3 FIBER 17F8 ++ TAG 202-228003	0401	1		

WILL SHIP WEEK OF

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO, CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

*****

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 19				
0130	1H282206992 KN 14022180 LOC EE18-03-3	VRC GASKET, COVER ACCOPAC	0416	1		
	++ TAG 202-228013					
0131	1H854703012 KN 05015072 LOC PP09-06-7	VRC GASKET, PEDESTAL NEOPRENE/17G1	0301	1		
	++ TAG 202-228053					
0133	1U504704302 KN 16137527 LOC AA17-43-6*	VRC GASKET 5X5 15/32X1/32 ASB-NIT 17A4	0430	1		
	++ TAG 202-565293					
0134	1P927299102 KN 04055220 LOC LB05-11-5	VRC GASKET, SPIRAL WOUND 3 9/16X4 5/16X1/8 316L SST & ASB	9910	2		
	++ TAG 202-565533					
0136	1R309999282 KN 15131280 LOC AA17-33-5	VRC GASKET, SPIRAL WOUND 2 9/16X3 1/16X.175 316L SST & ASB	9910	1		
	++ TAG 202-228103					
0137	1R310104022 KN 15131320 LOC AA17-32-4	VRC GASKET 2 1/2X3 17/32X1/32 ASBESTOS 17A2	0402	2		
	++ TAG 202-564993					

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP DUKE PWR CO,CATAWBA NUCL STA
TO %J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 20				
0138 1R372299442 KN 16137522 LOC AA17-47-6	VRC GASKET,SPIRAL WOUND 5 1/16X5 9/16X.175 INCONEL & GRAPH	9944	2		
++ TAG 202-228133					
0139 1R372304022 KN 16137530 LOC AA17-46-4	VRC GASKET 5X5 19/32X1/32 ASBESTOS 17A2	0402	4		
++ TAG 202-565053					
0140 1R384599282 KN 16137600 LOC AA21-45-5	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 316L SST & ASB	9910	1		
++ TAG 202-565413					
0141 1R578599102 KN 04117165 LOC LB10-05-5	VRC GASKET,SPIRAL WOUND 1 3/4X1 3/8X1/16 316L SST & ASB	9910	4		
++ TAG 202-228183					
0142 1U180704022 KN 04043040 LOC LB05-16-6	VRC GASKET 10X12 3/4X1/16 ASBESTOS 17A2	0402	1		
++ TAG 202-228223					
0144 1U508104302 KN 17139542 LOC AA16-43-6	VRC GASKET 9 11/64X7 11/16X1/32 ASB-NIT 17A4	0430	1		
++ TAG 202-228233					

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ACKNOWLEDGEMENT

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIPDUKE PWR CO,CATAWBA NUCL STA
TO %J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 21				
0145 1U508304302 KN 17139551 LOC AA16-47-8 ++ TAG 202-228243	VRC GASKET 8 17/32 X 7 11/16 X 1/32 ASB-NIT 17A4	0430	1		
0146 1U508599442 KN 17139562 LOC AA16-38-7 ++ TAG 202-565153	VRC GASKET,SPIRAL WOUND 7 27/32X8 1/2X.175 INCONEL & GRAPH	9944	1		
0147 12A4768X012 KN 14021724 LOC EE18-04-6 ++ TAG 202-228413	VRC GASKET,SLOT COVER ALL SIZES 350 MISC ELECTRONIC	EXXX	2		
0148 1J8225X0032 KN NS LOC ++ TAG 202-228323	VRC PACKING,RING 5/8X1X3/16 STYLE D110 ASB FOIL 17D9	0106	4		
0149 1P9295X0012 KN 04092548 LOC LB05-15-5 ++ TAG 202-228543	VRC PACKING,RING 2 1/8X2 5/8X1/4 STYLE D110 ASB FOIL 17D9	0106	2		
0150 1P9295X0092 KN NS LOC ++ TAG 202-228552	VRC PACKING,RING 2 1/8X2 5/8X1/4 GRAPH 17D19	0190	2		

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033. -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO, CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 22				
0151	1R2523X0032 KN NS LOC	VRC PACKING,RING 3/8X3/4X3/16 GRAPH 17D19	0190	4		
	++ TAG 202-228563					
0152	1V2396X0022 KN 16138505 LOC AA28-44-8	VRC PACKING,RING 3/4X1 3/8X5/16 GRAPH/17D16,17	019A	6		
	++ TAG 202-228613					
0153	1V920001652 KN NS LOC	VRC PACKING,RING 1 1/4X1 5/8X3/16 GRAFOIL	0165	3		
	++ TAG 202-228663					
0154	1V920101652 KN NS LOC	VRC PACKING,RING 1 11/16X2 1/16X3/16 GRAFOIL	0165	2		
	++ TAG 202-228673					
0155	1V949601652 KN 04055610 LOC LB06-05-6	VRC PACKING,RING 2 1/8X2 5/8X1/4 GRAFOIL	0165	3		
	++ TAG 202-228683					
0156	1V972801652 KN 04050480 LOC LB09-04-4	VRC PACKING,RING 5/8X1X3/16 GRAFOIL	0165	6		
	++ TAG 202 228693					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 23				
0157 13A4218X022 KN NS LOC	VRC PACKING,RING 3/8X3/4X3/16 GRAPH/17D16,17	019A	3		
++ TAG 202 228713					
0159 1H291706562 KN 14022700 LOC EE18-12-4*	VRC O-RING 2 5/8X2 7/8X1/8 NITRILE-DS52-2	065B	3		
++ TAG 202 230023					
0160 1H291806562 KN 14022720 LOC EE18-09-4*	VRC O-RING 1 1/4X1 1/2X1/8 NITRILE-DS52-2	065B	1		
++ TAG 202 230033					
0161 1H292006992 KN 14024060 LOC EE18-09-6*	VRC O-RING 1/4X3/8X1/16 NITRILE-DS52-2	065B	3		
++ TAG 202 230053					
0162 1H292106562 KN 14022740 LOC EE18-01-4*	VRC O-RING 2 1/4X2 1/2X1/8 NITRILE-DS52-2	065B	3		
++ TAG 202 230063					
0163 1H292706562 KN 14022760 LOC EE18-10-4*	VRC O-RING 1/2X11/16X3/32 NITRILE-DS52-2	065B	1		
++ TAG 202 230083					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP DUKE PWR CO,CATAWBA NUCL STA
TO %J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 27					
0182	1J505206992 KN 13012870 LOC AA23-08-4*	VRC RING,BACK-UP 2 1/4 ID X 2 5/8 OD TFE FMS 17F3	0624	2		
	++ TAG 202 230433					
0183	1N852435072 KN NS LOC	VRC SEAT RING 2X3/4 IN S31600,20B20	3557	1		
	++ TAG 202 230443					
0184	1P568435402 KN 04050340 LOC LB04-13-4	VRC RING,SPLIT 6 IN 2 HALVES PER SET S17400,HT	3540	1		
	++ TAG 202 -230453					
0185	1P582735402 KN 04051360 LOC LB02-10-4	VRC RING,SPLIT 3 IN 2 HALVES PER SET S17400,HT	3540	1	1	
	++ TAG 202 230473					
0186	1P590835402 KN 04052380 LOC LB05-03-4	VRC RING,SPLIT 8 IN 2 HALVES PER SET S17400,HT	3540	1		
	++ TAG 202 230483					
0187	1P926735402 KN 04055120 LOC LB05-11-4	VRC RING,SPLIT 10 IN 2 HALVES PER SET S17400,HT	3540	2		
	++ TAG 202 567513					

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MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO, CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

*****

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 28			
0188	1P928436042 KN 04042450 LOC LB05-13-3	VRC RING,BACK-UP 10 IN 300 LB FOR METAL SEAL S31600	1		
	++ TAG 202 230493	3604			
0189	1P929635072 KN 04055560 LOC LB05-14-5	VRC RING,LANTERN 2 1/8 X 2 5/8 S31600,20B20	1		
	++ TAG 202 567333	3557			
0190	1R580535402 KN 04117400 LOC LB08-06-5	VRC RING,SPLIT 2 & 3 IN 150 LB S17400,HT	4		
	++ TAG 202 230503	3540			
0191	1R659735072 KN 04119260 LOC LB08-04-5	VRC RING,LANTERN 5/8 X 1 S31600,20B20	2		
	++ TAG 202 230513	3557			
0192	1R672535072 KN 04119820 LOC LB08-06-6	VRC RING,RETAINING,SPLIT 2-3-150 LB S31600,20B20	3		
	++ TAG 202 230353	3557			
0193	1U103735072 KN 04051510 LOC LB02-09-3	VRC RING,RETAINING,SPLIT 3-300 LB S31600,20B20	1		
	++ TAG 202 230563	3557			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA.
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

*****

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 29					
0194	1U104935072 KN 04053910 LOC LB04-13-4	VRC	RING,RETAINING,SPLIT 6-300 LB S31600,20B20	1		
	++ TAG 202 230583		3557			
0195	1U105535072 KN 04052530 LOC LB05-02-4	VRC	RING,RETAINING,SPLIT 8-300 LB S31600,20B20	1		
	++ TAG 202 230593		3557			
0196	1U106135072 KN 04055090 LOC LB05-12-5	VRC	RING,RETAINING,SPLIT 10-300 LB S31600,20B20	2		
	++ TAG 202 230603		3557			
0197	1U106735072 KN 04056290 LOC LB06-12-4	VRC	RING,RETAINING,SPLIT 12-300 LB S31600,20B20	4		
	++ TAG 202 230613		3557			
0198	1U221505092 KN 15080200 LOC AA17-36-6	VRC	RING,PISTON 1 1/2 IN TFE/CARBON17F18	1		
	++ TAG 202 567373		0509			
0199	1U222946172 KN 16113700 LOC AA17-49-5	VRC	SEAT RING 4 IN S41600,HT	1		
	++ TAG 202 566753		3467			

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ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 30			
0200	1U225705092 KN 15127100 LOC AA23-47-6	VRC RING,PISTON 2 IN TFE/CARBON17F18	2		
	++ TAG 202 566793	0509			
0201	1U229905092 KN 16024300 LOC AA21-48-5	VRC RING,PISTON 2 1/2 IN TFE/CARBON17F18	1		
	++ TAG 202 230633	0509			
0202	1U234105092 KN 16057200 LOC AA19-47-5	VRC RING,PISTON 3 IN TFE/CARBON17F18	1		
	++ TAG 202 230653	0509			
0203	1U239105092 KN 16113900 LOC AA17-47-4	VRC RING,PISTON 4 IN TFE/CARBON17F18	1		
	++ TAG 202 566833	0509			
0204	1U274250332 KN 04016195 LOC AA18-21-6	VRC SEAT RING 2 IN,1/2 ORF,#6 SEAT S31600/COCR-A	1		
	++ TAG 202 566893	3434			
0205	1U285435072 KN 15030060 LOC AA19-37-6	VRC SEAT RING 1 IN X 1/2 ORIF S31600,20B20	3		
	++ TAG 202-567233	3557			

WILL SHIP WEEK OF

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

CONTINUED FROM PAGE 31

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0206	1U285535072 KN 15030160 LOC AA19-38-5 ++ TAG 202 230673	VRC SEAT RING 1 IN X 3/4 ORIF S31600,20B20 3557	1		
0207	1U506805092 KN 17139135 LOC AA16-45-4 ++ TAG 202 566813	VRC RING,PISTON 6 IN TFE/CARBON17F18 0509	2		
0208	1V642346172 KN 17129510 LOC AA16-42-2 ++ TAG 202 567173	VRC SEAT RING 8 X 4 IN 4 3/8 ORIF S41600,HT 3584	2		
0209	1V676446172 KN 17126810 LOC AA16-38-5 ++ TAG 202 567193	VRC SEAT RING 6 X 4 IN 4 3/8 ORIF S41600,HT 3584	1		
0210	1V903635072 KN 04100430 LOC LB10-10-3 ++ TAG 202 230803	VRC RING,BACK-UP 2 IN S31600,20B20 3557	2		
0211	2U855946052 KN 15030312 LOC AA19-38-8 ++ TAG 202 566853	VRC SEAT RING 1/2-1 1/4 ORF COCR-A SEAT S31600/COCR-A 3434	1		

WILL SHIP WEEK OF

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE PWR CO, CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 32			
0212 2V371946192 KN 17139210 LOC AA16-44-4	VRC SEAT RING 6 X 4 IN 410 SST/HT 3365	1		
++ TAG 202 567013				
0213 2V643946172 KN 17133510 LOC AA23-22-5	VRC SEAT RING 12 X 6 IN 7 IN ORIF S41600,HT 3584	3		
++ TAG 202 230813				
0214 10A2643X022 KN 17098025 LOC AA16-37-4	VRC SEAL RING/SPRING,RAD 6 11/16X7 1/16X3/16 HVY HAST C & TFE 9963	4		
++ TAG 202 230823				
0215 10A3389X012 KN 01115130 LOC AA25-22-7	VRC RING,BACK-UP 2 IN 2 5/16 ORIF ETH-PRO 17G38 0539	1		
++ TAG 202 230833				
0217 10A4207X012 KN 17086115 LOC AA29-32-7	VRC SEAL RING/SPRING,RAD 1 5/32X1 13/32X1/8 HVY HAST C & TFE 9963	1		
++ TAG 202 230853				
0218 10A4215X012 KN 17092050 LOC AA29-33-8	VRC SEAL RING/SPRING,RAD 2 19/32X2 31/32X3/16 HVY HAST C & TFE 9963	2		
++ TAG 202 567113				

WILL SHIP WEEK OF.

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FORM 2592 PRINTED IN U.S.A.

DPC_0551736

CONTINUED ON PAGE 34

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033.-62330		03/18/80	REPLACEMENT PARTS

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE PWR CO, CATAWBA NUCL STA
%J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 33			
0219	10A4223X012 VRC SEAL RING/SPRING,RAD KN 17098100 4 3/32X4 15/32X3/16 HVY LOC AA29-33-5 HAST C & TFE 9963 ++ TAG 202 566973	4	/	/
0220	12A3331X012 VRC RING,PISTON KN 17139162 12X6, 5 3/8 ORF LOC AA23-23-7 GRAPHITE 17F27 0544 ++ TAG 202 230923	1		
0221	21A4523X012 VRC SEAT RING KN NS 12X6 7 IN ORF 6 TRAV CAV 111 LOC S17400,HT 3540 ++ TAG 202 231053	1		
0222	1H286099012 VRC ELEMENT KN 14022480 LOC EE18-09-2* VENDOR 9998 ++ TAG 202 231083	1		
0223	1R672235072 VRC THRUST SPACER KN 04119800 10-150 LB LOC LB09-14-4 S31600,20B20 3557 ++ TAG 202 231123	1		
0224	1R841619042 VRC YOKE EXTENSION KN 05003628 SIZE 34 & 40 LOC AA09-37-1 CI F12101(30A) 1904 ++ TAG 202 231133	1		

WILL SHIP WEEK OF

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FORM 2317 PRINTED IN U.S.A.

DPC_0551737

CONTINUED ON PAGE 35

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-7728-73		033 -62330		03/18/80	REPLACEMENT PARTS

SOLD TO MIEL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE PWR CO,CATAWBA NUCL STA *****
J.W. HAMPTON/F-7728-73
STEAM PROD. DEPT. , HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP COLLECT
VIA ROADWAY
MARK F-7728-73
NOTE
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 34			
0225 14A5726X032	VRC BELLOWS ASSY,6-30PSI	1		
KN 09009315	PAINT RED FFS 6A19 PAINT NO.3			
LOC PP11-13-4	BRASS			
++ TAG 202. 220623				

WILL SHIP WEEK OF

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DPC_0551738

Jolly - Fisher Exh 940-0035

MILL-POWER SUPPLY COMPANY

Electrical Equipment and Supplies

EAL 4/4

PURCHASING DEPARTMENT

422 SOUTH CHURCH STREET

March 28, 1980

P. O. BOX 32307
CHARLOTTE, N. C. 28232

FisherControls Co.
C/O Robert E. Mason Co.
P.O. Box 33424
Charlotte, N.C. 28233

REQUEST FOR INFORMATION

Attention _____

Subject: Our Order F7728

Your Order 33-62329 & 62330

Location Newport, S.C.

Acknowledge Order & advise shipping date.

Advise current shipping schedule. Plug, Valve, etc...

When will balance of order be shipped?

Will your schedule of _____ be maintained?

Was your schedule of _____ maintained?

Advise current shipping schedules on the attached computer print-out & return to my attention.

This is SECOND request for information, reply immediately

Send us your invoice in Triplicate

Other

SIGNED Cindy Green

704-373- 5253

REPLY HERE Thank you

FOB. Coraopolis, Penna. parts are sched 4-5-80

FOB Manufacturer Iowa parts are sched 7/18/80

(OVER)

MP-200 DATE 4/2/80 SIGNED Jim Marshall

DPC 0551703

ROA_02982

Jolly - Fisher Exh 940-0036

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA 50158
AUTOMATIC CONTROL EQUIPMENT
SINCE 1880

Reply to: ROBERT E. MASON COMPANY, P.O. Box 33424, Charlotte, N.C. 28233 Phone (704) 375-4464

TRACE DESK
PLEASE NOTE & RETURN
E A L

April 3, 1980

EAL (ack dated 3/18)

MESS

Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

Attention: Mr. E. A. Lail

SUBJECT: Your Purchase Order No. F-7728-73

Dear Mr. Lail:

As per our recent telephone conversation, we indicated that the factory is reworking gasket sets available, particularly for high temperature, and as a result, we have eliminated items 132, 135 and 143 on your above order. These particular gaskets are no longer available. To supply correct packing sets to replace these items, we would need to know the valve model and serial numbers for which these parts are desired.

If you have further questions, please do not hesitate to contact this office.

Very truly yours,

FISHER CONTROLS COMPANY

James B. Marshall/bg

James B. Marshall
ROBERT E. MASON COMPANY
DIST. REP.

JBM/bg

DPC_0551700

Ed hailey
not complete
order

ORDER COMPLETE
EAL

CP
4/10

CG 5/1/80

April 30, 1980

146371

Steam Production Dept.
Building

ATTENTION: Mr. Gene Harwell
Catawba Station

SUBJECT: Req. 7330790308
Our order F7728-73
Fisher Controls Co.

We enclose, for your information, copy of letter received from Robert E. Mason Company dated April 3, 1980. Please review and advise how you wish us to proceed in this matter.

E. A. Lail

fs

Enclosure

DPC_0551701

Mr Lail

FISHER CONTROLS COMPANY

~~TRACE DESK~~ PLEASE NOTE & RETURN

MARSHALLTOWN, IOWA 50158

AUTOMATIC CONTROL EQUIPMENT
SINCE 1880

EAL

Reply to: ROBERT E. MASON COMPANY, P.O. Box 33424, Charlotte, N.C. 28233 Phone (704) 375-4464

[redacted]

April 3, 1980

EAL (ack dated 3/18)

7-18

SG 4/8

MESS

Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

Attention: Mr. E. A. Lail

SUBJECT: Your Purchase Order No. F-7728-73

Dear Mr. Lail:

As per our recent telephone conversation, we indicated that the factory is reworking gasket sets available, particularly for high temperature, and as a result, we have eliminated Items 132, 135 and 143 on your above order. These particular gaskets are no longer available. To supply correct packing sets to replace these items, we would need to know the valve model and serial numbers for which these parts are desired.

If you have further questions, please do not hesitate to contact this office.

Very truly yours,

FISHER CONTROLS COMPANY

James B. Marshall/bg

James B. Marshall
ROBERT E. MASON COMPANY
DIST. REP.

JBM/bg

DPC_0561702

Ed Cook

~~Pls expedite~~ Forwarded to Eng 12-16

FISHER CONTROLS COMPANY

PHONE: (412) 264-3010
TWX: 710-793-3616
TELEX: 086-785
CORAOPOLIS, PENNSYLVANIA 15108

PAGE 1 OF 1

CC NO.	CUSTOMER NO.	PRODUCT CODE	TERR. NO.	
AK125-T	412 2 810			

REPRESENTATIVE ORDER NO.	RECEIVED	ENTERED	EXPORT BOX / SUBJ. TO INSP. / CUST. DATA / HOLD FOR DWG. APPL.	QUOTED SHIP DATE	QUOTE NO.
33-65486-B	11-5-80	11-11-80			11/24

CUSTOMER ORDER NO.	REV.	REV. DATE	REQUESTED SHIP DATE	SCH'D SHIP DATE
F-40823-73			2-15-81	2/17/81

MMIS

220582

SOLD TO: Mill Power Supply Co.
P.O. Box 32307
Charlotte, NC 28232

SHIP TO: Duke Power Co.
J.W. Hampton F-40823-73
Catawba Nuclear Station/Steam Prod.
Hwy. 274, Newport, SC

MK: PO# F-40823-73, Item #5,6,104,105,106, 107

VIA: Roadway - Prepay and Bill

ACKNOWLEDGEMENT

ITEM NO.	PART NUMBER	DESCRIPTION OF PART	QUANTITY	LIST PRICE	NET PRICE
5	F163393 6042	PKG WASHER	1	.90	.84
6	F163403 6042	PKG WASHER	2	1.10	2.04
104	F61764 50012	PKG, GRAPH FILA. 5/8" SFT	4	3.70	13.76
105	J122590 1652	PKG RING GRAFOIL 5/8" SFT	3	5.80	16.17
106	J122600 1652	PKG RING GRAFOIL 3/4" SFT	7	6.00	39.06
107	J194800 1822	PKG RING GRAFOIL FILA. 3/4" SFT	10	12.00	111.60
					183.47

MILL POWER SUPPLY CO. NOV 24 1980 MAIL DEPT. RECEIVED

1/17/81

VALVE ORDER _____ S/N _____

PARTS FOR _____ CLASS _____ ANSI _____ TYPE _____

CHECK LIST:	PUR. (33)	ENGR	TERR
W/UP Ed	002752		
ENG'R			
Q. C.			
DFT'R			

ROA_02986

Jolly - Fisher Exh 940-0040

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J. W. HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWBORY, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

220582

MMIS

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0001	1F257706992 KN 50001760 LOC EE17-06-1*	VRC FILTER ELEMENT RIBON RIBON-CELLULOSE PURCHASED PART 0699	40		
0002	1R669241122 KN 04056020 LOC LB06-12-5*	VRC SEAL,SHIM 12-300 LB N04400MONEL19B3 4112	20		
0003	1R970336142 KN 04053945 LOC LB04-14-3	VRC SEAL,BALL 6 IN 150 & 300 LB S31600,SPG T 3614	2		
004	1U659841122 KN 04123500 LOC LB09-06-3*	VRC SEAL,SHIM 6-150 LB N04400MONEL19B3 4112	7		
0007	1L402335402 KN 04010470 LOC LB03-01-5	VRC WASHER 4 IN/6 IN 150 LB S17400,HT 3540			
0008	14A9774X012 KN NS LOC	VRC WASHER,PACKING 2 9/16 X 2 31/32 X .004 ZINC B69 4405			
0009	0T019104082 KN 09002190 LOC PP03-01-6*	VRC GASKET 1 7/8X2 5/32X3/64 NEOPRENE 17G25 0408	10		
0010	1G128003012 KN 50000760 LOC EE17-03-6*	VRC GASKET 2 7/16X2 7/8X1/32 NEOPRENE/17G1 0301	40		

Rec'd 2/17/81

1/27/81 Ed/18

FEB 27 1981
WILL SHIP WEEK OF

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ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM				QUANTITY ORDERED	DATE ORDERED	SHIPPED
		CONTINUED FROM PAGE 1				
0011	1C328603012 KN 09003290 LOC PP03-03-2*	VRC GASKET 1 7/8X1 1/2X1/32 NEOPRENE/1761	0301	5		
0012	1C495704022 KN 50000920 LOC EE17-05-6*	VRC GASKET 15/32X11/16X.02 ASBESTOS 17A2	0402	5		
0013	1C897403012 KN 08012100 LOC PP05-04-6*	VRC GASKET,RELAY NEOPRENE/1761	0301	5		
0014	1D191804022 KN 11004930 LOC AA07-14-7	VRC GASKET 45/64X1/16 ASBESTOS 17A2	0402	2		
0015	1D397003012 KN 08015880 LOC PP05-03-4*	VRC GASKET 3/16X5/8X1/32 NEOPRENE/1761	0301	16		
0016	1E845404022 KN 05009070 LOC AA08-44-8*	VRC GASKET 5X7 1/8X1/32 ASB-NIT 17A4	0430	9		
0017	1H265403012 KN 09008870 LOC PP11-06-5	VRC GASKET,BELLOWS FRAME NEOPRENE/1761	0301	8		
0018	1H269603012 KN 09009510 LOC PP04-23-2	VRC GASKET 7/16X1X1/32 NEOPRENE/1761	0301	5		

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MILL POWER SUPPLY CO. NOV 24 1980 MAIL DEPT.

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CONTINUED ON PAGE 3

ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPC# F-40823-73
NOTE $HIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 2				
0019	1H288703012 VRC GASKET,RELAY KN 09009830 LOC PP11-18-6 NEOPRENE/17G1	0301	5		
0020	1H853804042 VRC GASKET,COVER KN 05014545 LOC PP09-05-5* CORK FMS 17J1	0404	4		
0021	1H854703012 VRC GASKET,PEDESTAL KN 05015072 LOC PP09-06-7 NEOPRENE/17G1	0301	3		
0022	1H855903012 VRC GASKET,RELAY KN 05014710 LOC PP09-07-7* NEOPRENE/17G1	0301	7		
0023	1J407506432 VRC GASKET,COVER KN NS .240-.260 DIA 34 LG LOC NITRILE D1056	0606	5		
0024	1J504704022 VRC GASKET KN 11007850 5X5 15/32X1/32 LOC AA17-47-3 ASB-17A2/17A4	0442	11		
0025	1L120899322 VRC GASKET,SPIRAL WOUND KN 04022800 2 5/8X3 1/16X.125 LOC AA18-22-7 316L SST & ASB	9910	5		
0026	1L122099322 VRC GASKET,SPIRAL WOUND KN 04022810 2 1/16X2 1/2X1/8 LOC AA18-23-7 316L SST & ASB	9910			

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CONTINUED ON PAGE 4

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	ATTACHMENT TAKES
F-40823-73		033 -65486-A		11/10/80	

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA: SHIP PREPAY
ROADWAY
MARK: CPC# F-40823-73
NOTE: SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	MARK ORDERED	SHIPPED
	CONTINUED FROM PAGE 3				
0027 1L179999102 KN 12004080 LOC AA24-02-5	VRC GASKET,SPIRAL WOUND 3 3/4X4 5/16X.175 316L SST & ASB	9910	1		
0028 1N297899102 KN 04022830 LOC AA18-23-7	VRC GASKET,SPIRAL WOUND 1 13/16X2 7/16X.175 316L SST & ASB	9910	6		
0029 1N297999102 KN 04022840 LOC AA18-23-7	VRC GASKET,SPIRAL WOUND 1 5/16X1 13/16X.175 316L SST & ASB	9910	3		
0030 1R285904022 KN 15130500 LOC AA19-34-6	VRC GASKET 1 15/16X2 29/32X1/32 ASBESTOS 17A2	0402	7		
0031 1R285904302 KN 15130515 LOC AA20-36-6	VRC GASKET 1 15/16X2 29/32X1/32 ASB-NIT 17A4	0430	4		
0032 1R286099282 KN 15130520 LOC AA19-34-5	VRC GASKET,SPIRAL WOUND 2X2 1/2X.175 316L SST & ASB	9910	1		
0033 1R286099442 KN 15130522 LOC AA19-33-8	VRC GASKET,SPIRAL WOUND 2X2 1/2X.175 INCONEL & GRAPH	9944	11		
0034 1N286104022 KN 15130540 LOC AA19-34-4	VRC GASKET 1 15/16X2 17/32X1/32 ASBESTOS 17A2	0402	9		

WILL SHIP WEEK OF

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 4				
0035	1R286104302 KN 15130555 LOC AA20-36-6	VRC GASKET 1 15/16X2 17/32X1/32 ASB-NIT 17A4 0430	4		
0036	1R286204022 KN 15130560 LOC AA19-33-5	VRC GASKET 1 13/16X2 7/32X1/32 ASBESTOS 17A2 0402	1		
0037	1R2862X0062 KN 15130581 LOC AA19-35-2	VRC GASKET 1 13/16 X 2 7/32 X 1/32 GRAPH-316,17F38 0451	11		
	++ SUPERSEDES 1R286204262				
0038	1R287704022 KN 15130660 LOC AA18-34-7	VRC GASKET 29/32X1 5/32X1/32 ASBESTOS 17A2 0402	7		
0039	1R289104022 KN 15130760 LOC AA19-33-7	VRC GASKET 2 3/16X2 29/32X1/32 ASBESTOS 17A2 0402	4		
0040	1R309804022 KN 15131260 LOC AA17-33-3	VRC GASKET 2 3/8X2 25/32X1/32 ASBESTOS 17A2 0402	2		
0041	1R309999442 KN 15131282 LOC AA17-35-4	VRC GASKET,SPIRAL WOUND 2 9/16X3 1/16X.175 INCONEL & GRAPH 9944	1		

WILL SHIP WEEK OF

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RECEIVED NOV 24 1980

DPC-

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CONTINUED ON PAGE 6

ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

CONTINUED FROM PAGE 5

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0042	1R310004022 KN 15131300 LOC AA17-33-4	VRC GASKET 2 1/2X3 3/32X1/32 ASBESTOS 17A2 0402	2		
0043	1R329604022 KN 15131520 LOC AA23-46-4	VRC GASKET 2 7/8X3 9/32X1/32 ASBESTOS 17A2 0402	4		
0044	1R3296X0042 KN 15131531 LOC AA24-46-8	VRC GASKET 2 7/8 X 3 9/32 X 1/32 GRAPH-316,17F38 0451	12		
	++ SUPERSEDES 1R329604262				
0045	1R329799282 KN 15131540 LOC AA23-46-3	VRC GASKET,SPIRAL WOUND 3X3 1/2X.175 316L SST & ASB 9910	5		
0046	1R329799442 KN 15131542 LOC AA24-44-7	VRC GASKET,SPIRAL WOUND 3X3 1/2X.175 INCONEL & GRAPH 9944	12		
0047	1R329804022 KN 15131560 LOC AA23-46-4	VRC GASKET 2 15/16X3 17/32X1/32 ASBESTOS 17A2 0402	16		
0048	1R329804302 KN 15131575 LOC AA24-45-8	VRC GASKET 2 15/16X3 17/32X1/32 ASB-NIT 17A4 0430	4		

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. KNOXVILLE, TENN.

DPC_05580

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CONTINUED ON PAGE 7

Jolly - Fisher Exh 940-0046

ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED	
		CONTINUED FROM PAGE 6				
0049	1R329904022 KN 15131580 LOC AA23-47-4	VRC GASKET 2 15/16X4 1/32X1/32 ASBESTOS 17A2 0402	14			
0050	1R329904302 KN 15131581 LOC AA24-45-5	VRC GASKET 2 15/16X4 1/32X1/32 ASB-NIT 17A4 0430	4			
0051	1R336304022 KN 15124800 LOC AA23-47-5	VRC GASKET 1 11/32X1 19/32X1/32 ASBESTOS 17A2 0402	1			WILL SHIP WEEK OF
0052	1R348104022 KN 16137050 LOC AA19-46-7	VRC GASKET 4 1/16X4 15/32X1/32 ASBESTOS 17A2 0402	3			WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.
0053	1R348299282 KN 16137070 LOC AA19-46-3	VRC GASKET,SPIRAL WOUND 4 1/8X4 5/8X.175 316L SST & ASB 9910	3			
0054	1R348304022 KN 16137090 LOC AA19-46-5	VRC GASKET 4 1/16X4 21/32X1/32 ASBESTOS 17A2 0402	2			IF INCORRECT, PLEASE INFORM US AT ONCE.
0055	1R348304302 KN 16137105 LOC AA19-47-8	VRC GASKET 4 1/16X4 21/32X1/32 ASB-NIT 17A4 0430	2			NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.
0056	1R348404022 KN 16137110 LOC AA19-46-6*	VRC GASKET 4 1/16X5 5/32X1/32 ASBESTOS 17A2 0402	3			

RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. MARSHALLTOWN

DPC 066738

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Jolly - Fisher Exh 940-0047

ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 7				
0057	1R348404302 KN 16137130 LOC AA19-45-6	VRC GASKET 4 1/16X5 5/32X1/32 ASB-NIT 17A4	0430	2		
0058	1R372299282 KN 16137520 LOC AA17-46-3	VRC GASKET,SPIRAL WOUND 5 1/16X5 9/16X.175 316L SST & ASB	9910	3		
0059	1R372304302 KN 16137536 LOC AA17-45-7	VRC GASKET 5X5 19/32X1/32 ASB-NIT 17A4	0430	1		
0060	1R372404022 KN 16137540 LOC AA17-46-5	VRC GASKET 5X6 3/32X1/32 ASBESTOS 17A2	0402	12		
0061	1R372404302 KN 16137560 LOC AA17-43-8	VRC GASKET 5X6 3/32X1/32 ASB-NIT 17A4	0430	1		
0062	1R384404022 KN 16137590 LOC AA21-45-6	VRC GASKET 3 1/2X3 29/32X1/32 ASBESTOS 17A2	0402	11		
0063	1R384599282 KN 16137600 LOC AA21-45-5	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 316L SST & ASB	9910	2		
0064	1R384599442 KN 16137602 LOC AA21-45-7	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 INCONEL & GRAPH	9944	3		

WILL SHIP WEEK OF

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DPC 100,885

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 8			
0065 1R384604022 KN 16137610 LOC AA21-45-4	VRC GASKET 3 1/2X4 3/32X1/32 ASBESTOS 17A2 0402	5		
0066 1R384704022 KN 16137620 LOC AA21-45-4	VRC GASKET 3 1/2X4 19/32X1/32 ASBESTOS 17A2 0402	2		
0067 1R384599442 KN 16137602 LOC AA21-45-7	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 INCONEL & GRAPH 9944	6		
0068 1R384604022 KN 16137610 LOC AA21-45-4	VRC GASKET 3 1/2X4 3/32X1/32 ASBESTOS 17A2 0402	13		
0069 1R384704022 KN 16137620 LOC AA21-45-4	VRC GASKET 3 1/2X4 19/32X1/32 ASBESTOS 17A2 0402	2		
0070 1R669199102 KN 04056010 LOC LB06-10-5	VRC GASKET,SPIRAL WOUND 4 3/16X4 15/16X1/8 316L SST & ASB 9910	4		
0071 1U180504022 KN 04040820 LOC LB04-10-6	VRC GASKET 6X8 1/2X1/16 ASBESTOS 17A2 0402	2		
0072 1U180604022 KN 04043545 LOC LB06-14-6	VRC GASKET 12X15X1/16 ASBESTOS 17A2 0402	3		

WILL SHIP WEEK OF

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RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. CHARLOTTE, N.C.

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ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO
MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO
DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 9			
0073 1U508104022 KN 17139540 LOC AA16-47-2	VRC GASKET 9 11/64X7 11/16X1/32 ASBESTOS 17A2 0402	10		
0074 1U508304022 KN 17139550 LOC AA16-47-5	VRC GASKET 7 11/16X8 17/32X1/32 ASBESTOS 17A2 0402	9		
0075 1U508599282 KN 17139560 LOC AA16-44-3	VRC GASKET,SPIRAL WOUND 7 27/32X8 1/2X.175 316L SST & ASB 9910	8		
0076 1U508604022 KN 17139570 LOC AA16-47-6	VRC GASKET 7 7/8X8 15/32X1/32 ASBESTOS 17A2 0402	2		
0077 1V557902032 KN 14080191 LOC PP01-16-7	VRC GASKET 5/8X2 NITRILE 17E37 0203	50		
0078 1V644199282 KN 17133550 LOC AA16-42-5	VRC GASKET,SPIRAL WOUND 7 9/16X8 1/16X.175 316L SST & ASB 9910	7		
0079 10A3265X012 KN 17165135 LOC AA21-22-6	VRC GASKET 9 7/8X11X1/32 ASBESTOS 17A2 0402	2		
0080 10A3266X012 KN 17165145 LOC AA21-23-6	VRC GASKET 8 11/16X9 3/16X1/32 ASBESTOS 17A2 0402	2		

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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MILL POWER SUPPLY CO. RECEIVED NOV 24 1980 MAIL DEPT.

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C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 10			
0081	10A3326X012 KN 01115015 LOC AA25-17-7	VRC GASKET 2 1/32X2 11/32X1/32 ASB-NIT 17A4 0430	1		
0082	10A3327X012 KN 01115020 LOC AA25-17-7	VRC GASKET 1 3/8X1 29/32X1/32 ASB-NIT 17A4 0430	1		
0083	10A3383X012 KN 01115100 LOC AA25-22-8	VRC GASKET,SPIRAL WOUND 2 5/8X3 1/32X.175 S31603(316L) 3612	2		
0084	10A3384X012 KN 01115105 LOC AA25-22-6	VRC GASKET 3 5/32X3 15/32X1/32 ASB-NIT 17A4 0430	3		
0085	10A3385X012 KN 01115110 LOC AA25-22-6	VRC GASKET 2 11/32X3 1/16X1/32 ASB-NIT 17A4 0430	3		
0086	10A3436X022 KN NS LOC	VRC GASKET,SPIRAL WOUND 4 1/8X3 3/4X.175 N06600(INCONEL) 4109	1		
0087	10A3437X012 KN 01115205 LOC AA20-46-7	VRC GASKET 4 1/4X4 19/32X1/32 ASB-NIT 17A4 0430	2		
0088	10A3438X012 KN 01115210 LOC AA20-46-6	VRC GASKET 3 1/2X4 5/32X1/32 ASB-NIT 17A4 0430	2		

WILL SHIP WEEK OF

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DPC 0551388

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033-65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P.O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA: SHIP PREPAY
MARK: ROADWAY
NOTE: GRO# F-40823-73
TAG: SHIP 02-15-81 REQUESTED

CONTINUED FROM PAGE 11

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
0089	10A3478X012 VRC GASKET,SPIRAL WOUND KN 01115300 4 11/16X5 3/32X.175 LOC AA17-48-8 S316031316L) 3612	1		
0090	10A3479X012 VRC GASKET KN 01115305 5 7/32X5 17/32X1/32 LOC AA18-47-7 ASB-NIT 17A4 0430	1		
0091	10A3480X012 VRC GASKET KN 01115310 4 13/32X5 1/8X1/32 LOC AA17-47-2 ASB-NIT 17A4 0430	1		
0092	10A4154X012 VRC GASKET KN 17092015 4 3/8X5 1/32X1/32 LOC AA29-33-4 N04400MONEL/SIL 4121	1		
0093	10A4155X012 VRC GASKET KN 17092020 4 19/32X5 1/32X1/32 LOC AA29-33-8 N04400MONEL/SIL 4121	1		
0094	10A5412X012 VRC GASKET KN 17044070 7 13/32X8 1/16X1/32 LOC AA29-38-5 N04400MONEL/SIL 4121	2		
0095	10A5413X012 VRC GASKET KN 17044080 7 19/32X8 1/16X1/32 LOC AA29-38-8 N04400MONEL/SIL 4121	2		
0096	10A5457X012 VRC GASKET KN 17044050 5 7/32X5 7/8X1/32 LOC AA29-38-7 N04400MONEL/SIL 4121	7		

WILL SHIP WEEK OF

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ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.H.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 12			
0097	10A5458X012 KN 17044060 LOC AA29-37-5	VRC GASKET 5 7/16X5 7/8X1/32 N04400MONEL/SIL 4121	7		
0098	1D7518X0132 KN 17140510 LOC AA28-50-7	VRC PACKING,RING 1X1 3/4X3/8 GRAPH 17D19,16 0190	14		
0099	1E3190X0022 RING PACKING KN 11006950 LOC AA28-47-5 ASB FOIL 17D9	NON	8		
0100	1E3190X0222 KN 16139753 LOC AA27-33-8	VRC PACKING,RING 1/2X1X1/4,LOW-CHL FMS17D16 GRAPH 17D19,16 0190	10		
0101	1E3191X0282 KN 17139505 LOC AA28-50-8	VRC PACKING,RING 3/4X1 3/8X5/16 GRAPH 17D19,16 0190	10		
0102	1E3191X0282 KN 17139505 LOC AA28-50-8	VRC PACKING,RING 3/4X1 3/8X5/16 GRAPH 17D19,16 0190	51		
0103	1F3370X0322 KN 15146104 LOC AA28-49-8	VRC PACKING,RING 3/8X7/8X1/4 GRAPH 17D19,16 0190	23		

WILL SHIP WEEK OF

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C-42280 5-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 13				
0108 1P5765X0102 KN NS LOC	VRC PACKING,RING 1 1/16X1 9/16X1/4 GRAPH 17D19,16	0190	4		
0109 1R6702X0082 KN NS LOC	VRC PACKING,RING 2 1/2X3X1/4 GRAPH 17D19,16	0190	4		
0110 1U6768X0022 KN 17140505 LOC AA28-42-8	VRC PACKING,RING 1X1 3/4X3/8 GRAPH/17D16,17	019A	3		
0111 1U6768X0022 KN 17140505 LOC AA28-42-8	VRC PACKING,RING 1X1 3/4X3/8 GRAPH/17D16,17	019A	13		
0112 1V2396X0022 KN 16138505 LOC AA28-44-8	VRC PACKING,RING 3/4X1 3/8X5/16 GRAPH/17D16,17	019A	39		
0113 1V3160X0022 KN 15139905 LOC AA28-43-8	VRC PACKING,RING 3/8X7/8X1/4 GRAPH/17D16,17	019A	18		
0114 1V3802X0022 KN 15145005 LOC AA28-44-8	VRC PACKING,RING 1/2X1X1/4 GRAPH/17D16,17	019A	73		
0115 1V3802X0022 KN 15145005 LOC AA28-44-8	VRC PACKING,RING 1/2X1X1/4 GRAPH/17D16,17	019A	4		

WILL SHIP WEEK OF

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO
MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO
DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

CONTINUED FROM PAGE 14

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
0116 1V7899X0032 KN NS LOC	VRC PACKING,RING 1 1/16X1 7/16X3/16 GRAPH/17D16,17 019A	5		
0117 1V9762X0012 KN NS LOC	VRC PACKING RING 2 1/2X3X1/4 GRAPH-17D15,16 018B	8		
0118 14A3207X012 KN NS LOC	VRC PACKING,RING 1 1/16X1 9/16X1/4 GRAPH 17D16,18 019H	7		
0120 18885506992 KN 52037800 LOC EE01-07-4*	VRC O-RING 7/8X1 1/8X1/8 NITRILE-DS52-1 065A	6		
0121 1C334206992 KN 05021030 LOC AA16-15-7	VRC O-RING 2 3/8X2 3/4X3/16 NITRILE-DS52-1 065A	3		
0122 1C376206992 KN 09003770 LOC PP03-05-2*	VRC O-RING 13/16X1 1/16X1/8 NITRILE 0656	5		
0123 1C415706992 KN 05008060 LOC AA10-46-6*	VRC O-RING 1 3/8X1 5/8X1/8 NITRILE-DS52-1 065A	18		
0124 1C562206992 KN 11004210 LOC AA08-46-8*	VRC O-RING 1 1/8X1 3/8X1/8 NITRILE-DS52-1 065A	18		

WILL SHIP WEEK OF

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DPC_0554

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C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

CONTINUED FROM PAGE 15

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0125	1C853806992 KN 05014530 LOC PP09-05-6*	VRC O-RING 5/16X7/16X1/16 NITRILE-DS52-2 065B	60		
0126	1C854606992 KN 05030330 LOC EE24-12-5*	VRC O-RING 5/32X9/32X1/16 NITRILE-DS52-3 065C	1		
0127	1D134606992 KN 14020360 LOC PP03-14-3*	VRC O-RING 1/8X1/4X1/16 NITRILE 0656	69		
0128	1D134706992 KN 14020380 LOC PP03-14-3*	VRC O-RING 3/16X5/16X1/16 NITRILE 0656	11		
0129	1D191706992 KN 05021035 LOC AA13-10-8	VRC O-RING 3/16X5/16X1/16 NITRILE/MOS2 050F	5		
0130	1D237506992 KN 11004960 LOC AA03-03-2*	VRC O-RING 3/4X1X1/8 NITRILE/MOS2 050F	40		
0131	1D267306992 KN 11005040 LOC AA11-16-8*	VRC O-RING 5 3/8X5 5/8X1/8 NITRILE-DS52-1 065A	18		
0132	1D269106992 KN 11005070 LOC AA11-19-6*	VRC O-RING 9 1/4X9 1/2X1/8 NITRILE-DS52-1 065A	5		

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. MAIL DEPT.

DPO 001401

FORM 1572 PRINTED IN U.S.A.

CONTINUED ON PAGE 17

Jolly - Fisher Exh 940-0056

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 16				
0133 1D348306992 KN 07020820 LOC AA13-10-5	VRC O-RING 1 1/2X1 3/4X1/8 NITRILE-DS52-1	065A	4		
0134 1D444806992 KN 05021040 LOC AA11-15-8	VRC O-RING 5 7/8X6 1/8X1/8 NITRILE-DS52-1	065A	10		
0135 1D547106992 KN 11005370 LOC AA12-08-5*	VRC O-RING 6 3/4X7X1/8 NITRILE-DS52-1	065A	6		
0136 1D687506992 KN 51012180 LOC EE06-15-5*	VRC O-RING 1/4X3/8X1/16 NITRILE-DS52-1	065A	100		
0137 1E139106992 KN 11005920 LOC GG01-13-5	VRC O-RING 2 1/2X2 7/8X3/16 NITRILE-DS52-1	065A	4		
0138 1E216306992 KN 11006000 LOC AA13-08-3	VRC O-RING 3/8X1/2X1/16 NITRILE/MOS2	050F	7		
0139 1E222606992 KN 09004350 LOC PP11-05-6	VRC O-RING 3/32X7/32X1/16 NITRILE-DS52-1	065A	8		
0140 1E547706992 KN 09022530 LOC AA27-01-7*	VRC O-RING 3/8X9/16X3/32 NITRILE-DS52-1	065A	10		

WILL SHIP WEEK OF

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FORM 2597 PRINTED IN U.S.A.

CONTINUED ON PAGE 18

ACKNOWLEDGEMENT

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 17				
0141	1E591406992 KN 05008130 LOC AA10-47-5*	VRC O-RING 5/8X13/16X3/32 NITRILE-DS52-1 065A	6		
0142	1E736806992 KN 14101660 LOC PP01-01-3	VRC O-RING 7/8X1X1/16 NITRILE-DS52-1 065A	10		
0143	1E736906992 KN 05021050 LOC AA12-28-5*	VRC O-RING 1 1/4X1 1/2X1/8 NITRILE/MDS2 050F	13		
0144	1E845806992 KN 05009120 LOC AA08-46-7*	VRC O-RING 1 7/8X2 1/8X1/8 NITRILE-DS52-1 065A	12		
0145	1F463606992 KN 14000110 LOC PP09-19-4*	VRC O-RING 3/4X7/8X1/16 NITRILE-DS52-1 065A	40		
0146	1H133006992 KN 12018990 LOC AA13-09-7	VRC O-RING 3/8X9/16X3/32 NITRILE/MDS2 050F	7		
0147	1H291906992 KN 14024040 LOC EE18-09-6*	VRC O-RING 3/16X5/16X1/16 NITRILE-DS52-2 065B	40		
0148	1H292306992 KN 05027330 LOC AA12-37-7*	VRC O-RING 5/16X7/16X1/16 NITRILE-DS52-2 065B	50		

WILL SHIP WEEK OF

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RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. CHARLOTTE, N.C. 28232

FDRM 1592 PRINTED IN U.S.A.

CONTINUED ON PAGE 19

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 18				
0149 1H861906992 KN 05014930 LOC PP09-11-5*	VRC O-RING 3/32X7/32X1/16 NITRILE/MOS2	050F	13		
0150 1H862106992 KN 05021090 LOC AA12-28-5	VRC O-RING 4 3/8X4 3/4X3/16 NITRILE	0656	50		
0151 1H862506992 KN 05021140 LOC AA12-29-7	VRC O-RING 10 1/4X10 3/4X1/4 NITRILE/MOS2	050F	6		
0152 1H862706992 KN 05021160 LOC AA12-29-4	VRC O-RING 2X2 3/8X3/16 NITRILE/MOS2	050F	3		
0153 1J415106992 KN 05019520 LOC AA12-29-4*	VRC O-RING 1 1/8X1 3/8X1/8 NITRILE	0656	3		
0154 1J488806992 KN 13011689 LOC AA23-01-7*	VRC O-RING 1/2X5/8X1/16 NITRILE-DS52-3	065C	50		
0155 1K149906992 KN 13004554 LOC EE09-15-4*	VRC O-RING 11/16X7/8X3/32 NITRILE-DS52-1	065A	20		
0156 1N285406382 KN 04011345 LOC LB03-01-4*	VRC O-RING 1 1/8X1 3/8X1/8 VITON-DS52-5	065E	2		

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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RECEIVED NOV 24 1980 MILL POWER SUPPLY CO. MAIL DESK

FORM 2592 PRINTED IN U.S.A.

DPC 0651404

CONTINUED ON PAGE 20

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 19				
0157 1N285606382 KN 12013810 LOC AA25-02-7*	VRC O-RING 1 3/4X2X1/8 VITON-DS52-5	065E	2		
0158 1U879006562 KN 53024300 LOC EE24-02-7*	VRC O-RING 1 3/16X1 5/16X1/16 NITRILE-DS52-1	065A	10		
0159 1V547606382 KN 04136030 LOC LB09-08-5	VRC O-RING 7X7 1/4X1/8 VITON-DS52-5	065E	2		
0160 10A0871X012 KN 05035170 LOC GG03-05-5	VRC O-RING 7/64X11/64X1/32 NITRILE	0656	70		
0161 1F364135072 KN 11007031 LOC AA29-49-8*	VRC RING,LANTERN 3/8 STEM 316 SST-P/M HT	3396	5		
0162 1H266428992 KN 09009010 LOC PP11-11-5	VRC SEAL RING CARBON STEEL	2899	21		
0163 1H875027022 KN 05021420 LOC AA12-31-6*	VRC RING,SNAP SIZE 80-100 STL K07001/PL	2702	5		
0164 1H875127022 KN 05021430 LOC AA12-31-6*	VRC RING,SNAP SIZE 80-100 STL K07001/PL	2702	5		

WILL SHIP WEEK OF

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FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 21

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	CO. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA: SHIP PREPAY
ROADWAY
MARK: CPO# F-40823-73
NOTE: SHIP 02-15-81 REQUESTED
TAG:

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 20			
0165	4J454127022 KN 05016770 LOC AA12-31-6*	VRC RING,SNAP SIZE 130 STL K07001/PL 2702	5		
0166	1J962335072 KN 11008230 LOC AA29-48-8*	VRC RING,LANTERN 1/2 STEM 316 SST-R/M HT 3396	10		
0167	1P573935402 KN 04050670 LOC LB03-10-4	VRC RING,SPLIT 4 IN 2 HALVES PER SET S17400,HT 3540	2		
0168	1P661327022 KN 05021625 LOC AA11-23-7	VRC RING,SNAP SIZE 60 STL K07001/PL 2702	5		
0169	1R667636042 KN 04043330 LOC LB06-14-5	VRC RING,BACK-UP 12 IN 300 LB FOR METAL SEAL S31600 3604	2		
0170	1R669035402 KN 04056000 LOC LB06-12-4	VRC RING,SPLIT 12 IN 2 HALVES PER SET S17400,HT 3540	2		
0171	1R670335072 KN 04056120 LOC LB06-11-5	VRC RING,LANTERN 2 1/2 X 3 S31600,20B20 3557	3		
0172	1U104335072 KN 04053930 LOC LB03-10-3	VRC RING,RETAINING,SPLIT 4-300 LB S31600,20B20 3557	2		

WILL SHIP WEEK OF

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DPC_035486

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 22

C-42280 S-4911 P-

ACKNOWLEDGEMENT

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A		11/10/80	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO/CATAWBA NUC STA
J.W.HAMPTON/F-40823-73
STEAM PRODUCTION-HWY 274
NEWPORT, SOUTH CAROLINA 29730

VIA SHIP PREPAY
ROADWAY
MARK CPO# F-40823-73
NOTE SHIP 02-15-81 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 21				
0173 1U230005102 KN 16024305 LOC AA21-48-5	VRC RING,PISTON 2 1/2 IN GRAPHITE 17F19	0510	4		
0174 1U506905102 KN 17139140 LOC AA16-45-5	VRC RING,PISTON 6 IN GRAPHITE 17F19	0510	1		
0175 1U508046172 KN 17139125 LOC AA16-44-5	VRC SEAT RING 6 IN 410 SST/HT	3365	2		
176 1E801204022 KN 05008540 LOC AA10-46-7*	VRC GASKET 3 3/4X5 3/4X1/32 ASBESTOS 17A2	0402	16		
0177 1F826804022 KN 53010580 LOC EE03-12-6*	VRC GASKET 1/4X1/2X1/32 ASB-17A2/17A4	0442	40		
119A 1D7518X0132 KN 17140510 LOC AA28-50-7	VRC PACKING,RING 1X1 3/4X3/8 GRAPH 17D19,16	0190	4		
119B 1U6768X0022 KN 17140505 LOC AA28-42-8	VRC PACKING,RING 1X1 3/4X3/8 GRAPH/17D16,17	019A	3		

WILL SHIP WEEK OF

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FORM 2592 PRINTED IN U.S.A.

DPC_0551407

Jolly - Fisher Exh 940-0062

1-27-81 Ed have

Pls ~~[illegible]~~ 12/16 Send to Ed

RPT P825
PREPARED: 11/19/80

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

12/4/80

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Cindy Green
704-373-
TELEX 57-2346
5253
Newport, S.C.

SUBJECT: OUR ORDER NUMBER: F40823-73
OUR ORDER DATE:
YOUR ORDER NUMBER:
WANTED DATE IS: 4/01/81
PROMISED DATE IS:

Line #	22-0582
Operator	NMIS

~~THIS IS OUR SECOND REQUEST FOR ACKNOWLEDGMENT OF THIS~~ ORDER. PLEASE REPLY IMMEDIATELY GIVING DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:

Order is scheduled to ship on or before 4-1-81

5-1-81
EAL/dlt

RECEIVED
DEC 4 1980
MILL POWER SUPPLY CO.
MAIL DEPT.

DATE: SIGNED:

Req. let 3/16/81

DPC_0551385

ROA_03009

Jolly - Fisher Exh 940-0063

C-42280 S-4911 P-

ACKNOWLEDGEMENT

Ed Hall 5-1

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

Send to Eh

CUSTOMER ORDER NUMBER	CO. NUMBER	REPRESENTATIVE ORDER NUMBER	CO. NUMBER	ORDER DATE	
F-40823-73		033 -65486-A	A	12/18/80	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.

SHIP TO: DUKE POWER CO/CATAWBA NUC STA
J.W. HAMPTON/F-40823-73
STEAM PRODUCTION, HWY. 274
NEWPORT, SOUTH CAROLINA 29730

VIA: SHIP PREPAY
MARK: ROADWAY
NOTE: F-40823-73
TAG:

TRADE DESK 28232
IS ORDER COMPLETE
E A L
ADDL. ITEMS

220582

QS 1/5/81

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
099A	1E3190X0222 KN 16139753 LOC AA27-33-8	VRC PACKING,RING 1/2X1X1/4,LOW-CHL FMS17D16 GRAPH 17D19,16 0190	8		
119C	1D7518X0132 KN 17140510 LOC AA28-50-7	VRC PACKING,RING 1X1 3/4X3/8 GRAPH 17D19,16 0190	28		
119D	1U6768X0022 KN 17140505 LOC AA28-42-8	VRC PACKING,RING 1X1 3/4X3/8 GRAPH/17D16,17 019A	21		

WILL SHIP WEEK OF JAN 28 1981

RECEIVED JAN 5 1981 MILL POWER SUPPLY CO. MAIL DEPT.

Not Eal

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PAGE 1 OF 1

FORM 2519 PRINTED IN U.S.A.

DPC_0551384

ROA_03010

Jolly - Fisher Exh 940-0064

~~PTS [illegible]~~ 12/16/80 & send
4-27 to ~~E to [illegible]~~

RPT P825
PREPARED: 04/02/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

~~220582~~ 4-10-81

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

MMIS

FROM: Hoaglin Linder
704-373-5253
TELEX 57-2346
Newport, S.C.
DUKE POWER COMPANY

SUBJECT: OUR ORDER NUMBER: F40823-73
OUR ORDER DATE:
YOUR ORDER NUMBER: 033-65486-A
WANTED DATE IS: 4/01/81
PROMISED DATE IS: 3/27/81

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

~~4-24-81~~
AL
~~4-15-81~~

VENDOR REPLY:

5-26-81 Items 8, 86, 108, 109, 116,
AL 5-8-81 117, 118, 150
Schd. To ship 5-9-81

~~5-8-81~~
~~L.A.C. 4-24-81~~

All others: Shipped in Dec. & and Jan. 81

~~RL 4-24-81 ④ S/D 5-9-81~~

RECEIVED APR 9 1981 MILL POWER SUPPLY CO. MAIL DEPT.

DATE: ---------- SIGNED: ----------

~~RL 4-24-81 ④~~ RL 5-11-81 ⑤

DPC_0581382

RPT P825
PREPARED: 04/25/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

Line #	PAGE 308713
Operator	Kay

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Angelia Linder
704-373-5253
TELEX 57-2346
Newport, SC
DUKE POWER COMPANY

SUBJECT: OUR ORDER NUMBER: F40823-73
OUR ORDER DATE:
YOUR ORDER NUMBER: 033-55486-A
WANTED DATE IS: 4/01/81
PROMISED DATE IS: 5/09/81

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

VENDOR REPLY: Shipped 5-5-81

RECEIVED MAY 11 1981 MILL-POWER SUPPLY CO. MAIL DEPT.

DATE: 5-6-81 SIGNED:

DPC_0551381

Form 184 (5-76)

Dev./Station _____ Unit _____ File No. _____

Subject _____

By _____ Date _____

Sheet No. ____ of ____ Problem No. _____ Checked By _____ Date _____

E. H. Hall

RB 3-17-81 Fisher 220582

F-40823-73

3/27/81 Call rec'd 3-27-81 (per Elaine Hudgins)

E. H. Hall

RB 3-18-81

27 Ed

DPC_0551383

RPT P825
PREPARED: 05/20/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

5-27-81

File Order in Complete

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Angelia Yoder
704-373-5253
TELEX 57-2346
Newport, S.C.

SUBJECT: OUR ORDER NUMBER: F40823-73
OUR ORDER DATE:
YOUR ORDER NUMBER: 033-65486-A
WANTED DATE IS: 4/01/81
PROMISED DATE IS: 5/05/81

DUKE POWER COMPANY

MATERIAL HAS BEEN RECEIVED. PLEASE SEND INVOICE IN TRIPLICATE.

VENDOR REPLY: PLEASE BE ADVISED THAT OUR INVOICE #1460420 WAS ISSUED ON 5/14/81 FOR THE ABOVE MENTIONED MATERIAL. I TRUST YOU HAVE RECEIVED THE INVOICE BY NOW. IF YOU HAVE NOT, PLEASE CONTACT ME.

DATE: 5/27/81 SIGNED: Elaine Patterson

DPC_0551380

ROA_03014

Jolly - Fisher Exh 940-0068

C-42280 S-4911

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT AND ENGINEERING SPEC.

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	SERIAL NUMBER
G-37548-72		033 -68233-A		06-01-81	8099738-739

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
%J.H. HAMPTON, MGR (G-37548-72)
CATAWBA NUCLEAR STATION, HWY 274
NEWPORT, SOUTH CAROLINA 29710

TOTAL NO. OF PIECES 3

VIA ROADWAY EXP OR UPS PPD
MARK PO# G-37548-72 AND ITEM 10 NOS.
NOTE SHIP 06-30-81 REQUESTED

SN

#DEAN SPLITTGERBER

ITEM 0001 TAG
TYPE 1151DP TRANSMITTER

QUANTITY ITEM 2

A SQUARE ROOT/DELTA P FLOW TRANSMITTER
TYPE 1151DP-5-J-12-B1, RANGE 0-125/0-750 IN H2O,
0-3175/0-19050 MM H2O, OUTPUT 4-20 MADC,SQUARE
ROOT OF INPUT, STL,CDPL ENDS/316 SST VALVES/316
SST DIAPH, MTG BRACKET,2 IN PIPE, FM EP CL1 DIV2
GP BCD,CL2 DIV1 GP EFG,CL3 DIV1
1151DPX2-A30-9A3-9B1-9C1-9H1-9J2
VRC
OGBD----------

RECEIVED JUN 10 1981 MILL POWER SUPPLY CO. CHARLOTTE, N.C.

SEP 26 1981

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION. 613

DPC_0551128

FORM 2421B PRINTED IN U.S.A.
06/05/81

ROA_03015

Jolly - Fisher Exh 940-0069

L-4/2R3 S-49E1

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT AND ENGINEERING SPEC.

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	SERIAL NUMBER
G-37548-72		033 -65233-8		06-02-81	80097-0

SOLD TO: REAL POWER SUPPLY CO
P-O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER COMPANY
Bldg. HAMPTON, MGR 1G-37548-72B
CATAWBA NUCLEAR STATION, Hwy 160
NEWPORT, SOUTH CAROLINA 29711

TOTAL NO. OF PIECES: 2

VIA: ROADWAY EXP GR UPS PPD
MARK: FOR G-37548-72 AND ITEM ID NOS.
NOTE: SHIP 06-30-81 REQUESTED

MORAN SPLITTSCHEDER

ITEM: 0012 TAG
TYPE 1151DP TRANSMITTER

QUANTITY: ITEM 1

A DIFFERENTIAL PRESSURE TRANSMITTER
TYPE 1151DP-4-E-12-B1, RANGE 0-25/0-150 IN H2O,
0-635/0-3810 MM H2O, OUTPUT 4-20 MADC/ADJ DAMPING,
STL.CDPL BODS/316 SST VALVES/316 SST DIAPH, MTG
BRACKET,2 IN PIPE, FM EP CLX DIV1 GP BCD.CLZ DIV1
GP EFG,CL3 DIV1
1151DPE1-A13-5A2-9B2-9C1-9M1-9J2
NRC
DGGD----------

JUL 25 1981

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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FORM 2478 PRINTED IN U.S.A.
06/08/08

DPC_0551129
PAGE 1 OF 1

ROA_03016

Jolly - Fisher Exh 940-0070

Line #	281091
Operator	PAGE 4

RPT P825
PREPARED: 06/03/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Mrs. Joan I. Tolbert
704-373- 5252
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: G37548-72
OUR ORDER DATE: 5/19/81
YOUR ORDER NUMBER: 33-68233A, B
WANTED DATE IS: 6/30/81
PROMISED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

6-26
J. Tolbert

WE HAVE RECEIVED NO ACKNOWLEDGMENT OF THIS ORDER. PLEASE ACKNOWLEDGE AND GIVE DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:
We acknowledge the order,
Ship dates will be advised later,

RECEIVED
JUN 12 1981
MILL-POWER SUPPLY CO.
PURCHASING DEPT.

DATE: 6-11-81 SIGNED: Faye Chang

DPC_0561126

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
G-37548-72		033 -68233-B		08/08/81	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER CO
%J.W.HAMPTON,MGR.,G-37548-72
CATAWBA NUCLEAR STA.,HWY. 274
NEWPORT, SOUTH CAROLINA 29710

VIA: SHIP PREPAY
UPS OR ROADWAY

MARK: G-37548-72

NOTE TAG: SHIP 06-30-81 REQUESTED

SHIP DIRECT

281091

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0002	1R0CC4X0AN2 KN NS LOC	VRC SQUARING ASSY, AMPL 01151-0378-0001 J OUT 4-20MAD	8		
	++ TAG 0224221293				
0003	1R0CC4X0AM2 KN NS LOC	VRC CIRCUIT BOARD, CALIB 01151-0377-0001 J OUT 4-20MAD	8		
	++ TAG 0224221412				
0005	1R0C01XACM2 KN NS LOC	VRC COVER, ELECTRONICS 50032-0240-0003	4		
	++ TAG 0224221443				
0006	1R0C01XAC22 KN NS LOC	VRC O-RING 01151-0033-0002 FOR ELEK COVE	1		
	++ TAG 0224221453				
0007	1R0C01XADG2 KN NS LOC	VRC HOUSING, ELECT 01151-0060-0014	6		
	++ TAG 0224221463				
0008	1R0C01XADC2 KN NS LOC	VRC O-RING VITON 01151-0035-0001 FOR FLG ADPTR	12		
	++ TAG 0224221473				

MMIS

WILL SHIP WEEK OF
SEP 25 1981

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

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8/19

8-1(4)

DPC_0551124

FORM 1597 PRINTED IN U.S.A.

CONTINUED ON PAGE 2

Jolly - Fisher Exh 940-0072

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
G-37548-72		033 -68233-B		06/08/81	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO
%J.W.HAMPTON,MGR.,G-37548-72
CATAWBA NUCLEAR STA.,HWY. 274
NEWPORT, SOUTH CAROLINA 29710

VIA SHIP PREPAY
UPS OR ROADWAY
MARK G-37548-72
NOTE TAG SHIP 06-30-81 REQUESTED

SHIP DIRECT

ITEM		QUANTITY ORDERED	RATE ORDERED	SHIPPED
	CONTINUED FROM PAGE 1			
0009	1R0001XABA2 VRC SENSOR MODULE KN NS 01151-0011-0052 0-125/750INH2 LOC	2		
	++ TAG Q224221483			
0010	1R0001XADA2 VRC O-RING VITON KN NS 01151-0034-0001 FOR PRCS FLG LOC	1		
	++ TAG Q224221493			
0011	1R0001XAAX2 VRC SENSOR MODULE KN NS 01151-0011-0042 0-25/150 INH2 LOC	2		
	++ TAG Q224221503			

WILL SHIP WEEK OF _____

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

RECEIVED JUN 16 1981 MILL POWER SUPPLY CO. MAIL DEPT.

FORM 2591 PRINTED IN U.S.A.

DPC_0551126

RPT P825
PREPARED: 06/11/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: ----------
704-373-
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: G37548-72
OUR ORDER DATE: 5/19/81
YOUR ORDER NUMBER:
WANTED DATE IS: 6/30/81
PROMISED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

THIS IS OUR SECOND REQUEST FOR ACKNOWLEDGMENT OF THIS ORDER. PLEASE REPLY IMMEDIATELY GIVING DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:

DATE: ---------- SIGNED: ----------

DPC 0551127

RPT P825
PREPARED: 08/01/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

OUR ORDER NUMBER: G37548-72. CONTINUED FROM PREVIOUS PAGE

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION	
005	4	0	COVER, ELECTRONIC HOUSING PN	90032-
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	
006	1	0	O-RING, TYPE 70 DURO ETHYLENE PROPYLENE SIZE N	
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	
007	6	0	BOARD, CONNECTOR CIRCUIT PN:	01151-
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	
008	12	0	O-RING, VITON SIZE NO.: 210 PN:	01151-
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	
009	2	0	MODULE, SENSOR 0-125/750 INCH H2O, 316 SST, P	
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	
010	~~12~~ 1 ← your C.O. #001	0	O-RING, DURO VITON SIZE 0226, PN:	01151-
011				
012				
VENDOR REPLY:			WANTED:	6/30/81
			PROMISED:	

plus 011, 012 per your P.O.

Items are scheduled to ship 6-30-81

RECEIVED AUG 10 1981 MILL POWER SUPPLY CO. MAIL DEPT.

DATE: 8-6-81 SIGNED: Gaye Chang

DPC_0551123

2810 91
2

RPT P825
PREPARED: 08/01/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Joan Tolbert
704-373-5252
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: G37548-72
OUR ORDER DATE: 5/19/81
YOUR ORDER NUMBER:

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

9/20
10/6

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION	
001	2	0	TRANSMITTER, DIFFERENTIAL PRESSURE,	TYPE:
VENDOR REPLY:				WANTED: 6/30/81 PROMISED:
002	8	0	BOARD, AMPLIFIER CIRCUIT: PN	01151-
VENDOR REPLY:				WANTED: 6/30/81 PROMISED:
003	8	0	CALIBRATION CIRCUIT BOARD ASSY., PN:	01151-
VENDOR REPLY:				WANTED: 6/30/81 PROMISED:
~~004~~	~~8~~	~~0~~	~~POTENTIOMETER, 20K OHM~~	
VENDOR REPLY:				WANTED: 6/30/81 PROMISED:

See your G37548-72 P#001

MMIS

RECEIVED AUG 10 1981 MILL POWER SUPPLY CO. MAIL DEPT.

9-15(4)

DPC_0551122

~~28409~~

RPT P825
PREPARED: 09/15/81

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

9-23-81

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Joan Tolbert
704-373-5252
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: G37548-72
OUR ORDER DATE: 5/19/81
YOUR ORDER NUMBER: 33-68233A,B

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION
001	2	0	TRANSMITTER, DIFFERENTIAL PRESSURE, TYPE
VENDOR REPLY:			WANTED: 6/30/81 ~~PROMISED:~~ Shipped 9-3-81
002	8	0	BOARD, AMPLIFIER CIRCUIT: PN 01151-
VENDOR REPLY:			WANTED: 6/30/81 PROMISED:
003	6	0	CALIBRATION CIRCUIT BOARD ASSY, PN: 01151-
VENDOR REPLY:			WANTED: 6/30/81 PROMISED:
~~004~~	~~6~~	~~0~~	~~POTENTIOMETER, 20K OHM~~
VENDOR REPLY:			WANTED: 6/30/81 PROMISED:

MISS

Cancelled Per your C.O. #1 (9-14-81)

MILL POWER RECEIVED SEP 24 1981 MGR. DEPT. PURCHASING

DPC_0551120

ROA_03023

Jolly - Fisher Exh 940-0077

RPT P825 REQUEST FOR INFORMATION PAGE 2
PREPARED: 09/15/81 FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

OUR ORDER NUMBER: 637548-72, CONTINUED FROM PREVIOUS PAGE

PO ITEM	QTY ORDER	QTY RECVD	-DESCRIPTION-	
005	4	0	COVER, ELECTRONIC HOUSING PN	90032-

VENDOR REPLY: WANTED: 6/30/81
PROMISED:

Item #1 was Shipped 9-3-81

Other Items: Schd to ship 10-10-81

MILL POWER RECEIVED SEP 24 1981 MDL DIV. PURCHASING

DATE: 9-23-81 SIGNED: [signature]

DPC_0551121

18618
rly SP 126

MATERIALS STATUS LETTER

Catawba
Steam Station

TO: S. L. Smith

cc: Materials Management Section

EXP

~~Patch~~ T

SLS

Date Sept. 30, 1981

Previous Correspondence:

Reqn. No. 7330810015

Order No. G37548

Vendor: Fisher Controls

Invoice No.

____ Please Expedite - Material Needed by ____

____ Shipping Date Requested.

____ Purchase order not received.

____ Damaged Material. Form 50 Filed.

____ Duplicate shipment.

____ Correct Material Received.

X Return shipping instructions requested.

____ Invoice Not Received.

____ Credit invoice not received.

____ Remove Exception from Invoice.

X Incorrect Material Received (See remarks below)

____ Shortage (See remarks below)

____ Overshipment ____ Request to retain

____ Request to return (See remarks below)

____ Q A Documentation Required (See remarks below)

X Remarks:

Item no. 5 - we ordered 4 each no. 90032-0240-0008.

We received 4 each no. 90032-0240-0003.

Please have vendor verify material received as being correct or provide return shipping instructions.

PEC/tpo

RECEIVED OCT 1 1981 MPS CO. S. L. SMITH

RECEIVED OCT 2 1981 MPS CO. FILE ROOM

____ Transaction complete. Please close file.

DPC 0551131

Matls. Supv. ~~XXXXXXX~~

ROA_03025

Jolly - Fisher Exh 940-0079

13618
Merly SP 126

MATERIALS STATUS LETTER

Catawba
Steam Station

To: S. L. Smith

cc: Materials Management Section

Date Sept. 30, 1981

Previous Correspondence:

Reqn. No. 7330810015

Order No. G37548

Vendor: Fisher Controls

Invoice No. _____

_____ Please Expedite - Material Needed by _____

_____ Shipping Date Requested.

_____ Purchase order not received.

_____ Damaged Material. Form 50 Filed.

_____ Duplicate shipment.

_____ Correct Material Received.

X Return shipping instructions requested.

_____ Invoice Not Received.

_____ Credit invoice not received.

_____ Remove Exception from Invoice.

X Incorrect Material Received (See remarks below)

_____ Shortage (See remarks below)

_____ Overshipment _____ Request to retain

_____ Request to return (See remarks below)

_____ Q A Documentation Required (See remarks below)

X Remarks:

Item no. 5 - we ordered 4 each no. 90032-0240-0008.

We received 4 each no. 90032-0240-0003.

Please have vendor verify material received as being correct or provide return shipping instructions.

PEC/tpo

_____ Transaction complete. Please close file.

DPC_0551132

Matls. Supv. XXXXXXXX

ROA_03026

Jolly - Fisher Exh 940-0080

FISHER CONTROLS COMPANY

MARSHALLTOWN, IOWA 50158

AUTOMATIC CONTROL EQUIPMENT
SINCE 1880

Reply to: ROBERT E. MASON COMPANY, P.O. Box 33424, Charlotte, N.C. 28233 Phone (704) 375-4464

October 13, 1981

Mill Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

Attn: Ms. Joan Tolbert

Reference: P.O. No. G-37548-72
Item #5

Dear Ms. Tolbert:

In confirming our telephone conversation, please be advised that Part No. 90032-0240-0008 and Part No. 90032-0240-0003 are interchangeable.

If you should have questions regarding the above, please feel free to give me a call.

Sincerely,

FISHER CONTROLS COMPANY

George Chang

George Chang
ROBERT E. MASON COMPANY
DIST. REPR.

GC/ewp

Sent ORSINAL to Gene HARWELL 10-15

MILL POWER RECEIVED OCT 14 1981 MAIL DEPT. PURCHASE

DPC_0551130

IF IT FLOWS THROUGH PIPE . . . CHANCES ARE IT'S CONTROLLED BY . . . FISHER TELEPHONE (515) 754-3011 . . . TWX 910-520-1420 . . . TELEX 478456

ROA_03027

Jolly - Fisher Exh 940-0081

Line # 304472
Operator PAGE 7m

RPT P825
PREPARED: 03/04/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704/373-5324
TELEX 57-2346

~~4-5-82~~
4-21-82

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER:
WANTED DATE IS: 1/03/83
COMMITTED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WE HAVE RECEIVED NO ACKNOWLEDGMENT OF THIS ORDER. PLEASE ACKNOWLEDGE AND GIVE DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:

We acknowledge the order. We'll advise you the ship schedule as soon as it is available

DATE: 3-8-82 SIGNED: Carol Chang

DPC_0409399

ROA_03028

Jolly - Fisher Exh 940-0082

C-42280 S-4911 ~~[illegible]~~

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT AND ENGINEERING SPECIFICATIONS

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O.NUMBER	ORDER DATE	SERIAL NUMBER
H-09458-73		033 -71990-A		04-06-82	

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO
%J.W. HAMPTON, MGR. H09458-73
CATAWBA NUCLEAR STATION
HWY 274,NEWPORT,S.CAROLINA 29710

TOTAL NO. OF PIECES 2

VIA SMITH'S TRANSFER, PPO
MARK H09458-73 & ITEM ID NO. 1155-01049N
NOTE SHIP 12-01-82 REQUESTED

*JIM JONES

B04472

ITEM 0007 TAG
TYPE 67AFR/239 1/4 INCH REGULATOR
COMPLETE DUKE POWER PA FORM 930.1A
++ ~~LSC PROJ NO 82P359,~~ FOR N-STAMP VALVE
ASSY & ORIENTATION DWG N/A
MUST SHIP FROM M'TOWN
SPARES FOR SN 5930672-675 CUSTOMER HAS

QUANTITY
ITEM 2

SUBJECT TO INSPECTION

A FS67AFR-239
1/4 PRESSURE REGULATOR
ALUMINUM BODY SIDE OUTLET TAPPED BRASS DRAIN VALVE, CELLULOSE FILTER ELEMENT, ALUMINUM BONNET, NITRILE INNER VALVE BRASS STEM, NITRILE DIAPHRAGM W/RELIEF, SPRING NO. 1K748527202,RANGE 0-100 PSI, SQ HD ADJUSTING SCREW, 0-100 PSIG GAUGE, TYPE 67AFR/239
67X6-A3-B1-C1-D1-E3-F4-G1-J4-9A25
VRC
CCAHALACD9AHWAWAEM--

7-7-82 (5)

6-21-82 (4)

JUN 26 1982

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT

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218

DPC_0409397

FORM 2421B PRINTED IN U.S.A.
05/03/82

ROA_03029

Jolly - Fisher Exh 940-0083

304472

RPT. P825
PREPARED: 04/07/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

4-09-82
5-13-82
5-27-82
6-4-82

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER: 33-71990, -A
WANTED DATE IS: 1/03/83
COMMITTED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWFORT
P.O. BOX 256
CLOVER, SC 29710

PLEASE GIVE DATE(S) ITEMS WILL BE SHIPPED:

VENDOR REPLY:

Please be advised that the order has been entered with our factory, but, as of this date, we have not received the factory acknowledgement advising us of the scheduled ship dates. Upon receipt of this acknowledgement, we will advise.

I trust this is satisfactory with your requirements. Should you have further questions, please give me a call.

Thank you.

DATE: 4/12/82 SIGNED: Elaine Patterson

DPC_0409398

ROA_03030

Jolly - Fisher Exh 940-0084

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H 09458-73		033 -71990		05/21/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER
ATT J.W.HAMPTON, MGR. H09458-73
CATAWBA NUCLEAR STA., HWY.275
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA SMITHS TRANSFER
MARK H 09458-73
NOTE SHIP 12-01-82 REQUESTED ADHERE TO LSC82P359, 10CFR21 REQD.
TAG SPARE PARTS FOR W-SPIN#GAVAFWAA SUBJECT TO INSPECTION

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0001	1U7470X00A2 KN NS LOC	VRC ASSY RING 12 IN S31600	1		
	++ TAG 244401664N	3401			
0003	1U7677X0012 KN NS LOC	VRC RING,PISTON 12 IN GRAPHITE 17F19	12		
	++ TAG 244401666N	0510			
0004	2U7345X0052 P KN NS LOC	VRC SEAT/LINER 12 IN 410 SST/HT	4		
	++ TAG 244401667N	3365			
0005	2R637602202 KN 05002596 LOC AA05-50-8	VRC DIAPHRAGM SIZE 80 NITRILE 17E44	4		
	++ TAG 25510258N	0220			
0006	15A6010X042 KN NS LOC	VRC PARTS KIT,BAILEY NUMBER 256168-A2 FOR POSITION VENDOR	2		
	++ TAG 115501048N	9998			
0008	1D5604000A2 KN 50001480 LOC EE17-04-5#	VRC PLUG,VALVE 1/4 IN C36000(B16)NITR	1		
	++ TAG 115501050N	1436			

WILL SHIP WEEK OF MAR 11 1983

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY, AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

MILL POWER RECEIVED JUL 23 1982 MAIL DEPT. PURCHASING

DPC_0409391

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 2

Jolly - Fisher Exh 940-0085

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H 09458-73		033 -71990		05/21/82	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P. O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER
%J.W.HAMPTON, MGR. H09458-73
CATAWBA NUCLEAR STA., HWY.274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA SMITHS TRANSFER
MARK H 09458-73
NOTE SHIP 12-01-82 REQUESTED ADHERE TO LSC82P359, 10CFR21 REQD.
TAG SPARE PARTS FOR W-SPIN#GAVAFWAA SUBJECT TO INSPECTION

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 1			
)009 1B7989000B2 KN 50000421 LOC EE31-19-2*	VRC	DIAPHRAGM ASSY WITH RELIEF BRASS/FMS 17E39	4		
++ TAG 115501051N					
)010 1F257706992 KN 50001760 LOC EE17-06-1*	VRC	FILTER ELEMENT RIBON RIBON-CELLULOSE PURCHASED PART 0699	4		
++ TAG 115501052N					
)011 1P548406992 KN NS LOC	VRC	SWITCH,NAMCO EA170-61100,SNAP-LOCK VENDOR 9998	2		
++ TAG 110800056N					
)012 15A5650X552 KN NS LOC	VRC	SWITCH,NAMCO ELECT REPAIR KIT EA171-12100 VENDOR 9998	2		
++ TAG 110800057N					
)013 15A5650X562 KN NS LOC	VRC	SWITCH,NAMCO MECH REPAIR KIT EA171-11109 VENDOR 9998	2		
++ TAG 110800058N					
)014 15A5650X572 KN NS LOC	VRC	SWITCH,NAMCO LEVER SHAFT KIT EA171-10109 VENDOR 9998	2		
++ TAG 110800059N					

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

MILL POWER RECEIVED JUL 23 1982 EMIL DEPT.

DPC_0409392

FORM Z582 PRINTED IN U.S.A.

CONTINUED ON PAGE 3

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H 09458-73		033-71990		05/21/82	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER
&J.W.HAMPTON, MGR. H09458-73
CATAWBA NUCLEAR STA., HWY.274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA SMITHS TRANSFER
MARK H 09458-73
NOTE SHIP 12-01-82 REQUESTED ADHERE TO LSC82P359, 10CFR21 REQD.
TAG SPARE PARTS FOR W-SPIN#GAVAFWAA

SUBJECT TO INSPECTION

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 2			
0015	1M201399012 KN 05026516 LOC ACN0-04-6	VRC RELAY,MOORE MODEL #61H,1/4NPT,LESS BRACKE PURCHASED PART 0699	1		
	++ TAG 044601159N				
0016	33A4775X042 P KN NS LOC	VRC CAGE,SPECIAL FOR WH 12 IN,8 IN ORF 17-4,H1100 331S	4		
	++ TAG 244401668N				
0017	1U7833X0012 KN NS LOC	VRC CAGE PIN 12 IN S31600,B,G&P 3516	12		
	++ TAG 244401669N				
0018	1U8500X0012 KN NS LOC	VRC SPRING,RETAINING 12 IN S30200 3702	4		
	++ TAG 244401670N				
0019	1V334035072 KN 17140030 LOC AA27-41-4	VRC PIN,GROOVE 1/4 X 1 1/2 S31600,20B20 3557	8		
	++ TAG 244401671N				
02A	NUCLEAR INS FOR ITEM 2B SN 5930672-675 NUCLEAR-SECIII W/WINTER 72 CL3 NPT STAMP YES DESIGN PRESS 1860 PSIG TEMP 460 DEG F	VRC	1		

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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MILL POWER RECEIVED JUL 28 1982 MAIL DEPT.

DPC_0409393

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 4

ROA_03033

Jolly - Fisher Exh 940-0087

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H 09458-73		033 -71990		05/21/82	REPLACEMENT PARTS

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER
ZJ.W.HAMPTON, MGR. H09458-73
CATAWBA NUCLEAR STA., HWY.274
NEWPORT, SOUTH CAROLINA 29730

SHIP PREPAY
VIA SMITHS TRANSFER
MARK H 09458-73
NOTE SHIP 12-01-82 REQUESTED ADHERE TO LSC82P359, 10CFR21 REQD.
TAG SPARE PARTS FOR W-SPIN#GAVAFNAA SUBJECT TO INSPECTION

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 3			
002B 2V4787X0032 P	VRC PLUG/STEM ASSY	4		
KN NS	12 IN,8 IN ORF,30 7/16 REF			
LOC	316L&HF S&G/316			
++ TAG 244401665N				

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

MILL POWER RECEIVED JUL 29 1982

DPC_0409394

FORM 2592 PRINTED IN U.S.A.

C-42280 S-4911 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT AND ENGINEERING SPECIFICATIONS

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	SERIAL NUMBER
H-09458-73		033 -71990-A	X	04-06-82	

304472

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER CO
% J.W. HAMPTON, MGR H09458-73
CATAWBA NUCLEAR STN, HWY 274
NEWPORT, SOUTH CAROLINA 29710

TOTAL NO. OF PIECES: 2

VIA: SMITH'S TRANSFER/PPD

MARK NOTE: H09458-73 AND ITEM ID NO.
SHIP 12-01-82 REQUESTED

*JIM JONES

8-6-82

ITEM 0007 TAG
TYPE 67AFR/239 1/4 INCH REGULATOR

++ COMPLETE DUKE POWER QA FORM 930.1A
ASSY & ORIENT DWG N/A
MUST SHIP FROM MARSHALLTOWN, SUBJECT TO
INSPECTION, SPARES FOR SN 5930672-675 CUST HAS

Δ FS67AFR-239
1/4 PRESSURE REGULATOR
ALUMINUM BODY SIDE OUTLET TAPPED BRASS DRAIN
VALVE, CELLULOSE FILTER ELEMENT, ALUMINUM BONNET,
NITRILE INNER VALVE BRASS STEM, NITRILE DIAPHRAGM
W/RELIEF, SPRING NO. 1K74B527202, RANGE 0-100 PSI,
SQ HD ADJUSTING SCREW, 0-100 PSIG GAUGE, TYPE
67AFR/239
67X6-A3-B1-C1-D1-E3-F4-G1-J4-9A25
VRC
CCAHALACD9AHWAWAEM--

QUANTITY
ITEM 2

JUL 24 1987

MMC
8-6-82 (4)

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT

IF INCORRECT, PLEASE INFORM US AT ONCE.

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218

MILL POWER RECEIVED JUL 19 MILL PWR PURCHASING

DPC_040339

FORM 24218 PRINTED IN U.S.A.

07/12/82

PAGE 1 OF 1

Jolly - Fisher Exh 940-0089

304472

RPT P825 REQUEST FOR INFORMATION PAGE 1
PREPARED: 06/19/82 FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

8-18-82

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER: 033-71990-A

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S)

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION	
007	2	0	REGULATOR,FISHER	67FR-239

VENDOR REPLY: WANTED: 1/03/83
PROMISED: 6/26/82

Order is rescheduled to 9-1-82

RECEIVED
JUN 22 1982
ROBERT E. MASON CO.

RECEIVED
JUL 8 1982
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: 7-2-82 SIGNED: Gaye Chey

DPC_0409396

ROA_03036

Jolly - Fisher Exh 940-0090

Robert E. Mason Company
1726 North Graham Street
P.O. Box 33424
Charlotte, North Carolina 28233
Phone 704/375-4464

FISHER

Robert E. Mason

August 4, 1982

Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

ATTENTION: Mr. E. A. Lail

REFERENCE: Purchase Order No. H31384-73

Dear Ed:

We are in receipt of the above purchase order and have proceeded to place it on order at the factory. This is to advise you that the factory has changed their method of identifying these particular valves and the new identification is as follows:

ITEM 1: FS No. ES-878 with option T-54.
This will be identical to the ES-4179 that you ordered.

Also, at this time I would like to call to your attention that your purchase order states that these valves are going to be used with a 650 degree Fahrenheit temperature. These valves are furnished with a standard TFE packing which is only good up to a limit of 450 degrees Fahrenheit. You may wish to review this with your engineer and should you need the 650 degrees Fahrenheit temperature, we will need to furnish this valve with laminate graphite packing and a FGM gasket set, which would mean an increase in price.

If you do require the valve to be suitable for 650 degrees Fahrenheit, please notify me immediately so that I might change the order at the factory. If we may be of any further assistance to you, please do not hesitate to contact the office.

Very truly yours,

FISHER CONTROLS INTERNATIONAL, INC.

J. M. Hearn

J. M. Hearn
ROBERT E. MASON COMPANY

JMH:ays

DPC_0409372

A Sales Representative of Fisher Controls

ROA_03037

Jolly - Fisher Exh 940-0091

Pls. noted 8/10

August 9, 1982

Line #	35 2441
Operator	E

Steam Production Dept.
Building

ATTENTION: Mr. Wayne McDonald
Catawba Station

SUBJECT: Req. 7330820546
Order H31384-73
Fisher Controls

We enclose, for your information, copy of letter received from Robert E. Mason Comapny dated August 4, 1982 concerning temperature requirements for line item #1. In addition, please note the correct part number for line item #1.

Please review and let us have your comments concerning this matter.

E. A. Lail

fs

Enclosure

DPC_0409371

Robert E. Mason Company
1726 North Graham Street
P.O. Box 33424
Charlotte, North Carolina 28233
Phone 704/375-4464

FISHER

Robert E. Mason

August 4, 1982

Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

ATTENTION: Mr. E. A. Lail

REFERENCE: Purchase Order No. H31384-73

Dear Ed:

We are in receipt of the above purchase order and have proceeded to place it on order at the factory. This is to advise you that the factory has changed their method of identifying these particular valves and the new identification is as follows:

ITEM 1: FS No. ES-878 with option T-54.
This will be identical to the ES-4179 that you ordered.

Also, at this time I would like to call to your attention that your purchase order states that these valves are going to be used with a 650 degree Fahrenheit temperature. These valves are furnished with a standard TFE packing which is only good up to a limit of 450 degrees Fahrenheit. You may wish to review this with your engineer and should you need the 650 degrees Fahrenheit temperature, we will need to furnish this valve with laminate graphite packing and a FGM gasket set, which would mean an increase in price.

If you do require the valve to be suitable for 650 degrees Fahrenheit, please notify me immediately so that I might change the order at the factory. If we may be of any further assistance to you, please do not hesitate to contact the office.

Very truly yours,

FISHER CONTROLS INTERNATIONAL, INC.

J. M. Hearn

J. M. Hearn
ROBERT E. MASON COMPANY

JMH:ays

DPC_0409372

A Sales Representative of Fisher Controls

8-30

August 9, 1982

Steam Production Dept.
Building

ATTENTION: Mr. Wayne McDonald
Catawba Station

SUBJECT: Req. 7330820546
Order H31384-73
Fisher Controls

CATAWBA Received AUG 12 '82 Mech. STEAM

We enclose, for your information, copy of letter received from Robert E. Mason Comapny dated August 4, 1982 concerning temperature requirements for line item #1. In addition, please note the correct part number for line item #1.

Please review and let us have your comments concerning this matter.

E. A. Lail

RECEIVED AUG 30 1982 MPS. CO. FILE ROOM

fs

Enclosure

First Indorsement August 25, 1982

Please be advised that we need the 650°F as ordered. Addendum no. 001 has been written to change the p/n of item no. 001.

K. W. MCDONALD

DPC_0409370

PEC/tnc

ROA_03040

Jolly - Fisher Exh 940-0094

Mr. Shugell
As noted
9/2

9-21 Eal/8

352441

August 31, 1982

Mr. Mitch Hearn
Fisher Controls
% R. E. Mason Co.
P.O.BOx 33424
Charlotte, NC 28233

SUBJECT: Order H31384-73
Your letter of August 4, 1982

Dear Mr. Hearn:

In response to your subject letter, please proceed with furnishing item #1 on the subject order with the laminate graphite packing and the FGM gasket set required to increase the temperature limit to 650 degrees Fahrenheit. Please advise additional pricing for this material.

In addition, we will forward at a later date a Change Notification Sheet to correct the part number of item #1 as indicated in your subject letter.

Thank you for your copperation in this matter.

Sincerely yours,

E. A. Lail
Assistant Purchasing Agent

fs

DPC_0409369

Robert E. Mason Company
1726 North Graham Street
P.O. Box 33424
Charlotte, North Carolina 28233
Phone 704/375-4464

Match 9-21

FISHER

Robert E. Mason

412592

~~10-25-82~~
~~11-5-82~~
~~11-30-82~~
~~12-31-82~~
~~1-31-83~~
~~2-15-83~~
3-2-83

October 8, 1982

Mr. E. A. Lail
Assistant Purchasing Agent
Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232

need Ins Item 1

RE: Your Order #H31384-73
Our Order #33-A110015086
Your letter of August 31, 1982

1-31-83 (C)

Dear Ed:

We are in receipt of your above letter and have proceeded to place a change order with the factory to furnish the valve with laminated graphite packing and an FGM gasket set which will allow this valve to be used in a service of 650° F. The new price of the valve will be $1,735.36 each.

We respectfully request that you pleaes change your records at this time to reflect the new pricing.

If we may be of any further assistance to you, please do not hesitate to contact this office.

Very truly yours,

FISHER CONTROLS INTERNATIONAL, INC.

J. Mitchell Hearn

J. Mitchell Hearn
ROBERT E. MASON COMPANY
DIST. REPR.

gs

Checked CRT 11/9 all Items
~~Checked~~ shipped

RECEIVED
OCT 11 1982
MPS. CO.
FILE ROOM

DPC_0409368

A Sales Representative of Fisher Controls

Line #	41597
Operator PAGE	2

RPT P825
PREPARED: 08/06/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232.

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-379-5324
TELEX 57-2346

9-9-82

SUBJECT: OUR ORDER NUMBER: H31384-73
OUR ORDER DATE: 7/23/82
YOUR ORDER NUMBER: 33-74139 & "A" Portion
WANTED DATE IS: 8/31/82
COMMITTED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WE HAVE RECEIVED NO ACKNOWLEDGMENT OF THIS ORDER. PLEASE ACKNOWLEDGE AND GIVE DATE(S) ITEMS WILL BE SHIPPED.

RECEIVED
AUG 9 1982
ROBERT E. MASON CO.

VENDOR REPLY:

This order has been entered with Fisher Controls.
Acknowledgment will be received within 2 to 3 weeks.
Order has not, as yet, been scheduled for shipment.

Anne Stehley 8/12/82

RECEIVED
AUG 13 1982
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: ---------- SIGNED: ----------

DPC_0409378

ROA_03043

Jolly - Fisher Exh 940-0097

304470

RPT P825
PREPARED: 08/07/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janie Sherrill
704-373-5324
TELEX 57-2345

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER: 033-71990-A
WANTED DATE IS: 1/03/83
COMMITTED DATE IS: 7/24/82

SHIP TO: DUKE POWER COMPANY
C/O J. W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

~~11-11-82~~
~~12-13-82~~
~~1-14-83~~
~~1-31-83~~
2-15-83

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

1-14-83
(4)

VENDOR REPLY:

Item #7 was Shipped on 8-10-82

All other items are sch'd to 1-31-83
(4)

Ship 3-11-1983

MMIS
~~11-11-82~~

RECEIVED
AUG 19 1982
EXPEDITING DEPT.
MILL-POWER
SUPPLY

DATE: 8-16-82 SIGNED: Gaye Chay

DPC_0409390

ROA_03044

Jolly - Fisher Exh 940-0098

2-19505 S- P-0000000

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT AND ENGINEERING SPECIFICATIONS

412592

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	SERIAL NUMBER
H31384-75		033 -A210015086		08-13-82	[illegible]

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
ATT: HAMPTON, NGR.
CATAWBA NUCLEAR, HWY 30
NEWPORT, SOUTH CAROLINA 29710

VIA PPD MOTOR FREIGHT
MARK PO# H31384-75
NOTE SH SP REQUESTED

10-25-82

TOTAL NO. OF PIECES 2

SN

ITEM 0001 TAG IEA: 244401963N
TYPE ES SIZE 4

QUANTITY	
ITEM	0000000000
2	0000000000

A VALVE BODY ASSY
4 IN NCB STL CL300 RF FLG GLOBE BODY, IRON ENC EQ
POS CAGE 2 IN TRAV, 416 SST VALVE PLUG & RING 4
3/4 PORT, GASKETS ASBESTOS,SPIRAL WOUND 316L SST &
ASB, CAR-ON FILLED TFE PISTON RING, 316 SST VALVE
STEM MAX 1.5000, DESIGN ES PUSH DOWN TO CLOSE,
FLO, DT, MSS 816.5-68 CLASS 300
ECX6-A21-C2D-D38R-F2-G15-H1-J1-K1-L1-9A4-9B12
V3C
AEDACBHADLLVLVCDSD--

NOV 13 1982

B FSE-20
BONNET 3 13/16 YOKE BOSS, 1/2 STEM
STEEL PACKING FLANGE STUDS AND NUTS, TFE PACKING,
ARRANGEMENT DEATSIL, STEEL STD BONNET, PLUGGED
EK2-[illegible]-C2-D129-E1
V3C
AEBACKFA-[illegible]TKG------

10-5-82 (4)

0000000 SAMPLATE STA8601X012 COMP A 0000
SERIAL NO. , TYPE , SIZE ,
ACTUATOR PORT WHEN POWERED,
MAX ALLOW. SUPPLY , TRAVEL , BENCH SET TO ,
SERIAL NO. , TYPE ES, BODY SIZE 4 IN.,
BODY MATL NCB STL, SEAT MATL 416 SST,
STEM/PLUG MATL 316 SST/ 416 SST ,
RATING/CLASS B16.5-68-300, , , TAG NO.
CUST NO.
0000000000000000000000000000000000000000000000000000000000

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

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MILL POWER & POWER SUPPLY CO. SEP 27 1982 MAIL DEPT. PURCHASE ORDER

DPC_0409373

FORM 2421B PRINTED IN U.S.A.
09/15/82

PAGE 1 OF 1

ROA_03045

Jolly - Fisher Exh 940-0099

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H31384-73		033 -74139		08/25/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA

VIA SHIP PREPAY
UNITED PARCEL SERVICE
MARK J W HAMPTON, MGR H31384-73
NOTE SHIP REQUESTED
TAG

~~29710~~ 412592

V9-30-82

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0002	2U7413X0012 KN 16109120 LOC AA18-48-4	VRC CAGE,EQ % 4 IN CI F12102(B)ENC 1947	3		
	++ TAG 244401964N				
0003	1LA5238X012 KN 16104201 LOC AA18-46-3	VRC PLUG,VALVE 4 3/8 ORIF VSC 1L5000 S41600,HT 3584	3		
	++ TAG 244401965N				
0004	1U222946172 KN 16113700 LOC AA17-49-5	VRC SEAT RING 4 S41600,HT 3467	3		
	++ TAG 244401966N				
0005	1U230535162 KN 15131790 LOC AA27-37-6	VRC STEM,PLUG 1/2 IN X 12 5/8 VSC 1L5000 S31600,B,G&P 3516	3		
	++ TAG 244401967N				
0006	1R3722X0012 KN 16137521 LOC LL06-13-5	VRC GASKET SET,TO 450F 4 E & ER 6 EA 6X4 & 8X4 EW ASB/316L	6		
	++ TAG 244401968N				
0007	1B599635072 KN 11003490 LOC AA27-45-2B	VRC PIN,GROOVE,TYPE C 1/8X15/16 S31600 3507	3		
	++ TAG 244401969N				

MINT 9-30-82 (Y)

OCT 30 1982

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

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MILL POWER RECEIVED SEP 7 1982 MAIL DEPT. PURCHASING

DPC_0409374

FORM 2682 PRINTED IN U.S.A.

CONTINUED ON PAGE 2

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H31384-73		033 -74139		08/25/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

SHIP PREPAY
VIA UNITED PARCEL SERVICE
MARK J W HAMPTON, MGR H31384-73
NOTE SHIP REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 1					
0008	2R366923022 KN 16096400 LOC AA18-50-5	VRC BONNET 4 IN 2 13/16 YOKE BOSS STL 105	2302	3		
	++ TAG 244401970N					
0009	1R290201012 KN 15131000 LOC AA27-37-3*	VRC PACKING,SET 1/2X1 TFE FMS 17D7	0101	18		
	++ TAG 244401971N					
0010	2E859602202 KN 05009160 LOC AA13-45-1	VRC DIAPHRAGM SIZE 45 & 50 NITRILE 17E44	0220	6		
	++ TAG 25510270N					
0011	1E845714012 KN 05009110 LOC AA08-43-2	VRC BUSHING,SEAL 45-50-60 BRS C36000(B16)	1401	3		
	++ TAG 25510271N					
0012	1C562206992 KN 11004210 LOC AA08-46-8*	VRC O-RING 1 1/8X1 3/8X1/8 NITRILE-DS52-1	065A	18		
	++ TAG 25510272N					
0013	1E845806992 KN 05009120 LOC AA08-46-7*	VRC O-RING 1 7/8X2 1/8X1/8 NITRILE-DS52-1	065A	9		
	++ TAG 25510273N					

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DPC_0409375

FORM 2692 PRINTED IN U.S.A.

CONTINUED ON PAGE 3

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H31384-73		033 -74139		08/25/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA UNITED PARCEL SERVICE
MARK J.W. HAMPTON, MGR H31384-73
NOTE SHIP REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 2				
0014 1E826527082 KN 05010960 LOC AA07-43-1	VRC SPRING SIZE 45-50-60 STL H51600	2708	3		
++ TAG 25510274N					
0015 1R410224052 KN 05010418 LOC AA08-44-2	VRC SCREW,CAP,HEX HD 3/4-16X3 STL GR 5/PL	2405	3		
++ TAG 25510275N					
0016 1R410724092 KN 05010423 LOC AA08-45-4	VRC TRAVEL STOP SPACER SIZE 45-50-60 2 IN TRAVEL STL G12144	2409	3		
++ TAG 1R410724092					
0017 1E846224102 KN 05009140 LOC AA08-45-3	VRC SCREW,ADJUSTING SIZE 45-50-60 STL G12144/PL	2414	3		
++ TAG 25510277N					
0018 1J333000A2 KN 05010150 LOC AA08-49-2*	VRC STEM CONNECTOR ASSY SIZE 45 1/2 IN STEM 416 SST		3		
++ TAG 25510278N					
0019 1E845638992 KN 05009100 LOC AA08-48-8	VRC RING,SNAP SIZE 45-50-60 S30200	3702	6		
++ TAG 25510279N					

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DPC_0409346

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 4

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H31384-73		033 -74139		08/25/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA UNITED PARCEL SERVICE
MARK J W HAMPTON, MGR H31384-73
NOTE SHIP REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 3			
0020 1J332824222	VRC DIAPHRAGM ROD	3		
KN 05010130	SIZE 45			
LOC AA08-47-4	STL G12144/CRPL			
	2422			
++ TAG 25510280N				

WILL SHIP WEEK OF

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DPC_0409377

FORM 2502 PRINTED IN U.S.A.

Jolly - Fisher Exh 940-0103

FROM	Catawba Nuclear Station Steam Production Materials Section
TO	E.A. Lail Mill Power Supply Purchasing Dept.
SUBJECT	7330821111 H-38738 Fisher Controls Co.

☐ URGENT REPLY NECESSARY
☐ REPLY NOT NECESSARY

DATE Sept. 24, 1982

RECEIVED OCT 4 1982 MPS. CO. FILE ROOM

FOLD TO 1 SEND

FOLD TO 1 RETURN

MESSAGE

On the p.o. H38738 items 13 and 58 differ in catalog number when compared to the requisition. Item 13 on p.o. shows the cat no as 1R336304022; the req. shows it as 1R338304022. Item no. 58 on p.o. shows cat no. as 1H862706992; while the req. shows it as 1B862706992. Are these new nos. or typos. If they are typos, please correct by issuing a change order.

Thanks!

Terry Orders
Materials

advised Orders 10/5/82 that p/n shown on req. are same as on order with 10/5

SIGNED

REPLY

DPC_0452896

SIGNED DATE

ORIGINAL

ROA_03050

Jolly - Fisher Exh 940-0104

FROM	Entergy Nuclear Northeast Atom Production Materials Section

☐ **URGENT REPLY NECESSARY**
☐ **REPLY NOT NECESSARY**

DATE Sept. 24, 1982

TO	C.H. Zail Mail room supply Purchasing Dept.

SUBJECT	13 30831111 H-38438 Disk Certificates

FOLD TO | RETURN

FOLD TO | SEND

MSSAG

Per our p.o. H38438 items 13 and 58 differ in catalog numbers when compared to the requisition and in 13 on p.o. the cat. no. is 1R336304022; the req. shows it as 1K338304022. Item no. 58 on p.o. amendment no. is 1H8621106992; while the req. shows it as 1B8621106992. Check these new nos. as typos. If they are typos, please correct by issuing a change order.

Thanks!

Jerry Orters
Materials

Advised [illegible] that [illegible]

SIGNED

RPLY

DPC_0452897

SIGNED DATE

RETAIN THIS COPY

ROA_03051

Jolly - Fisher Exh 940-0105

TO

☐ URGENT REPLY NECESSARY
☐ REPLY NOT NECESSARY

DATE

FROM

SUBJECT

FOLD TO | RETURN

FOLD TO | SEND

MESSAGE

SIGNED

REPLY

DPC_0452898

SIGNED DATE

RETURN THIS COPY TO SENDER

ROA_03052

Robert E. Mason Company
1726 North Graham Street
P.O. Box 33424
Charlotte, North Carolina 28233
Phone 704/375-4464

Match order

FISHER Controls

Line #	449422
Operator	Robert E. Mason

H 38738-73

10-27-82

11-11-82

September 27, 1982

Mr. E. A. Lail
Mill-Power Supply Company
P. O. Box 32307
Charlotte, NC 28232-2307

10-12-82 (3)

10-27-82 (3)

Dear Mr. Lail:

In reference to your purchase order #H38738-73 the following items were incorrectly priced. Correct pricing read as follows:

Item 1	1R970336142	$ 29.92 each
Item 4	1L402335402	13.60 each
Item 47	1R669035402	132.60 each
Item 48	1R670335072	52.36 each

Thank you for this order. We appreciate the opportunity of serving you. If there are any questions, please do not hesitate to call or contact this office.

Very truly yours,

FISHER CONTROLS INTERNATIONAL, INC.

Henry Mullis

H. C. Mullis
ROBERT E. MASON COMPANY
DIST. REPR.

gs

DPC_0452895

A Sales Representative of Fisher Controls

28101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA 29710

VIA: SHIP PREPAY
DO NOT SPLIT SHIP MOTOR FREIGHT
MARK: H38738-73ATTN J.W. HAMPTON, MGR
NOTE: SHIP 11-25-82 REQUESTED
TAG

12-14-82

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
0001	1R970336142 KN 04053945 LOC LB04-14-3	VRC SEAL,BALL 6 IN 150 & 300 LB S31600,SPG T	3614	2		
	++ TAG ,254200267					
0002	F1633936042 KN 19070805 LOC AA30-16-6	VRC WASHER 5/8 SHAFT S31600	3604	3		
0003	F1634036042 KN 19074014 LOC LB10-14-4	VRC WASHER 3/4 SHAFT S31600	3604	2		
0004	1L402335402 KN 04010470 LOC LB03-C1-5	VRC WASHER 4 IN/6 IN 150 LB S17400,HT	3540	2		
0005	1D191804022 KN 11004930 LOC AA07-14-7	VRC GASKET 45/64X1/16 ASBESTOS L7A2	0402	2		
0006	1L179999102 KN 12004080 LOC AA24-02-5	VRC GASKET,SPIRAL WOUND 3 3/4X4 5/16X.175 316L SST & ASB	9910	3		
0007	1N297999102 KN 04022840 LOC AA18-23-7	VRC GASKET,SPIRAL WOUND 1 5/16X1 13/16X.175 316L SST & ASB	9910	4		

JAN 14 1983 WILL SHIP WEEK OF

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DPC_0452887

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 2

C-18101 S-F1 . P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	REPLACEMENT PARTS
H38738-73		033 -74684		10/15/82	

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP MOTOR FREIGHT
MARK H38738-75ATTN J.W. HAMPTON, MGR
NOTE SHIP 11-25-82 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 1			
0008	1R286099282 KN 15130520 LOC AA19-34-5	VRC GASKET,SPIRAL WOUND 2X2 1/2X.175 316L SST & ASB 9910	3		
0009	1R286204022 KN 15130560 LOC AA19-33-5	VRC GASKET 1 13/16X2 7/32X1/32 ASBESTOS 17A2 0402	3		
0010	1R309804022 KN 15131260 LOC AA17-33-3	VRC GASKET 2 3/8X2 25/32X1/32 ASBESTOS 17A2 0402	2		
0011	1R309999442 KN 15131282 LOC AA17-35-4	VRC GASKET,SPIRAL WOUND 2 9/16X3 1/16X.175 INCONEL & GRAPH 9944	3		
0012	1R310004022 KN 15131300 LOC AA17-33-4	VRC GASKET 2 1/2X3 3/32X1/32 ASBESTOS 17A2 0402	2		
0013	1R336304022 KN 15124800 LOC AA23-47-5	VRC GASKET 1 11/32X1 19/32X1/32 ASBESTOS 17A2 0402	3		
0014	1R348104022 KN 16137050 LOC AA19-46-7	VRC GASKET 4 1/16X4 15/32X1/32 ASBESTOS 17A2 0402	3		
0015	1R348299282 KN 16137070 LOC AA19-46-3	VRC GASKET,SPIRAL WOUND 4 1/8X4 5/8X.175 316L SST & ASB 9910	3		

WILL SHIP WEEK OF

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	REPLACEMENT PART

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP MOTOR FREIGHT
MARK H38738-73ATTN J.W. HAMPTON, MGR
NOTE SHIP 11-25-82 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED	
		CONTINUED FROM PAGE 2				
0016	1R348304022 KN 16137090 LOC AA19-46-5	VRC GASKET 4 1/16X4 21/32X1/32 ASBESTOS 17A2 0402	2			
0017	1R348304302 KN 16137105 LOC AA19-47-8	VRC GASKET 4 1/16X4 21/32X1/32 ASB-NIT 17A4 0430	2			
0018	1R348404022 KN 16137110 LOC AA19-46-6*	VRC GASKET 4 1/16X5 5/32X1/32 ASBESTOS 17A2 0402	3			WILL SHIP WEEK OF
0019	1R384599282 KN 16137600 LOC AA21-45-5	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 316L SST & ASB 9910	2			WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.
0020	1R384599442 KN 16137602 LOC AA21-45-7	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 INCONEL & GRAPH 9944	3			
0021	1R384704022 KN 16137620 LOC AA21-45-4	VRC GASKET 3 1/2X4 19/32X1/32 ASBESTOS 17A2 0402	2			IF INCORRECT, PLEASE INFORM US AT ONCE.
0022	1R384704022 KN 16137620 LOC AA21-45-4	VRC GASKET 3 1/2X4 19/32X1/32 ASBESTOS 17A2 0402	2			NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.
0023	1U508604022 KN 17139570 LOC AA16-47-[illegible]	VRC GASKET 7 7/8X8 15/32X1/32 ASBESTOS 17A2 0402	2			

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ROA_03056

Jolly - Fisher Exh 940-0110

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	**REPLACEMENT PARTS**

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

VIA: SHIP PREPAY
DO NOT SPLIT SHIP MOTOR FREIGHT

MARK: H38738-73ATTN J.W. HAMPTON, MGR

NOTE: SHIP 11-25-82 REQUESTED

TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 3			
0024	10A3265X012 KN 17165135 LOC AA21-22-6	VRC GASKET 9 7/8X11X1/32 ASBESTOS 17A2 0402	2		
0025	10A3266X012 KN 17165145 LOC AA21-23-6	VRC GASKET 8 11/16X9 3/16X1/32 ASBESTOS 17A2 0402	2		
0026	10A4154X012 KN 17092015 LOC AA29-33-4	VRC GASKET 4 3/8X5 1/32X1/32 N04400MONEL/SIL 4121	3		
0027	10A4155X012 KN 17092020 LOC AA29-33-8	VRC GASKET 4 19/32X5 1/32X1/32 N04400MONEL/SIL 4121	3		
0028	10A5412X012 KN 17044070 LOC AA29-38-5	VRC GASKET 7 13/32X8 1/16X1/32 N04400MONEL/SIL 4121	2		
0029	10A5413X012 KN 17044080 LOC AA29-38-8	VRC GASKET 7 19/32X8 1/16X1/32 N04400MONEL/SIL 4121	2		
0030	1U506905102 KN 17139140 LOC AA16-45-5	VRC RING,PISTON 6 IN GRAPHITE 17F19 0510	3		
0031	1R343404302 KN 16137130 LOC AA19-45-6	VRC GASKET 4 1/16X5 5/32X1/32 ASB-NIT 17A4 0430	2		

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ROA_03057

Jolly - Fisher Exh 940-0111

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	REPLACEMENT PARTS

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO: DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

VIA: SHIP PREPAY
DO NOT SPLIT SHIP MOTOR FREIGHT
MARK: H38738-73ATTN J.W. HAMPTON, MGR
NOTE: SHIP 11-25-82 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 4			
0032	10A3327X012 KN 01115020 LOC AA25-17-7	VRC GASKET 1 3/8X1 29/32X1/32 ASB-NIT 17A4 0430	3		
0033	10A3383X012 KN 01115100 LOC AA25-22-8	VRC GASKET,SPIRAL WOUND 2 5/8X3 1/32X.175 S31603(316L) 3612	2		
0034	10A3384X012 KN 01115105 LOC AA25-22-6	VRC GASKET 3 5/32X3 15/32X1/32 ASB-NIT 17A4 0430	3		
0035	10A3385X012 KN 01115110 LOC AA25-22-6	VRC GASKET 2 11/32X3 1/16X1/32 ASB-NIT 17A4 0430	3		
0036	10A3437X012 KN 01115205 LOC AA20-46-7	VRC GASKET 4 1/4X4 19/32X1/32 ASB-NIT 17A4 0430	2		
0037	10A3438X012 KN 01115210 LOC AA20-46-6	VRC GASKET 3 1/2X4 5/32X1/32 ASB-NIT 17A4 0430	2		
0038	10A3478X012 KN 01115300 LOC AA17-48-8	VRC GASKET,SPIRAL WOUND 4 11/16X5 3/32X.175 S31603(316L) 3612	3		
0039	10A3479X012 KN 01115305 LOC AA18-47-7	VRC GASKET 5 7/32X5 17/32X1/32 ASB-NIT 17A4 0430	3		

WILL SHIP WEEK OF

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DPC_0452891

FORM 2602 PRINTED IN U.S.A.

CONTINUED ON PAGE 6

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA 29710

VIA SHIP PREPAY
DO NOT SPLIT SHIP MOTOR FREIGHT
MARK H38738-73ATTN J.W. HAMPTON, MGR
NOTE SHIP 11-25-82 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 5			
0040	10A3480X012 KN 01116310 LOC AA17-47-2	VRC GASKET 4 13/32X5 1/8X1/32 ASB-NIT 17A4 0430	3		
0041	J1225901652 KN 19066670 LOC AA30-16-2	VRC PACKING,RING 5/8 SHAFT GRAPH RIBBON 011D	3		
0042	1N285406382 KN 04011345 LOC L803-01-4*	VRC O-RING 1 1/8X1 3/8X1/8 VITON-DS52-5 065E	2		
0043	1N285606382 KN 12013810 LOC AA25-02-7*	VRC O-RING 1 3/4X2X1/8 VITON-DS52-5 065E	2		
0044	1V547606382 KN 04136030 LOC L809-08-5	VRC O-RING 7X7 1/4X1/8 VITON-DS52-5 065E	2		
0045	1P573935402 KN 04050670 LOC L803-10-4	VRC RING,SPLIT 4 IN 2 HALVES PER SET S17400,HT 3540	2		
0046	1R667636042 KN 04043330 LOC L806-14-5	VRC RING,BACK-UP 12 IN 300 LB FOR METAL SEAL S31600 3604	2		
0047	1R669035402 KN 04056000 LOC L806-12-4	VRC RING,SPLIT 12 IN 2 HALVES PER SET S17400,HT 3540	2		

WILL SHIP WEEK OF

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MILL POWER RECEIVED AT OCT 29 1982 MAIL DEPT. PURCHASING

DPC_0452892

FORM 2092 PRINTED IN U.S.A.

CONTINUED ON PAGE 7

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP MOTOR FREIGHT
MARK H38738-73ATTN J.W. HAMPTON, MGR
NOTE SHIP 11-25-82 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 6				
0048	1R670335072 KN 04056120 LOC LB06-11-5	VRC RING,LANTERN 2 1/2 X 3 S31600,20B20	3557	3		
0049	1U104335072 KN 04053930 LOC LB03-10-3	VRC RING,RETAINING,SPLIT 4-300 LB S31600,20B20	3557	2		
0050	1R372304302 KN 16137536 LOC AA17-45-7	VRC GASKET 5X5 19/32X1/32 ASB-NIT 17A4	0430	3		
0051	1R372404302 KN 16137560 LOC AA17-43-8	VRC GASKET 5X6 3/32X1/32 ASB-NIT 17A4	0430	3		
0052	1U180504022 KN 04040820 LOC LB04-10-6	VRC GASKET 6X8 1/2X1/16 ASBESTOS 17A2	0402	2		
0053	1U180604022 KN 04043545 LOC LB06-14-6	VRC GASKET 12X15X1/16 ASBESTOS 17A2	0402	3		
0054	10A3326X012 KN 01115015 LOC AA25-17-7	VRC GASKET 2 1/32X2 11/32X1/32 ASB-NIT 17A4	0430	3		
0055	1C334206992 KN 05021030 LOC AA16-15-7	VRC O-RING 2 3/8X2 3/4X3/16 NITRILE-DS52-1	065A	3		

WILL SHIP WEEK OF

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CONTINUED ON PAGE 8

C-18101 5-F1 P-.

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H38738-73		033 -74684		10/15/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

VIA SHIP PREPAY
DO NOT SPLIT SHIP MOTOR FREIGHT
MARK H38738-73ATTN J.W. HAMPTON, MGR
NOTE SHIP 11-25-82 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 7			
0056	1C854606992 KN 05030330 LOC EE24-12-5*	VRC O-RING 5/32X9/32X1/16 NITRILE-DS52-3 065C	3		
0057	1H862706992 KN 05021160 LOC AA12-29-4	VRC O-RING 2X2 3/8X3/16 NITRILE/MOS2 050F	3		
0058	1J415106992 KN 05019520 LOC AA12-29-4*	VRC O-RING 1 1/8X1 3/8X1/8 NITRILE 0656	3		
0059	1U508046172 KN 17139125 LOC AA16-44-5	VRC SEAT RING 6 410 SST/HT 3365	2		

WILL SHIP WEEK OF

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DPC_0452894

FORM 2592 PRINTED IN U.S.A.

ROA_03061

Jolly - Fisher Exh 940-0115

RPT P825
PREPARED: 10/13/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

RECEIVED
OCT 15 1982
ROBERT E. MASON CO.

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janie Sherrill
704-373-5324
TELEX 57-2346

12-28-82

SUBJECT:
OUR ORDER NUMBER: H38738-73
OUR ORDER DATE: 9/20/82
YOUR ORDER NUMBER:
WANTED DATE IS: 11/01/82
COMMITTED DATE IS:

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

PLEASE GIVE DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:

Scheduled 1-14-83

DATE: 11-8-82 SIGNED: H C Mullis

DPC_0452886

ROA_03062

Jolly - Fisher Exh 940-0116

Line #	46242
Operator	PAGE 72

RPT P625
PREPARED: 10/23/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janie Sherrill
704-373-5324
TELEX 57-2346

11-29-82

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER:
WANTED DATE IS: 12/31/82
COMMITTED DATE IS: 12/31/82

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WE HAVE RECEIVED NO ACKNOWLEDGMENT OF THIS ORDER. PLEASE ACKNOWLEDGE AND GIVE DATE(S) ITEMS WILL BE SHIPPED.

VENDOR REPLY:

MMS 11-29-82 (4)

RECEIVED NOV 30 1982 EXPEDITING DEPT. MILL-POWER SUPPLY

Scheduled 12-11-82

DATE: 11-8-82 SIGNED: HC Mullis

DPC_0409149

Jolly - Fisher Exh 940-0117

C-18101 8-F1 P-

FISHER CONTROLS COMPANY
SHERMAN, TEXAS

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/05/82	REPLACEMENT

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

VIA SHIP PREPAY
DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

SHERMAN, BAL. MTOWN

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0095	F1914848112 KN 79004780 LOC 30809-7	VRC BUSHING 1 SHAFT X 1 LG #1616 VENDOR 9998	3		
	++ TAG ,254100272				
0096	L11147K0012 KN 79003700 LOC 30812-5	VRC SLEEVE,THRUST BUSH 6 9500 125-150# STL 20B13/PL 2886	4		
	++ TAG ,254100274				
0097	F3581005452 KN 79003810 LOC 30812-5	VRC LINER ASSY 6 9500 TFE/NEOPRENE 9966	4		
	++ TAG ,254100278				
0098	F3588105452 KN 79004810 LOC 30812-6	VRC LINER ASSY 8 9500 TFE/NEOPRENE 9966	3		
	++ TAG ,254100279				
0099	F3588205452 KN 79005810 LOC 30812-7	VRC LINER ASSY 10 9500 TFE/NEOPRENE 9966	3		
	++ TAG ,254100280				
0187	L11148K0012 KN 79004700 LOC 30812-6	VRC SLEEVE,THRUST BUSH 8 9500 125-150# STL 20B13/PL 2886	4		
	++ TAG ,254100275				

WILL SHIP WEEK OF

JAN 15 1983

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

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PAGE 1 OF 1

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Jolly - Fisher Exh 940-0118

DL S-E1 P

CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0001	1H854703012 KN 05015072 LOC PP09-06-7	VRC GASKET,PEDESTAL NEOPRENE/17G1	3		
	++ TAG ,115500016	0301			
0002	10A4223X012 KN 17098100 LOC AA29-33-5	VRC SEAL RING/SPRING,RAD 4 3/32X4 15/32X3/16 HVY HAST C & TFE	4		
	++ TAG ,244400452	9963			
0003	10A4207X012 KN 17086115 LOC AA29-32-7	VRC SEAL RING/SPRING,RAD 1 5/32X1 13/32X1/8 HVY HAST C & TFE	3		
	++ TAG ,244400450	9963			
0004	1D5604000B2 KN 50001500 LOC EE17-06-3	VRC PLUG,VALVE 1/4 IN S30400/17G14	3		
	++ TAG ,115500422	3484			
0007	1R872332012 KN 09005510 LOC PP10-14-6	VRC BOURDON TUBE ASSY 600 PSIG/ 4,000 KPA STL G41300	3		
	++ TAG ,115500425	3201			
0008	10A0618X012 KN 09005435 LOC PP10-18-6	VRC BOURDON TUBE ASSY 60 PSIG/ 400 KPA STL G41300	3		
	++ TAG ,115500426	3201			

WILL SHIP WEEK OF FEB 3 1983

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DPC_0409120

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CONTINUED ON PAGE 2

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Jolly - Fisher Exh 940-0119

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED.
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 1			
0009 T10546X00A2 KN 50000266 LOC EE17-08-7	VRC DIAPHRAGM ASSY STL/TFE/316/NIT	3		
++ TAG ,115500427				
0014 1D4684000C2 KN 53021260 LOC EE21-07-5	VRC DISC,VALVE ASSY 303-NYLON	4		
++ TAG ,115500437				
0023 1P696235072 KN NS LOC	VRC PLUG TIP 3/4-2 IN,3/4 ORF S31600,20820	3		
++ TAG ,244400378	3557			
0024 1U288746172 KN 15016985 LOC AA20-38-6	VRC PLUG,M-FORM 1/2-2 IN VSC 1L3750 1/2 ORIF S41600,HT	3		
++ TAG ,244400379	3584			
0025 1U844235072 KN 15000854 LOC AA20-38-2	VRC PLUG,3 FLUTE 1/2-2 IN VSC 1L3750 1/2 ORIF S31600,20820	4		
++ TAG ,244400380	3557			
0026 1V657346172 KN 15073320 LOC AA18-32-7	VRC PLUG,BAL 1 1/2 IN 1 7/8 ORIF VSC 1L375 S41600,HT	3		
++ TAG ,244400381	3584			

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 2			
0027 1V657546172 KN 15116112 LOC AA24-47-4	VRC PLUG,BAL 2 IN 2 5/16 ORIF VSC 1L5000 S41600,HT 3584	4		
++ TAG ,244400382				
0028 1V658146172 KN 16104410 LOC AA17-48-5	VRC PLUG,BAL 4 IN 4 3/8 ORIF VSC 1L5000 S41600,HT 3584	3		
++ TAG ,244400383				
0029 2U4891X0012 KN NS LOC	VRC PLUG/STEM,M-FORM 1 IN 1/4 ORF FOR STD BNT 316/#6-316SST	3		
++ TAG ,244400384				
0030 2U7537X0012 KN NS LOC	VRC PLUG/STEM,M-FORM 2 IN 1/2 ORF 3/4 DIA X 15 3/8 316 #6 S&G-316	3		
++ TAG ,244400385				
0031 2U9452X0012 KN NS LOC	VRC PLUG/STEM ASSY 1 IN M-FORM 3/8 ORIF 1/2 STEM 316 & #6/316	4		
++ TAG ,244400386				
0032 2U868446422 KN 15021550 LOC AA20-38-5	VRC PLUG,M-FLUTE,3F 1/2-2 1/4 ORF 1L3750 COCR-A T S31600/COCR-A 3434	3		
++ TAG ,244400387				

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C-18101 S-F1 P--

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PART**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 3			
0033	11A5239X012 KN 16104219 LOC AA18-45-5	PLUG,VALVE 4 3/8 ORIF VSC 1L7500 S41600,HT 3584	3		
	++ TAG ,244400388				
0034	14A2839X0A2 KN NS LOC	VRC PLUG/STEM/RING 2 IN,1 ORF 1L7500X17 ACT 440C HT/316	4		
	++ TAG ,244400389				
0035	20A2641X012 KN 17097005 LOC AA29-34-4	VRC PLUG,BAL 6,4 3/8 ORIFICE 1L5000 VSC S41600,HT 3584	4		
	++ TAG ,244400390				
0036	20A4103X012 KN NS LOC	VRC PLUG,VALVE 3 IN VSC 1L3750 1 5/16 ORIFIC S41600,HT 3584	2		
	++ TAG ,244400392				
0037	20A9533X012 KN 17091012 LOC AA29-34-2	VRC PLUG,VALVE 3 IN VSC1L5000 2 7/8 ORIFICE S41600,HT 3584	4		
	++ TAG ,244400393				
0038	21A5356X012 KN 17163011 LOC AA21-23-5	VRC PLUG,VALVE 8 ORIF VSC 1L7500 S41600,HT 3584	3		
	++ TAG ,244400394				

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CONTINUED ON PAGE 5

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 4

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0039	24A1141X022 KN NS LOC	VRC PLUG/STEM ASSY 7 ORF 6 TRAV VSC1L7500 24 5/8 420 HT49-52/316	3		
	++ TAG ,244400395				
0040	1K587635162 KN 15130087 LOC AA25-43-6	VRC STEM,PLUG VSC 1L7500 15 1/4 S31600,B,G&P 3516	3		
	++ TAG ,244400396				
0041	1K588035162 KN 17165050 LOC AA25-42-2*	VRC STEM,PLUG VSC 1L7500 X 19 3/8 S31600,B,G&P 3516	3		
	++ TAG ,244400397				
0042	1R288535162 KN 15131755 LOC AA27-38-8	VRC STEM,PLUG 3/8 IN X 8 3/4 VSC 1L3750 S31600,B,G&P 3516	3		
	++ TAG ,244400398				
0043	1U223635162 KN 15131760 LOC AA27-38-7*	VRC STEM,PLUG 3/8 IN X 9 3/8 VSC 1L3750 S31600,B,G&P 3516	3		
	++ TAG ,244400399				
0044	1U226335162 KN 16137910 LOC AA27-35-5	VRC STEM,PLUG 1/2 IN X 16 1/4 VSC 1L5000 S31600,B,G&P 3516	3		
	++ TAG ,244400400				

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MILL POWER RECD NOV 22 1982 MAT DPT. PURCHASING

DPC_0409124

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED.
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 5			
0045	1U294135162 KN 04016248 LOC 482152	VRC STEM,PLUG 3/4 X 17 IN,VSC 1L7500 S31600,B,G&P 3516	4		
	++ TAG ,244400401				
0046	1U531035162 KN 15133010 LOC AA27-36-7	VRC STEM,PLUG 1/2 X 15 5/8 VSC 1L5001 S31600,B,G&P 3516	3		
	++ TAG ,244400402				
0047	1U928235162 KN NS LOC	VRC STEM,PLUG 3/4IN 21IN ACT 1L7500 4-1/4-1 S31600,B,G&P 3516	3		
	++ TAG ,244400403				
0048	1V430535072 KN 15146038 LOC AA27-35-4	VRC STEM,PLUG 1/2-1 1/2 3/8 STEM 1/4 ORIF S31600,20B20 3557	3		
	++ TAG ,244400404				
0049	1V431135072 KN 15146052 LOC AA27-35-8	VRC STEM,PLUG 1/2-1 1/2 3/8 STEM 3/4 ORIF S31600,20B20 3557	3		
	++ TAG ,244400405				
0050	1D269635072 KN 17165155 LOC AA27-45-6B	VRC PIN,GROOVE 3/16 X 1 3/4 S31600,20B20 3557	3		
	++ TAG ,244400406				

WILL SHIP WEEK OF

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MILL POWER RECEIVED NOV 22 1982 DUKE DEPT. PURCHASING

DRC 0409725

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 6			
0051	1V322635072 KN 15139990 LOC AA27-41-5B	VRC PIN,GROOVE 3/32 X 13/16 S31600,20B20	4		
	++ TAG ,244400407	3557			
0052	10A2909X012 KN 15130213 LOC AA29-42-6*	VRC BAFFLE,STEM GUIDE 1-2 IN 1/2 STEM STL G12144	3		
	++ TAG ,244400408	2409			
0053	10A2910X012 KN 15130113 LOC AA29-42-7*	VRC BAFFLE,STEM GUIDE 1-1 1/2 IN 3/8 STEM STL G12144	3		
	++ TAG ,244400409	2409			
0054	1P696103152 KN NS LOC	VRC DISC 3/4- 2 IN 3/4 ORIFICE NYLON FMS 17F6	3		
	++ TAG ,244400410	0315			
0055	1P729435072 KN 01009562 LOC AA12-08-5	VRC DISC RETAINER 1/2-2 IN 1/4 ORIF S31600,20B20	3		
	++ TAG ,244400411	3557			
0056	1V711533092 KN 16113732 LOC AA17-44-2	VRC DISC RETAINER 4 IN 316 SA-351-CF8M	3		
	++ TAG ,244400412	3309			

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 7				
0057 1V711606242 KN 16113733 LOC AA17-45-8	VRC DISC 4 IN TFE FMS 17F3	0624	3		
++ TAG ,244400413					
0058 1V711833092 KN 17139212 LOC AA16-46-8	VRC DISC RETAINER 6 IN 316 SA-351-CF8M	3309	3		
++ TAG ,244400414					
0059 1V711906242 KN 17139213 LOC AA16-45-8	VRC DISC 6 IN TFE FMS 17F3	0624	3		
++ TAG ,244400415					
0060 1J872606332 KN 11008090 LOC AA28-50-3*	VRC WIPER,UPPER 3/8 STEM FELT SAE F3	0633	3		
++ TAG ,244400416					
0061 1J872706332 KN 11008100 LOC AA28-49-3*	VRC WIPER,UPPER 1/2 STEM FELT SAE F3	0633	3		
++ TAG ,244400417					
0062 1R3722X0142 KN NS LOC	VRC GASKET SET,OVER 450F 4 E&ER 6 EA 6X468X4 EW GRAPH/INCONEL		4		
++ TAG ,244400418					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 8			
0063	1J504704302 KN 16137527 LOC AA17-43-6*	VRC GASKET 5X5 15/32X1/32 ASB-NIT 17A4	3		
	++ TAG ,244400419	0430			
0064	1R3098X0052 KN 15131276 LOC AA17-35-7	VRC GASKET 2 3/8 X 2 25/32 X 1/32 GRAPH-316,17F38	3		
	++ TAG ,244400420	0451			
0065	1R309999282 KN 15131280 LOC AA17-33-5	VRC GASKET,SPIRAL WOUND 2 9/16X3 1/16X.175 316L SST & ASB	3		
	++ TAG ,244400421	9910			
0066	1R310104022 KN 15131320 LOC AA17-32-4	VRC GASKET 2 1/2X3 17/32X1/32 ASBESTOS 17A2	4		
	++ TAG ,244400422	0402			
0067	1R372299442 KN 16137522 LOC AA17-47-6	VRC GASKET,SPIRAL WOUND 5 1/16X5 9/16X.175 INCONEL & GRAPH	4		
	++ TAG ,244400423	9944			
0068	1R384599282 KN 16137600 LOC AA21-45-5	VRC GASKET,SPIRAL WOUND 3 9/16X4 1/16X.175 316L SST & ASB	3		
	++ TAG ,244400425	9910			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

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MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 9				
0069	1U508104302 KN 17139542 LOC AA16-43-6	VRC GASKET 9 11/64X7 11/16X1/32 ASB-NIT 17A4	0430	3		
	++ TAG ,244400427					
0070	1U508304302 KN 17139551 LOC AA16-47-8	VRC GASKET 8 17/32 X 7 11/16 X 1/32 ASB-NIT 17A4	0430	3		
	++ TAG ,244400428					
0071	1U508599442 KN 17139562 LOC AA16-38-7	GASKET,SPIRAL WOUND 7 27/32X8 1/2X.175 INCONEL & GRAPH	9944	3		
	++ TAG ,244400429					
0072	13A4218X022 KN NS LOC	VRC PACKING,RING 3/8X3/4X3/16 GRAPH/17D16,17	019A	3		
	++ TAG ,244400432					
0073	1N852435072 KN NS LOC	VRC SEAT RING 2X3/4 S31600,20B20	3557	3		
	++ TAG ,244400433					
0074	1U221505092 KN 15080200 LOC AA17-36-6	VRC RING,PISTON 1 1/2 IN TFE/CARBON17F18	0509	3		
	++ TAG ,244400434					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

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CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 10

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0075	1U222946172 KN 16113700 LOC AA17-49-5 ++ TAG ,244400435	VRC SEAT RING 4 S41600,HT 3467	3		
0076	1U225705092 KN 15127100 LOC AA23-47-6 ++ TAG ,244400436	VRC RING,PISTON 2 IN TFE/CARBON17F18 0509	4		
0077	1U229905092 KN 16024300 LOC AA21-49-5 ++ TAG ,244400437	VRC RING,PISTON 2 1/2 IN TFE/CARBON17F18 0509	3		
0078	1U234105092 KN 16057200 LOC AA19-47-5 ++ TAG ,244400438	VRC RING,PISTON 3 IN TFE/CARBON17F18 0509	3		
0079	1U239105092 KN 16113900 LOC AA17-47-4 ++ TAG ,244400439	VRC RING,PISTON 4 IN TFE/CARBON17F18 0509	3		
0080	1U274250332 KN 04016195 LOC AA18-21-6 ++ TAG ,244400440	VRC SEAT RING 2,1/2 ORF,#6 SEAT S31600/COCR-A 3434	3		

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

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CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 11

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0081	1U285435072 KN 15030060 LOC AA19-37-6	VRC SEAT RING 1,1/2 ORIF S31600,20B20 3557	3		
	++ TAG ,244400441				
0082	1U285535072 KN 15030160 LOC AA19-38-5	VRC SEAT RING 1,3/4 ORIF S31600,20B20 3557	3		
	++ TAG ,244400442				
0083	1U506805092 KN 17139135 LOC AA16-45-4	VRC RING,PISTON 6 IN TFE/CARBON17F18 0509	4		
	++ TAG ,244400443				
0084	1V642346172 KN 17129510 LOC AA16-42-2	VRC SEAT RING 8X4,4 3/8 ORIF S41600,HT 3584	4		
	++ TAG ,244400444				
0085	1V676446172 KN 17126810 LOC AA16-38-5	VRC SEAT RING 6X4,4 3/8 ORIF S41600,HT 3584	3		
	++ TAG ,244400445				
0086	2U855946052 KN 15030312 LOC AA19-38-8	VRC SEAT RING 1/2-1 1/4 ORF COCR SEAT S31600/COCR-A 3434	3		
	++ TAG ,244400446				

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

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CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 12			
0087	2V371946192 KN 17139210 LOC AA16-44-4	SEAT RING 6X4 410 SST/HT	3		
	++ TAG ,244400447	3365			
0088	2V643946172 KN 17133510 LOC AA23-22-5	VRC SEAT RING 12X6,7 ORIF S41600,HT	3		
	++ TAG ,244400448	3584			
0089	10A4215X012 KN 17092050 LOC AA29-33-8	VRC SEAL RING/SPRING,RAD 2 19/32X2 31/32X3/16 HVY HAST C & TFE	4		
	++ TAG ,244400451	9963			
0090	12A3331X012 KN 17139162 LOC AA23-23-7	VRC RING,PISTON 12X6, 5 3/8 ORF GRAPHITE 17F27	3		
	++ TAG ,244400453	0544			
0091	21A4523X012 KN NS LOC	VRC SEAT RING 12X6,7 ORF 6 TRAV CAV 111 S17400,HT	3		
	++ TAG ,244400454	3540			
0092	G1193835362 KN 19065215 LOC AA31-07-8	VRC PIN,TAPER S17400,HT	3		
	++ TAG ,254100268	3536			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

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CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	REPLACEMENT PARTS

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P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER CO
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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY.
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 13					
0093	G1194035362 KN 19065220 LOC AA30-03-2	VRC PIN,TAPER #4 X 1 1/2 LG S17400,HT	3536	4		
	++ TAG ,254100269					
0094	1249556X012 KN 19067305 LOC AA30-12-7	VRC BUSHING,LINED,DU 3/4X7/8X3/4 VENDOR	9998	4		
	++ TAG ,254100271					
0100	1B561235072 KN 04115050 LOC LB08-05-5	VRC PIN,GROOVE,TYPE B 3/32X1/4 S31600	3507	4		
	++ TAG ,254200182					
0101	1K249838992 KN 17151535 LOC AA27-45-5	VRC PIN,GROOVE S31600,20B20	3557	3		
	++ TAG ,254200183					
0102	1P585899012 KN 04051760 LOC LB02-10-5	VRC BEARING,NEEDLE 5/8X13/16X3/4 CARBON STEEL	2899	3		
	++ TAG ,254200184					
0103	1P594299012 KN 04052860 LOC LB05-01-5	VRC BEARING,NEEDLE 1 3/8X1 5/8X1 CARBON STEEL	2899	3		
	++ TAG ,254200185					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

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H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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28232

SHIP TO DUKE POWER CO.
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

VIA SHIP PREPAY
DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 14				
0104	1P930699012 KN 04055700 LOC LB05-12-5	VRC BEARING,NEEDLE 1 3/4X2 1/8X1 1/2 CARBON STEEL	2899	3		
	++ TAG ,254200187					
0105	1R4462000A2 KN 04012122 LOC LB04-11-4	VRC BEARING ASSY 5/8 SST-STL		3		
	++ TAG ,254200188					
0106	1R591947812 KN 04117750 LOC LB10-07-2	VRC BEARING BEARING S31600/30B5	35BN	3		
	++ TAG ,254200189					
0107	1R593247812 KN 04117840 LOC LB09-13-3	VRC BEARING 8 & 10-150 LB S31600/30B5	35BN	3		
	++ TAG ,254200190					
0108	1R595547812 KN 04117950 LOC LB09-10-5	VRC BEARING 4-150 LB S31600/30B5	35BN	3		
	++ TAG ,254200191					
0109	1R663028992 KN 04119560 LOC LB08-03-2	VRC BEARING,NEEDLE 1 1/16X1 5/16X5/8 CARBON STEEL	2899	4		
	++ TAG ,254200192					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525/		11/07/82	**REPLACEMENT PARTS**

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CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

VIA SHIP PREPAY
DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 15				
0110	2R4404000A2 VRC KN 04012115 LOC LB05-14-4	BEARING ASSY 3/4 STL CD PL-SST	3		
	++ TAG ,254200193				
0111	1P871947812 VRC KN 04091420 LOC 482047	BUSHING 7/8 X 1 1/4 X 3/4 S31600/30B5 35BN	3		
	++ TAG ,254200194				
0112	1P883347812 VRC KN 04091960 LOC 482045*	BUSHING 1 1/4 X 1 5/8 X 1 1/4 S31600/30B5 35BN	4		
	++ TAG ,254200195				
0113	1R664447812 VRC KN 04119680 LOC 482044	BUSHING 12-150 LB S31600/30B5 35BN	3		
	++ TAG ,254200196				
0114	1R659147812 VRC KN 04119210 LOC LB08-06-5	BUSHING 5/8 X 7/8 X 1 7/16 S31600/30B5 35BN	4		
	++ TAG ,254200197				
0115	1U105847812 VRC KN 04055085 LOC LB05-15-3	BUSHING 2 1/8 X 2 13/16 X 3 3/8 S31600/30B5 35BN	4		
	++ TAG ,254200198				

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MARSHALLTOWN, IOWA

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MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 16					
0116	1R970736142 KN 04055385 LOC LB05-11-5	VRC SEAL,BALL 10 IN 150 & 300 LB S31600,SPG T	3614	3		
	++ TAG ,254200204					
0117	1V627805302 KN 04095000 LOC LB10-11-6	VRC SEAL,BALL 2 IN 150 LB-600 LB RULON FMS 17F25	0530	4		
	++ TAG ,254200205					
0118	1V628405302 KN 04095010 LOC LB03-12-5	VRC SEAL,BALL 4 IN 150 & 300 LB RULON FMS 17F25	0530	3		
	++ TAG ,254200206					
0119	1V628605302 KN 04095015 LOC LB04-15-3	VRC SEAL,BALL 6 IN 150 & 300 LB RULON FMS 17F25	0530	3		
	++ TAG ,254200207					
0120	1V629105302 KN 04095025 LOC LB05-17-6	VRC SEAL,BALL 10 IN 150 & 300 LB RULON FMS 17F25	0530	4		
	++ TAG ,254200208					
0121	1V629505302 KN 04095030 LOC LB06-10-6	VRC SEAL,BALL 12 IN 150 & 300 LB RULON FMS 17F25	0530	3		
	++ TAG ,254200209					

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C-18101 S-E1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -AI1015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA: DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK: J. W. HAMPTON / H41043-73
NOTE: SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 17

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
0122	1V629805302 KN 04095040 LOC LB06-08-6	VRC SEAL,BALL 16 IN 150 LB & 300 LB RULON FMS 17F25	0530	3		
	++ TAG ,254200210					
0123	1R664535402 KN 04119690 LOC LB10-08-4	VRC WASHER 12-150 LB S17400,HT	3540	3		
	++ TAG ,254200213					
0124	1R672606412 KN 04119830 LOC LB08-05-5	VRC WASHER 49/64X13/16X1/16 ARMALON 17F13	0641	3		
	++ TAG ,254200214					
0125	1U103606412 KN 04051515 LOC LB02-09-3	VRC WASHER 13/16X1 3/16X1/16 ARMALON 17F13	0641	3		
	++ TAG ,254200215					
0126	1U104806412 KN 04053915 LOC LB04-13-4	VRC WASHER 1 17/64X15/16X1/16 ARMALON 17F13	0641	4		
	++ TAG ,254200216					
0127	1U105406412 KN 04052535 LOC LB05-01-5	VRC WASHER 1 45/64X2 3/8X1/16 ARMALON 17F13	0641	3		
	++ TAG ,254200217					

WILL SHIP WEEK OF

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MILL POWER SUPPLY CO. ACCTD NOV 22 1982 AUD. DEPT.

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CONTINUED ON PAGE 19

C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 18			
0128 1U106006412 KN 04055095 LOC LB05-11-3	VRC WASHER 2 17/64X2 11/16X1/16 ARMALON 17F13	4		
++ TAG ,254200218	0641			
0129 1P927299102 KN 04055220 LOC LB05-11-5	VRC GASKET,SPIRAL WOUND 3 9/16X4 5/16X1/8 316L SST & ASB	4		
++ TAG ,254200219	9910			
0130 1U180704022 KN 04043040 LOC LB05-16-6	VRC GASKET 10X12 3/4X1/16 ASBESTOS 17A2	3		
++ TAG ,254200221	0402			
0131 1P9295X0012 KN 04092548 LOC LB05-15-5	VRC PACKING,RING 2 1/8X2 5/8X1/4 STYLE D110 ASB FOIL 17D9	4		
++ TAG ,254200223	0106			
0132 1P9295X0092 KN NS LOC	VRC PACKING,RING 2 1/8X2 5/8X1/4 GRAPH 17D19,16	4		
++ TAG ,254200224	0190			
0133 1V920101652 KN NS LOC	VRC PACKING,RING 1 11/16X2 1/16X3/16 GRAFOIL	4		
++ TAG ,254200226	0165			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 19

ITEM				QUANTITY ORDERED	BACK ORDERED	SHIPPED
0134	IV949601652 KN 04055610 LOC LB06-05-6	VRC PACKING,RING 2 1/8X2 5/8X1/4 GRAFOIL	0165	3		
	++ TAG ,254200227					
0135	IK756206382 KN 09024490 LOC AA10-06-8	VRC O-RING 1 3/8X1 5/8X1/8 VITON-DS52-5	065E	4		
	++ TAG ,254200229					
0136	IL112406382 KN 07035860 LOC AA25-01-7*	VRC O-RING 1 1/2X1 3/4X1/8 VITON-DS52-5	065E	3		
	++ TAG ,254200230					
0137	IL112606382 KN 04115500 LOC LB09-13-6	VRC O-RING 2X2 1/4X1/8 VITON-DS52-5	065E	4		
	++ TAG ,254200231					
0138	IN332506382 KN 04011410 LOC LB04-08-5*	VRC O-RING 1 7/8X2 1/8X1/8 VITON-DS52-5	065E	3		
	++ TAG ,254200232					
0139	IU250406382 KN 04120000 LOC LB09-15-6	VRC O-RING 2 1/2X2 3/4X1/8 VITON-DS52-5	065E	4		
	++ TAG ,254200233					

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	REPLACEMENT PARTS

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

VIA SHIP PREPAY
DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 20			
0140	1V282606382 KN 04132200 LOC LB09-15-6	VRC O-RING 13X13 3/8X3/16 VITON-DS52-5	3		
	++ TAG ,254200234	065E			
0141	10A3588X012 KN 04155880 LOC LB09-09-5	VRC O-RING 4 3/4X4 15/16X3/32 VITON-DS52-5	3		
	++ TAG ,254200235	065E			
0142	10A3590X012 KN 04155900 LOC LB09-15-4	VRC O-RING 10 1/2X10 7/8X3/16 VITON-DS52-5	3		
	++ TAG ,254200236	065E			
0143	1P568435402 KN 04050340 LOC LB04-13-4	VRC RING,SPLIT 6 IN 2 HALVES PER SET S17400,HT	3		
	++ TAG ,254200237	3540			
0144	1P582735402 KN 04051360 LOC LB02-10-4	VRC RING,SPLIT 3 IN 2 HALVES PER SET S17400,HT	3		
	++ TAG ,254200238	3540			
0145	1P590835402 KN 04052380 LOC LB05-03-4	VRC RING,SPLIT 8 IN 2 HALVES PER SET S17400,HT	3		
	++ TAG ,254200239	3540			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

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CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 21			
0146 1P926735402 KN 04055120 LOC LB05-11-4	VRC RING,SPLIT 10 IN 2 HALVES PER SET S17400,HT 3540	4		
++ TAG ,254200240				
0147 1P928436042 KN 04042450 LOC LB05-13-3	VRC RING,BACK-UP 10 IN 300 LB FOR METAL SEAL S31600 3604	3		
++ TAG ,254200241				
0148 1P929635072 KN 04055560 LOC LB05-14-5	VRC RING,LANTERN 2 1/8 X 2 5/8 S31600,20B20 3557	3		
++ TAG ,254200242				
0149 1R659735072 KN 04119260 LOC LB08-04-5	VRC RING,LANTERN 5/8 X 1 S31600,20B20 3557	4		
++ TAG ,254200244				
0150 1R672535072 KN 04119820 LOC LB08-06-6	VRC RING,RETAINING,SPLIT 2-3-150 LB S31600,20B20 3557	3		
++ TAG ,254200245				
0151 1U103735072 KN 04051510 LOC LB02-09-3	VRC RING,RETAINING,SPLIT 3-300 LB S31600,20B20 3557	3		
0152 1U104935072 KN 04053910 LOC LB04-13-4	VRC RING,RETAINING,SPLIT 6-300 LB S31600,20B20 3557	3		
++ TAG ,254200247				

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

CONTINUED FROM PAGE 22

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
0153	1U105535072 KN 04052530 LOC LB05-02-4	VRC RING,RETAINING,SPLIT 8-300 LB S31600,20B20	3		
	++ TAG ,254200248	3557			
0154	1U106135072 KN 04055090 LOC LB05-12-5	VRC RING,RETAINING,SPLIT 10-300 LB S31600,20B20	4		
	++ TAG ,254200249	3557			
0155	1V903635072 KN 04100430 LOC LB10-10-3	VRC RING,BACK-UP 2 IN S31600,20B20	4		
	++ TAG ,254200251	3557			
0156	1R672235072 KN 04119800 LOC LB09-14-4	VRC SPACER,THRUST 10-150 LB S31600,20B20	3		
	++ TAG ,254200252	3557			
0157	10A3541X012 KN 01115520 LOC AA25-25-2	VRC STEM,PLUG 1/2 X 11 7/8 VSC 1L5003 S31600,B,G&P	3		
	++ TAG ,254600038	3516			
0158	10A3387X012 KN 01115120 LOC AA25-23-7	VRC O-RING 3 1/4X3 7/16X3/32 ETHYL/PR-DS52-7	3		
	++ TAG ,254600039	065H			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR.
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 23			
0159	10A3389X012 KN 01115130 LOC AA25-22-7	VRC RING, BACK-UP 2 IN 2 5/16 ORIF ETH-PRO 17G38	3		
	++ TAG ,254600040	0539			
0160	1H937906992 KN 05020240 LOC AA12-29-1*	VRC BOOT 30-60 NEOPRENE-BLACK	5		
	++ TAG ,25510053	0531			
0161	1F581424102 KN 06008630 LOC AA12-50-4	VRC DIAPHRAGM ROD SIZE A - 60 1/2 IN STEM STL G12144/PL	3		
	++ TAG ,25510054	2414			
0162	1F725102192 KN 06008800 LOC AA13-40-8	VRC DIAPHRAGM SIZE 3A & 4A NEOPRENE 17E43	3		
	++ TAG ,25510055	0219			
0163	1R637502202 KN 05002595 LOC AA05-49-8	VRC DIAPHRAGM SIZE 80 NITRILE 17E44	3		
	++ TAG ,25510056	0220			
0164	2E791902202 KN 05008310 LOC AA13-50-1	VRC DIAPHRAGM SIZE 30 NITRILE 17E44	3		
	++ TAG ,25510057	0220			

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C-18101 S-F1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

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SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 24			
0165	2E859802202 KN 05009185 LOC AA13-43-4	VRC DIAPHRAGM SIZE 60 NITRILE 17E44	3		
	++ TAG ,25510058	0220			
0166	2N130902202 KN 05000780 LOC AA04-41-6	VRC DIAPHRAGM SIZE 70 & 87 NITRILE 17E44	4		
	++ TAG ,25510059	0220			
0167	1H286206992 KN 14022520 LOC EE18-11-4*	VRC SEAL,OIL 1 X 1 1/2 X 1/4 VENDOR	3		
	++ TAG ,25510060	9998			
0168	1H281304012 KN 14022120 LOC EE18-12-3	VRC GASKET,TERM BOX FIBER 17F8	3		
	++ TAG ,25510062	0401			
0169	1H282206992 KN 14022180 LOC EE18-03-3	VRC GASKET,COVER ACCOPAC	3		
	++ TAG ,25510063	0416			
0170	12A4768X012 KN 14021724 LOC EE18-04-6	VRC GASKET,SLOT COVER ALL SIZES 350 PURCHASED PART	4		
	++ TAG ,25510064	0699			

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 25				
0171	1H291706562 VRC O-RING KN 14022700 2 5/8X2 7/8X1/8 LOC EE18-12-4* NITRILE-DS52-2 ++ TAG ,25510065	065B	3		
0172	1H291806562 VRC O-RING KN 14022720 1 1/4X1 1/2X1/8 LOC EE18-09-4* NITRILE-DS52-2 ++ TAG ,25510066	065B	3		
0173	1D6875X0022 VRC O-RING KN 14024061 1/4X3/8X1/16 LOC EE18-10-6 NITRILE-DS52-2 ++ TAG ,25510067	065B	3		
0174	1H292106562 VRC O-RING KN 14022740 2 1/4X2 1/2X1/8 LOC EE18-01-4* NITRILE-DS52-2 ++ TAG ,25510068	065B	3		
0175	1C7822X0012 VRC O-RING KN 14022761 1/2X11/16X3/32 LOC EE18-10-4 NITRILE-DS52-2 ++ TAG ,25510069	065B	3		
0176	1H292806562 VRC O-RING KN 14022780 3/4X1X1/8 LOC EE18-10-4* NITRILE-DS52-2 ++ TAG ,25510070	065B	3		

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM		QUANTITY ORDERED	BACK ORDERED	SHIPPED
	CONTINUED FROM PAGE 26			
0177 1H849806992 KN 05018410 LOC AA12-29-5*	VRC O-RING 1X1 1/4X1/8 NITRILE-DS52-2 065B	3		
++ TAG ,25510071				
0178 1H862306992 KN 05021120 LOC AA12-28-2	VRC O-RING 8 1/4X8 1/2X1/8 NITRILE-DS52-I 065A	3		
++ TAG ,25510072				
0179 1H862406992 KN 05021130 LOC AA12-28-1	VRC O-RING 8X8 1/2X1/4 NITRILE/MOS2 050F	3		
++ TAG ,25510073				
0180 1K117806992 KN 13015210 LOC AA24-03-7*	VRC O-RING 2 1/4X2 5/8X3/16 NITRILE/MOS2 050F	3		
++ TAG ,25510074				
0181 1J489106992 KN 13011700 LOC AA23-01-5*	VRC RING,BACK-UP 1 ID X 1 1/4 OD TFE FMS 17F3 0624	4		
++ TAG ,25510077				
0182 1J505206992 KN 13012870 LOC AA23-08-4*	VRC RING,BACK-UP 2 1/4 ID X 2 5/8 OD TFE FMS 17F3 0624	4		
++ TAG ,25510078				

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FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

FISHER Controls

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

*****

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 27			
0183	1H286099012 KN 14022480 LOC EE18-09-2*	VRC ELEMENT VENDOR	3		
	++ TAG ,25510079	9998			
0184	1R841619042 KN 05003628 LOC AA09-37-1	VRC YOKE EXTENSION SIZE 34 & 40 CI F12101(30A)	3		
	++ TAG ,25510080	1904			
0185	G1329135362 KN 19074025 LOC LB10-12-2	VRC PIN,TAPER NO.6X2 1/2 S17400,HT	4		
	++ TAG ,254100270	3536			
0186	1P571999012 KN 04050540 LOC LB04-14-4	VRC BEARING,NEEDLE 1X1 1/4X1 CARBON STEEL	3		
	++ TAG ,254200186	2899			
0188	1L487035402 KN 04010930 LOC LB05-07-4	VRC WASHER 10 IN & 12 IN S17400,HT	3		
	++ TAG ,254200212	3540			
0189	1R372304022 KN 16137530 LOC AA17-46-4	VRC GASKET 5X5 19/32X1/32 ASBESTOS 17A2	4		
	++ TAG ,244400424	0402			

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS, RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

MILL POWER RECEIVED NOV 22 198 MAIL DEPT. PURCHASING

DPC_0409147

FORM 2592 PRINTED IN U.S.A.

CONTINUED ON PAGE 29

C-18101 S-E1 P-

FISHER CONTROLS COMPANY
MARSHALLTOWN, IOWA

ACKNOWLEDGEMENT

CUSTOMER ORDER NUMBER	C.O. NUMBER	REPRESENTATIVE ORDER NUMBER	C.O. NUMBER	ORDER DATE	
H41043-73		033 -A11015525		11/07/82	**REPLACEMENT PARTS**

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

*****

SHIP PREPAY
VIA DO NOT SPLIT SHIP UNITED PARCEL SERVICE
MARK J. W. HAMPTON / H41043-73
NOTE SHIP 01-14-83 REQUESTED
TAG

ITEM			QUANTITY ORDERED	BACK ORDERED	SHIPPED
		CONTINUED FROM PAGE 28			
0190	1R578599102 KN 04117165 LOC LB10-05-5	VRC GASKET,SPIRAL WOUND 1 3/4X1 3/8X1/16 316L SST & ASB	4		
	++ TAG ,254200220	9910			
0191	1R2860X0272 KN NS LOC	VRC GASKET SET,OVER 450F SIZE 1 1/2 X 1 E & ER 2 X 1 E GRAPH/INCONEL	4		
	++ TAG ,244400426				
0192	1J8225X0032 KN NS LOC	VRC PACKING,RING 5/8X1X3/16 STYLE D110 ASB FOIL 17D9	4		
	++ TAG ,254200222	0106			
0193	1R2523X0032 KN NS LOC	VRC PACKING,RING 3/8X3/4X3/16 GRAPH 17D19,16	4		
	++ TAG ,244400430	0190			
0194	1V920001652 KN NS LOC	VRC PACKING,RING 1 1/4X1 5/8X3/16 GRAFOIL	3		
	++ TAG ,254200225	0165			
0195	1R580535402 KN 04117400 LOC LB08-06-5	VRC RING,SPLIT 2 & 3 IN 150 LB S17400,HT	4		
	++ TAG ,254200243	3540			

WILL SHIP WEEK OF

WE ACKNOWLEDGE WITH THANKS: RECEIPT OF YOUR ORDER OF WHICH THIS IS AN EXACT COPY AS WE HAVE ENTERED IT FOR SHIPMENT.

IF INCORRECT, PLEASE INFORM US AT ONCE.

NO CREDIT WILL BE ALLOWED FOR MATERIAL RETURNED WITHOUT OUR PERMISSION.

MILL POWER RECEIVED NOV 22 1982 MAIL DEPT. PURCHASING

DPC_0409148

FORM 2592 PRINTED IN U.S.A.

ROA_03093

Jolly - Fisher Exh 940-0147

Acknowledgement

Fisher Controls

Fisher Controls International, Inc.
McKinney, Texas 75069

FISHER

I 325

Order Number
Please refer to the order number on any correspondence regarding this order.

46246

Sold To:
MILL POWER SUPPLY CO.
P O BOX 32307
CHARLOTTE, NORTH CAROLINA 28232

Ship To:
DUKE POWER CO.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT S CAROLINA
CLOVER, SOUTH CAROLINA 29710

Order Date	Rep.	Customer	Industry	State	Customer Order No.	Rep. Order No.	Fisher Order No.
11/18/82	33	42280	F1	A4	H41043-73	D33-C110155 25-1	I 96325 PG

Special Instructions

Ship via
PARCEL SERVICE
PREPAY AND BILL

Tag Mark

Indicate if Prepaid
PREPAID

	Part Number	Description	Quantity Ordered	Scheduled Shipping Date
5	1E39174617 2 I	CP LUG VALVE 1/4 IN METAL SEAT	5	11/29/82
	TAG: (5) 11550142	38		
6	1E39814617 2 I	CP LUG VALVE 3/4-1 IN METAL SEAT	3	11/29/82
	TAG: (3) 11550	104		
10	0W01990219 2 N	CD TA HIGH PRESSURE	3	11/29/82
	TAG: (3) 11550	128		
11	1E39053601 2 I	CD IAPHRAGM 3/4-1 IN	4	11/29/82
	TAG: (4) 11550	130		
13	1D468400 0B2 I	CVALVE DISC ASSY	3	11/29/82
	TAG: (3) 11550	438		
15	1E399600 0B2 I	CD ISC HOLDER ASSY 3/4-1 IN COMP	4	11/29/82
	TAG: (4) 11550	136		
16	1E39164517 2 I	CORIFICE 1/4 IN METAL SEAT	3	11/29/82
	TAG: (3) 11550	391		
17	1E39804517 2 I	CORIFICE 3/4-1 IN METAL SEAT	3	11/29/82
	TAG: (3) 11550	400		
18	1E399535 13 2 I	CORIFICE 3/4-1 IN COMP SEAT	4	11/29/82
	TAG: (4) 11550	401		
19	0W01870402 2 N	GASKET 1-25/64X1-7/8X1/32	7	11/29/82
	TAG: (4) EA 11550	142 (3) EA 11550 443		
21	1E39040402 2 I	GASKET 8X8 63/64X1/32	3	11/29/82
	TAG: (3) 11550	447		

We acknowledge with thanks, receipt of your order of which this is an exact copy as we have entered it for shipment. If incorrect, please inform us at once.

Instruction sheets will be included in shipment. If you do not receive the appropriate instruction sheet, please advise immediately in writing.

Notwithstanding any inconsistent or additional terms that may be embodied in your purchase order, we accept your order only on the express condition that you assent to the terms and conditions contained herein and on the reverse side; and your acceptance and receipt of the goods shipped hereunder shall constitute assent to such terms.

MILL POWER RECEIVED NOV 29 1982 MAT. MGT. PURCHASING

MCK00041

CUSTOMER'S COPY

ROA_03094

Jolly - Fisher Exh 940-0148

Acknowledgement

Fisher Controls

Fisher Controls International, Inc.
McKinney, Texas 75069

FISHER

Order Number: I 325

Please refer to the order number on any correspondence regarding this order.

Sold To:

MILL POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, NORTH CAROLINA 28232

Ship To:

DUKE POWER CO
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT S CAROLINA
CLOVER, SOUTH CAROLINA 29710

MILL POWER SUPPLY RECEIVED NOV 29 1982 PURCHASING

Order Date	Rep.	Customer	Industry	State	Customer Order No.	Rep. Order No.	Fisher Order No.
11/18/8	33	4228	F1	A4	141043-73	033-C110155-25-4	I 963 25 PO 2

Special Instructions:

Ship via: PARCEL SERVICE PREPAY AND BILL

11/22/82

Tag Mark:

Indicate if Prepaid: PREPAID

	Part Number	Description	Quantity Ordered		Scheduled Shipping Date
2	1E3940040022	GASKET 3 3/4X4 15/64X1/32	3		11/29/82
	PAC: (33) 11.55100	143			
	END OF ORDER.				

We acknowledge with thanks receipt of your order of which this is an exact copy as we have entered it for shipment. If incorrect, please inform us at once.

Instruction sheets will be included in shipment. If you do not receive the appropriate instruction sheet, please advise immediately in writing.

Notwithstanding any inconsistent or additional terms that may be embodied in your purchase order, we accept your order only on the express condition that you assent to the terms and conditions contained herein and on the reverse side, and your acceptance and receipt of the goods shipped hereunder shall constitute assent to such terms.

MCK0004H-1

CUSTOMER'S COPY

ROA_03095

Jolly - Fisher Exh 940-0149

RPT P825
PREPARED: 12/04/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

RECEIVED
DEC 7 1982
ROBERT E. MASON CO.

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER: 033-C11015525-A
WANTED DATE IS: 12/31/82
COMMITTED DATE IS: 11/29/82

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON MGR
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

1-5-83
1-17-83
1-27-83
2-11-83

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

VENDOR REPLY:

Sch 2/3/83
Called Ann 12/16 to check on S/D of 11-29-82 will advise if shipped
Called Ann to has not gotten answer yet from factory

1-27-83
(4)

RECEIVED
DEC 15 1982
EXPEDITING DEPT.
MILL-POWER SUPPLY

R E Mason C
Mike Carroll

DATE: 12/8/82 SIGNED:

DPC_0409116

RPT P825
PREPARED: 12/14/82

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE 1

12-17-82

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janie Sherrill
704-373-5324
TELEX 57-2346

1-7-83
~~1-24-83~~

SUBJECT:
OUR ORDER NUMBER: H38738-73
OUR ORDER DATE: 9/20/82
YOUR ORDER NUMBER: 033-74684
WANTED DATE IS: 11/01/82
COMMITTED DATE IS: 1/14/83

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

File Order Complete 1/24

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

1-7-83 (4)

VENDOR REPLY:

Cadiz is scheduled for week of 1-14-83. Thank you,
Merry Christmas - Happy New Year!

DATE: 12-16-82 SIGNED: Jim Marshall

DPC_0452885

ROA_03097

Jolly - Fisher Exh 940-0151

RPT P825
PREPARED: 01/28/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE

RECEIVED
JAN 31 1983
ROBERT E. MASON CO.

TO: ~~FISHER CONTROLS COMPANY~~
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Shemell
704-373-6324
TELEX 57-2346

2-22-83
3-9-83
3-28-83

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER: 033-C11015525-A
WANTED DATE IS: 12/31/82
COMMITTED DATE IS: 2/04/83

SHIP TO: DUKE POWER COMPANY
C/O J. W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

VENDOR REPLY:

2-22-83
(5)

Partial 1-19 Shipped
ITEMS 5, 6, 10, 11, 13, 15, 16, 17, 18, 19, 21, 22

Complete 2-08-83

RECEIVED FEB 1 7 1983 MAIL DEPT. PURCHASING

DATE: 2-3-83 SIGNED: Ocmula

DPC_0409115

Jolly - Fisher Exh 940-0152

RECEIVED
FEB 4 1983
ROBERT E. MASON CO.

RPT P825
PREPARED: 02/01/83

PAGE 1

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

304472

TO: FISHER CONTROLS COMPANY
% ROBERT E. MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

3-18-83
4-5-83
4-20-83

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER: 033-71990-A
WANTED DATE IS: 1/03/83
COMMITTED DATE IS: 3/11/83

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

VENDOR REPLY:

3-18-83 (5)
4-5-83 (5)

Acknowledged for 3-11-83

FEB 10 1983

DATE: 2-4-83 SIGNED: Sherrill

DPC_0409389

ROA_03099

Jolly - Fisher Exh 940-0153

GC

412592

RPT P825
PREPARED: 02/15/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO.
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janie Sherrill
704-373-5324
TELEX 57-2346

3-14-83
4-15-83

SUBJECT: OUR ORDER NUMBER: H31384-73
OUR ORDER DATE: 7/23/82
YOUR ORDER NUMBER: 33-74139 & "A"

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

MATERIAL HAS BEEN RECEIVED. PLEASE SEND INVOICE IN TRIPLICATE.

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION
001	2	2	VALVE,GL 4 515 650DEG FL DA FISHER

VENDOR REPLY:

WANTED: 8/31/82
PROMISED:

Invoice requested for Item 2 on 2-2-83. Fisher should invoice within 2 weeks. Anne Stokley

Called Ann 2/22 need Inv for Item #1 not Item 2
Called Ann 3/14 to check on Inv & call back
Ann to JS 3/17 will Issue Inv be about 4 more wks
Rec'd Inv called Ann 4/8 billed incorrect price
Nitin Hem is checking to see if we rec'd the valve correct according to CNS00148002

RECEIVED
FEB 22 1983
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: SIGNED:

DPC_0409367

ROA_03100

Jolly - Fisher Exh 940-0154

462462

RPT P825
PREPARED: 03/12/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE

RECEIVED
MAR 16 1983
ROBERT E. MASON CO.

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

4-5-83
4-20-83

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER: 033-C11015525-A
033-A11015525

SHIP TO: DUKE POWER COMPANY
C/O J.W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

4-5-83

RECEIVED
MAR 22 1983
EXPEDITING DEPT.
MILL-POWER SUPPLY

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION	
001	3	0	GASKET,PEDESTAL	FISHER 1H854704142
VENDOR REPLY:				WANTED: 12/31/82 PROMISED: 2/08/83
002	4	0	RING,SEAL SPR LOADED GLVLV 6,8,6X10,10X16&14X1	
VENDOR REPLY:				WANTED: 12/31/82 PROMISED: 2/08/83
003	3	0	RING,SEAL/SPRING RAD GLVLV 2 485 430DEG FISHER	
VENDOR REPLY:				WANTED: 12/31/82 PROMISED: 2/08/83
004	3	0	PLUG,VLV FISHER	1D5604000B2
VENDOR REPLY:				WANTED: 12/31/82 PROMISED: 2/08/83

DPC_0409112

RPT P825 REQUEST FOR INFORMATION PAGE 2
PREPARED: 03/12/83 FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

OUR ORDER NUMBER: H41043-73 CONTINUED FROM PREVIOUS PAGE

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION
007	3	0	BOURDON TUBE ASSEMBLY, FISHER 1R872332012
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
008	3	0	BOURDON TUBE ASSEMBLY, FISHER 10A0618X012
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
009	3	0	DIAPHRAGM ASSEMBLY, FISHER T10546X00A2
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
012	2	0	DIAPHRAGM,FISHER 1E399902112
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
014	4	0	DISC,VLV ASSY FISHER 1D468400002
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
023	3	0	TIP,PLUG GL VLV 1 600 FISHER 1P696235072
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
024	3	0	PLUG,M-FORM GL VLV 2 150 FISHER 1U288745172
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83

DPC_0409113

Va

RPT P825 REQUEST FOR INFORMATION PAGE 3
PREPARED: 03/12/83 FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

OUR ORDER NUMBER: H41043-73. CONTINUED FROM PREVIOUS PAGE

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION
025	4	0	PLUG,3-FLUTE GL VLV 1 170 350DEG FISHER 1U844
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
026	3	0	PLUG,VALVE GL VLV 3 380390DEG FISHER 1V6573461
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
027	4	0	PLUG,VALVE GL VLV 3 3X486 380 390DEG FISHER
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
028	3	0	PLUG,VALVE GL VLV 4&8 150 FISHER 1V659146172
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
029	3	0	PLUG/STEM,M-FORM GL VLV 75 900 FISHER 2U4801X0
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83
030	3	0	PLUG/STEM,M-FORM GL VLV4 900 FISHER 2U7537X001
VENDOR REPLY:			WANTED: 12/31/82 PROMISED: 2/08/83

Scheduled to ship 3-25-83

DATE: 3-21 SIGNED: A C Mill DEC 0409114

ROA_03103

Jolly - Fisher Exh 940-0157

RPT P825
PREPARED: 04/05/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

RECEIVED
APR 8 1983
ROBERT E. MASON CO.

PAGE 1

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-376-5324
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER: 033-C11015525-A
WANTED DATE IS: 12/31/82
COMMITTED DATE IS: 3/25/83

SHIP TO: DUKE POWER COMPANY
C/O J. W. HAMPTON, MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

VENDOR REPLY:

Item 19 - will ship correct part within 3 weeks. (OWO 18462022

Will ship Other items - wk. of May 7, 1983

Called Bob Dickson 4/15 with inf on Item # 19 — Anne Stokley

RECEIVED
APR 12 1983
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: ---------- SIGNED: ----------

DPC_0409111

~~304472~~

RPT P825
PREPARED: 04/06/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

PAGE

RECEIVED
APR 8 1983
ROBERT E. MASON CO.

4-12-83

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO.
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Shewell
704-373-5324
TELEX 57-2346

5-24-83
6-8-83
6-30-83
7-29-83

SUBJECT: OUR ORDER NUMBER: H09458-73
OUR ORDER DATE: 2/17/82
YOUR ORDER NUMBER: 033-71990-A
WANTED DATE IS: 1/03/83
COMMITTED DATE IS: 3/11/83

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY.274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

File Order Complete 7/29

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

5-24-83 (4)

VENDOR REPLY:

67 AFR } Scheduled to ship wk of 7-24-83.
Anne Stehley
4-8-83

Checked CRT 6/9 not shipped

RECEIVED
APR 12 1983
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: ---------- SIGNED: ----------

DPC_0409388

ROA_03105

Jolly - Fisher Exh 940-0159

528679

RECEIVED
APR 13 1983
ROBERT E MASON CO.

RPT P825
PREPARED: 04/11/83

PAGE 1

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

4-18-83

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Sherrill
704-373-5324
TELEX 57-2346

SUBJECT: OUR ORDER NUMBER: J12989-79
OUR ORDER DATE: 3/07/83
YOUR ORDER NUMBER: 033-A11016903

SHIP TO: DUKE POWER COMPANY
C/O H.K.TYLER,MGR.
BUCK STEAM STATION
DUKEVILLE ROAD
P. O. BOX 25
SPENCER, NC 28159

File Order complete 5/20

WILL YOUR SCHEDULE(S) BE MAINTAINED? IF NOT, GIVE CURRENT SHIPPING DATE(S).

PO ITEM	QTY ORDER	QTY RECVD	DESCRIPTION
001	3	0	CAGE,CAVITOL CONTROL VLV FISHER 2V31925012

VENDOR REPLY:

WANTED: 4/18/83
PROMISED: 5/12/83

MILL POWER RECEIVED APR 18 1983 MAIL DEPT. PURCHASING

5/12/83

DATE: 4/13/83 SIGNED: R.E. Mason Co. Mike Campbell

DPC_0409379

ROA_03106

Jolly - Fisher Exh 940-0160

Acknowledgement

Fisher Controls

Fisher Controls International, Inc.
McKinney, Texas 75069

FISHER

Order Number: T 27277
Please refer to the order number on any correspondence regarding this order.

Sold To:
MILL POWER SUPPLY CO.
P.O.BOX 32307
CHARLOTTE, NORTH CAROLINA 28232

Ship To:
4-20-83
CATAWBA NUCLEAR STATION
C/O J.W. HAMPTON, STATION MGR.
HWY 274, NEWPORT
CLOVER, SOUTH CAROLINA 29170

Order Date	Rep.	Customer	Industry	State	Customer Order No.	Rep. Order No.	Fisher Order No.
04/12/83	33	42280	F1	A41	H41043-73	033 -C110155256	T 27277 PG. 1

Special Instructions

Ship via: UPS PREPAY AND BILL

04/13/83

Tag Mark

Indicate If Prepaid: PREPAID

	Part Number	Description	Quantity Ordered	Scheduled Shipping Date
12	1E3999021 12	ICDIAPHRAGM, 3/4-1 IN	2	05/02/83
	TAG: 1155C0412			
	END OF ORDER			

We acknowledge with thanks, receipt of your order of which this is an exact copy as we have entered it for shipment. If incorrect, please inform us at once.

Instruction sheets will be included in shipment. If you do not receive the appropriate instruction sheet, please advise immediately in writing.

Notwithstanding any inconsistent or additional terms that may be embodied in your purchase order, we accept your order only on the express condition that you assent to the terms and conditions contained herein and on the reverse side, and your acceptance and receipt of the goods shipped hereunder shall constitute assent to such terms.

MILL POWER SUPPLY CO. RECEIVED 4-20-83 CHARLOTTE, N.C.

Sale Order Complete

MCK0009H-1 CUSTOMER'S COPY

ROA_03107

Jolly - Fisher Exh 940-0161

RPT P825
PREPARED: 05/13/83

REQUEST FOR INFORMATION
FROM
MILL-POWER SUPPLY COMPANY
P. O. BOX 32307
CHARLOTTE, N. C. 28232

5-20-83

RECEIVED
MAY 17 1983
ROBERT E MASON CO.

TO: FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FROM: Janice Stowell
704-373-5324
TELEX 57-2346

File Order Complete

SUBJECT: OUR ORDER NUMBER: H41043-73
OUR ORDER DATE: 10/11/82
YOUR ORDER NUMBER: 033-C11015525-A
WANTED DATE IS: 12/31/82
COMMITTED DATE IS: 5/07/83

SHIP TO: DUKE POWER COMPANY
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

WAS YOUR SCHEDULE(S) MAINTAINED? IF SO, PLEASE SEND INVOICE IN TRIPLICATE. IF NOT, GIVE CURRENT SHIPPING DATES.

VENDOR REPLY:

Shipped 5-9-83

RECEIVED
MAY 20 1983
EXPEDITING DEPT.
MILL-POWER SUPPLY

DATE: 5-18 SIGNED:

DPC_0409109

Robert E. Mason Company
1726 North Graham Street
P.O. Box 33424
Charlotte, North Carolina 28233
Phone 704/375-4464

FISHER

Robert E. Mason

April 12, 1983

Mr. E. A. Lail
Mill Power Supply Co.
P.O. Box 32307
Charlotte, NC 28232

Re: PO #H31384-73, item 1; our order #033-A110015086, item 1

Dear Ed:

Janice Sherrill has brought to our attention that the above item was invoiced at the originally quoted price of $ 1,581.66. This, however, does not include the optional FGM gasket sets and graphoil packing for the 650 degree F. temperature. In checking, we find that by the time we received your change order and forwarded it on to the factory, it was to late to make the changes and the equipment shipped as originally entered, with the TFE packing and low temperature gasket sets.

At this point, my recommendations are that you proceed to pay the invoice and order two (2) sets of the high temperature gaskets and graphoil packing to change out with the gaskets and packing that are currently in these two valves. When ordering, please specify the following: PER VALVE.

Item	Part Number	Qty	Price
1	1R3722X0142, gasket set	1	$61.20 net ea.
2	1E3190X0222, packing ring	2	5.44 net ea.
3	1V3802X0022, packing ring	2	11.56 net ea.
4	1J962335072, lantern ring	3	13.60 net ea.

By replacing the gasket set and packing that is in the valves with the above parts, the valves may be used in your service which requires a 650 degree F. temperature. We apologize for any inconvenience that this may have caused you and if we may be of any further assistance to you, please do not hesitate to contact this office.

Yours very truly,

FISHER CONTROLS INTERNATIONAL, INC.

Mitch Hearn

Mitch Hearn
ROBERT E. MASON CO.
DIST. REPR.

DPC_0409366

A Sales Representative of Fisher Controls

April 19, 1983

Nuclear Production Dept.
Building

ATTENTION: Mr. Wayne McDonald
Catawba Station

SUBJECT: Reg. 7330820546
Order H31384-73
Fisher Controls
Our letter of August 9, 1982
Your response of August 25, 1982

We enclose, for your information, copy of letter received from Robert E. Mason Company dated April 12, 1983. Please review and advise how you wish us to proceed.

E. A. Lail

fs

Enclosure

First Indorsement April 27, 1983

We will keep the valves as shipped. We will not order the 650°F materials.

K. W. McDONALD

Bob Dickson

By Bob Dickson
Mtls. Coord.

/tpo

DPC_0409364

ROA_03110

Jolly - Fisher Exh 940-0164

TAU A

41592

April 19, 1983

5-17 Eal

Nuclear Production Dept.
Building

ATTENTION: Mr. Wayne McDonald
Catawba Station

SUBJECT: Req. 7330820546
Order H31384-73
Fisher Controls
Our letter of August 9, 1982
Your response of August 25, 1982

We enclose, for your information, copy of letter received from Robert E. Mason Company dated April 12, 1983. Please review and advise how you wish us to proceed.

E. A. Lail

fs

Enclosure

DPC_0409365

Invoice **Fisher Controls**

Fisher Controls International, Inc.
McKinney, Texas 75069

FISHER

Please Remit to:
Fisher Controls
P.O. BOX 98963

Sold To:

MILL POWER SUPPLY CO.
P O BOX 32307
CHARLOTTE, NORTH CAROLINA 28232

Ship To:

DUKE POWER CO
% J.W. HAMPTON PWR
CATAWBA, NUCLEAR STATION-HWY
274
CLOVER, SOUTH CAROLINA 29710

Invoice Date	Rep.	Customer	Industry	State	Customer Order No.	Rep. Order No.	Invoice or Shipping Order No.
06/07/83	33	42280	F1	A41	J15727-73	033 -C11017200	T 27861 PG. 1

Special Instructions

Ship via
MOTOR FRT
PREPAY AND BILL

Tag Mark:

	Part Number	Description	Quantity Shipped	Unit Price	Discount	Net Amount
1	95H-123	PI PRESSURE REGULATOR	2	1140.00	42 20	1057.92
		SUB TOTAL				1057.92
		INVOICE TOTAL				1057.92
	TERMS: OPEN ACCOUNT - NET 30 DAYS					
	LAST PAGE					

RECEIVED JUN 13 1983 MILL POWER SUPPLY

Triplicate Invoice — Please pay against this invoice. A statement will not be furnished. — MPK0005-H

DPC_0267157

ROA_03112

Jolly - Fisher Exh 940-0166

7330630441 TEN CS DHG V#90520901 0T00 CC9460 EU76 EAL/CJC/

PURCHASE ORDER

Mill-Power Supply Co.

3-23-83

IMPORTANT

No. J15727-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

033-C11017200

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P.O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SHIPPER

SHIP TO: DUKE POWER CO.
C/O J.W.HAMPTON,MGR. J15727-73
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

VIA ROADWAY EXPRESS

MAKE INVOICE TO: DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED, AT THE LOCATION, AT THE TIME OR TIMES, AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA 2 INCH WATER PRESSURE REGULATING VALVE MANUFACTURED IN ACCORDANCE WITH ANSI B31.1 MATERIALS AND WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY FOR THIS TYPE PRODUCT. SUPPLIER TO FURNISH MAINTENANCE MANUALS FOR VALVES AND OPERATORS ALONG WITH SIX (6) COPIES OF OUTLINE DRAWINGS. SUPPLIER TO FURNISH OUTLINE DRAWINGS AND MAINTENANCE MANUALS WITHIN 4 WEEKS AFTER AWARD OF ORDER TO: DUKE POWER CO. CATAWBA NUCLEAR STATION C/O J.W. HAMPTON, MGR. P.O. BOX 256 HWY. 274 - NEWPORT CLOVER, S.C. 29710 ATTN: TERRY NAHAY		
1	2	EA	2 IN. AUTOMATIC PRESSURE REGULATING VALVE, FURNISH VALVE WITH SCREWED NPT ENDS. VALVE WILL BE USED IN A FILTERED WATER MEDIUM WITH DESIGN CONDITIONS OF (CONT. ON PAGE 2)		528.96 EA

SHIPPING TERMS: FOB. MCKINNEY, TEXAS

CASH TERMS: NET 30 DAYS

NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
CHARLOTTE, N.C. 28232-2307
P.O. BOX 32307 TELEX 57-2345

FILE COPY

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

E.A. LAIL

ADDRESS REPLY TO: RPC-0267158

(704) 5773

REV. 11-82

ROA_03113

Jolly - Fisher Exh 940-0167

RECEIVED
MAR 25 1983
EXPEDITING DEPT.
MILL-POWER
SUPPLY

		DATE	INVOICE AMOUNT
	4/6 l 4/19 l	6/28	35.31 fpt
Ack rec'd 4/25 sch SID 6-6-83 Filet rec'd 4/26 sch to ship week of 6-10-83 (T 5/6)	R 1/6 5/27 5/31 l	(4)	
4/29 filet rec'd 5/4 sch 6-6-83			
6/1 filet rec'd 6/3 (T 6/14) (T 5/27)			
Ack to ship 6-10-83 (T 6/14)			

DPC_0267159

7330830441 TEN GS DHG V#90520801 0T00 CC9460 EU76 EAL/CJC/

PURCHASE ORDER

Mill-Power Supply Co.

IMPORTANT

No. J15727-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 38424
CHARLOTTE N C 28233

HEREIN DESIGNATED SHIPPER

VIA

MAKE INVOICE TO:

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER, OR TO PERSON HEREIN DESIGNATED, AT THE LOCATION, AT THE TIME OR TIMES, AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			140 PSIA AND 68 DEGREES FARENHEIT. THE VALVE IS TO BE CAPABLE OF MAINTAINING 5-30 PSIG ON THE DISCHARGE. VALVE SHALL BE FISHER CONTROL VALVE MODEL NO. 95H-123 WITH SOFT SEAT. BASIC MATERIALS OF CONSTRUCTION ARE AS FOLLOWS: REGULATOR BODY - CAST STEEL; SPRING CASE - CAST STEEL; ORIFICE - 416 SS; VALVE PLUG 416 SS/NEOPRENE; VALVE PLUG GUIDE - 416 SS; STEM ASSY - SS; STEM GUIDE BUSHING - SS; LOWER SPRING SEAT - STEEL ; UPPER SPRING SEAT - STEEL; VALVE PLUG SPRING - SS; REGULATOR SPRING - STEEL; DIAPHRAGM - NEOPRENE; PITOT TUBE - 304SS; O-RING - NITRIL		
			PRICE & DELIVERY PER GEORGE CHANG VERBAL QUOTE 3/22/83.		
			COMMITTED DELIVERY: 6-3-83 (10-WKS.)		
			DELIVERY REQUIRED: 5-31-83		

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
CHARLOTTE, NC 28232-2307
P.O. BOX 32307 TELEX 57-2346

FILE COPY

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704)

PC_0267160

REV. 11-82

ROA_03115

Jolly - Fisher Exh 940-0169

Form 00225 (R3-81)

Fisher Controls Fisher

DUKE POWER COMPANY
SHIPPING MEMORANDUM

Ed Lail

Ship To: Robert E. Mason & Co.
1726 No. Graham St.
Charlotte, NC 28233
Attn: Ann Stehley

Catawba
Shipping Location

7330
Stores Location No.

Shipping Memo No. 1

Date June 28, 1983

Shipped Via:		Package Type & Quantity:			
UPS	x	Cartons		Vendor	Robert E. Mason & Co.
Parcel Post		Boxes	1	Purchase Order No.	H41043-23
Air Freight		Pallets		Requisition No.	7330821110
Vendor Truck		Skids		Repair Order No.	
Rail Car No.		Pieces		Shipment No.	
DP Co. Truck		Bundles		Q.A. Cond. Required	
Common Carrier	Name	Bags		Insp. Notification Req'd	☐ Yes ☐ No
		Other		Inspector Notified	
Prepaid	☒ Yes ☐ No	ANSI Pkg Level		NCIR No.	
Freight Bill	☐ Yes ☐ No	Weight	7#	Decontamination Certificate Required	☐ Yes ☐ No

ID No.	Qty.	Unit	Description (Include Mfg., Model No., Serial No., Line Item No., Mark No., Reel Ticket No.)
	4	e a	Bushing p/n 440HT
			Agent Order no. 033-A-11015525

File Order Complete 7/13

Reason Or Authority For Shipping:

Disposition To Be Made of Material:

vendor to identify parts and return

If For Repair, Explain Work To Be Done:

DUKE POWER RECEIVED JUL 8 1983

Original — ☐ To Mill\Power Repairs, Replacement, Etc.
☐ To M&F Accounting — Returnable Items (Reels, Drums, Etc.)
Canary — Shipper's File
Pink — Packed With Material
Goldenrod — Extra File Copy

Carl Gerald 7/1/83
Shipped By (Person) Date

DPC 0400108

Rusty Correll 6-28-83
Authorized Signature

ROA_03116

Jolly - Fisher Exh 940-0170

7330821708 JFB GS DHG V#90520801 0T00 EU76 STK EAL/CJO/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

11-17-83

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

CnSA003

SHIP TO: DUKE POWER CO. CnS#001
C/O J.W.HAMPTON,MGR. J50235-73
CATAWBA NUCLEAR STATION CnS4001
HWY 274, NEWPORT 033-A02C81018
P.O. BOX 256 033-A02C81018A
CLOVER, SC 29710 033-A02C81018B
VIA ROADWAY EXPRESS 033-A02C81018C

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

MAKE INVOICE TO: DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA THE FOLLOWING PARTS ARE FOR THE VALVES PURCHASED UNDER SPEC. CNS-1205.06-3 AND CNS-1205.06-1 LATEST REVISION. PLEASE FURNISH PARTS UNDER THE APPROPRIATE SPECIFICATION.		
1	2	EA	1E546124222 STEM,ACUTATOR FOR 10 INCH GLOBE VALVE FISHER P/N 1E546124222 1E846124222	244402772N	40.80 EA
2	4	EA	1J332824222 STEM,ACTUATOR FOR 1,2,3,4,6,8, AND 14X16 INCH GLOBE VALVE FISHER P/N 1J332824222	244402773N	47.60 EA
3	4	EA	1E846124222 STEM,ACTUATOR FOR 2,4,6 AND 18X20 INCH GLOBE VALVE FISHER P/N 1E846124222	244402774N	40.80 EA
4	10	EA	1E807124102 STEM,ACTUATOR FOR 2,2.5,3,4,6 AND 6X10 INCH GLOBE VALVE FISHER P/N 1E807124102	244402775N	13.60 EA
5	6	EA	1E832424102 STEM,ACUTATOR FOR 3,4,6,8 AND 12X20 INCH GLOBE VALVE FISHER P/N 1E832424102	244402776N	20.40 EA
6	2	EA	21A3812X012 (CONT. ON PAGE 2)	244402777N	176.80 EA

SHIPPING TERMS: FOB MARSHALLTOWN, IOWA

CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER

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4. Show ID numbers on boxes and invoices if shown on this order.
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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL

(704) 3[illegible]5773
[illegible]0254522

TELEX 57[illegible]46

REV. 9-83

FILE COPY

ROA_03117

Jolly - Fisher Exh 940-0171

RECEIVED
NOV 18 1983
Invoice Desk
Mill Power
Supply

		DATED	INVOICE AMOUNT
E.A. Lail File Let 11-22-83			
We enclose for your inf copy	R.L.L. 2/7/84	2/13/84	3,714.08
of quotation rec'd from Fisher covering	2/14/84	3/1/84	58.37 frt
the material specified on the	R.L.L. 3/9	3/8	10,129.20
subject req. Please note the	3/12/84	3/23/84	193.12 frt
numerous part # change & issue		4/30	609.67
an addendum if you are in	R.L.L. 3/20	6/4/84	4,859.88
agreement	3/27/84		46.09 frt
(Please be advised that an addendum	R.L.L. 6		
has been written to comply with the	7/29		
above request)	8/84		
Ack rec'd 12-28-83	R.L.L. 7/16		
Item 1-20 Sh'd wk of 1-27-84	7/17 Item	21	24
Ack rec'd 12-28-83			
Item 21-40 Will ship week			
of April 12, 1984 Item 41-60 wk of 4-13-84			
Ack rec'd 12-28-83 Items 61-72			
Will ship week of 3-12-84			
Ltr to Ltd 1-12-84			
Cpy to Catawba Special Group			
(E.A. Lail File) Let 12-23-83			
Let to inform you of all the P/N			
discrepancies on Catawba Nuc Valve			
AS-006. Catawba has consistently			
req parts for a Vee Ball Valve			
but AS-006 is a 10" Butterfly			
Valve. The discrepancies are as			
follows Item 35 P/N 8V62 14193 12			
Lever Part is incorrect for AS-006			
Item 62 P/N 2V24 975 0042 Vee			
Bal Body Part is incorrect for AS-006			
Fisher to quote Correct P/N for butterfly			
valve Item 1 P/N 1U105 847812, Bushing			
Part is incorrect for AS-006 Correct for CM-83			
Item 47, P/N 4052 16 19052, Bonnet Part is			
incorrect for AS-006			
Item 49 Item 37, 18 052 74, Incorrect for AS-006			

Over

DPC 0254523

ROA_03118

Jolly - Fisher Exh 940-0172

7330821708 JFB GS DHG V#90520801 0T00 EU76 STK EAL/CJC/

JC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50295-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			STEM ACTUATOR FOR 6 INCH GLOBE VALVE FISHER P/N 21A3812X012		
7	2	EA	2V245446582 STEM ACTUATOR FOR 2 INCH VEEBALL VALVE FISHER P/N 2V245456582 2V245446582	254200815N	51.00 EA
8	2	EA	1E820924022 STEM ACTUATOR FOR 4 AND 3X4 INCH GLOBE VALVE FISHER P/N 1E820924022 1E820924222	244402779N	23.00 EA
9	2	EA	2N131724222 STEM ACTUATOR FOR GLOBE 8 AND 20 INCH GLOBE VALVE FISHER P/N 2N131724222	244402779N	149.60 EA
10	2	EA	2B975948582 STEM ACTUATOR FOR 12 INCH VEEBALL VALVE FISHER P/N 2B975948582 2R675946582	254200816N	251.60 EA
11	6	EA	1J332924102 STEM ACTUATOR FOR 1,2,2.5,3,4 AND 10X16 INCH GLOBE VALVE FISHER P/N 1J332924101	244402780N	19.72 EA
12	2	EA	1H745024102 STEM ACTUATOR FOR 20X30 INCH GLOBE VALVE FISHER P/N 1H745024102	244402781N	81.60 EA
13	4	EA	1E607124102	244402782N	13.60 EA

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

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4. Show ID numbers on boxes and invoices if shown on this order
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [illegible] 0254524

TELEX 57[illegible]2346

REV. 9-83

FILE COPY

ROA_03119

Jolly - Fisher Exh 940-0173

RECEIVED
NOV 18 1988
Invoice Desk
Mill Power
Supply

DATE | INVOICE AMOUNT

Filet rec'd 2-13-84 Items 61, 62, 63, 64
65, 66, 67, 68, 69, 70, 71, 72 sch 3-2-84

Manf Cut for Parts rec'd 3/5/84
Items 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
53, 54, 55, 56, 57, 58, 59, 60
Sent to QA 3-5-84

QA Rel rec'd 3/5/84
telephone Rel Items 1, 2, 3, 4, 5, 6
7, 8-10, 11, 12, 13, 14-16, 17, 18, 20

Filet rec'd 3-15-84 Items 61-72
rec'd 3-15-84

Filet rec'd 3-30-84

Shipped 3-6-84 Items 21-34
36-60

Ed Lal to Gl 2 Henry Mullin needs
copy of Chs 003
mailed 4-2-84

QA Vendor Rel rec'd 4-11-84
Items 61-72 telephone released
4-5-84

Called Ann 4/12/84 Items 21-60
have not shipped rescheduled to
4-28-84

Filet to file 4-12-84

Let 4/3/84
Intent of this correspondence is to quote price for the final Inspection 100.00 net (add to P.O. per CR Lail 4/5/84)

QA Vendor Rel rec'd 4/18/84
Items 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56
57, 58, 59, 60 telephone Rel 4-11-84

Over

DPC_0254525

ROA_03120

Jolly - Fisher Exh 940-0174

7330821708 JFB CS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 3

SHIP TO:

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			STEM,ACTUATOR FOR 2 AND 4 INCH GLOBE VALVE FISHER P/N 1E607124102 1E807124102		
14	2	EA	1N132524102 STEM,ACTUATOR FOR 8 INCH GLOBE VALVE FISHER P/N 1N132524102	244402783N	42.16 EA
15	2	EA	2R676846582 STEM,ACTUATOR FOR 4 X 6 INCH GLOBE VALVE FISHER P/N 2R676846582	244402784N	268.60 EA
16	2	EA	1E884724222 STEM,ACTUATOR FOR .75 AND 1 INCH GLOBE VALVE FISHER P/N 1E884724222	244402785N	27.20 EA
17	4	EA	1E872924102 STEM,ACTUATOR FOR 1 INCH GLOBE VALVE FISHER P/N 1E872924102	244402786N	13.26 EA
18	2	EA	1E329324222 STEM,ACTUATOR FOR 2 INCH GLOBE VALVE FISHER P/N 1E329324222 1E8209422	244402787N	23.80 EA
19	2	EA	1E892424102 STEM,ACTUATOR FOR 8 INCH GLOBE VALVE FISHER P/N 1E892424102 1E832424102	244402788N	20.40 EA
20	2	EA	2R675946582	254200817N	251.60 EA

(CONT. ON PAGE 4)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] C 0254526

TELEX 57[illegible]2346

REV. 9-83

FILE COPY

ROA_03121

Jolly - Fisher Exh 940-0175

RECEIVED
NOV 18 1983
Invoice Desk
Mill Power
Supply

DATE | INVOICE AMOUNT

Cert of Comp. sent to QA Items 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60

Called Ann 5/8/84 Items 21-40 new sch 6-23-84 will chek to see what Items are ready (T 6/8/84)

Flit to field 5-8-84

Ann to J. 5/9/84 All Items can ship except Item (24) 21-40 Item 24 SID in 6-16-84 Items 21-40 will can in about a week will call for QA Rel

Flit to field 5-9-84

Manufacturer's Certification for parts covering items 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 36, 37, 38, 39, 40 sent to QA 6/30/84

QA Venda Rel rec'd 6-4-84

Items 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 34, 36, 37, 38, 39, 40

Flit rec'd 7-20-84 (T 7/20/84) (T 7/31/84)

Item 21 & 24 Resch to sch of 8-4-84 (T 8/10/84)

Flit to field 7-20-84

Flit rec'd 8-6-84

Resch to sch of 8-4-84 (T 8/21/84)

Called Ann 8/21 will Chek & call back

Rec'd Manuf Cert for Parts 8-24-84

sent to QA 8/24 Items 21, 24

Ann to J. 8/28 sch this week (T 9/10)

QA Venda Rel rec'd 9/4 (T 9/18)

In Plant Rel 8-27-84

DPC_0254527

7330821708 JFB CS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 4

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO.
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			STEM,ACTUATOR FOR 10 INCH VEEBALL VALVE FISHER P/N 2R675946582		
21	2	EA	2R719546502 STEM,ACTUATOR FOR 6 INCH GLOBE VALVE FISHER P/N 2R719546502 2R719546582	244402789N	255.00 EA
22	2	EA	1E845124222 STEM,ACTUATOR FOR 2 INCH GLOBE VALVE FISHER P/N 1E845124222 1E846124222	244402790N	40.80 EA
23	2	EA	2R836146582 STEM,ACTUATOR FOR 4 INCH VEEBALL VALVE FISHER P/N 2R836146582	254200818N	170.00 EA
24	2	EA	2R719546582 STEM,ACTUATOR FOR 6 INCH VEEBALL VALVE FISHER P/N 2R719546582	254200819N	255.00 EA
25	10	EA	1R180023122 SEAT,LOWER SPRING FOR 1,2,2.5,3,4,6,8, 12X20,18X20 AND 10 INCH GLOBE VALVE FISHER P/N 1R180023122	244402791N	8.16 EA
26	10	EA	1R179923122 SEAT,LOWER SPRING FOR 1,2,2.5,3 AND 4 INCH GLOBE VALVE FISHER P/N 1R179923122	244402792N	5.10 EA
			(CONT. ON PAGE 5)		

SHIPPING TERMS

CASH TERMS

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P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [illegible] C 0254528

TELEX 57-2346

REV. 9-83

FILE COPY

ROA_03123

Jolly - Fisher Exh 940-0177

7330821708 JFB GS DHC V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 5

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
27	6	EA	1U425623122 SEAT,LOWER SPRING FOR 1,1.5 AND 2 INCH GLOBE VALVE FISHER P/N 1U425623122	244402793N	6.80 EA
28	2	EA	1N129619052 SEAT,LOWER SPRING FOR 8 AND 20 INCH GLOBE,10 AND 12 INCH VEEBALL VALVE FISHER P/N 1N129619052	243900191N	23.80 EA
29	2	EA	1E398608012 SEAT,LOWER SPRING FOR .75 AND 1 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1E398608012	115501251	2.55 EA
30	2	EA	0W020144022 SEAT,LOWER SPRING FOR 1 INCH HIGH PRESSURE REGULATOR VALVE FISHER P/N 0W020144022	115501252	2.55 EA
31	2	EA	0W026324102 SEAT,LOWER SPRING 2 INCH LOW PRESSURE REGULATOR FISHER 0W026324102 0W020324102	115501253	2.04 EA
32	2	EA	1N757722012 SEAT,LOWER SPRING FOR 2 AND 6 INCH GLOBE VALVE FISHER P/N 1N757722012	244402794N	442.00 EA
33	2	EA	1K161724492 (CONT. ON PAGE 6)	254200919N	47.60 EA

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] 0254529

TELEX 57-2346

REV. 9-83

FILE COPY

ROA_03124

Jolly - Fisher Exh 940-0178

7330821708 JFB GS DHC V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 6

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			SEAT,LOWER SPRING FOR 6 AND 4X6 INCH VEEBALL VALVE FISHER P/N 1K161724492		
34	2	EA	1C173023122 SEAT,LOWER SPRING FOR 2 INCH GLOBE VALVE FISHER P/N 1C173023122 1R179923122	244402795N	5.10 EA
35	2	EA	3U621419312 LEVER,FOR 10 INCH BUTTERFLY FISHTAIL DISC VALVE FISHER P/N 3U621419312	254100957N	374.00 EA
36	2	EA	2R579919312 LEVER,FOR 2 INCH VEEBALL VALVE FISHER P/N 2R579919312	254200920N	23.80 EA
37	2	EA	3R644110312 LEVER,FOR 10 INCH AND 16 INCH VEEBALL VALVE FISHER P/N 3R644110312 3R644119312	254200921N	217.60 EA
38	2	EA	2F593819312 LEVER,FOR 12 INCH VEEBALL VALVE FISHER P/N 2F593819312 2P593819312	254200922N	74.80 EA
39	2	EA	3R675619312 LEVER,FOR 12 INCH GLOBE VALVE FISHER P/N 3R675619312	244402796N	180.20 EA
40	2	EA	2V9120X0012	244402797N	1,081.20 EA

(CONT. ON PAGE 7)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [illegible] 0254530

TELEX 57-2346

REV. 9-83

FILE COPY

ROA_03125

Jolly - Fisher Exh 940-0179

7330821708 JFD CS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

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PAGE 7

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			LEVER, FOR 4 INCH GLOBE VALVE FISHER P/N 2V9120X0012		
41	2	EA	2P571519312 LEVER, FOR 10 INCH VEEBALL BALVE FISHER P/N 2P571519312.	254200923N	67.32 EA
42	2	EA	2P577019312 LEVER, FOR 6 INCH VEEBALL VALVE FISHER P/N 2P577019312	254200924N	47.60 EA
43	2	EA	2P585619312 LEVER, FOR 4 INCH VEEBALL VALVE FISHER P/N 2P585619312	254200925N	46.24 EA
44	2	EA	1D387137022 SPRING, VALVE FOR .25 HIGH PRESSURE REGULATOR VALVE FISHER P/N 1D387137022	115501254	1.53 EA
45	2	EA	1B797937022 SPRING, VALVE FOR .25 INCH PRESSURE REGULATOR VALVE FISHER P/N 1B797937022	115501255	.31 EA
46	2	EA	1E398837022 SPRING, VALVE FOR .75 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1E398837022	115501256	1.02 EA

(CONT. ON PAGE 8)

SHIPPING TERMS

CASH TERMS

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P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [illegible] 0254531

TELEX 57-2346

REV. 9-83

FILE COPY

7930821708 JFB 08 DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

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PAGE 8

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28230

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER* BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
47	2	EA	1K155828982 SEAT,UPPER SPRING FOR .25 INCH HIGH PRESSURE REGULATOR FISHER P/N 1K155828982	115501257	2.38 EA
48	4	EA	1B798525062 SEAT,UPPER SPRING FOR .25 INCH HIGH PRESSURE AND PRESSURE REDUCING REGULATOR VALVE FISHER P/N 1B798525062	115501258	.41 EA
49	2	EA	1E999725072 SEAT,UPPER SPRING FOR .75 AND 1 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1E399725072	115501259	1.53 EA
50	2	EA	0W019344022 SEAT,UPPER SPRING FOR 1 INCH PRESSURE REDUCING REGULATOR VALVE FISHER P/N 0W019344022 16A9812X012	115501260	1.02 EA
51	2	EA	1D667125072 SEAT,UPPER SPRING FOR .50 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1D667125072	115501261	1.02 EA
52	2	EA	1K140624092 SCREW,ADJUSTING FOR .25 INCH HIGH PRESSURE REGULATOR FISHER P/N	115501262	5.44 EA

(CONT. ON PAGE 9)

SHIPPING TERMS

CASH TERMS

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P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] 0254532

TELEX 57-2346

REV. 9-83

FILE COPY

7830821708 JFB GS DHG V#90520801 0T00 EU76 STK EAL/CJE/

CC9410 FCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No: J50235-73

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PAGE 9

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*. BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID-NUMBER	PRICE
			1K140624092		
53	2	EA	1B798628982 SCREW,ADJUSTING FOR .25 INCH PRESSURE REGULATOR FISHER P/N 1B798628982	115501263	.31 EA
54	2	EA	1A368728982 SCREW,ADJUSTING FOR .25 INCH HIGH PRESSURE REGULATOR FISHER P/N 1A368728982	115501264	.41 EA
55	2	EA	1E633928992 SCREW,ADJUSTING FOR FISHER .25 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1E633928992 1E639928992	115501265	.65 EA
56	2	EA	1A330828982 SCREW,ADJUSTING FOR .75 INCH PRESSURE REDUCING REGULATOR FISHER P/N 1A330828982	115501266	2.04 EA
57	2	EA	1A500528982 SCREW,ADJUSTING FOR 1 INCH HIGH PRESSURE REGULATOR FISHER P/N 1A500528982	115501267	2.04 EA
58	2	EA	1A279126982 SCREW,ADJUSTING FOR 2 INCH LOW PRESSURE REGULATOR FISHER P/N 1A279126982 1A279128982 (CONT. ON PAGE 10)	115501268	2.38 EA

SHIPPING TERMS:

CASH TERMS:

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P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[redacted] 0254533

TELEX 57[redacted]6

REV. 9-83

FILE COPY

ROA_03128

Jolly - Fisher Exh 940-0182

7330921708 JFB GS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

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SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
59	2	EA	1R719414042 SCREW,ADJUSTING FOR 4 X 6 INCH GLOBE VALVE FISHER P/N 1R719414042	244402798N	85.00 EA
60	2	EA	1D995448702 SCREW,ADJSUTING FOR .50 INCH PRESSURE REGULATOR FISHER P/N 1D995448702	115501269	1.02 EA
61	2	EA	3K1641000A2 CYLINDER,FOR 12 INCH GLOBE AND 10 INCH FISHTAIL BALL VALVE FISHER P/N 3K1641000A2	24390192N	299.20 EA
62	2	EA	3K1642000A2 CYLINDER,FOR 10 AND 16 INCH VEE BALL AND 12 INCH GLOBE VALVE FISHER P/N 3K1642000A2	243900193N	994.40 EA
63	2	EA	21A7022X012 CYLINDER,FOR 20 INCH GLOBE VALVE FISHER P/N 21A7022X012	244402799N	9,828.40 EA
64	2	EA	1R287535012 ANTIROTATOR,FOR .75 AND 1 INCH GLOBE VALVE FISHER P/N 1R287535012	244402800N	40.80 EA
65	2	EA	1R336235012 ANTIROTATOR,FOR 2 INCH GLOBE VALVE (CONT. ON PAGE 11)	244402801N	57.80 EA

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted] 0254534

TELEX 57[redacted]

REV. 9-83

FILE COPY

7330021708 JFB GS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 11

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FISHER P/N 1R936235012		
66	4	EA	1E832723062 LOCKNUT,YOKE FOR 2,3,4,6,8,10,12,12 X 20,18 X 20,AND 20 INCH GLOBE 10,12,AND 16 INCH VEE BALL VALVE FISHER P/N 1E832723062	243900194N	15.30 EA
67	10	EA	1E807423062 LOCKNUT,YOKE FOR 1,2,2.5,3,4,6,8,6 X 10, 8 X 10,14 X 16,10 X 16 AND 6 X 10 GLOBE 4,6,AND 10 INCH VEE BALL VALVE FISHER P/N 1E807423062	243900195N	10.20 EA
68	4	EA	1E793023062 LOCKNUT,YOKE FOR .75,1,1.5 AND 2 INCH GLOBE AND 2 INCH VEE BALL VALVE FISHER P/N 1E793023062	243900196N	8.16 EA
69	3	EA	1E8327X0012 LOCKNUT,YOKE FOR 2,3,4,6,8 AND 12 INCH GLOBE VALVE FISHER P/N 1E8327X0012	244402802N	74.80 EA
70	3	EA	1E8074X0032 LOCKNUT,YOKE FOR .75 1,2,2.5,4,AND 6 INCH GLOBE VALVE FISHER P/N 1E8074X0032	244402803N	57.12 EA
71	2	EA	1E807423012 (CONT. ON PAGE 12)	244402804N	10.20 EA

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[redacted] 0254535

TELEX 57[redacted]

REV. 9-83

FILE COPY

ROA_03130

Jolly - Fisher Exh 940-0184

7330821708 JFB GS DHG V#90520801 OT00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50205-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 12

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			LOCKNUT, YOKE FOR .75 INCH GLOBE VALVE FISHER P/N 1E807423012 1E807423062		
72	2	EA	1E7930X0022 LOCKNUT, YOKE FOR 1 INCH GLOBE VALVE FISHER P/N 1E7930X0022	244402805N	108.80 EA
73	1	LOT	SPECIAL PACKAGING, CLEANING & DUKE 930.1A.		233.60 LOT
			COMMITTED DELIVERY: MARCH 1994 (16 WKS)		
			PRICE & DELIVERY PER YOUR QUOTATION 304587.		
			THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS FACILITY AT GOV. RD. & OLIVE ST., MARSHALLTOWN, IOWA.		
			DELIVERY REQUIRED: 2-28-94		
			ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05)		
			(CONT. ON PAGE 13)		

MMIS 17.85 58.40 28.05 17.85 12.50 28.05 17.85 12.50 28.05 12.50 100.00 Rall

Fin Inspection quality el EAL 4/17/94

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

(704) 3[illegible] 0254536

TELEX 57[illegible]

REV. 9-83

FILE COPY

ROA_03131

Jolly - Fisher Exh 940-0185

7330821708 JEB GS DHG V#90520801 0T00 EU76 STK EAL/CJC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J50235-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 13

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65)		
			DO NOT MAKE PARTIAL SHIPMENT EXCEPT BY REQUEST. (04)		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			QUALITY ASSURANCE REQUIRED CONTROL LEVEL: 2 PROTECTION LEVEL: C CONDITION LEVEL: 1		

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED: ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[redacted]4537

TELEX 57[redacted]

REV. 9-83

FILE COPY

INDEX:

7330 821708-001 TF RW

EAL/CJC

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

1/13/84

FISHER CONTROLS COMPANY
%R.E. MASON & CO.
PO BOX 33424
CHARLOTTE, N.C. 28233

MMIS

CHANGE ORDER J50235-73-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. J50235-73 11/17/83
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION - 1 CONTROL LEVEL - NA PROTECTION LEVEL - C THIS CHANGE ORDER IS TO CHANGE THE PART NUMBERS ON THE FOLLOWING ITEMS: ITEM 1, P/N 1E846124222 ITEM 7, P/N 2V245446582 ITEM 8, P/N 1E820924222 ITEM 10, P/N 2R675946582 R ITEM 13, P/N 1E807124102 ITEM 18, P/N 1E82094222 ITEM 19, P/N 1E832424102 ITEM 21, P/N 2R719546582 ITEM 22, P/N 1E846124222 ITEM 31, P/N 0W020324102 ITEM 34, P/N 1R179923122 ITEM 37, P/N 3R644119312 ITEM 38, P/N 2P593819312 ITEM 50, P/N 16A9812X012 ITEM 55, P/N 1E639928992 ITEM 58, P/N 1A279128982 ITEM 71, P/N 1E807423062 ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME. (21)		

CONTROL ORDER

CONT. ON PAGE 002

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL CJC BUYER

704-373-5773

C 0254538

FILE COPY

CONTINUATION OF PURCHASE ORDER NO. J50235-73-001 PAGE 2 OF 2 PAGES

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

SUPPLIER FISHER CONTROLS
CHARLOTTE, N.C. 28233

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			ID NUMBER AND PURCHASE ORDER NUMBERS MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART TAGS, AND INVOICES. (05)		
			IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65)		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PARTT 21 APPLY TO THIS PURCHASE. THE SIGNER OF THE PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER

0264539

FILE COPY

INDEX:
7330821708-002 PC RW NSR STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

2-7-84

FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

NMIS

CHANGE ORDER J50235-73-002

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. J50235-73 11-17-83
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA THIS CHANGE ORDER IS TO CANCEL ITEM 35 IN ITS ENTIRETY. ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME. A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE. FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL-POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED. THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		

SHIPPING TERMS | CASH TERMS

CHANGE ORDER

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

LATIONS OF PURCHASE ORDERS WILL
THORIZED BY THIS CHANGE ORDER
DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373- 5773

C 0254540

FILE COPY

INDEX:
7330831708-003 GA RW STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

3-1-84

FISHER CONTROLS
C/O R.E. MASON
OFFICE RECORDS ONLY

CHANGE ORDER J50235-73-003

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. J50235-73 DATE 11-17-83

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA THIS CHANGE ORDER IS TO CHANGE THE PART NUMBER ON LINE ITEM 18 TO READ: 1E820924222 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65) THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		

SHIPPING TERMS | CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373- 5773

0254541

FILE COPY

Jolly - Fisher Exh 940-0190

7330821460 WLA GS DAG V#90520801 0T00 EU76 STK EAL/SHC/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

1-17-84

CNS#005 CNS#001

SHIP TO: DUKE POWER CO. 102C81560
C/O J.W.HAMPTON,MGR. K05586-73
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT 033-102C81560
P.O. BOX 256 Item 21-29.308
CLOVER, SC 29710 CNS002
VIA: ROADWAY EXPRESS CNS#003 CNS#004

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 35424
CHARLOTTE N C 28238

HEREIN DESIGNATED SELLER

MAKE INVOICE TO: DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA THE FOLLOWING PARTS ARE FOR VALVES PURCHASED UNDER SPEC. CNS-1205.06-3,CNS-1206.06-1 AND CNS 1205.00-0005. PLEASE FURNISH PARTS UNDER THE APPROPRIATE SPECIFICATION.		
1	2	EA	ADAPTER,BONNET FOR 2 INCH GLOBE VALVE FISHER P/N 1U120735072	244402845N	149.60 EA
2	2	EA	COVER,BONNET FOR 2 INCH VEE BALL VALVE FISHER P/N 3R580419042	254200926N	91.80 EA
3	2	EA	COVER,BONNET FOR 10 INCH AND 16 INCH VEE BALL VALVE FISHER P/N 2P930819052	254200927N	79.20 EA
4	2	EA	COVER,BONNET FOR 12 INCH VEE BALL VALVE FISHER P/N 2P594318042 2P594319042	254200928N	64.60 EA
5	2	EA	COVER,BONNET FOR 12 INC GLOBE VALVE FISHER P/N 2R668319052	244402846N	132.60 EA
6	2	EA		244402847N	805.80 EA

(CONT. ON PAGE 2)

SHIPPING TERMS: FOB MARSHALLTOWN, IOWA

CASH TERMS: NET 30 DAYS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL

(704) 3[illegible] 282800

TELEX 57[illegible]

REV. 9-83

FILE COPY

ROA_03137

Jolly - Fisher Exh 940-0191

RECEIVED JAN 18 1984 Invoice Desk MM Power Supply

		DATE	INVOICE AMOUNT
		(4)	
Reg letter to Wayne McDonald We enclose copy of quotation rec'd from Fisher Controls covering the material specified on the subject req. Please note the various P/N changes & issue an addon if you are in agreement. In addition, please note that Items 1 thru 17, 19, & 37 were cancelled verbally per Bob Dickson on 1-13-84 These cancellations should also be on your addendum.	P.L. 6/29 10/22		2,540.22
	7/2	10/24	47.59
		(4)	
	R.L. 7/11	11/14	9,696.54
	7/17	12/26	149.60
	R.L. 7/31	12/26	822.80
	8/7	485	
	R.L. 8/14		
	8/15	11/15/84	63.40 ft
		1/22/85	48.86 ft
First Endorsement 1-31-84 (T 2/17/84)		4/17/85	N/C
Please be advised that addon 2 has been written to cancel Items 1-17 & to correct P/N on suggested by vendor (T 2/17/84) (T 3/31/84)			for Item #9
Called Henry Mullin 3/8/84 order been entered now a while before (T 4/4/84)			
Called Ann 4/10/84 not cleared Order Entry yet couple more weeks (T 4/25/84)			
4/13/84 Let the Intent of correspondence is to quote price for the final Inspection GA rel req 200.00 Net (add on P.O. per E.A. Lail)			
Let 4/17/84 Fisher Controls has informed me that Items 10 & 11 must change to proven coded parts in Order to meet the spec req on P.O. Item 10 P/N 1N339222012 must change to 1N3392X0442 Item 11 P/N 1L121833092 must change to 1L1218X0402 Net price would remain the same (sent copy of letter to Wayne McDonald 4/18) (T 4/24/84)			

DPC 0262801

Over

7330821460 WLA CS DAC V#90520801 0T00 EU76 STK EAL/SHG/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

VIA

HEREIN DESIGNATED SELLER.

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			COVER, BONNET FOR 4 INCH GLOBE VALVE FISHER P/N 2V9113X0022 2V9113X0012		
7	2	EA		254200929N	60.52 EA
			COVER, BONNET FOR 10 INCH VEE BALL VALVE FISHER P/N 2P572119042		
8	2	EA		243900197N	47.60 EA
			COVER, BONNET FOR 6 INCH VEE BALL AND GLOBE CONTROL VALVE FISHER P/N 1P577719042		
9	2	EA		254200930N	51.00 EA
			COVER, BONNET FOR 4 INCH VEE BALL VALVE FISHER P/N 1P585919042		
10	2	EA		244402848N	183.60 EA
			FLANGE, BONNET FOR 2 INCH GLOBE VALVE FISHER P/N 1N3392Z2012 1N3392X0442 see ens 002		
11	2	EA		244402649N	635.80 EA
			FLANGE, BONNET FOR .75 AND 1 INCH GLOBE VALVE FISHER P/N 1L121833092 1L1218X0402		
12	2	EA		244402850N	897.60 EA
			FLANGE, BONNET FOR .75 AND 1 INCH VALVE FISHER P/N 1L119233092 1L1192X0192		
			(CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

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3. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

REV. 9-83

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] DPC_0262802

TELEX 57[illegible]6

FILE COPY

ROA_03139

Jolly - Fisher Exh 940-0193

RECEIVED
JAN 18 1984
Invoice Desk
Mill Power
Supply

DATE | INVOICE AMOUNT

Ack rec'd 4-20-84 Will ship week of
17-13-84 Items: 21, 22, 23, 24, 29, 30, 31,
32, 33, 34, 35, 36, 37, 38, 39
Copy to Catawba Special Group 4/20/84
(T 5/1/84)

Ack rec'd 4-30-84
Items 2, 3, 4, 7, 8, 9, 10, 11, 16, 17,
18, 19, 25, 26, 27, 28 Will ship
week of 8-31-84 (T 6/29/84)

Ack rec'd 6-11-84 Items 1, 5, 6, 12
13, 14, 15, 20 Will ship week
of 10-26-84 4 items
Flt to Fld 6-11-84
Copy to Catawba Special Group 6/11/84
(T 6/25/84)

E.A. Lal's file
Let 6/22/84
Items 25 should now read
1R6602X0062P & Item 26
should read 1U6602X0082P
Let 6/26 Mr. Wayne McDonald
We enclose copy of letter
rec'd from Robert E. Mason covering
correct P/N on line Item 25 + 26
If you are in agreement, please
issue addendum to correct these
P/N (T 8/29) (T 8/14) (T 7/31/84) (T 7/16/84)

Flt rec'd 8-23-84 Items 2, 3, 4,
7, 8, 9, 10, 11, 16, 17, 18, 19, 25, 26, 27, 28
still sch to ship w/w of 8-31-84 (T 8/29)
Called Ann 9/6 Items sch for
7-13-84 have not shipped waiting on answer
9/6 Ann to let the A-Portion Items 2-4, 7-11, 16, 17, 18, 19, 25, 26, 27,
28 release to assembly 9-4-84 should be ready for
Over

DPC 0262803

7330821460 WLA GS DAG V#90520801 OT00 EU76 STK EAL/SHG7

.09410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
13	2	EA	FLANGE, BONNET FOR 2 INCH GLOBE VALVE FISHER P/N 1N3392X3092 1N3392X0492P	244402851N	1,740.80 EA
14	2	EA	FLANGE, BONNET FOR 2 INCH GLOBE VALVE FISHER P/N 1N3392X0172 1N3392X0172P	244402852N	686.80 EA
15	2	EA	FLANGE, BONNET FOR 1 INCH GLOBE VALVE FISHER P/N 1L1218X0062 1L1218X0392P	244402853N	1,523.20 EA
16	2	EA	FLANGE, BONNET FOR 2 INCH GLOBE VALVE FISHER P/N 1N3392X0220 1N3392X0442P	244402854N	455.60 EA
17	2	EA	FLANGE, BONNET FOR 1 INCH GLOBE VALVE FISHER P/N 1L1192X0012 1L1192X0092P	244402855N	527.00 EA
18	2	EA	SPACER, BONNET FOR 12 INCH GLOBE VALVE FISHER P/N 22A9313X012	244402856N	992.80 EA
19	2	EA	FLANGE, BOTTOM FOR 2 INCH VEE BALL VALVE FISHER P/N 1V7238X0102 1V7238X0122P	254200931N	268.60 EA

(CONT. ON PAGE 4)

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] OPC_0262804

TELEX 57-[illegible]6

REV. 9-83

FILE COPY

ROA_03141

Jolly - Fisher Exh 940-0195

RECEIVED
JAN 18 1984
Invoice Desk
Mill Power
Supply

	DATE	INVOICE AMOUNT
Release 9/9 should ship out of 9-17-84		
Flt to field 9-6-84		
Ann to J 9/13/84 the A portion		
Items 21-24, 29, 30, 31, 32, 33, 34, 35,		
36, 37, 38, 39 to ship early out of		
9-17-84 (T 9/28/84)		
Flt to field 9-13-84		
QA Vendor Rel rec'd 10-19-84		
Items 21-24, 29-39 In Plant		
Rel 10-15-84		
Called Ann 10/22 to check &		
advise		
10/25 Ann to J A Portion		
Items 2-4, 7-11, 16-19, 25,		
26, 27, 28 waiting on Duke's		
QA to get with Fisher QA		
Item #1 rel to assembly ready		
to ship by 11-15-84 Item 1, 5, 6,		
12, 13, 14, 15, 20		
Flt to field 10-26-84		
cpy to Buyer		
QA Vendor Rel rec'd (T 11/9/84)		
11-5-84. Item 2, 3, 4,		
7, 8, 9, 10, 11, 16, 17, 18, 19, 25		
& 26 Item 28, 27 telephone		
Rel 10-29-84 (T 11/21/84)		
Mill Power Exp Report		
Contact 11-15 11-16 33402 02222 67		
shipped on 11-7-84		

DPC_0262805

7330821460 WLA GS DAG V#90520801 0T00 EU76 STK EAL/SHG/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 4

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
20	2	EA	FLANGE,BOTTOM FOR 12 INCH GLOBE VALVE FISHER P/N 2R667122012 2R6671X0142	244402857N	204.00 EA
21	2	EA	PIN,ROLL FOR 4 INCH GLOBE VALVE FISHER P/N 1P109928992	244402858N	40.80 EA
22	2	EA	PIN,FOR 20 INCH GLOBE VALVE FISHER P/N 11A6823X012 11A6823X012	244402859N	51.00 EA
23	2	EA	PIN,FOR 1 INCH HIGH PRESSURE AND 2 INCH LOW PRESSURE REGULATOR VALVE FISHER P/N 0W018835172	115501277N	1.36 EA
24	2	EA	PIN,FOR 20 X 30 INCH GLOBE VALVE FISHER P/N 11A6823X01	244402860N	51.00 EA
25	2	EA	POST,GUIDE FOR 10 INCH VEE BALL VALVE FISHER P/N 1R660235072 ~~1R6602X0082P~~ 1R6602X0062P	254200317N	564.00 EA
26	2	EA	POST,GUIDE FOR ~~6 INCH~~ VEE BALL VALVE FISHER P/N 1U660235072 ~~1U6602X0062P~~ 1R6602X0082P	254200932N	646.00 EA
			(CONT. ON PAGE 5)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER.

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] MPC_0262806

TELEX 57-2[illegible]6

REV. 9-83

FILE COPY

ROA_03143

Jolly - Fisher Exh 940-0197

7330821460 WLA GS DAG V#90520801 0T00 EU76 STK EAL/SHG/

9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-79

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
27	2	EA	POST,GUIDE FOR 4 INCH VEE BALL VALVE FISHER P/N 1R596035072	254200933N	411.40 EA
28	2	EA	GUIDE,FOR 1 INCH GLOBE VALVE FISHER P/N 2R289235072	244402861N	74.80 EA
29	2	EA	ROD,EXTENSION FOR 6 INCH GLOBE VALVE FISHER P/N 21A8132X012	244402862N	438.60 EA
30	2	EA	ROD,EXTENSION FOR 2 INCH GLOBE VALVE FISHER P/N 1F119935132	244402863N	74.80 EA
31	2	EA	CONNECTOR,EXTENSION ROD FOR 6 INCH GLOBE VALVE FISHER P/N 11A8130X012	244402864N	289.00 EA
32	2	EA	CONNECTOR,EXTENSION ROD FOR 2 INCH GLOBE VALVE FISHER P/N 1F119424092	244402865N	14.96 EA
33	2	EA	ARM,FEEDBACK FOR 20 INCH GLOBE VALVE FISHER P/N 21A7161X012	244402866N	136.00 EA

(CONT. ON PAGE 6)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3 DPC_0262807

TELEX 57-2346

REV. 9-83

FILE COPY

ROA_03144

Jolly - Fisher Exh 940-0198

7330021460 WLA CS DAG V#90520001 0T00 EU76 STK EAL/SHO/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

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SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
34	4	EA	PLATE,PUSHER FOR 4,6,AND 8 INCH GLOBE VALVE FISHER P/N 1F118399012	244402867N	17.68 EA
35	7	EA	PLATE,PUSHER FOR 1,2,3, AND 4 GLOBE VALVE FISHER P/N 1F117999012	244402868N	8.50 EA
36	2	EA	1R679619022 PLATE,PUSHERFOR 8 AND 10 INCH VEEBALL VALVE FISHER P/N 1R679619022		44.20 EA
37	2	EA	PLATE,PUSHER FOR 3 INCH GLOBE VALVE FISHER P/LN 1F118028992 1F117999012	244402869N	8.50 EA
38	2	EA	PUSHERPLATE ASSEMBLY,FOR 2 AND 2.5 INCH VEE BALL VALVE FISHER P/N 1F117999012	254200935N	8.50 EA
39	2	EA	PUSHER PLATE ASSEMBLY,FOR 6 INCH GLOE VALVE FISHER P/N 1F118399012	244402870N 14.50	17.68 EA
40			SPECIAL CLEANING, PACKAGING AND DUKE 930.1A		172.40 LOT
			DELIVERY: 26 TO 36 WEEKS		
			(CONT. ON PAGE 7)		

24.90 15.80 24.90 15.80 16.50 24.90 15.80 16.50 24.90 15.80 16.50

Final Inspection per E.A.Lal 4/17/87

200.00
66.70 Net

SHIPPING TERMS

CASH TERMS 66.70

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted] DPC_0262808

TELEX 57[redacted]46

REV. 9-83

FILE COPY

7330821460 WLA GS DAC V#90520801 OT00 EU76 STK EAL/SHG/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K05586-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 7

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E. MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			(7-15 TO 9-20-84) MMIS PRICE AND DELIVERY PER YOUR QUOTATION #304725 DATED 1/9/84 THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS FACILITY AT GOV. RD. & OLIVE ST, MARSHALLTOWN, IOWA DELIVERY REQUIRED: 7-15-84 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05) THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. QUALITY ASSURANCE REQUIRED CONTROL LEVEL: Z PROTECTION LEVEL: C CONDITION LEVEL: 1		

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted] PC_0262809

TELEX 57[redacted]46

REV. 9-83

FILE COPY

ROA_03146

Jolly - Fisher Exh 940-0200

INDEX:
7330821460-002 PC RW NSR STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

3-5-84

FISHER CONTROLS
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

MMIS

CHANGE ORDER K05586-73-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K05586-73 1-17-84
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA CHANGE THE PART NUMBERS FOR THE FOLLOWING ITEMS AS FOLLOWS: LINE ITEM 4 (I.D. NO. 2542-00928N) P/N 2P594319042 LINE ITEM 6 (I.D. NO. 2444-02847N) P/N 2V9113X0012 LINE ITEM 13 (2444-02851N) P/N 1N3392X0492P LINE ITEM 14 (I.D. NO. 2444-02852N) P/N 1N3392X0172P LINE ITEM 15 (I.D. NO. 2444-02853N) P/N 1L1218X0392P. LINE ITEM 16 (I.D. NO. 2444-02854N) P/N 1N3392X0442P LINE ITEM 17 (I.D. NO. 2444-02855N) P/N 1L1192X0092P		

CHANGE ORDER

SHIPPING TERMS

(CONT PAGE 2)

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373-5773 C 0262810

FILE COPY

Jolly - Fisher Exh 940-0201

CONTINUATION OF PURCHASE ORDER NO. K05586-73-001 PAGE 2 OF 2 PAGES

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

SUPPLIER FISHER CONTROLS
CHARLOTTE NC

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			LINE ITEM 19 (I.D. NO. 2542-00931N) P/N 1V7238X0122P		
			LINE ITEM 22 (I.D. NO. 2444-02859N) P/N 11A6823X012		
			LINE ITEM 25 (I.D. NO. 2542-00317N) P/N 1R6602X0082P		
			LINE ITEM 26 (I.D. NO. 2542-00932N) P/N 1U6602X0062P		
			LINE ITEM 27 (I.D. NO. 2542-00933N) P/N 1R5960X0092P		
			LINE ITEM 30 (I.D. NO. 2444-02863N) P/N 27A9637X012		
			LINE ITEM 37 (I.D. NO. 2444-02869N) P/N 1F117999012		
			ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES.		
			IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65)		
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE.		
			FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL-POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED.		
			ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME.		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

PC_0262811

FILE COPY

INDEX:

7330 821460-003 RW EGS

7330 154.10
RW
FISHER VALVE SPARE PARTS.

EAL/CDH

MMIS

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

5-29-84

FISHER CONTROLS
& R.E. MASON
PO BOX 33424
CHARLOTTE, NC 28238

MMIS

CHANGE ORDER K05586-73-002

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K05586-73 1-17-84
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			PLANT - CATAWBA THIS CHANGE ORDER IS TO CHANGE PARTS NUMBER ON LINE ITEMS 10 AND 11 OF P.O. NO. K05586. CHANGE LINE ITEM 10 FROM 1N339222012 TO 1N3392X0442 CHANGE LINE ITEM 11 FROM 1L121833092 TO 1L1218X0402 QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THE PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. IF PARTS NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED ALL OTHER TERMS & CONDITIONS REMAIN THE SAME.		

CHANGE ORDER

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

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MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY EA LAIL BUYER

704-373-5773

C_0262812

FILE COPY

INDEX:

7330 821460-004 DGS RW

EAL/CJC

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

6/27/84

FISHER CONTROLS
%ROBERT E. MASON & CO.
PO BOX 33424
CHARLOTTE, N.C. 28233

MMIS

CHANGE ORDER K05586-73-003

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K05586-73 1/17/84 DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION - 1 CONTROL LEVEL - NA PROTECTION LEVEL - B		
			THIS CHANGE ORDER IS TO CHANGE THE PART NUMBERS ON LINE ITEM 12 AND 20 AS FOLLOWS:		
			LINE ITEM 12 FROM 1L119233092 TO 1L1192X0192		1013.20
			LINE ITEM 20 FROM 2R667122012 TO 2R6671X0142		
			Q.A. RELEASE & INSPECTION		200.00 LOT
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THE PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR		
			CONT. ON PAGE 002		

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAAL CJC BUYER

704-373- 5773 C_0262813

FILE COPY

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

CONTINUATION OF PURCHASE ORDER NO. K05586-73-003 PAGE 2 OF 2 PAGES

SUPPLIER FISHER CONTROLS
CHARLOTTE, N.C. 28233

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS. NUMBER	PRICE
			DIFFERENT MANUFACTURER IS NOT ALLOWED.(65)		
			NUCLEAR SAFETY RELATED		
			ITEMS AND "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J.M. CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED THEN QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS. (80)		
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMAPNY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST(5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE.		
			FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED. (81)		
			ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME. (21)		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

PC 0262814

FILE COPY

INDEX:

7330821460-005 GS RW STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

7-31-84

FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

MMIS

CHANGE ORDER K05586-73-004

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K05586-73 1-17-84
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 2 PROTECTION LEVEL C CONTROL LEVEL 2 THIS CHANGE ORDER IS TO CHANGE PART NUMBERS ON LINE ITEMS 25 AND 26. LINE ITEM 25 FROM 1R660235072 TO 1R6602X0062P LINE ITEM 26 FROM 1U660235072 TO 1U6602X0082P REF: HENRY MULLIS LETTER DATED 6-22-84 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65) (CONT. PAGE 2)		

CHANGE ORDER

SHIPPING TERMS | CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373-5773

C_0262815

FILE COPY

ROA_03152

Jolly - Fisher Exh 940-0206

CONTINUATION OF PURCHASE ORDER NO. K05586-73-004 PAGE 2 OF 2 PAGES

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

SUPPLIER: FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
CHARLOTTE NC 28233

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS. NUMBER	PRICE
			********** * * * NUCLEAR SAFETY RELATED * * * **********		
			ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J.M. CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED THEN QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS.		
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE.		
			FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL-POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED.		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME.		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

PC_0262816

FILE COPY

INDEX: 7330821460-006 SLM WGM RLC/VDS

CHANGE Q.A. REQUIREMENTS

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

FISHER CONTROLS CO.
% ROBERT E. MASON & CO
P.O. BOX 33424
CHARLOTTE, NC 28233

4-29-87

MMIS

CHANGE ORDER K05586-73-005
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. K05586-73 1-17-84
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA N. STATION USE THIS CHANGE ORDER AS YOUR AUTHORIZATION TO DELETE ALL QA REQUIREMENTS FOR LINE ITEM #41, ID NUMBER 2444-02859N AND LINE ITEM #43 ID NUMBER 2444-02860N MATERIAL ALREADY RECEIVED THE QUALITY ASSURANCE REQUIREMENTS CONTAINED IN THE ORIGINAL PURCHASE ORDER REMAIN APPLICABLE IN ALL RESPECTS TO THIS CHANGE ORDER. (61) ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME. (21)		

SHIPPING TERMS | CASH TERMS

CHANGE ORDER

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY ~~R.L. CALDWELL~~ VDS BUYER

704-373-5773 0262817

FILE COPY

ROA_03154

Jolly - Fisher Exh 940-0208

7330821460-006 SLM WGM RLC/VDS

CHANGE Q.A. REQUIREMENTS

CHANGE ORDER

Mill-Power Supply Co.

P.O. Box 32307
Charlotte, N.C. 28232-2307

FISHER CONTROLS CO.
% ROBERT E. MASON & CO
P.O. BOX 33424
CHARLOTTE, NC 28233

4-29-87

CHANGE ORDER K05586-73-005
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. K05586-73 1-17-84
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA N. STATION USE THIS CHANGE ORDER AS YOUR AUTHORIZATION TO DELETE ALL QA REQUIREMENTS FOR LINE ITEM #41, ID NUMBER 2444-02859N AND LINE ITEM #43 ID NUMBER 2444-02860N MATERIAL ALREADY RECEIVED THE QUALITY ASSURANCE REQUIREMENTS CONTAINED IN THE ORIGINAL PURCHASE ORDER REMAIN APPLICABLE IN ALL RESPECTS TO THIS CHANGE ORDER. (61) ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME. (21)		

SHIPPING TERMS

CASH TERMS

CHANGE ORDER

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MILL-POWER SUPPLY COMPANY

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W. T. ROBERTSON, JR. PRESIDENT

BY R.L. CALDWELL VDS BUYER

704-373-5773 C 0262818

ACCOUNTING DEPT.

ROA_03155

Jolly - Fisher Exh 940-0209

7330921339 WLA GS DHG V#90520801 0T00 EU76 STK EAL/SHG/C
7330921339-002 WLA GS DHG

CC2444 PCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

2-03-84

IMPORTANT
No. K08635-73
THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

033-A020207B3

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233
HEREIN DESIGNATED SELLER

SHIP TO: DUKE POWER CO.
C/O J.W.HAMPTON,MGR. K08635-73
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710
VIA ROADWAY EXPRESS

MAKE INVOICE TO: DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER* BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE	
			CATAWBA			
1	2	EA	1U50810402 3-05 GASKET;BONNET FOR 6 X 10 INCH GLOBE VALVE FISHER	244403162	2.55	~~2.38~~ EA
2	2	EA	1R285904302 3-05 GASKET;BONNET FOR GLOBE VALVE TYPE 667-EC 1/2 INCH 185 POUNDS PROPANE AT 100 DEGREES F. PRESSURE RATING 600 PSI PER ANSI PRESSURE/TEMPERATURE RATING TABLE B16.5 SOCKET WELD ENDS DIAPHRAGM ACTUATED WCB STEEL BODY SERIAL NUMBER 5578875 VALVE TAG NUMBER FA2 FA4 FISHER	244400748	1.30	~~1.19~~ EA
3	2	EA	1U508304022 3-05 GASKET;CAGE FOR 8 INCH GLOBE VALVE FISHER	244403165	2.55	~~2.38~~ EA
4	4	EA	1R286104302 3-05 GASKET;CAGE FOR GLOBE VALVE TYPE 667-EC 1/2 INCH 185 POUNDS PROPANE AT 100 DEGREES F. PRESSURE RATING 600 PSI PER ANSI PRESSURE/TEMPERATURE RATING TABLE B16.5 SOCKET WELD ENDS DIAPHRAGM ACTUATED WCB STEEL BODY SERIAL NUMBER 5578875 VALVE TAG NUMBER FA2 FA4 FISHER	244400749	2.72	~~2.55~~ EA

(CONT. ON PAGE 2)

SHIPPING TERMS: FOB MARSHALLTOWN, IOWA
CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:
MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

1/27/84
R30007

MILL-POWER SUPPLY COMPANY ("BUYER")
W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL
(704) 3[illegible] PC 0262635
TELEX 57[illegible]

REV. 9-83

FILE COPY

ROA_03156

Jolly - Fisher Exh 940-0210

RECEIVED FEB 7 1984 Invoice Desk Mill Power Supply

	DATE	INVOICE AMOUNT
Flet rec'd 2-22-84 To ship approx 5-21-84 (T 4/4/84)	2/17 l (4)	
Ach rec'd 2/24/84 Will ship wk of 5-11-84 (T 4/6)	RIL 4/6 4/9/84 l (4)	
Let 2/22/84 The purpose of this correspondence is to advise you that the net price for the above ref P.O. have increased since our quotation date of 10-26-83. The total net price of the P.O. would increase $72.80 (T 4/24) (T 4/6)	RIL 4/27 l (5)	
Flet rec'd 4-13-84 set to ship week of 5-11-84 (T 5/4/84) (T 4/27/84)	RIL 5/18 5/21/84 l	
Flet rec'd 5/2/84 Sch 5-11-84 (T 5/29) (T 5/18/84)		
Inv'd 5/29/84 comp file		

DPC_0262636

ROA_03157

Jolly - Fisher Exh 940-0211

7330821339 WLA GS DHG V#90520801 0T00 EU76 STK EAL/SHG/C
7330821339-002 WLA GS DHG

CC2444 PCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT
No. K08635-73
THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

SHIP TO
FISHER CONTROLS COMPANY
%ROBERT E MASON & CO
P O BOX 38424
CHARLOTTE N C 28233

VIA

HEREIN DESIGNATED SELLER

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
5	2	EA	1U508604022 GASKET,CAGE FOR 6 INCH ELECTRO-PNEUMATIC ACTUATED GLOBE VALVE FISHER	244403167	2.21 ~~2.04~~ EA
6	2	EA	1R578599102 GASKET,SPIRAL WOUND FOR BALL VALVE 1 INCH DESIGN PRESSURE 300 PSIG DESIGN TEMPERATURE 125 DEGREES F. FLANGED ENDS DIAPHRAGM ACTUATED MODEL UR VEE BALL ANSI CLASS 150 POUND FISHER	254200326	4.08 ~~3.74~~ EA
7	2	EA	1U508599442 GASKET,SPIRAL WOUND FOR 6 INCH GLOBE VALVE FISHER	244403168	6.052 ~~57.12~~ EA
8	2	EA	10A3486X012 GASKET,SPIRAL WOUND FOR 3 INCH GLOBE VALVE FISHER P/N 10A3486X012	244403169	8.16 ~~7.48~~ EA
9	2	EA	1L122099322 GASKET,SPIRAL WOUND PART NO. 1L122099322,316L SST & ASBESTOS FOR FISHER CONTROLS 1 INCH,2500 LB,800 DEG. F,DBB	244400734	4.42 ~~4.00~~ EA
10	2	EA	10A3325X012 GASKET,SPIRAL WOUND FOR 1 INCH GLOBE	244403170	8.16 ~~7.48~~ EA

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")
W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible]

TELEX 57[illegible]

REV. 9-83

FILE COPY

PC_0262637

ROA_03158

Jolly - Fisher Exh 940-0212

7330821339
7330821339-002

WLA GS DHG
WLA GS DHG

V#90520901 0T00

EU76 STK EAL/SHG/C

CC2444 PCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K08635-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			VALVE FISHER P/N 10A3325X012		
11	2	EA.	12A1413X012 ~~[illegible]~~ GASKET,FOR FISHER GLOBE STYLE VALVE BODY SIZE 12X16 INCHES TYPE 657-ELT 80 ACTUATOR DESIGN PRESSURE 215 PSIA AT 300 DEGREES F SCHEDULE 40 BUTT WELD ENDS DUKE DWG. NO MCM 1205.06-184 DUKE TAG	244400913	241.40 ~~227.80~~ EA
12	2	EA.	1U180604022 ~~[illegible]~~ GASKET,FOR 12 INCH VEE BALL VALVE FISHER	254200961	14.28 ~~13.60~~ EA
13	2	EA	11A68220X012 ~~[illegible]~~ GASKET, FOR 20 X 30 INCH GLOBE VALVE FISHER	244403172	278.80 ~~265.20~~ EA
14	2	EA	15A9184X012 ~~[illegible]~~ GASKET,FOR 2 INCH GLOBE VALVE FISHER P/N 15A9184X012	244403173	14.28 ~~13.60~~ EA
15	2	EA	1R589404022 ~~[illegible]~~ GASKET,FOR 16 INCH VEE BALL VALVE FISHER P/N 1R589404022	254200962	21.08 ~~19.72~~ EA
			DELIVERY COMMITMENT: 5/25/84 (16 WKS)		EM 2/28
			PRICE AND DELIVERY PER HENRY MULLIS (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted]

TELEX 5[redacted]

REV. 9-83

FILE COPY

PC_0262638

ROA_03159

Jolly - Fisher Exh 940-0213

7330821339 WLA GS DHG V#90520001 0T00 EU76 STK EAL/SHG/C
7330821339-002 WLA GS DHG

CC2444 PCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT
No. K08635-73
THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 4

SHIP TO
FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28239

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			QUOTATION 304589 DELIVERY REQUIRED: 5-25-84 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05)		

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

REV. 9-83

FILE COPY

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: [redacted]PC_0262639

(704) 3[redacted]

TELEX 57[redacted]

ROA_03160

Jolly - Fisher Exh 940-0214

Form 0T185 (R8-81)

NSM CN-1-0018

PLANT: Catawba

SYSTEM NAME: EDWP Condensate Seal - CL

SYSTEM FILE: CN-1223.41-02

Document No.: CN-1223.41-02-0138

VALVE DATA SHEET

[X] CONTROL

[ ] ACTIVE

[X] NON-ACTIVE

FLOW DIAGRAM SERIES: CN-1591

BY: A. D. Lee

DATE: February 29, 1984 REVISION: 1A

DPC_0262485

Valve Number(s)	1CL10, 1CL50
Valve Function	seal injection control
Desired Control Action	control ΔP across pump seals
Duke Pipe Class - G	Code - ANSI-B31-1.0
IWV Category - NA	Class - NA

Actuator Type (EMO, Electrohydraulic, Hand, Pneumatic, Solenoid, etc.) Failure Mode (FC, FO, FAI) — Type: Pneumatic Mode: FO

Travel Stop Reqments: Open ( ) Closed ( ) Position

General Valve Body Material Recommended: CS

Nominal IN/OUT Pipe Size - IN: 2" OUT: 2"

Design Inlet: Pressure (PSIA) 395 Temperature (°F) 180

Operating Mode (Describe)	Maximum Condition (Note 1)				
Inlet Pressure (PSIA)	395				
Inlet (°F) Temperature	180°F				
Flow Rate (Specify Units)					
Operating ΔP (PSI)	Shut Off 395				
Down Stream Pressure (PSIA)	Minimum 0				
Process Fluid	Condensate				

Note 1: Max. Conds. (may) (~~do~~) (~~not~~) occur simultaneously.

CONTROL VALVE MAX. ALLOWABLE SEAT LEAKAGE - ANSI B16.104-1976 - Check One

Class I - No test reqmts. (see ref) ... X
Class II - 0.5% of rated vlv. capac. ...
Class III - 0.1% of rated vlv. capac. ...
Class IV - 0.01% of rated vlv. capac. ...
Class V - $5X10^{-4}$ ml water/min/in orifice dia/PSID. ...
Class VI - See Table 2 of reference. ...

Valve Normally Open (X) Closed ( )

Valve must Open ( ) Close ( ) Modulate ( ) to complete safety function.

Remarks/Accessories: Each valve to be supplied with a Fisher "Wizard" ΔP indicating controller type number 4194HBFER with 0-75 psid range.

Recommend: Fisher design ES, 2" body size, EQL percentage cage, restricted trim, Max. C_v=20.8

THIS DATA HAS BEEN REVIEWED FOR ACCURACY AND IS SATISFACTORY FOR MATERIAL & EQUIPMENT SPECIFICATIONS.

PREPARED BY: A. D. Lee DATE: 2-29-84

CHECKED BY: R. O. Shaw DATE: 2-29-84

APPROVED BY: C. G. Sandberg DATE: 2-29-84

Rev. 7/29/81

Jolly - Fisher Exh 940-0215

ROA_03161

Form 01185 (R8-81)

PLANT: Catawba	VALVE DATA SHEET	FLOW DIAGRAM SERIES: CN-2591
SYSTEM NAME: FDWP Condensate Seal - CL	[X] CONTROL	BY: A. D. Lee
SYSTEM FILE: CN-1223.41-02	[ ] ACTIVE	DATE: March 8, 1984 REVISION: 2
Document No: CN-1223.41-02-013-sh. 2	[X] NON-ACTIVE	

Valve Number(s)	2CL10, 2CL50	Actuator Type (EMO, Electrohydraulic, Hand, Pneumatic, Solenoid, etc.) Failure Mode (FC, FO, FA)	Type: Pneumatic Mode: FO
Valve Function	seal injection control		
Desired Control Action	control ΔP across pump seals	Travel Stop Reqments: Open ( ) Closed ( ) Position	
Duke Pipe Class - G	Code - ANSI-B31-1.0	General Valve Body Material Recommended: CS	
IWV Category - NA	Class - NA	Nominal IN/OUT Pipe Size - IN: 2" OUT: 2"	

Design Inlet: Pressure (PSIA) 395 Temperature (°F) 180

Operating Mode (Describe)	Maximum Condition (Note 1)				
Inlet Pressure (PSIA)	395				
Inlet (°F) Temperature	180°F				
Flow Rate (Specify Units)					
Operating ΔP (PSI)	Shut Off 395				
Down Stream Pressure (PSIA)	Minimum 0				
Process Fluid	Condensate				

Note 1: Max. Conds. (may) (~~do~~) (~~not~~) occur simultaneously.

CONTROL VALVE MAX. ALLOWABLE SEAT LEAKAGE - ANSI B16.104-1976 - Check One

Class I- No test reqmts. (see ref) X
Class II- 0.5% of rated vlv. capac.
Class III- 0.1% of rated vlv. capac.
Class IV- 0.01% of rated vlv. capac.
Class V-5X10^{-4} ml water/min/in orifice dia/PSID
Class VI- See Table 2 of reference

Valve Normally Open (X) Closed ( )
Valve must Open ( ) Close ( ) Modulate ( ) to complete safety function.

Remarks/Accessories: Each valve to be supplied with a Fisher "Wizard" ΔP indicating controller type number 4194HBFER with 0-75 psid range.

Recommend: Fisher design ES, 2" body size, EQL percentage cage, restricted trim; Max. C_v =20.8

THIS DATA HAS BEEN REVIEWED FOR ACCURACY AND IS SATISFACTORY FOR MATERIAL & EQUIPMENT SPECIFICATIONS.

PREPARED BY: A. D. Lee DATE: 3-8-84
CHECKED BY: J. P. Thomas DATE: 3-8-84
APPROVED BY: DATE:

Rev. 7/29/81

0262486

Jolly - Fisher Exh 940-0216

ROA_03162

INDEX: 7330 821198-001 TP RN 7330 354.10 STOCK EAL/COK

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

1-19-84

FISHER CONTROLS
% R.E. MASON & CO
PO BOX 33424
CHARLOTTE, NC 28233

CHANGE ORDER J51148-73-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER No. J51148-73 DATE 11-29-83

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			THIS CHANGE ORDER IS TO DELETE AND CHANGE PART NUMBER ON THE FOLLOWING ITEMS:		
			ITEM 3, DELETE, SAME AS ITEM 4		
			ITEM 8, P/N 1U401124102		
			ITEM 10, DELETE, SAME AS ITEM 12		
			ITEM 11, DELETE, SAME AS ITEM 12		
			ITEM 14, DELETE, SAME AS ITEM 13		
			ITEM 15, P/N 18A1685X012		
			ITEM 16, P/N 18A1668X012		
			ITEM 17, P/N 18A1672X012		
			ITEM 18, P/N 18A1692X012		
			ITEM 19, P/N 18A1675X012		
			ITEM 21, P/N 18A1671X012		
			ITEM 22, P/N 18A1691X012		
			ITEM 23, DELETE, SAME AS ITEM 19		
			(CONT. ON P. 2)		

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY EA LAIL BUYER

704-373- 5777

DPC_0125606

FILE COPY

ROA_03163

Jolly - Fisher Exh 940-0217

CNS J51148-73-001

CONTINUATION OF PURCHASE ORDER NO. _____ PAGE 2 OF 3 PAGES

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

SUPPLIER
FISHER CONTROLS
CHAR. NC

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			ITEM 24, DELETE, SAME AS ITEM 16		
			ITEM 25, DELETE, SAME AS ITEM 21		
			ITEM 26, P/N 18A1243X012		
			ITEM 27, DELETE, SAME AS ITEM 21		
			ITEM 28, DELETE, SAME AS ITEM 16		
			ITEM 29, DELETE, SAME AS ITEM 17		
			ITEM 30, P/N 2H2946000A2		
			ITEM 32, P/N 1K328828992		
			ITEM 33, DELETE, SAME AS ITEM 32		
			ITEM 34, DELETE, SAME AS ITEM 32		
			ITEM 35, DELETE, SAME AS ITEM 32		
			ITEM 39, P/N 2J897246322		
			ITEM 40, DELETE, SAME AS #39		
			ITEM 42, P/N 1U286646172		
			ITEM 44, P/N 1U222646172		
			ITEM 48, P/N 21A4523X012		
			ITEM 52, P/N 1K416235032		
			ITEM 57, P/N 2U855946052		
			ITEM 63, P/N 13A5874X012		
			ITEM 64, P/N 1U286546172		
			ITEM 66, P/N 15A1276X052		
			ITEM 69, P/N 14A9407X032		
			ALL OTHER TERMS & CONDITIONS TO REMAIN THE SAME.		
			ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES.		

(CONT. ON P. 3)

DPC 0125607

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

FILE COPY

CNS J51148-73-001

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

CONTINUATION OF PURCHASE ORDER NO. _____ PAGE 3 OF 3 PAGES

SUPPLIER

FISHER CONTROLS
CHAR., NC.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED.		
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE		
			FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED.		
			QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THE PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			FORMS ATTACHED: SEE ORIGINAL		

DPC 0125608

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

FILE COPY

93371205.06-00-0001-12 GMB CLS RLD V#90520801 0T00 EU20 RHA/MES/

CC9385 PCC9385

PURCHASE ORDER

MILL-POWER SUPPLY CO.

3-22-84

IMPORTANT

No. K16318-13

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

FISHER CONTROLS COMPANY
X ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
C/O E M COUCH
PROJECT MANAGER
CATAWBA NUCLEAR STATION
SC HWY 274
NEWPORT, SC 29710

K16318-13

VIA ROADWAY EXPRESS

MAKE INVOICE TO:
DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION		
			FORMS ATTACHED: DOCUMENT NO. CN-1223. 41-02-013B		
1	4	EA	FOUR CONTROL VALVES IN ACCORDANCE WITH THE ATTACHED DATA SHEET. CONTROL VALVES SHALL BE FURNISHED WITH METAL TAGS STAMPED WITH DUKE TAG NUMBERS 1CL10, 1CL50, 2CL10 AND 2CL50.		3,488.14 EA DWGS. $1500.00 LOT
			TYPE III DRAWINGS SHALL BE SUPPLIED BY THE MANUFACTURER. THEY SHALL INCLUDE 5 PRINTS AND 1 REPRODUCIBLE.		
2	4	EA	FOUR WIZARD DIFFERENTIAL PRESSURE INDICATING CONTROLLERS AND MOUNTING HARDWARE, TYPE4194HBFER WITH 0-75 PSIG RANGE. THESE CONTROLLERS ARE TO REPLACE POSITIONERS ON VALVE TAG NUMBERS 1&2/CL/14 AND 46		1,797.22 EA DWGS. $500.00 LOT
			FISHER DRAWING NUMBER 55A7224 SHALL BE REVISED TO SHOW CONTROLLER MOUNTED ON THE VALVE, AND DELETION OF VALVE TAGS 1&2/CL/10 AND 50 FROM THE DRAWING. THEY SHALL INCLUDE 5 PRINTS AND 1		

(CONT. ON PAGE 2)

SHIPPING TERMS: FOB MARSHALLTOWN, IOWA

CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O.
CHARLO

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: R.H. ARMSTRONG

(704) 3 6859

TELE 6

REV. 9-83

MMIS

PC_0262482

ROA_03166

Jolly - Fisher Exh 940-0220

RECEIVED
MAR 23 1984
Mill Power Supply

		DATE	INVOICE AMOUNT
4/9/84 Ack. rec. - o/p 6-9-84	7.5/8	5/1/84	10828
		5/9/84	1056.19
		5/17/84	7741.93
		5/17/84	6825.92
		5/23/84	fpt. 568.12
		5/23/84	fpt. 66.82
			17,341.86
		6/22/84	6,337.14
		7/6/84	3,412.96
		7/6/84	3,412.96
		7/27/84	143.60
		8/18/84	fpt. 178.17
		8/1/84	fpt. 123.00

DPC_0262483.

93071205.06-00-0001-12 GMB CLS RLD V#90520801 0T00 EU20 RHA/MES/

CC9385 PCC9385

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K16318-13

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW, UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			REPRODUCIBLE.		
3	8	EA	EIGHT WIZARD PRESSURE INDICATING CONTROLLERS AND MOUNTING HARDWARE, TYPE 4195 BFME WITH 0-300 PSIG RANGE. THESE CONTROLLERS ARE TO REPLACE POSITIONERS ON VALVE TAG NUMBERS 182/CL/35, 39, 71, AND 75.		993.69 EA DWGS. $500.00 LOT
			FISHER DRAWING NUMBERS 55A7226 AND 55A7227 SHALL BE REVISED TO SHOW CONTROLLERS MOUNTED ON THE VALVE. THEY SHALL INCLUDE 5 PRINTS AND 1 REPRODUCIBLE.		
			VENDOR COMMITMENT: 5-28-84		
			PRICING PER OUR INQUIRY 0787-K-C-13 AND G. CHANG'S VERBAL QUOTE 3-21-84		
			DELIVERY REQUIRED: 4-20-84		
			ON ALL DRAWINGS/CORRESPONDENCE, CONTRACTOR MUST SHOW THE FOLLOWING: STATION CATAWBA D.E.FILE # CN-1205.06 MPS ORD. # K16318-13		

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE [redacted]

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted]

TELEX [redacted]

REV. 9-83

PC_0262484

ROA_03168

Jolly - Fisher Exh 940-0222

INDEX:

7310521190-002 JC RW STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

4-16-84

FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

CHANGE ORDER J511143-73-003

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER No. J511148-73 11-29-83 DATE

All Invoices and Correspondence Should Show Purchase No. as Reference

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL MA THIS CHANGE ORDER IS TO DELETE LINE ITEM 65 IN ITS ENTIRETY, TO CHANGE PART NUMBER ON LINE ITEM 63 TO 15A5873X012 REF: HENRY MULLIS' LETTER DATED 2-14-84 ALL OTHER TERMS AND CONDITIONS TO REMAIN THE SAME. THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373- 377 DPC_0125609

FILE COPY

ROA_03169

Jolly - Fisher Exh 940-0223

COPY OF INVOICE

Fisher Controls International, Inc.

FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
K08635-73	030 -A0202G783	05/23/84	2159091

Sold To: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 6596
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
A/B J.N. HAMPTON, MGR
CATAWBA NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
5	22	84

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
000001	TAG 244403162/K08635-73 1U508104022 GASKET 4 11/64X7 11/16X1/32	2	2.55	5.10
000002	TAG 244400748/K08635-73 1R285904302 GASKET 1 15/16X2 29/32X1/32	2	1.36	2.72
000003	TAG 244403165/K08635-73 1U508304022 GASKET 7 11/16X8 17/32X1/32	2	2.55	5.10
000004	TAG 244400749/K08635-73 1R286104302 GASKET 1 15/16X2 17/32X1/32	4	2.72	10.88
000005	TAG 244403167/K08635-73 1U508604022 GASKET 7 7/8X8 15/32X1/32	2	2.21	4.42
000006	TAG 254200326/K08635-73 1L578599102 GASKET,SPIRAL WOUND 1 3/4X1 3/8X1/16 7	2	4.08	8.16
000007	TAG 244403168/K08635-73 1U508599442 GASKET,SPIRAL WOUND 7 27/32X8 1/2X.175	2	60.52	121.04
000008	TAG 244403169/K08635-73	2	8.16	16.32

INVOICE CONTINUED

DPC_0262633

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export or export license may be required.

Form FG 1482E

COPY OF INVOICE

Fisher Controls International, Inc. FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
K08635-73	033 -402020783	05/23/84	2159091

DUKE POWER COMPANY

Sold To: MILL POWER SUPPLY CO
P. O. BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 4599
ST. LOUIS, MO. 63150

PAGE 2

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
5	22	84

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
	10A3436X012 GASKET,SPIRAL WOUND 4 1/8X3 3/4X.175			
000009	TAG 244400734/K08635-73 1L122099322 GASKET,SPIRAL WOUND 2 1/16X2 1/2X1/8	2	4.42	8.84
000010	TAG 244403170/K08635-73 10A3326X012 GASKET,SPIRAL WOUND 1 7/8X1 5/8X1/8	2	8.16	16.32
000011	TAG 244400913/K08635-73 12A1413X012 GASKET 13 3/8X14X1/32	2	241.40	482.80
000012	TAG 254200961/K08635-73 1U180804022 GASKET 12X15X1/16	2	14.28	28.56
000013	TAG 244403172/K08635-73 11A6822X012 GASKET 17 5/32X18 3/32X1/32	2	278.80	557.60
000014	TAG 244403173/K08635-73 15A9184X012 GASKET SIZE 70	2	14.28	28.56
000015	TAG 254200962/K08635-73 1R589404022	2	21.08	42.16

INVOICE CONTINUED

MILL POWER SUPPLY CO. PURCHASING MAY 29 1984 RECEIVED

DPC_0262634

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482B

ROA_03171

Jolly - Fisher Exh 940-0225

COPY OF INVOICE

Fisher Controls International, Inc. FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
KU8035-73	033 -A02U20783	05/23/84	2159091

Sold To: MILL POWER SUPPLY CO
P. O. BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 2399
ST. LOUIS, MO. 63150

PAGE 3

DUKE POWER COMPANY

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
5	22	84

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
	CASKET 15 1/4X18 1/2X1/16			
	SUBTOTAL			1338.58
	PPD FREIGHT CHARGES			6.60
	INVOICE TOTAL			1345.18

MAY 29 1984 MILL POWER BILL DEPT. WATCHUNG

DPC_0262632

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482

Jolly - Fisher Exh 940-0226

		DATE	INVOICE AMOUNT
flet recd 3/23 S/D w/o 4/5	T 4/8 (3)		

DPC_0256277

INDEX: 8337-1205.06-00-0001-12- CMG CLS RLD RHA/CDH

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

8-6-84

FISHER CONTROLS
% ROBERT E MASON & CO
PO BOX 33424
CHARLOTTE, NC 28233

CHANGE ORDER K16318-13-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K16318-13 3-22-84
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			PLANT - CATAWBA THIS CHANGE WRITTEN TO RETURN A QTY. OF EIGHT (8) PRESSURE INDICATING CONTROLLERS, LINE ITEM #3, TO FISHER FOR THE ADDITION OF REMOTE SET POINT MODULE NOTE: QTY. OF FOUR (4) RETURNED 7-27-84. BALANCE TO BE RETURNED WHEN UNIT #2 RECEIVED BACK ONSITE. PRICING PER GEORGE CHANG'S LETTER 8-1-84.		475.39 EA

RP41

CHANGE ORDER

SHIPPING TERMS | CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY R ARMSTRONG BUYER

704-373-8859 PC 0262487

FILE COPY

COPY OF INVOICE

Fisher Controls International, Inc.

FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
35/235-73	035 -A02C81C18A	08/28/84	2215953

Sold To: MILL POWER SUPPLY CO
P.O. BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
PAYABLE AT SIGHT IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
8	27	84

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
000021	TAG 244402789N 2R7185465 82 STEM, ACTUATOR SIZE 46	2	255.00	510.00
000024	TAG 254200819N 2R7195465 82 STEM, ACTUATOR SIZE 46	2	255.00	510.00
	SUBTOTAL			1020.00
	PPD FREIGHT CHARGES			11.94
	INVOICE TOTAL			1031.94

MILL POWER RECEIVED SEP 5 1984 MAT. MGT. PURCHASING

DPC_0254521

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482B

ROA_03175

Jolly - Fisher Exh 940-0229

Fisher Controls

A02016704

REM SERVICES

ROBT. E. MASON & ASSOCIATES, INC.

CONTROLS AND PROCESS EQUIPMENT FOR CAROLINA INDUSTRIES

P.O. Box 33424 Accounting Dept. (704) 375-4464

Charlotte, N. C. 28233

DUKE POWER COMPANY

SOLD TO: HILL POWER SUPPLY CO
PO BOX 32307
CHARLOTTE NC 28232

SHIP TO: DUKE POWER ATTN BILL ARCHER
CATAWBA NUCLEAR STATION
HIGHWAY 274
NEWPORT SC 29170

01

CUSTOMER ORDER NO.	CUST. NO.	SLS. NO.	TERMS	INVOICE DATE
K16318-13-001	30475	02	NET 30 DAYS	9/20/84

SHIPPED FROM	SHIPPED VIA	SHIP DATE
COLUMBIA SC	UPS	

PC	ORDER	B/ORDER	SHIP	DESCRIPTION	STOCK #	PRICE	PER	TOTAL
19	8		8	REMOTE SET POINT MODULES		475.39		3803.12
						SUBTOTAL		3803.12
						SHIPPING		20.80
						TOTAL		3823.92

MATERIAL MAY NOT BE RETURNED, CREDITED, OR REPLACED WITHOUT WRITTEN PERMISSION.

SHORTAGES MUST BE REPORTED WITHIN 5 DAYS AFTER RECEIPT OF SHIPMENT.

NO WARRANTY IS EXTENDED OR IMPLIED OTHER THAN THOSE OFFERED BY THE ORIGINAL MANUFACTURER.

OUR TERMS OF PAYMENT ARE STATED ABOVE, HOWEVER, ANY UNPAID INVOICE MORE THAN 30 DAYS PAST DUE, WILL BE SUBJECT TO A CHARGE OF 1½% PER MONTH WHICH IS AN 18% ANNUAL RATE.

DPC 0262481

INVOICE NO. A02016704

TRIPLICATE INVOICE

ORIGINAL INVOICE COPY

FISHER CONTROLS INTERNATIONAL, INC.

FISHER

CUSTOMER ORDER NUMBER	FOREIGN/AGENT ORDER NUMBER	INVOICE DATE	INVOICE NUMBER
K05584-73	033 -A02C81560	11/28/84	2270655

SOLD TO: MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C. 28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

SHIP TO: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA 29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

DATE SHIPPED: MO 11 DAY 21 YEAR 84

VIA ROADWAY PPD.

PARTS NO.	DESCRIPTION	QUANTITY	UNIT PRICE	NET AMOUNT
000001	TAG 2 244602849N 1U120735072 ADAPTOR,UPPER 2 IN X 1 IN	2	149.60	299.20
000005	TAG 2 244602846N 2R668319052 BONNET COVER 12 IN 300 LB.	2	132.60	265.20
000006	TAG 2 244602847N 2V9113X0012 BONNET COVER ASSY SS-84	2	805.80	1611.60
000012	TAG 2 244602850N 1L1192X0192 FLANGE,BONNET 1,CL2500	2	897.60	1795.20
000013	TAG 2 244602851N 1N3392X0492 FLANGE,BONNET 2,CL1500	2	1740.80	3481.60
000014	TAG 2 244602852N 1N3392X0172 FLANGE,BONNET 2 IN, 1500 LB.	2	686.80	1373.60
000015	TAG 2 244602853N 1L1218X0392 FLANGE,BONNET 1,CL1500	2	1523.20	3046.60

DPC_0262799

ORIGINAL INVOICE COPY

FISHER CONTROLS INTERNATIONAL, INC.

FISHER

CUSTOMER ORDER NUMBER	FISHER/AGENT ORDER NUMBER	INVOICE DATE	INVOICE NUMBER
K05586-73	033 -A02C01560	11/28/84	2270655

SOLD TO MILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 4599
ST. LOUIS, MO. 63190

PAGE 2

SAME AS "SOLD TO" UNLESS OTHERWISE INDICATED

SHIP TO DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 276
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA
VIA ROADWAY EXPR.

DATE SHIPPED: MO. 11 DAY 21 YEAR 84

ITEM NO.	DESCRIPTION	QUANTITY	UNIT PRICE	NET AMOUNT
	2R6671X0142 FLANGE,BOTTOM 12,CL300			
00040A	SPECIAL PACKAGING	1	24.90	24.90
00041A	SPECIAL CLEANING	1	15.00	15.00
00042A	DUKE FORM 930-1A	1	16.50	16.50
00043A	FINAL INSPECTION QUALITY RELEASE	1	66.70	66.70
	SUBTOTAL			12404.70
	INVOICE TOTAL			12404.70

RECEIVED JAN 18 1985 EXPEDITING DEPT MILL-POWER SUPPLY

INVESTIGATE YOUR RECORDS

DPC_0262798

ROA_03178

Jolly - Fisher Exh 940-0232

COPY OF INVOICE

Fisher Controls International, Inc.

FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
K31242-73	U33 -A02C22628	01/18/85	2298877

Sold To: MILL POWER SUPPLY CO
P. O. BOX 32307
CHARLOTTE N.C.
28232

REMIT TO: FISHER CONTROLS INTL INC
P.O. BOX 459E
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
S.L.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Via: UPS

Date Shipped Mo.	Day	Year
9	10	84

Item No.	Description	Quantity	Unit Price	Net Amount
000001	TAG 115501049N TYPE 67AFR REGULATOR SIZE 1/4 S/N 9361968-909	2	551.92	1103.84
	SUBTOTAL			1103.84
	PPD FREIGHT CHARGES			2.37
	INVOICE TOTAL			1106.21

MILL POWER RECEIVED JAN 24 1985 DIV. DEPT. PURCHASING

DPC_0262060

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 14821

Jolly - Fisher Exh 940-0233

7330841832 RW LF V#90520801 0T00 EU76 STK EAL/CDH/

C1155 PCC1930

PURCHASE ORDER

MILL-POWER SUPPLY CO.

7-06-84

IMPORTANT

No. K31242-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

CMS#001
033-A02C226
28
K31242-73
CMS# 002

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT
P.O. BOX 256
CLOVER, SC 29710

VIA ROADWAY EXPRESS

MAKE INVOICE TO:
DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER* BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
1	2	EA	67FR-239 REGULATOR,FISHER FOR THE FEEDWATER VALVE 16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA MANUFACTURED ON WESTINGHOUSE SHOP ORDER 220 FURNISHED ON WESTINGHOUSE PURCHASE ORDER 546-178317 WESTINGHOUSE E.SPEC/DRAWING 952730 COMMITTED DELIVERY 10-19-84 (14 WKS). PRICE AND DELIVERY PER GEORGE CHANG'S QUOTATION DATED 6-29-84. THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS FACILITY AT GOVERNOR RD. & OLIVE ST., MARSHALLTOWN, IOWA FORMS ATTACHED QA 505B 7330841832 AND 930.1 DELIVERY REQUIRED: 10-19-84 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05) (CONT. ON PAGE 2)	115501049N	551.92 EA

CANCELLED

SHIPPING TERMS FOB MARSHALLTOWN, IOWA

CASH TERMS NET 30 DAYS

*NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.
4. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL

(704) [redacted] 2061

TELEX [redacted]

REV. 9-83

FILE COPY

ROA_03180

Jolly - Fisher Exh 940-0234

RECEIVED JUL 9 1984 Invoice Desk MM Power Supply

		DATE	INVOICE AMOUNT
E.A. Lail S. File 7-11-84		7/30 l 8/6 l	
Let 6/29			
Find enclosed the priced specification sheet and its QA form for the type 67AFR-239 pressure regulator. The price is quoted F.O.B. Marshalltown, Iowa. Our standard terms are net 30 days. The price is firm for 30 days. The regulator can be shipped in approximately 14 weeks following the receipt of your P.O.			
Let 7/11 J.W. Temple			
The subject requisition has specified Protection Level B. Fisher Controls advises that the correct Protection Level for this material is Level C. If you are in agreement please issue an addendum to correct to Level C.	(T 8/10/84)		
Flet rec'd 8-21-84			
Order in Ack. cfm 9-25-84			
~~Ack~~ rec'd 8-24-84	(T 9/21/84)		
Will ship wk of 9-15-84			
QA Vendor Rel rec'd 9/4			
telephone rel 8-27-84	(T 9/21/84)		
Manuf Cert rec'd 9/11			
Sent to QA 9-11-84			
Flet rec'd 9-12-84 Ack 9-10-84			
(T 10/31/84) (T 9/21/84)			

DPC_0262062

7330841832 RW LF V#90520801 0T00 EU76 STK EAL/CDH/

C1155 PCC1330

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K31242-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			********** * * * NUCLEAR SAFETY RELATED * * * **********		
			ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J M CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED THEN QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS. (80)		
			A QUALITY RELEASE IS REQUIRED FOR THIS		

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

* NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.
4. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] FAX [illegible]C_0262063

TELEX 5[illegible]

REV. 9-83

FILE COPY

ROA_03182

Jolly - Fisher Exh 940-0236

7330841832 RW LF V#90520801 0T00 EU76 STK EAL/CDH/

31155 PCC1330

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. K31242-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE		
			FINAL RELEASE OF ITEMS FOR SHIPMENT WILL BE MADE BY MILL POWER SUPPLY COMPANY AFTER ALL OTHER RELEASES HAVE BEEN OBTAINED. (81)		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			QUALITY ASSURANCE REQUIRED CONTROL LEVEL: NA PROTECTION LEVEL: B CONDITION LEVEL: 1		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible] PC_0262064

TELE[illegible]346

REV. 9-83

FILE COPY

ROA_03183

Jolly - Fisher Exh 940-0237

INDEX:

7330 841832-001 MEU NSR

7330 15410 EAL/CDH
MATLS/STOCK REORDER.

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

7-30-84

FISHER CONTROLS
% R.E. MASON & CO
PO BOX 33424
CHARLOTTE, NC 28233

MMIS

CHANGE ORDER K31242-73-001
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. K31242-73 7-6-84
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			PLANT - CATAWBA NUC STA THIS CHANGE ORDER IS ISSUED TO CHANGE THE PROTECTION LEVEL ON ORDER K31242-73 FROM B TO C. QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA FORMS ATTACHED - SEE ORIGINAL THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THE PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. ALL OTHER TERMS & CONDITIONS TO REMAIN THE SAME.		

CHANGE ORDER

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

W. T. ROBERTSON, JR. PRESIDENT

BY EA LAIL BUYER

704-373- 5773

PO 0262066

FILE COPY

Jolly - Fisher Exh 940-0238

INDEX:

7330841832-002 CJ RW STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

2-13-85

FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

MMIS

CHANGE ORDER K31242-73-002

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. K31242-73 7-6-84
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA THIS CHANGE ORDER IS TO CHANGE P/N ON ID #115501049N FROM 67FR-239 TO 67AFR-239 REF: GEORGE CHANG'S LETTER DATED 11-20-84 THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65) (CONT. PAGE 2)		

CHANGE ORDER

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY E.A. LAIL BUYER

704-373- 577

0262067

FILE COPY

ROA_03185

Jolly - Fisher Exh 940-0239

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

CONTINUATION OF PURCHASE ORDER NO. K31242-73-002 PAGE 2 OF 2 PAGES

SUPPLIER
FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
CHARLOTTE NC

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE.		
			**********		
			* *		
			* NUCLEAR SAFETY RELATED *		
			* *		
			**********		
			ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J.M. CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED THEN QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS.		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER

C_0262068

FILE COPY

INDEX

7330841832-002 CJ RW STOCK EAL/MES

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

2-13-85

FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
P O BOX 33424
CHARLOTTE NC 28233

K31242-73-002
CHANGE ORDER

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. K31242-73 DATE 7-6-84

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION QUALITY ASSURANCE REQUIRED CONDITION 1 PROTECTION LEVEL C CONTROL LEVEL NA THIS CHANGE ORDER IS TO CHANGE P/N ON ID #115501049N FROM 67FR-239 TO 67AFR-239 REF: GEORGE CHANG'S LETTER DATED 11-20-84 THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. IF PART NUMBERS FOR THE MATERIAL COVERED BY THIS ORDER DIFFER FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCY MUST BE FURNISHED. (65) (CONT. PAGE 2)		

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

W. T. ROBERTSON, JR. PRESIDENT

BY E. A. LAIL BUYER

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

704-373-5[illegible]

PC_0262069

ACCOUNTING DEPT.

CERTIFIED COPY

CONTINUATION OF PURCHASE ORDER NO. K31242-73-002 PAGE 2 OF 2 PAGES

MILL-POWER SUPPLY CO.
CHARLOTTE, N. C. 28232

SUPPLIER
FISHER CONTROLS CO.
C/O ROBERT E. MASON & CO.
CHARLOTTE NC

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	LOT/MESS NUMBER	PRICE
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT. THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-4368 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE.		
			**********		
			* *		
			* NUCLEAR SAFETY RELATED *		
			* *		
			**********		
			ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J.M. CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED THEN QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS.		

THIS PAGE OF ABOVE ORDER IS SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF ORIGINAL ORDER.

PC 0262070

ACCOUNTING DEPT.

COPY OF INVOICE

Fisher Controls International, Inc. FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
J51148-73	033 -A02C81023C	02/07/85	2311122

Sold To: MILL POWER SUPPLY CO
P O BOX 32317
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 45[illegible]
ST. LOUIS, MO 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
ATT J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
PELLEVER, SOUTH CAROLINA
29714

TERMS:
NET 30 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
1	15	85

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
0J1100	TAG 25514420N 15A1270X052 PLUG/STEM/RING 1,VSC IL5000	2	1720.40	3440.80
	SUBTOTAL			3440.80
	PPD FREIGHT CHARGES			15.25
	INVOICE TOTAL			3456.05

MILL POWER RECEIVED FEB 18 1985 MILL DEPT. PURCHASING

DPC_0125585

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482E

ROA_03189

Jolly - Fisher Exh 940-0243

7330821198 WLA JWH GWH V#90520801 DT00 EU76 STK EAL/MES/

Item 1-20 033-A02C81023
21-40 033-A02C81023A
41-60 033-A02C81023B

CC9410 FCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

11-29-83

IMPORTANT
No. J51148-73
THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

A02C81023
ABC

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
C/O J.W.HAMPTON,MGR. J51148-73
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT CNS#001
P.O. BOX 256 CNS#002
CLOVER, SC 29710 CNS#003

VIA ROADWAY EXPRESS

MAKE INVOICE TO:
DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA THE FOLLOWING PARTS ARE FOR VALVES PURCHASED UNDER SPEC. CNS.1205-06-3 REV. 12		
1	2	EA	1V245924102 CLEVIS,FOR AIR ACTUATOR FISHER P/N 1V245924102	25510357N	16.66 EA
2	2	EA	1P824124102 CLEVIS,FOR AIR ACTUATOR FISHER P/N 1P824124102	25510358N	48.96 EA
3	2	EA	1P888924102 CLEVIS,FOR AIR ACTUATOR FISHER P/N 1P888924102	25510359N	35.36 EA
4	2	EA	1P660924102 CLEVIS,FOR AIR ACTUATOR FISHER P/N 1P660924102	25510360N	35.36 EA
5	2	EA	1U401124102 CLEVIS,FOR AIR ACTUATOR	25510361N	45.56 EA

see CNS001 Delete Same on 4

(CONT. ON PAGE 2)

SHIPPING TERMS FOB MARSHALLTOWN, IOWA
CASH TERMS NET 30 DAYS

* NOTICE TO SELLER
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:
MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")
W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL
OPC 0125586
(704) 3[illegible] 5773
TELEX 57[illegible]2346

REV. 9-83

FILE COPY

ROA_03190

Jolly - Fisher Exh 940-0244

		DATE	INVOICE AMOUNT
EA Lal file.			
Let 12/5 We are enclosing copy of quotation rec'd from Robert E. Mason covering the material on the subject req line note the correct P/N for each line item & issue an addendum if you are in agreement.	12/13 l	3/6	2,747.38
	R/L 2/13	3/8/84	44.36
	12/10/84 l	4/3/84	1,559.86
		4/4/84	46.09
	R/L 3/13/84	3/17/84	28,155.24
	Item 21-48		
	R/L 5/14	10/19	6,336.85
	5/15/84 l		
Flet rec'd 12/19 Due to computer error, the quote read 4 to 6 weeks which is standard delivery time for commercial parts. This being a special parts order the estimated lead time should be 18 to 20 weeks from order entry which was 12-7-83 at the present time order has not been Ack	R/L 6/19		
	6/20/84 l		
	R/L 6/29		
	7/2 l		
	R/L 7/27		
	7/30 l		
	R/L 8/3		
	8/4 l		
	~~R/L 8/4~~		
Flet to field 12-28-83			
	R/L 11/12		
Ack rec'd 1-16-84 Items 1-20 Will ship week of Feb 3, 1984	11/13 l		
	R/L 12/7		
	12/10 l 84		
Copy to Catawba Special Group			
Ack rec'd 1-20-84 Item 21-40 Will ship week of 3-1-84			
Flet to Catawba Special Group 1-20-84			
Ack rec'd 1/30/84 Items 41-60 Will ship week of 5-23-84			
Flet to field 2-15-84			
copy to Catawba Special Group 2-15-84			
Flet to Let 2/14/84 Item 63 & 65			

Over

Fisher Control informs me that Item 63 DPC_0125587 must change from 1345874X012 to 1345873X012. The pricing will remain the same. This change is necessary

7330821199 WLA JWH GWH V#90520801 OT00 EU76 STK EAL/MES/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J61148-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FISHER P/N 1U401124102		
6	2	EA	1P512424102 CLEVIS,FOR AIR ACTUATOR	25510362N	40.12 EA
			FISHER P/N 1P512424102		
7	2	EA	1R835824102 CLEVIS,FOR AIR ACTUATOR	25510363N	47.60 EA
			FISHER P/N 1R835824102		
8	2	EA	1E401124102 1U401124102 CLEVIS,FOR AIR ACTUATOR	25510364N	45.56 EA
			FISHER P/N 1E401124102		
9	2	EA	1V245235132 PIN,CLEVIS FOR AIR ACTUATOR	25510365N	7.48 EA
			FISHER P/N 1V245235132		
10	Delete same as 12 2	EA	1P681435162 PIN,CLEVIS FOR AIR ACTUATOR	25510366N	13.60 EA
			FISHER P/N 1P681435162		
11	Delete same as 12 2	EA	1P861435162	25510367N	13.60 EA

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

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3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704)

TELEX 5[illegible]-2346

REV. 9-83

FILE COPY

	DATE	INVOICE AMOUNT
due to manual changes made to the serial # approximately Feb 28, 1977		
Let 2/20/84. We enclose copy of letter rec'd concerning P/N		
Corrections on line Item 63 & 65		
If you are in agreement please issue an addendum to correct these Items)		
Flt rec'd 2-22-84; Items 1-20		
resch to 3-13-84		
Flt to field 2-22-84		
QA Vendor Release rec'd 2-29-84 Items 1, 2, 4, 5, 6, 7, 8, 9, 12, 15, 16, 17, 18, 19, 20 telephone rec'd 2-27-84		
Manuf Cert for Parts rec'd 3-5-84		
Items 1, 2, 4, 5, 6, 7, 8, 9, 12, 13 sent to QA 3-5-84		
Flt rec'd 3-5-84 Items 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71		
Will ship week of 7-20-84		
Flt to field 3-8-84		
Copy to Catawba Special Group 3-8-84		
Ack rec'd 3/5/84 Items 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71. Will ship week of 7-20-84		
Called Henry Mullin 3/12/84 part # on Ack is correct has written letter to Mr. Lail		
Copy to Catawba Special Group 3-12-84		
Flt rec'd 3/29 Items 21, 22, 26, 30, 31, 32, 36, 37, 38, 39, resch to wk of 3-31-84		
Flt to field 3-29-84 Omar		

DPC_0125589

ROA_03193

Jolly - Fisher Exh 940-0247

7330821198 WLA JWH GWH V#905Z0801 0T00 EU76 STK EAL/MES/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			PIN,CLEVIS FOR AIR ACTUATOR FISHER P/N 1P661435162		
12	2	EA	1P661435162 PIN,CLEVIS FOR AIR ACTUATOR	25510368N	13.60 EA
			FISHER P/N 1P661435162		
13	2	EA	1L403735232 PIN,CLEVIS FOR AIR ACTUATOR	25510369N	2.89 EA
			FISHER P/N 1L403735232		
14	Delete some on 13 2	EA	1F403735232 PIN,CLEVIS FOR AIR ACTUATOR	25510370N	2.89 EA
			FISHER P/N 1F403735232		
15	2	EA	1H8655000A2 18A1685X012 CONNECTOR,STEM FOR AIR ACTUATOR	25510371N	54.40 EA
			FISHER P/N 1H8655000A2		
16	10	EA	1E8033000A2 18A1668X012 CONNECTOR,STEM FOR AIR ACTUATOR	25510306N	23.12 EA
			FISHER P/N 1E8033000A2 (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [illegible]

TELEX 5[illegible]346

REV. 9-83

FILE COPY

DPC_0125590

ROA_03194

Jolly - Fisher Exh 940-0248

		DATE	INVOICE AMOUNT
Manuf Cert for Parts rec'd 4-2-84			
Items 21, 22, 26, 30, 31, 32, 36, 37, 38, 39			
Sent to QA 4-2-84			
QA Vendor Rel rec'd 4/4/84 In Plant			
Rel 3-27-84 Items 21, 22, 26, 30, 31, 32, 36, 37, 38, 39			
(T 5/11/84)			
4/3/84 Let rec'd 4-17-84 The intent			
of this correspondence is to quote			
price for the final Inspection			
quality rel req 200.00 net			
(T 5/29/84)			
Flt rec'd 5-21-84			
Items 41-60 (033-A02C8102 3B)			
rush to 6-9-84			
Flt to field 5-21-84			
(T 7/16/84) (T 6/27/84) (T 6/10/84)			
Flt rec'd 7/6/84			
Items 41-60 Ready for			
Customer inspection 6-1-84			
(T 7/27/84)			
QA Vendor Rel rec'd 7/10/84			
All Items on attached list are			
quantity ordered & quantity released			
In Plant Rel 6-28-84 Items			
41-60 Manuf Cert for Parts			
sent to QA 7-10-84 (T 7/27/84)			
Flt rec'd 8/6 (T 8/13/84)			
Items 41-60			
shipped 7-3-84 (T 8/13/84)			
Flt rec'd 8-21-84 (T 8/21/84)			
Items 61-64, 66-76			
above items have been rescheduled to ship 9-7-84			
Flt to field 8-21-84			
Orm (T 9/14)			

DPC 0125591

7330821198 WLA JWH GWH V#90520801 OT00 EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
17	4	EA	1E8337000A2 18A1672X012 CONNECTOR,STEM FOR AIR ACTUATOR FISHER P/N 1E8337000A2	25510372N	40.00 EA
18	2	EA	21A6388X012 18A1692X012 CONNECTOR,STEM FOR AIR ACTUATOR FISHER P/N 21A6388X012	25510373N	122.40 EA
19	2	EA	1N1319000A2 18A1675X012 CONNECTOR,STEM FOR AIR ACTUATOR FISHER P/N 1N1319000A2	25510374N	57.80 EA
20	2	EA	21A7156X012 CONNECTOR,STEM FOR AIR ACTUATOR FISHER P/N 21A7156X012	25510375N	595.00 EA
21	2	EA	1J3320000A2 18A1671X012 CONNECTOR,STEM FOR AIR ACTUATOR FISHER P/N 1J3320000A2	25510376N	34.00 EA
22	2	EA	21A6387X012 18A1691X012 CONNECTOR,STEM FOR AIR ACTUATOR	25510377N	108.80 EA

(CONT. ON PAGE 5)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704)

TELEX 57-2346

REV. 9-83

FILE COPY

DPC_0125592

ROA_03196

Jolly - Fisher Exh 940-0250

	DATE	INVOICE AMOUNT
Ricky to JS 8/28 need to confirm that 9-7-84 ship still good, need Item #62		
Called Ann 8/28 all Items to ship except Item 66 on time end of Sept for Item 66		
Called Ricky 8/28 with info left message with Jim Fails		
Per Ann 9/18 Item 66 out of Dec 8 check on 9-7 sh		
Q-A Vendor Rel rec'd 10-19-84		
In Plant Rel rec'd 10-15-84		
Items 61-64 67-71 In Plant Rel 10-15-84		
Ann to JS 10/22/84 all Materials shipped except Item 66		
on 10-12-84 Ann checking on Item 66		
Ann to JS 10/25/84 Item 66 rescheduled to ship 12-12-84 will check why		
Flt to field 10-26-84		
copy to the Buyer		
Exp Report Contact date 11-15 11-16-84		
Item 66 33A02C8102.3C		
all shipped on 10-16-84 except Item 66. This Item is being reworked on the plug - Steam & Ring Assembly & it will be completed by 11-30-84 The documentation will be sent to our QA by 12-17-84		
Ann to JS 1/14/85 In assembly to be finished & documentation to be sent couple of weeks Over		

DPC_0125593

7330821198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

CC9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

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PAGE 5

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P.O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
	Delete Some on 19		FISHER P/N 21A6387X012		
23	2	EA	1N1315000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510378N	57.80 EA
			FISHER P/N 1N1315000A2		
24	Delete Some on 16 2	EA	1E8032000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510379N	23.12 EA
			FISHER P/N 1E8032000A2		
25	Delete Some on 21 2	EA	1E3330000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510380N	34.00 EA
			FISHER P/N 1E3330000A2		
26	2	EA	1E7877000A2 18A1243X012 CONNECTOR, STEM FOR AIR ACTUATOR	25510381N	18.36 EA
			FISHER P/N 1E7877000A2		
27	Delete Some on 21 2	EA	1J2330000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510382N	34.00 EA
			FISHER P/N 1J2330000A2		
28	Delete Some on 16 2	EA	1E6033000A2	25510383N	23.12 EA

(CONT. ON PAGE 6)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3

TELEX 57-2346

REV. 9-83

FILE COPY

PC_0125594

ROA_03198

Jolly - Fisher Exh 940-0252

		DATE	INVOICE AMOUNT
QA Vendor Rel rec'd 1-24-85			
Item 66 In Plant Rel 1-21-85			
Flet rec'd 2-7-85			
Shipped fully 1-25-85			

DPC_0125595

7330821198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

.9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51149-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 6

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CONNECTOR, STEM FOR AIR ACTUATOR		
			FISHER P/N 1E6033000A2		
29	Delete some or 2 17	EA	1A8337000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510384N	40.80 EA
			FISHER P/N 1A8337000A2		
30	2	EA	2H2946050A2 2H2946000A2 CONNECTOR, STEM FOR AIR ACTUATOR	25510385N	132.60 EA
			FISHER P/N 2H2946050A2		
31	2	EA	1H153828982 E-RING, FOR AIR ACTUATOR	25510386N	.31 EA
			FISHER P/N 1H153828982		
32	2	EA	1K328829992 1K328828992 E-RING, FOR AIR ACTUATOR	25510387N	.48 EA
			FISHER P/N 1K328829992		
33	Delete some or 2 32	EA	1K329820992 E-RING, FOR AIR ACTUATOR	25510388N	.48 EA
			FISHER P/N 1K329820992		
			(CONT. ON PAGE 7)		

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[redacted]

TELEX 57-2346

REV. 9-83

FILE COPY

7330821198 WLA JWH CWH V#90520801 0T00 EU76 STK EAL/MES/

.9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51149-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
34	Delete Done on 3 2	EA	1K328828992 E-RING, FOR AIR ACTUATOR FISHER P/N 1K328828992	25510389N	.40 EA
35	Delete Done on 32 2	EA	1K328826992 E-RING, FOR AIR ACTUATOR FISHER P/N 1K328826992	25510390N	.48 EA
36	2	EA	1F599428982 E-RING, FOR AIR ACTUATOR FISHER P/N 1F599428982	25510391N	.31 EA
37	2	EA	2H865807062 PISTON, FOR AIR ACTUATOR FISHER P/N 2H865807062	25510392N	68.00 EA
38	2	EA	2H873307062 PISTON, FOR AIR ACTUATOR FISHER P/N 2H873307062	25510393N	149.60 EA
39	2	EA	2J897248322 2J897246322 ROD, PISTON FOR AIR ACTUATOR	25510394N	224.40 EA

(CONT. ON PAGE 8)

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3 DPC_0125597

TELEX 57-2346

REV. 9-83

FILE COPY

ROA_03201

Jolly - Fisher Exh 940-0255

7330921198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

29410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

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PAGE 8

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE, N C 28233

HEREIN DESIGNATED SELLER

SHIP TO

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MAKE INVOICE TO:

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
	Delete some on 39		FISHER P/N 2J897246322		
40	2	EA	2J897246322 ROD,PISTON FOR AIR ACTUATOR	25510340N	224.40 EA
			FISHER P/N 2J897246322		
41	2	EA	21A9779X012 RING,SEAT FOR AIR ACTUATOR	25510395N	979.20 EA
			FISHER P/N 21A9779X012		
42	2	EA	1U286846172 1U286646172 RING,SEAT FOR AIR ACTUATOR	25510396N	129.20 EA
			FISHER P/N 1U286846172		
43	2	EA	1V642346172 RING,SEAT FOR AIR ACTUATOR	25510397N	472.60 EA
			FISHER P/N 1V642346172		
44	2	EA	1U222648172 1U222646172 RING,SEAT FOR AIR ACTUATOR	25510398N	57.80 EA
			FISHER P/N 1U222648172		
45	2	EA	14A2832X012 (CONT. ON PAGE 9)	25510399N	567.80 EA

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CASH TERMS

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

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REV. 9-83

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DPC_0125598

ROA_03202

Jolly - Fisher Exh 940-0256

7330821198 WLA JWH GWH V#90820801 0T00 EU76 STK EAL/MES/

:C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

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PAGE 9

SHIP TO

FISHER CONTROLS COMPANY
% RODERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			RING,SEAT FOR AIR ACTUATOR		
			FISHER P/N 14A2832X012		
46	2	EA	12A3528X022 RING,SEAT FOR AIR ACTUATOR	25510400N	1,604.80 EA
			FISHER P/N 12A3528X022		
47	2	EA	21A4523X012 RING,SEAT FOR AIR ACTUATOR FISHER P/N 21A4523X012	25510401N	1,380.40 EA
48	2	EA	24A8149X012 21A4523X012 RING,SEAT FOR AIR ACTUATOR	25510402N	1,380.40 EA
			FISHER P/N 24A8149X012		
49	2	EA	1U508046172 RING,SEAT FOR AIR ACTUATOR	25510403N	187.00 EA
			FISHER P/N 1U508046172		
50	2	EA	1U285435072 RING,SEAT FOR AIR ACTUATOR	25510404N	59.84 EA
			FISHER P/N 1U285435072		
			(CONT. ON PAGE 10)		

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible]

TELEX 57[illegible]6

REV. 9-83

FILE COPY

OPC_0125599

ROA_03203

Jolly - Fisher Exh 940-0257

7330821198 WLA JWH GWH V#90520801 OTOO EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

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PAGE 10

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28239

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
51	2	EA	1K416535032 RING,SEAT FOR AIR ACTUATOR FISHER P/N 1K416535032	25510405N	9.18 EA
52	2	EA	1K418235032 1K416235032 RING,SEAT FOR AIR ACTUATOR FISHER P/N 1K418235032	25510406N	8.50 EA
53	2	EA	2V643946172 RING,SEAT FOR AIR ACTUATOR FISHER P/N 2V643946172	25510407N	809.20 EA
54	2	EA	21A6819X012 RING,SEAT FOR AIR ACTUATOR FISHER P/N 21A6819X012	25510408N	4,269.60 EA
55	2	EA	1V676446172 RING,SEAT FOR AIR ACTUATOR FISHER P/N 1V676446172	25510409N	312.80 EA
56	2	EA	2V371946192 RING,SEAT FOR AIR ACTUATOR	25510410N	578.00 EA

(CONT. ON PAGE 11)

SHIPPING TERMS

CASH TERMS

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P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted]

TELEX 57[redacted]346

REV. 9-83

FILE COPY

DPC_0125600

ROA_03204

Jolly - Fisher Exh 940-0258

7330821198 WLA JWH GWH V#90520901 OT00 EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51148-73

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FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO

VIA

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FISHER P/N 2V371946192		
57	2	EA	2U855948052 2U855946052 RING,SEAT FOR AIR ACTUATOR	25510411N	241.40 EA
			FISHER P/N 2U855948052		
58	2	EA	2V721546172 RING,SEAT FOR AIR ACTUATOR	25510412N	550.80 EA
			FISHER P/N 2V721546172		
59	2	EA	20A3260X012 RING,SEAT FOR AIR ACTUATOR	25510413N	292.40 EA
			FISHER P/N 20A3260X012		
60	2	EA	1N852435072 RING,SEAT FOR AIR ACTUATOR	25510414N	149.60 EA
			FISHER P/N 1N852435072		
61	2	EA	1R765746202 RING,SEAT FOR AIR ACTUATOR	25510415N	102.00 EA
			FISHER P/N 1R765746202		
62	2	EA	10A3445X012 (CONT. ON PAGE 12)	25510416N	142.80 EA

SHIPPING TERMS

CASH TERMS

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CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible]

TELEX 57[illegible]46

REV. 9-83

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0821198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. J51149-73

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SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			RING,SEAT FOR AIR ACTUATOR		
			FISHER P/N 10A3445X012		
63	2	EA	13A5873X012 13A5874X012 RING,SEAT FOR AIR ACTUATOR	25510417N	153.00 EA
			FISHER P/N 13A5873X012		
64	2	EA	1U292648172 1U286546172 RING,SEAT FOR AIR ACTUATOR	25510418N	129.20 EA
			FISHER P/N 1U292648172		
65	Count see c'ns 2	EA	13A5874X012 RING,SEAT FOR AIR ACTUATOR	25510419N	153.00 EA
			FISHER P/N 13A5874X012		
66	2	EA	14A2327X012 15A1276X052 RING,SEAT FOR AIR ACTUATOR	25510420N	1,720.40 EA
			FISHER P/N 14A2327X012		
67	2	EA	1U2743X0022 RING,SEAT FOR AIR ACTUATOR	25510421N	829.60 EA
			FISHER P/N 1U2743X0022		
			(CONT. ON PAGE 13)		

SHIPPING TERMS

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CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[illegible]

TELEX 57[illegible]6

REV. 9-83

FILE COPY

7330821198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

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PAGE 13

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
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HEREIN DESIGNATED SELLER

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
68	2	EA	1U274250332 RING,SEAT FOR AIR ACTUATOR FISHER P/N 1U274250332	25510422N	278.80 EA
69	2	EA	12A0025X022 14A9407X032 RING,SEAT FOR AIR ACTUATOR FISHER P/N 12A0025X022	25510423N	1,360.00 EA
70	2	EA	1U285535072 RING,SEAT FOR AIR ACTUATOR FISHER P/N 1U285535072	25510424N	59.84 EA
71	2	EA	2H872946582 ROD,PISTON FOR AIR ACTUATOR FISHER P/N 2H872946582	25510425N	57.12 EA
72			SPECIAL PACKAGING	37.40 37.40 37.40 37.40	149.60 LOT
73			SPECIAL CLEANING	23.80 23.80 23.80 23.80	95.20 LOT

(CONT. ON PAGE 14)

SHIPPING TERMS

CASH TERMS

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W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3[redacted]

TELEX 57[redacted]6

REV. 9-83

FILE COPY

7330821198 WLA JWH GWH V#90820801 0T00 EU76 STK EAL/MES/

:9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

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PAGE 14

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
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HEREIN DESIGNATED SELLER

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
74			DUKE FORM 930.1A COMMITTED DELIVERY: 1-5-84 14-6 WEEKS PRICE AND DELIVERY PER YOUR QUOTATION 004642. THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER FACILITY AT GOV. RD. & OLIVE ST., MARSHALLTOWN, IOWA. DELIVERY REQUIRED: 1-05-84 ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05) THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. (CONT. ON PAGE 15)		25.00 25.00 100.00 LOT 25.00 25.00

SHIPPING TERMS

CASH TERMS

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W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) [redacted]

TELEX 57[redacted]6

REV. 9-83

FILE COPY

7330821198 WLA JWH GWH V#90520801 0T00 EU76 STK EAL/MES/

C9410 PCC9410

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

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PAGE 15

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			QUALITY ASSURANCE REQUIRED CONTROL LEVEL: 2 PROTECTION LEVEL: C CONDITION LEVEL: 1		

SHIPPING TERMS

CASH TERMS

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

(704) 3

TELEX 57

PC_0125605

REV. 9-83

FILE COPY

ROA_03209

Jolly - Fisher Exh 940-0263

COPY OF INVOICE

Fisher Controls International, Inc. FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
M25157-17	033 -A02026256	05/16/85	2372613

Sold To: HILL POWER SUPPLY CO
P O BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

DUKE POWER COMPANY

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
C/O E M COUCH, PROJ MGR
CATAWBA STA. HWY 274
NEWPORT, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
5	15	85

Via UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
000001	1046942892	9	0.35	3.15
	SCREW,MACH,RD HD 10-24X3/4			
	SUBTOTAL			3.15
	PPD FREIGHT CHARGES			1.52
	INVOICE TOTAL			4.67

DUKE POWER RECEIVED MAY 23 1985 MAT. MGT. PURCHASING

DPC_0284974

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482B

83271205.02-00-0045-00 FDC HEE RUD V490520801 0T00 EU20 JLM/SHG/

CC1620 PDC1620

PURCHASE ORDER

MILL-POWER SUPPLY CO.

4-24-85

IMPORTANT

No. M25157-17

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
C/O E M COUCH M25157-17
PROJECT MANAGER
CATAWBA NUCLEAR STATION
SC HWY 274
NEWPORT, SC 29710

VIA UPS OR ROADWAY EXPRESS

MAKE INVOICE TO:
DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 36 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION FISHER CONTROLS CO. THE FOLLOWING ARE TO BE USED ON [illegible] VALVES 2VP19B AND 2VP20B	MESS MMIS need	
1	9	EA	ROUND HEAD SCREWS PART NO.: F-13604 ITEM NO.: 43 FISHER DWG. NO.: G-31135 SERIAL NOS.: BF203293 & BF203295	2VP-1	.36 EA
			FOR RECEIVING PURPOSES REFERENCE PURCHASE REQUEST V-85-0047 PRICING PER JIM MARSHALL TO JLM 4/18/85 VENDOR COMMITMENT: 5/3/85 DELIVERY REQUIRED: 4-20-85 ON ALL DRAWINGS/CORRESPONDENCE, CONTRACTOR MUST SHOW THE FOLLOWING: STATION CATAWBA D.E.FILE # CN-1205.02 MPS ORD. # M25157-17 (CONT. ON PAGE 2)		

SHIPPING TERMS FOB MARSHALLTOWN, IOWA 5/10

CASH TERMS NET 30 DAYS

*** NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")
W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: JAMES L. MCCARTY
PC_0284975
(704) [redacted] 7104
TELEX [redacted]6

REV. 9-83

FILE COPY

ROA_03211

Jolly - Fisher Exh 940-0265

		DATE	INVOICE AMOUNT
	TL 5/8 T 5/24		
5/9/25 Ack. rec. - opd 5:20			
5/14 ack. axn. - opd 5:20	TL 5/22 T 6/7		

DPC_0284976

83371205.02-00-0045-00 FDC HEE RLD V090520801 0T00 EU20 JLM/SHG/

CC1620 PCC1620

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. M25157-17

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

SHIP TO:

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28333

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER, OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			THIS PURCHASE IS BEING MADE BY MILL-POWER SUPPLY COMPANY ACTING SOLELY IN ITS CAPACITY AS AGENT FOR DUKE POWER COMPANY.		

SHIPPING TERMS

CASH TERMS

*** NOTICE TO SELLER**

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MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: DPC-0284977

(704) [redacted]

TELEX [redacted]

REV. 9-83

FILE COPY

ROA_03213

Jolly - Fisher Exh 940-0267

COPY OF INVOICE

Fisher Controls International, Inc. FISHER

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
H10275-73	033 -A02C86505	04/10/86	2578971

DUKE POWER COMPANY

Sold To: MILL POWER SUPPLY CO
P. O. BOX 32307
CHARLOTTE N.C.
28232

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER CO
% J.W. HAMPTON, MGR
CATAWBA, NUCLEAR STATION-HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
4	10	86

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
00001	TAG-115501049N TYPE 67AFR REGULATOR SIZE 1/4	1	173.42	173.42
	SUBTOTAL			173.42
	PPD FREIGHT CHARGES			2.41
	INVOICE TOTAL			175.83

MILL POWER RECEIVED APR 14 1986 MAIL DEPT. PURCHASING

DPC_0282273

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1462

ROA_03214

Jolly - Fisher Exh 940-0268

7330056011 GA KWM V#90520801 0T00 EU76 STK EAL/CJC/

CC1155 FCC1330

IMPORTANT

No. P10275-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PURCHASE ORDER

MILL-POWER SUPPLY CO.

2-07-86

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

S DUKE POWER CO. A02C84952
H C/O J.W.HAMPTON,MGR. P10275-73
I CATAWBA NUCLEAR STATION
P HWY 274, NEWPORT A02C86503
T P.O. BOX 256 item 001
O CLOVER, SC 29710
VIA UPS INSURED

MAKE INVOICE TO: DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 26 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			REFERENCE (1) SPIN: GAVAFWAA (2) VALVE: TYPE 657EC S/N 6820717. DUKE SPEC: CNS-1205.06-00-0003 REV. 13		
1	1	EA	67AFR-239 REGULATOR,FISHER FOR THE FEEDWATER VALVE 16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA MANUFACTURED ON WESTINGHOUSE SHOP ORDER 220 FURNISHED ON WESTINGHOUSE PURCHASE ORDER 546-178317 WESTINGHOUSE E.SPEC/DRAWING 952730	115501049N	59.52 EA
2	3	EA	1F364135072 RING,LANTERN FOR FISHER 2,1.5 AND 1 INCH GLOBE CONTROL VALVE FISHER P/N 1F364135072	244402130N	9.94 EA
			SPECIAL CLEANING, PACKAGING, 930.1A & DUKE INSPECTION/WAIVER		130.90 LOT
			THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS FACILITY AT GOVERNOR RD. & OLIVE ST.,		
			(CONT. ON PAGE 2)		

SHIPPING TERMS: FOB MARSHALLTOWN, IA.

CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: MILL-POWER SUPPLY CO. P.O. BOX 32307 CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: E.A. LAIL

5773
C_0282274

REV. 10-85

TELEX 57-2346 • TELECOPIER (704) [illegible]-3336

FILE COPY

Jolly - Fisher Exh 940-0269

RECEIVED
FEB 11 1986
Invoice Desk
Mill Power Supply

		DATE	INVOICE AMOUNT
		4/	32.84
Filet rec'd 3-6-86 Fisher has not yet Ack their Order	3/6	3/21/86	138.90
Filet rec'd 3-12-86 Ack S/D not available for either Item yet		3/20/86	
Ack rec'd 3-27-86 Item 2 will ship week of 3-27-86		3/27/86	
Ack rec'd 3-28-86 Item 001 will ship week of 4-12-86		4/4/86	
P.A. Vendor Rel rec'd 4-4-86 Item 2 tol Rel 4-1-86		4/24/86	4/4/86

DPC_0282275

7330B56011 GA KWM V#90520801 0T00 EU76 STK EAL/CJC/

CC1155 FCC1330

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. P10275-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MARSHALLTOWN, IOWA.		
			PRICE & DELIVERY PER YOUR QUOTATION DATED 2/4/86.		
			COMMITTED DELIVERY: 6 TO 8 WKS. (4-11-86) MMIS		
			FORMS ATTACHED AS PART OF THIS ORDER: 930.1A.		
			DELIVERY REQUIRED: 4-11-86		
			ID NUMBER AND PURCHASE ORDER NUMBER MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PARTS TAGS, AND INVOICES. (05)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			A QUALITY RELEASE IS REQUIRED FOR THIS MATERIAL OR COMPONENT PRIOR TO SHIPMENT.		
			(CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

REV. 10-85

C_0282276

TELEX 57-2346 • TELECOPIER (704) [illegible]-3336

FILE COPY

ROA_03217

Jolly - Fisher Exh 940-0271

7330856011 GA KWM V090520801 OT00 EU76 STK EAL/CJC/

CC1155 PCC1330

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. P10275-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*.
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			THE DUKE POWER COMPANY QUALITY ASSURANCE DEPARTMENT SHALL BE NOTIFIED AT LEAST (5) WORKING DAYS PRIOR TO SHIPMENT. CONTACT 704-373-8435 OR 704-373-4299 FOR QUALITY ASSURANCE RELEASE. (Q2		
			********** * * * NUCLEAR SAFETY RELATED * * * **********		
			ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIERS' QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER QA DEPARTMENT. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO J. M. CURTIS AT 704-373-4299.		
			IF LOWER TIER PROCUREMENT IS REQUIRED, THEN APPLICABLE QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS. (Q4)		
			DUKE POWER COMPANY FORM 930.1 (SUPPLIER QA CERTIFICATION) IS REQUIRED WITH EACH SHIPMENT.		
			(CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

NOTICE TO SELLER

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

REV. 10-85

C_0282277

TELEX 57-2346 • TELECOPIER (704-[illegible]-3336

FILE COPY

7330856011 GA KWM V#90520801 0700 EU76 STK EAL/GJC/

CC1155 FCC1330

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. P10275-73

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 4

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			A COPY IS TO BE SENT TO: QA MANAGER, VENDORS DIVISION DUKE POWER COMPANY P. O. BOX 33189 CHARLOTTE, N. C. 28242 (Q5) THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. QUALITY ASSURANCE REQUIRED STANDARD STOCK: N PROTECTION LEVEL: C CONDITION LEVEL: 1 THIS PURCHASE IS BEING MADE BY MILL-POWER SUPPLY COMPANY ACTING SOLELY IN ITS CAPACITY AS AGENT FOR DUKE POWER COMPANY.		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

REV. 10-85

C_0282278

TELEX 57-2346 • TELECOPIER (704 -3336

FILE COPY

ROA_03219

Jolly - Fisher Exh 940-0273

COPY OF INVOICE

Del Rel-Ste 6/11/87

Fisher Controls International, Inc.

FISHER®

Customer Order Number	Fisher/Agent Order Number	Invoice Date	Invoice Number
P56567-77	033 -A02032261	11/25/86	2710745

Sold To: MILL POWER SUPPLY CO
P O BOX 32809
CHARLOTTE N.C.
28232

DUKE POWER COMPANY

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER COMPANY
CATAWBA NUCLEAR PLT/HWY 274
CLOVER, SOUTH CAROLINA
29710

TERMS:
NET 030 DAYS IN U.S. FUNDS
F.O.B. MARSHALLTOWN, IOWA

Date Shipped		
Mo.	Day	Year
11	25	86

Via: UPS PPD

Item No.	Description	Quantity	Unit Price	Net Amount
000001	TAG 2444402873 1U508599442 GASKET,SPIRAL WOUND 7 27/32X8 1/2X.175	1	45.00	45.00
000002	TAG 2444[illegible]3165 add 1 chang 1U5083X0982 GASKET 7 11/16X8 17/32X1/32	2	2.81	5.62
	SUBTOTAL			50.62
	PPD FREIGHT CHARGES			1.00
	INVOICE TOTAL			51.62

MILL POWER RECEIVED DEC 1 1986 MAIN DEPT. PURCHASING

DPC 0281282

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller hereby certifies that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 1482E

7330864592 DF KWM V890520801 0T00 EU76 STK JLR/GJM/C

TC2444 FCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. P56567-77

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

11-07-86

033-A0203226 CNS#001

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO. P56567-77
C/O J.W.HAMPTON,MGR.
CATAWBA NUCLEAR STATION
HWY 274, NEWPORT, SC 29730
P.O. BOX 256
CLOVER, SC 29710

VIA UPS INSURED

MAKE INVOICE TO:
DUKE POWER COMPANY
TAX CERTIFICATE NUMBER
NC 24 SC 1002-19

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ITEM (1) M29940 VALVE:CONTROL 6X10, TYPE 657-ET,S/N 6365055-058 ITEM (2) K08635 VALVE:CONTROL 8X6, S/N 6372322-323, TYPE 667-EWT		
1	1	EA	1U508599442 GASKET,SEAT RING FOR 6 INCH GLOBE VALVE FISHER P/N 1U508599442	244402873	45.00 EA
2	2	EA	1U508304022 1U5083X0082 GASKET,CAGE FOR 8 INCH GLOBE VALVE FISHER P/N 1U508304022 1U5083X0082	244403145	2.81 EA
			ABOVE PRICE PER R3000X DATED 9/26/86.		
			DELIVERY REQUIRED: 12-09-86		
			PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES.		
			THIS PURCHASE IS BEING MADE BY (CONT. ON PAGE 2)		

MMIS

Sel CNS 001

SHIPPING TERMS: FOB MARSHALLTOWN, IOWA

CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER,
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: MILL-POWER SUPPLY CO. P.O. BOX 32307 CHARLOTTE, N.C. 28232-2307.

MILL-POWER SUPPLY COMPANY ("BUYER")
W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO: J.L. ROSEMAN

REV. 10-85

FILE COPY

059
C 0281283

TELEX 57-2348 • TELECOPIER (704) 376-3336

ROA_03221

Jolly - Fisher Exh 940-0275

RECEIVED NOV 10 1986 Electric Boat Gen Power Supply

	DATE	INVOICE AMOUNT
Ack rec'd 11-24-86. Will ship week of 12-6-86 P/N for Item #2 different	11/21	
11/26 Called Ann the new P/N for Item 002. P/N on P.O. is obsolete. Per Ann Stehley at Fisher the new P/N has same fit, form, function for you inf. Sent copy of Ack to Tom Ferguson	12/10/86	

DPC_0281284

7330864592 DF KWM V090520001 0T00 EU76 STK JLR/CJM/C

C2444 PCC9370

PURCHASE ORDER

MILL-POWER SUPPLY CO.

IMPORTANT

No. P56567-77

THIS ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

MAKE INVOICE TO:

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER WHOSE ADDRESS AND SIGNATURE APPEAR BELOW AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO-PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MILL-POWER SUPPLY COMPANY ACTING SOLELY IN ITS CAPACITY AS AGENT FOR DUKE POWER COMPANY.		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.

THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:
MILL-POWER SUPPLY CO.
P.O. BOX 32307
CHARLOTTE, N.C. 28232-2307

MILL-POWER SUPPLY COMPANY ("BUYER")

W. T. ROBERTSON, JR., PRES.

ADDRESS REPLY TO:

REV. 10-85

FILE COPY

PC_0281285

TELEX 57-2340 • TELECOPIER (704) 373-3336

ROA_03223

Jolly - Fisher Exh 940-0277

INDEX:

7330864502-001 JPF WWM 7330 154.10 MATLS STOCK REORDER JLR/CDH

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

1-12-87

FISHER CONTROLS
% R.E. MASON
ORO

MMIS

CHANGE ORDER P56567-77-001
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. P56567-77 11-7-86
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUC STA. THIS CNS IS WRITTEN TO CHANGE THE PART NUMBER OF LINE ITEM 02 FROM 1U508304022 TO 1U5083X0082 ALL OTHER TERMS & CONDITIONS REMAIN THE SAME.(21)		

CHANGE ORDER

SHIPPING TERMS | CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY J. ROSEMAN BUYER

704-373- 6059

C_0281286

FILE COPY

INDEX:

7330864502-001 JPF WWM 7330 154.10 MATLS STOCK REORDER JLR/CDH

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

1-12-87

FISHER CONTROLS
% R.E. MASON
ORO

CHANGE ORDER P56567-77-001
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. P56567-77 11-7-86
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUC STA. THIS CNS IS WRITTEN TO CHANGE THE PART NUMBER OF LINE ITEM 02 FROM 1U508304022 TO 1U5083X0082 ALL OTHER TERMS & CONDITIONS REMAIN THE SAME. (21)		

CHANGE ORDER

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY J. ROSEMAN BUYER

704-373-605[redacted] PC_0281287

ACCOUNTING DEPT.

INDEX:
7330821198-003 SLM WGM
REASON CANCEL QA REQUIREMENTS

RLC/SHG

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307

5/21/87

FISHER CONTROLS CO.
ORO

CHANGE ORDER J 51148-73-003
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. J 51148-73 11/29/83
DATE
All Invoices and Correspondence Should Show Purchase No. as Reference

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION USE THIS CHANGE ORDER AS YOUR AUTHORIZATION TO DELETE ALL QA REQUIREMENTS FOR LINE ITEM 41, ID # 2551-0395N MATERIAL ALREADY RECEIVED ALL OTHER TERMS & CONDITIONS TO REMAIN THE SAME.		

SHIPPING TERMS

CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY R. L. CALDWELL BUYER

704-373- 5773

DPC_0125610

FILE COPY

ROA_03226

Jolly - Fisher Exh 940-0280

INDEX:
7330821198-003 SLM WGM
REASON CANCEL QA REQUIREMENTS

RLC/SHG

CHANGE ORDER

Mill-Power Supply Co.

P. O. Box 32307
Charlotte, N. C. 28232-2307
5/21/87

FISHER CONTROLS CO.
ORO

CHANGE ORDER J 51148-73-003
THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER
No. J 51148-73 11/29/83 DATE
All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION USE THIS CHANGE ORDER AS YOUR AUTHORIZATION TO DELETE ALL QA REQUIREMENTS FOR LINE ITEM 41, ID # 2551-0395N MATERIAL ALREADY RECEIVED ALL OTHER TERMS & CONDITIONS TO REMAIN THE SAME.		

CHANGE ORDER

SHIPPING TERMS | CASH TERMS

PLEASE ACKNOWLEDGE RECEIPT OF THESE INSTRUCTIONS BY RETURN MAIL.

THIS CHANGE ORDER IS SUBJECT TO THE TERMS AND CONDITIONS SHOWN ON REVERSE SIDE OF ORIGINAL PURCHASE ORDER.

MILL-POWER SUPPLY COMPANY

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL E RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, SSUED ONLY BY PURCHASING DEPARTMENT.

W. T. ROBERTSON, JR. PRESIDENT

BY R. L. CALDWELL BUYER

704-373-

577PC_0125611

ACCOUNTING DEPT

Jolly - Fisher Exh 940-0281

Invoice

Fisher Controls

FISHER

Please remit to:
Fisher Controls
P.O. Box 40000
Dept. 644
Hartford, CT 06151

Fisher Controls International, Inc.
Routes 49 & US 95
North Stonington, CT 06359
Phone 203/599-1140
Fax 203/599-3892

Invoice Number: S160859

Bill To: DUKE POWER
PURCHASING DEPT.
P.O. BOX 1002
CHARLOTTE, NC 28232

Attn.

Ship To: DUKE PWR CO.C/O DL FREEZE
MANAGE A19730-77 CENTRAL
DIV. CONST & MAIN DEPT SC
HWY 274.NEWPORT, SC 29710

Mark For: PO # A19730-77

11970 12967

Carrier	Freight Terms	B/L No.	Pkg. List No.	Ship Date	Invoice Date
YELLOW FRT	PREPAID/NO CHARGE	49485	0916104	91/09/16	91/09/17

Rel. No.	Terms	Order Date	Customer P.O. No.	Quote No.	Page
58221	NET-30 DAYS	91/06/25	A19730-77	N/A	1

Line Item	Quantity	Description / Remarks	Net Price
0024	1	247740 30-150 N S/S E/* G MODEL NO.-ALL FIGURE # 30-101-22051-F0-2-01-58221002 ACT 0000 0210 TAX-N MAT. CWP- 150	$56693.00

DUKE POWER RECEIVED SEP 24 1991 CENT. DIRS. PURCHASING

REFER QUESTIONS TO- GLENN SCOTT

Please Remit: DPC_0286880

Invoice Total: $56,693.00

REMITTANCE COPY

Jolly - Fisher Exh 940-0282

83371205.02-00-0063-00 CAH DLR BO V#90520801 0T52 EU20 STK JLR/GGC/

X to Bob Hollis per to JLR 7/8/91

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

$381790.00

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

CNS#001

ORDER DATE 6-24-91

X to Buyer for purchase

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO: DUKE POWER CO.
C/O D. L. FREEZE, MANA A19730-77
CENTRAL DIVISION
CONST. & MAINT. DEPT.
SC HWY 274
NEWPORT, SC 29710
DELIVER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-0205550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ATTN: RAY YOUNG/DICK MILLER *ORDER PLACED BY PHONE J. ROSEMAN TO RAY YOUNG/DICK MILLER ON 6-13-91. FISHER CONTROLS (POSI-SEAL, INT) IN ACCORDANCE WITH SPECIFICATIONS CNS-1205.02-00-0006, REVISION 5, DATED 12-15-87. REFERENCE: ROBERT E. MASON COMPANY RESPONSE TO DUKE POWER COMPANY REQUEST FOR QUOTE 01932-A-77 REGARDING FISHER CONTROLS COMPANY BUTTERFLY VALVES.		
1	5	EA	VALVE, BUTTERFLY, SIZE: 20", DE ITEM NUMBER: 05B-479, RATING: 150 PSIG AT 150 DEGREE F, OPERATED: ELECTRIC MOTOR, CONNECTION: WAFER, BODY MATERIAL: SS, TRIM: SS DISC & RETAINING RING, 17-4 PH STEM, SOFTGOODS: EPR, MFR SPECIFIC INFO: DISC TRAVEL STOP, VISUAL POSITION INDICATION ON VALVE STEM, APPLICATION: ACTIVE VALVE	2541339114N	19,665.00 EA
			PROCUREMENT: REFERENCE SPECIFICATION CNS-1205.02-00-0006 AND VALVE LIST CN-0150-36		
			(CONT. ON PAGE 2)		

SHIPPING TERMS: FOB NORTH STONINGTON, CT/FA

CASH TERMS: NET 30 DAYS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: J.L. ROSEMAN

(704) 373-6059

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

	DATE	INVOICE AMOUNT
	8/21/91	325097.00

6/28/91 Profs J L R to J
Bob Hollis will expedite this
Order. Please send a copy
of Order & work Out detail
on how MP30 will be
Updated etc
7/8 Sent copy to Bob Hollis

6/27/91 C.A Robinson the supplier
notified this date that source
Inspection would be performed

7/19/91 Fax to Bob Hollis
Attached is En & Manuf
Sch for this Order
Drawing Submittal 8-12-91
Material Procurement
Body 6-14-91
Disc 6-14-91
Rit Ring 7-24-91
Actuator N/A
Material Receipt 8-9-91
Fabrication Start 8-15-91
Fabrication Complete 9-9-91
Assembly & Testing Start 9-16-91
Testing Complete 9-20-91
Shipping Complete 9-23-91
Doc Complete 9-23-91

9/30/91

DPC_0286882

83371205.02-00-0063-00 CAH DLR BO V490520801 OT52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

PAGE 2

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19

EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MANUFACTURER: FISHER CONTROLS CO. DUKE POWER COMPANY WILL SUPPLY THE LIMITORQUE SMB-00-10/H2BC MOTOR OPERATORS COMPLETE WITH MOUNTING BRACKETS FOR THESE VALVES. ADDITIONAL INFORMATION FOR ITEM NUMBER 05B-479 * VALVE MUST BE FABRICATED SUCH THAT THE CUSTOMER SUPPLIED LIMITORQUE SMB-00-10/H2BC OPERATOR AND MOUNTING BRACKET TAKEN FROM POSI-SEAL ITEM NUMBER 02B-570 (POSI-SEAL DRAWING NUMBER 40846-01) CAN BE READILY TRANSFERRED BACK AND FORTH BETWEEN VALVES 02B-570 AND 05B-479. * THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 05B-479 MUST BE WITHIN +/- 10% OF THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 02B-570 (950 LBS.) * THE END TO END DIMENSION OF VALVE ITEM 05B-479 MUST BE THE SAME AS THAT OF VALVE ITEM 02B-570 (5.25"). (CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3335
POWER GROUP (704) 382-2298

FILE COPY

C_0286883

ROA_03231

Jolly - Fisher Exh 940-0285

83371205.02-00-0063-00 CAH DLR BO V#90520801 OT52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
2	5	EA	VALVE, BUTTERFLY, SIZE: 30", DE ITEM NUMBER: 05B-480, RATING: 150 PSIG AT 150 DEGREE F, OPERATED: ELECTRIC MOTOR, CONNECTION: WAFER, BODY MATERIAL: SS, TRIM: SS DISC & RETAINING RING, 17-4 PH STEM, SOFTGOODS: EPR, MFR SPECIFIC INFO: DISC TRAVEL STOP REQUIRED, VISUAL POSITION INDICATION ON VALVE STEM, APPLICATION: ACTIVE VALVE PROCUREMENT: REFERENCE SPECIFICATION CNS -1205.02-00-0006 AND VALVE LIST CN-0150-36; MANUFACTURER: FISHER CONTROLS CO. DUKE POWER COMPANY WILL SUPPLY THE LIMITORQUE SMB-00-10/H3BC MOTOR OPERATORS COMPLETE WITH MOUNTING BRACKETS FOR THESE VALVES ADDITIONAL INFORMATION FOR ITEM NUMBER 05B-480 * VALVE MUST BE FABRICATED SUCH THAT THE (CONT. ON PAGE 4)	2541339115N	56,693.00 EA

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
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THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

C_0286884

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

Jolly - Fisher Exh 940-0286

83371205.02-00-0063-00 CAH DLR BO V#90520801 OT52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CUSTOMER SUPPLIED LIMITORQUE SMB-00-10/H3BC OPERATOR AND MOUNTING BRACKET TAKEN FROM POSI-SEAL ITEM NUMBER 02B-571 (POSI-SEAL DRAWING NUMBER 40846-02) CAN BE READILY TRANSFERRED BACK AND FORTH BETWEEN VALVES 02B-571 AND 05B-480. * THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 05B-480 MUST BE WITHIN +/- 10% OF THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 02B-571 (1767 LBS.). * THE END TO END DIMENSION OF VALVE ITEM 05B-480 MUST BE THE SAME AS THAT OF VALVE ITEM 02B-571 (7.0625"). ALL MATERIALS FOR VALVE ITEMS 05B-479 AND 05B-480 SHALL BE FURNISHED AND CERTIFIED IN ACCORDANCE WITH DUKE POWER SPECIFICATION CNS-1205.02-00-0006, REVISION 5. COATING REQUIREMENTS FOR VALVE ITEMS 05B-479 AND 05B-480: THE COATING REQUIREMENTS ARE WAIVED FOR STAINLESS STEEL BODY VALVES. MANUFACTURER: FISHER CONTROLS COMPANY. (CONT. ON PAGE 5)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 · TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

C_0286885

ROA_03233

Jolly - Fisher Exh 940-0287

83371205.02-00-0063-00 CAH DLR BO V#90520801 0T52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 58-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			IF LOWER TIER PROCUREMENT IS REQUIRED, THE QA REQUIREMENTS MUST BE INVOKED ON THE LOWER TIER SUBCONTRACTORS AND VENDORS. ADDITIONAL INFORMATION APPLYING TO THE TOTAL LOT OF 10 VALVES: * THE ENTIRE LOT OF VALVES MUST BE ON SITE AT CATAWBA NUCLEAR STATION BY THURSDAY, SEPTEMBER 26, 1991. * THE OUTLINE DRAWINGS FOR 05B-479 AND 05B-480 MUST BE RECEIVED BY THURSDAY, JULY 11, 1991. * THE SEISMIC REPORTS AND STATIC DEFLECTION CERTIFICATES OF COMPLIANCE FOR 05B-479 AND 05B-480 MUST BE RECEIVED BY THURSDAY, JULY 18, 1991. ALL TECHINICAL DOCUMENTATION SHALL BE PROVIDED IN ACCORDANCE WITH CNS-1205.02-00-0006, REVISION 5, SECTIONS 12 AND 13 AND SENT TO: DUKE POWER COMPANY 500 SOUTH CHURCH STREET CHARLOTTE, NC 28201-1006 (CONT. ON PAGE 6)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.

THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

PC_0286886

TELEX 57-2946 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

83371205.02-00-0063-00 CAH DLR BO V#90520801 OT52 EU20 STK JLR/GGC/

PCC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS, HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ATTN: C.A. HELMERS (EC07A) ADDITIONAL NOTE: ATTACHED TO THIS ORDER ARE: 1. VALVE LIST CN-0150-36, REVISION 26, DATED 06/04/91. 2. A REVISION INFORMATION SHEET. 3. FORM 930.1A. IN ADDITION TO THE MATERIALS THAT ARE REQUIRED FOR LINE ITEMS 1 AND 2 (VALVE ITEMS 05B-479 AND 05B-480), IN REFERENCE TO ROBERT E. MASON COMPANY'S RESPONSE TO REQ 01932-A-77, THE FOLLOWING DOCUMENTATION WILL BE REQUIRED FOR SUBMISSION AT A FUTURE DATE THAT IS AGREED UPON BY DUKE POWER COMPANY AND FISHER CONTROLS COMPANY. 1. A CALCULATION FOR EACH ITEM NUMBER DOCUMENTING THE TORQUE REQUIREMENTS AT THE VALVE STEM FOR PURPOSES OF MOTOR OPERATOR SIZING FOR EACH FLOW CONDITION ON THE VALVE DATA SHEETS (TO BE PROVIDED LATER). 2. A WEAK LINK ANALYSIS FOR EACH ITEM NUMBER DOCUMENTING THE MAXIMUM TORQUE THAT MAY BE APPLIED TO THE VALVE STEM (CONT. ON PAGE 7)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

C_0286887

83371205.02-00-0063-00 CAH DLR BO V#90520801 0T52 EU20 STK JLR/GGC7

CC2541 FCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FOR BOTH THE OPENING AND CLOSING DIRECTIONS AND WHAT THE LIMITING COMPONENT IS FOR EACH CASE. THIS DOCUMENTATION IS TO BE FORWARDED TO:		
			DUKE POWER COMPANY P.O. BOX 1006 500 SOUTH CHURCH STREET CHARLOTTE, NC 28201-1006 ATTN: C.A. HELMERS (EC07A)		
			ONCE THE SHIPPING DATE HAS BEEN AGREED UPON.		
			FOR TECHNICAL INFORMATION CONTACT: C.A. HELMERS 382-2861		
			DELIVERY COMMITMENT: 10-1-91 AS REQ'D		
			PRICE AND DELIVERY COMMITMENT PER WYLIE BERRY WRITTEN QUOTATION DATED 6-4-91 IN RESPONSE TO OUR INQUIRY NO. 01932-A-77 DATED 6-4-91.		
			THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS INTER-		
			(CONT. ON PAGE 8)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

PC_0286888

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298 FILE COPY

83371205.02-00-0063-00 CAH DLR BO V#90520801 OT52 EU20 STK JLR/GBC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

PAGE 8

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			NATIONAL, INC. FACILITY AT RT. 49 AND I-95, N. STONINGTON, CT 06359.		
			FORMS ATTACHED AS PART OF THIS ORDER 930.1A		
			DELIVERY REQUIRED: 9-26-91		
			********** * CONFIRMATION-DO NOT DUPLICATE (01) * **********		
			********** * NUCLEAR SAFETY RELATED * **********		
			MATERIALS/ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIER'S QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY THE DUKE POWER QA DEPARTMENT. NON-ASME ITEMS SHALL BE SUPPLIED UNDER AN ANSI N45.2/10CFR50 APPENDIX B PROGRAM AS A MINUMUM. ANY		
			(CONT. ON PAGE 9)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

PC_0286889

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03237

Jolly - Fisher Exh 940-0291

03371205.02-00-0063-00 CAH DLR BO V#90520801 0T52 EU20 STK JLR/GGC/

SC2541 FCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

SHIP TO:

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO C.A. ROBINSON AT 704-373-4368. IF LOWER TIER PROCUREMENT IS REQUIRED, THEN APPLICABLE QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS. THE PRODUCT/SERVICE PROCURED BY THIS PURCHASE ORDER IS SUBJECT TO SOURCE INSPECTION/AUDIT BY THE BUYER'S QUALITY ASSURANCE DEPARTMENT PRIOR TO SHIPMENT. THE SUPPLIER WILL BE CONTACTED BY DUKE POWER'S VENDORS-NUCLEAR DIVISION WHEN SOURCE INSPECTION/AUDIT OF THE PRODUCT/SERVICE IS REQUIRED. (6Q) DUKE POWER COMPANY FORM 930.1 (SUPPLIER QA CERTIFICATION), OR APPROVED EQUIVALENT SUPPLIER C OF C IN ADDITION TO ANY QA DOCUMENTATION REQUIRED BY REFERENCED SPECIFICATION(S) OR CODE(S) IS REQUIRED TO ACCOMPANY EACH SHIPMENT. DOCUMENTS ARE TO BE ADDRESSED TO: (CONT. ON PAGE 10)		

SHIPPING TERMS | CASH TERMS

***NOTICE TO SELLER**
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
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THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298 FILE COPY

C_0286890

Jolly - Fisher Exh 940-0292

83371205.02-00-0063-00 CAH DLR BO V#90520801 0T52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

PAGE 10

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			QA DIRECTOR, OPERATIONS DUKE POWER COMPANY AT THE MATERIAL RECEIVING LOCATION. ABSENCE OF ANY REQUIRED DOCUMENTATION WILL RESULT IN MATERIAL / ITEM BEING PLACED IN QA HOLD. (5Q) ********** * * * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER * * (4G) * ********** THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. QUALITY ASSURANCE REQUIRED COMMERCIAL GRADE: N PROTECTION LEVEL: C CONDITION LEVEL: 1 (CONT. ON PAGE 11)		

SHIPPING TERMS | CASH TERMS

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ADDRESS REPLY TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.E. SMITH
General Manager, Purchases

REV. 09/90

PC_0286891

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

83371205.02-00-0063-00 CAH DLR BO, V#90520801 OT52 EU20 STK JLR/GGC/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A19730-77

ORDER DATE

PAGE 1

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ON ALL DRAWINGS/CORRESPONDENCE, CONTRACTOR MUST SHOW THE FOLLOWING:		
			STATION CATAWBA		
			D.E.FILE # CN-1205.02		
			DUKE ORDER # A19730-77		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/80

C_0286892

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3338
POWER GROUP (704) 382-2298

FILE COPY

ROA_03240

Jolly - Fisher Exh 940-0294

INDEX: 83371205.02-00-0063-01 CAH TLE BO JLR/CJM

CHANGE ORDER

DUKE POWER COMPANY

PURCHASING DEPARTMENT
P.O. Box 1002
Charlotte, N. C. 28201-1002

8/29/91

FISHER CONTROLS
C/O R.E. MASON & CO.
PO BOX 33424
CHARLOTTE, N.C. 28233

CHANGE ORDER A19730-77-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. A19730-77 6/24/91
DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CMD-CENTRAL THIS CHANGE ORDER IS WRITTEN TO AUTHORIZE FISHER CONTROLS TO TAKE AN EXCEPTION TO SECTION 14, PARAGRAPH 3 OF THE APPLICABLE DESIGN SPECIFICATION, CNS-1205.02-00-0006, REVISION 5. THE EXCEPTION ALLOWS FISHER CONTROLS TO PERFORM SEAT LEAKAGE TESTS AT 165 PSIG. ALL OTHER TESTING CONDITIONS AND METHODS MUST STILL CONFORM TO THE LIMITATIONS SET FORTH IN THE DATA SHEETS, DESIGN SPECIFICATION, AND IN AWWA C504-70. REF: VALVE ITEM NOS. 05B-479 AND 05B-480. THE QUALITY ASSURANCE REQUIREMENTS CONTAINED IN THE ORIGINAL PURCHASE ORDER REMAIN APPLICABLE IN ALL RESPECTS TO THIS CHANGE ORDER. ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME.		

SHIPPING TERMS | CASH TERMS

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R. F. SMITH — GENERAL MANAGER PURCHASES
BY J. L. ROSEMAN CJM — BUYER

704-37-36059 C 0286893

FILE COPY

ROA_03241

Jolly - Fisher Exh 940-0295

FISHER

FISHER SERVICE COMPANY - COLUMBIA, SOUTH CAROLINA

Customer Order Number	Fisher / Agent Order Number	Invoice Date	Invoice Number
A38822-15	033 -017C22288	11/11/91	K02598

Sold To: DUKE POWER COMPANY
P O BOX 1002
CHARLOTTE N.C. 28201

REMIT TO:
FISHER CONTROLS INTL INC
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER/JW HAMPTON
CATAWBA NUCLEAR STATION
4800 CONCORD RD.
YORK, SC 29745

TERMS:
IN U.S. FUNDS
NET 030 DAYS
F.O.B. COLUMBIA, SOUTH CAROLINA

Date Shipped		
Mo.	Day	Year
11	11	91

Via: UPS

Item No.	Description	Quantity	Unit Price	Net Amount
	JOB NO: T17916 BILL OF LADING NO: 17113			
000001	1R927299102 - GASKET,SPIRAL WOUND	4	9.05	36.20
000002	1R3298X0072 - GASKET,TO 302F/150C	7	0.84	5.88
000003	1D439206992 - O-RING	4	1.17	4.68
000004	1J453906992 - BOOT	2	40.20	80.40
000005	PSCD-069 - SHELF LIFE EXP. DATE ITEMS 3 & 4	1	25.00	25.00
	SUBTOTAL			152.16
	INVOICE TOTAL			152.16

FISHER

DUKE POWER
RECEIVED
NOV 25 1991
STATE DEPT
PURCHASING

DPC_0286222

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 7165

COPY OF INVOICE

ROA_03242

Jolly - Fisher Exh 940-0296

7330913465 EH WGM V#90520801 0J50 EU76 STK DSC/GGC/G

CC9390 PCC9390

127.20

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A38829-15 **EDI**

G 17C22288

ORDER DATE
10-23-91

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO
DUKE POWER CO.
C/O J. W. HAMPTON A38829-15
CATAWBA NUCLEAR STATION
4800 CONCORD RD.
YORK, SC 29745

HEREIN DESIGNATED SELLER

VIA UPS BROWN

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES,

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
			VENDOR #90520801		
			LINE #1: P.O. A21645 - VALVE TYPE 476V-8 -UR-1009, S/N 6396796		
			LINE #2: N07864 - FOR VALVE TYPE 657-ES S/N 6412171		
			LINE #3: P.O. A23637 - FOR TYPE SS-137-ENA SIZE 80 ACTUATORS S/N 5930664 THRU 67 AND 72 THRU 75.		
			SHELF LIFE MATERIAL - PLEASE HAVE VENDOR PROVIDE MFG. DATE AND PROVIDE MATERIAL AS CLOSE TO MFG. DATE AS POSSIBLE.		
			LINE #4: K27907		
1	4	EA	1P927299102	254202253	9.05 EA
			(CONT. ON PAGE 2)		

3

10/30

SHIPPING TERMS FOB SP

CASH-TERMS NET 30 DAYS

*NOTICE TO SELLER
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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: D.S. CARTER
(704) 373-5818

PC 0286223

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

Jolly - Fisher Exh 940-0297

		DATE	INVOICE AMOUNT
Jay D.E. Carter	10/30		
Order has been placed with Fisher for Manuf to shipment. Please note that Items 3 + 4 requested a shelf life Certificate. Fisher will furnish a cert for shelf life cost is $25.00 extra. We have placed Order and asked for a shelf life Cert to be furnished for both Items 3 & 4 and there is only 1 charge for the Cert.	11/13 (5)		
	R/L 56		
	J. 11/6/91		
Filt rec'd 11/12/91 Sch No 7	11-19-91		

DPC_0286224

7330913465 EH WGM V#90520801 DT50 EU76 STK DSC/GGC/G

CC9390 PCC9390

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A38829-15 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			GASKET, FLANGED FITTING, TYPE: SPIRAL WOUND, MATERIAL: 316 SS WITH ASBESTOS, SIZE: 3-9/16" ID X 4-5/16" OD X .125" THK, APPLICATION: FOR FISHER VEE-BALL VALVE U TYPE 10 INCH		
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 1R927299102		
2	7	EA	1R3298X0072 GASKET, , TYPE: GLOBE VALVE, APPLICATION: FOR FISHER GLOBE VALVE TYPE EC,EDAES SIZE 1,2,2.5,3,3X4;4&6 INCH	244400547	.84 EA
			MANUFACTURER: FISHER PRODUCTS INC., PART NUMBER: 1R3298X0072		
3	4	EA	1D439206992 O-RING, , TYPE: ACTUATOR, APPLICATION: FOR SS 137 ACTUATOR FOR THE FEEDWATER VALVE 16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA SHOP ORDER 220	25510256	1.18 EA
			MANUFACTURER: WESTINGHOUSE CORP., PART (CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

PC_0286225

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

ROA_03245

Jolly - Fisher Exh 940-0299

7330913465 EH WGM V#90520801 0T50 EU76 STK DSC/GGC/G

CC9390 PCC9390

DUKE POWER COMPANY

PURCHASING DEPARTMENT

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PURCHASE ORDER

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			NUMBER: 1D439206992, MFR DRAWING NUMBER 952730		
4	2	EA	1J453906992 BOOT, , TYPE: DIAPHRAGM ACTUATOR, MATERIAL: NEOPRENE, APPLICATION: FOR 657 -8 SIZE 60 AND 70 DIAPHRAGM ACTUATOR MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 1J453906992	25510698	40.20 EA 25.00 Shelf Life
			DELIVERY COMMITMENT: 3 WK (11-12-91) PRICE AND DELIVERY PER P/L DATED 4-15-91 PRICED PROPOSAL BY B. PARKER (10-16-91) DELIVERY REQUIRED: 11-18-91 PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05) IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE (CONT. ON PAGE 4)		

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286226

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

ROA_03246

Jolly - Fisher Exh 940-0300

7330913465 EH WGM V#90520801 OT50 EU76 STK DSC/GGC/G

CC9390 FCC9390

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES: A38829-15 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			ITEMS ON THIS ORDER REQUIRE SPECIAL SHELF LIFE CONSIDERATION. THE SUPPLIER/ MANUFACTURER SHALL PROVIDE SHELF LIFE DOCUMENTATION TO THE BUYER PRIOR TO OR AT TIME OF SHIPMENT. IN LIEU OF DOCUMENTATION BOTH THE MANUFACTURED DATE AND EXPIRATION DATE MAY BE IDENTIFIED ON THE ITEM OR ITS PACKAGING.		
			THE ITEMS ON THIS ORDER MUST BE FURNISHED AS CLOSE TO THE MANU- FACTURED DATE AS POSSIBLE. (59)		
			NOTIFY THE BUYER IMMEDIATELY IF ANY OF THE PART NUMBERS SHOWN ON THIS PURCHASE ORDER HAVE BEEN REVISED, SUPERCEDED OR OTHERWISE CHANGED. SUPPLIER SHALL NOT SUBSTITUTE OTHER ITEMS FOR ITEMS REQUESTED WITHOUT WRITTEN APPROVAL OF THE BUYER PRIOR TO SHIPMENT.		
			(CONT. ON PAGE 5)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286227

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

7330913465 EH WGM V#90520801 OT50 EU76 STK DSC/GGC/G

CC9390 PCC9390

DUKE POWER COMPANY
PURCHASING DEPARTMENT

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A38829-15 **EDI**

PURCHASE ORDER

ORDER DATE

PAGE 5

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N/C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MATERIALS/ PARTS FURNISHED ON THIS ORDER SHALL BE NEW. USED OR RE-MANUFACTURED ITEMS ARE NOT ACCEPTABLE. (81)2		
			********** * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER * * (4G) * **********		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286228

REV. 09/93

TELEX 57-2346 : TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2295

FILE COPY

ROA_03248

Jolly - Fisher Exh 940-0302

7330914355 EH WGM V#90520801 OT50 EU76 STK DSC/CGC/A

2444 PCC9370 920.39

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES: A44958-15 **EDI**

ORDER DATE 12-16-91

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO: DUKE POWER CO.
C/O J. W. HAMPTON A44958-15
CATAWBA NUCLEAR STATION
4800 CONCORD RD.
YORK, SC 29745

VIA UPS/ROADWAY-FRT COLLECT

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*.
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
			LINE ITEM 1 & 3: P.O. A10328 LINE ITEM 2: P.O. A24195 - FOR A 3" FISHER VLV., TYPE E5 WITH A 657 ACTUATOR, VALVE S/N 7226823, REFERENCE DUKE SPEC. CNS-1205.06-00-0001 REV. 008 LINE ITEM 4: P.O. A29485 - DUKE TAG #1 & 2HSCV0049 AND 1 & 2HSCV0026; S/N 7226806 -807. FISHER ITEM #174A LINE ITEM 5: J22421 LINE ITEM 6: P.O. A34746 - FOR 3/4" CONTROL VALVE TYPE 667-EC S/N 6479536-537. LINE ITEM 7: P.O. A34748 - FOR 4" GLOBE VALVE ES-878-T-54 S/N 7303078 & 7303077.		
			(CONT. ON PAGE 2)		

SHIPPING TERMS: FOB SP

CASH TERMS: NET 30 DAYS

NOTICE TO SELLER
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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: D.S. CARTER
(704) 373-5818

OPC 0286052

FILE COPY

REV: 08/91

ROA_03249

Jolly - Fisher Exh 940-0303

		DATE	INVOICE AMOUNT
1/4 P/C to vendor Jolly to ship item to Lowell	12/30 d	1/9/92	61.50
ck On	1/13/92	1/9/92	88.31

DPC_0286053

7330914355 EH WGM V#90520801 OT50 EU76 STK DSC/GGC/A

2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A44958-15 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			LINE ITEM 8: P.O. R55695 LINE ITEMS 9 & 10: P.O. A23637 - FOR FISHER TYPE SS-137-ENA SIZE 80 ACTUATORS S/N 5930664, 65, 66, 67, 72, 73, 74 & 75. LINE ITEMS 7 THRU 10: SHELF LIFE MATERIAL - PLEASE HAVE VENDOR PROVIDE MFG. DATE AND PROVIDE MATERIAL AS CLOSE TO MFG. DATE AS POSSIBLE.		
1	1	EA	10A5935X012 RING, SEAT, TYPE: VALVE, APPLICATION: FOR FISHER GLOBE VALVE SIZE 4 INCH TYPE EWD AND EWS MATERIAL S41600,HT MANUFACTURER: FISHER PRODUCTS INC., PART NUMBER: 10A5935X012	244406207	211.05 EA
2	2	EA	RPACKX00032 KIT, , MODIFIER REPAIR, TYPE: GLOBE VALVE, APPLICATION: FOR FISHER GLOBE VALVE TYPE 657-AR SIZE 3 INCH DESIGN PRESSURE 300 PSI DESIGN TEMPERATURE 300 DEGREES FAHRENHEIT SOCKET WELD AIR OPERATED CAST STEEL	244406359	26.46 EA

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286054

FILE COPY

REV. 08/91

ROA_03251

Jolly - Fisher Exh 940-0305

7330914355 EH WGM V#90520801 0150 EU76 STK DSC/GGO/A

2444 FCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

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PURCHASE ORDER

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: RPACKX00032		
3	1	EA	2U224033272 CAGE, VALVE, VALVE STYLE: GLOBE, VALVE SIZE: 4", MFR SPECIFIC INFO: LINEAR, APPLICATION: FOR FISHER GLOBE VALVE SIZE 4 INCH TYPE EWS AND EWD MANUFACTURER: FISHER PRODUCTS INC., PART NUMBER: 2U224033272	244406499	207.90 EA
4	1	EA	1U2258X0012 RING, PISTON, APPLICATION: FOR FISHER GLOBE VALVE 4 INCH TYPE EWD MANUFACTURER: FISHER PRODUCTS INC., PART NUMBER: 1U2258X0012	244406516	28.98 EA
5	3	EA	1R2891X0062 GASKET, , TYPE: VALVE, SIZE: 2-3/16" ID X 2-29/32" OD X 1/32" THK, MATERIAL: NON ASBESTOS, APPLICATION: FOR .75 AND 1 INCH TYPE EC GLOBE VALVE MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 1R2891X0062 (CONT. ON PAGE 4)	244406984	2.52 EA

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286055

S - FILE COPY

REV. 06/91

ROA_03252

Jolly - Fisher Exh 940-0306

7330914355 EH WGM V#90520801 0T50 EU76 STK DSC/GGC/A

C2444 PC09370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
6	4	EA	1R2877X0042 GASKET, , TYPE: VALVE, SIZE: 29/32" ID X 1-5/32" OD X 1/32" THK, MATERIAL: NON-ASBESTOS, APPLICATION: FOR .75 AND 1 INCH TYPE EC GLOBE VALVE MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 1R2877X0042	244406985	3.15 EA
7	6	EA	2E859602202 DIAPHRAGM, ACTUATOR, APPLICATION: FOR DIAPHRAGM ACTUATOR MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 2E859602202	25510088	56.70 EA
8	26	EA	1C562206992 O-RING, , TYPE: ACTUATOR, APPLICATION: FOR FISHER CONTROLS DIAPHRAGM ACTUATOR TYPE 667 SIZE 45 THRU 60 CLASS B FURNISHED TO D.P.CO. SPEC. CNS-1205.06-3 MANUFACTURER: FISHER PRODUCTS INC., PART NUMBER: 1C562206992	25510095	.35 EA
9	10	EA	1D542906992 O-RING, , TYPE: ACTUATOR, APPLICATION: (CONT. ON PAGE 5)	25510257	1.10 EA

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286056

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0307

7330914355 EH WGM V#90520801 0T50 EU76 STK DSC/GGC/A

2444 FCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FOR SS 137 ACTUATOR FOR THE FEEDWATER 16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA SHOP ORDER 220		
			MANUFACTURER: WESTINGHOUSE CORP., PART NUMBER: 1D542906992, MFR DRAWING NUMBER: 952730		
10	4	EA	1H7369X0012 GASKET, , TYPE: ACTUATOR, APPLICATION: FOR FISHER 667 SIZE 80 ACTUATOR	25511437	9.77 EA
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 1H7369X0012		
			DELIVERY COMMITMENT: 4-6 WKS 12-27-91		CERTIFICATE OF SHELF LIFE $25.00 PER ORDER
			PRICE AND DELIVERY PER ANNE STEHLEY'S FAXED PROPOSAL TO PAT BOYE 12-10-91		
			DELIVERY REQUIRED: 1-13-92		
			PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND (CONT. ON PAGE 6)		

SHIPPING TERMS | CASH TERMS

*NOTICE TO SELLER
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.

THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286057

FILE COPY

REV. 08/91

ROA_03254

Jolly - Fisher Exh 940-0308

7330914355 EH WGM V#90520801 0T50 EU76 STK DSC/GGC/A

2444 FCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A44958-15 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			INVOICES (05)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			ITEMS ON THIS ORDER REQUIRE SPECIAL SHELF LIFE CONSIDERATION. THE SUPPLIER/ MANUFACTURER SHALL PROVIDE SHELF LIFE DOCUMENTATION TO THE BUYER PRIOR TO OR AT TIME OF SHIPMENT. IN LIEU OF DOCUMENTATION BOTH THE MANUFACTURED DATE AND EXPIRATION DATE MAY BE IDENTIFIED ON THE ITEM OR ITS PACKAGING.		
			THE ITEMS ON THIS ORDER MUST BE FURNISHED AS CLOSE TO THE MANU- FACTURED DATE AS POSSIBLE. (59)		
			********** * * * PLEASE CONFIRM SHIP DATE UPON *		
			(CONT. ON PAGE 7)		

SHIPPING TERMS

CASH TERMS

NOTICE TO SELLER

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286058

FILE COPY

REV. 08/91

ROA_03255

Jolly - Fisher Exh 940-0309

7330914355 EH WGM V#90520801 0T50 EU76 STK DSC/GGC/A

C2444 FCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A44958-15 **EDI**

ORDER DATE

PAGE 7

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			* RECEIPT OF THIS ORDER *		
			* (4G) *		
			**********		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286059

FILE COPY

REV. 08/91

ROA_03256

Jolly - Fisher Exh 940-0310

7330914149 SM WGM V#90520801 OT50 EU76 STK JLR/GGC/G

C2410 FCC2410

29652.50

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A45924-77

CNS#001

ORDER DATE 12-26-95

G 17C95088

COMPLETE
OK TO FILE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO
DUKE POWER CO.
C/O J. W. HAMPTON A45924-77
CATAWBA NUCLEAR STATION
4800 CONCORD RD.

YORK, SC 29745

HEREIN DESIGNATED SELLER VIA STANDARD-FRT COLLECT

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ALL MATERIAL SHALL MEET DUKE POWER SPEC. CNS-1205.06-00-0003 REV. 003		
1	1	EA	30A5366X342 BONNET, VALVE, VALVE STYLE: CONTROL, VALVE SIZE: 6", APPLICATION: FOR TYPE 667-4-ET CONTROL VALVE, S/N 6431254 THRU 261	2546351555N	5,397.50 EA
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 30A5366X342, DUKE DRAWING NUMBER: CNM-1205.06-100		
2	2	EA	27A9604X032 ASSEMBLY, , MODIFIER: PLUG AND STEM, TYPE: CONTROL VALVE, SIZE: 6", MFR SPECIFIC INFO: FOR TYPE 667-4-ET, APPLICATION: FOR S/N 6431254 THRU 261	2546351611N	2,975.00 EA
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 27A9604X032, DUKE DRAWING NUMBER: CNM-1205.06-100		
3	2	EA	37A8714X012 CAGE, VALVE, VALVE STYLE: CONTROL, VALVE SIZE: 6", MFR SPECIFIC INFO: FOR TYPE,	2546351556N	9,052.50 EA

(CONT. ON PAGE 2)

SHIPPING TERMS FOB COLUMBIA, SC

CASH TERMS NET 30 DAYS

***NOTICE TO SELLER**

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Show ID numbers on boxes and invoices if shown on this order.
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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: J. L. ROSEMAN
PC_0285990
(704) 373-6059

REV. 09/90

TELEX 57-2348 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

		DATE	INVOICE AMOUNT
	1/9		
Slet rec'd 1/15/92 sch to ship wk of 4-16-92	5		
	4/23		
1/23 Fax copy of C.N.S. C.O.I to Maureen Hagore Q.A.	1/28		
1/30 P/C Venda C. Ann J. To be Resch well advise Pete Q.A. Come in for Inspection some Q.A. work to be done	5/12		

DPC_0285991

7330914149 SM WGM V490520801 0T50 EU76 STK JLR/GGD/G

9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

A45924-77

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			667-4-ET, APPLICATION: FOR S/N 6431254 THRU 261		
			MANUFACTURER: FISHER CONTROLS CO., PART NUMBER: 37A8714X012, DUKE DRAWING NUMBER: CNM-1205.06-100		
4	1	LT	DOCUMENTATION DUKE FORM 930.1A		50.00 LT
					PER SHIPMENT
5	1	LT	DUKE OPTION TO INSPECT (NO CHARGE IF OPTION DECLINED)		150.00 LT
			DELIVERY COMMITMENT: 16 WKS (4-16-92)		
			PRICE AND DELIVERY PER ANNE STEHLEY (12-4-91) FAXED PROPOSAL TO B. PARKER (330-4149 11-18-91)		
			FORMS ATTACHED AS PART OF THIS ORDER 930.1A		
			DELIVERY REQUIRED: 1-29-92		
			PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, (CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0285992

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

ROA_03259

Jolly - Fisher Exh 940-0313

7330914149 SM WGM V#90520801 DT50 EU76 STK JLR/GGC/G

C9410 FCC9410

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A45934-77

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC25 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05) DUKE POWER COMPANY FORM 930.1 (SUPPLIER QA CERTIFICATION), OR APPROVED EQUIVALENT SUPPLIER C OF C: IN ADDITION TO ANY QA DOCUMENTATION REQUIRED BY REFERENCED SPECIFICATION(S) OR CODE(S), IS REQUIRED TO ACCOMPANY EACH SHIPMENT. DOCUMENTS ARE TO BE ADDRESSED TO: QA DIRECTOR, OPERATIONS DUKE POWER COMPANY AT THE MATERIAL RECEIVING LOCATION. ABSENCE OF ANY REQUIRED DOCUMENTATION WILL RESULT IN MATERIAL / ITEM BEING PLACED IN QA HOLD. (5Q) ********** * * * NUCLEAR SAFETY RELATED * * * ********** (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0285993

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE-CORY

7330914149 SM WGM V#90520801 OT50 EU76 STK JLR/GCC/G

9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A45924-77

ORDER DATE

PAGE 4

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MATERIALS/ITEMS ARE "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIER'S QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY THE DUKE POWER QA DEPARTMENT. NON-ASME ITEMS SHALL BE SUPPLIED UNDER AN ANSI N45.2/10CFR50 APPENDIX B PROGRAM AS A MINUMUM. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO C.A. ROBINSON AT 704-373-4360.		
			IF LOWER TIER PROCUREMENT IS REQUIRED, THEN APPLICABLE QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS.		
			THE PRODUCT/SERVICE PROCURED BY THIS PURCHASE ORDER IS SUBJECT TO SOURCE INSPECTION/AUDIT BY THE BUYER'S QUALITY ASSURANCE DEPARTMENT PRIOR TO SHIPMENT. THE SUPPLIER WILL BE CONTACTED BY DUKE POWER'S VENDORS-NUCLEAR DIVISION WHEN SOURCE INSPECTION/AUDIT OF THE PRODUCT/SERVICE IS REQUIRED. (6Q)		
			NOTIFY THE BUYER IMMEDIATELY IF ANY (CONT. ON PAGE 5)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0285994

REV. 09/90

TELEX 57-2346 · TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298

FILE COPY

ROA_03261

Jolly - Fisher Exh 940-0315

7330914149 SM WGM V#90520801 OT50 EU76 STK JLR/GGC/G

C9410 PCC9410

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A45924-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			OF THE PART NUMBERS SHOWN ON THIS PURCHASE ORDER HAVE BEEN REVISED, SUPERCEDED OR OTHERWISE CHANGED. SUPPLIER SHALL NOT SUBSTITUTE OTHER ITEMS FOR ITEMS REQUESTED WITHOUT WRITTEN APPROVAL OF THE BUYER PRIOR TO SHIPMENT.		
			MATERIALS/ PARTS FURNISHED ON THIS ORDER SHALL BE NEW. USED OR RE-MANUFACTURED ITEMS ARE NOT ACCEPTABLE. (81)2		
			********** * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER * * (4G) * **********		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			(CONT. ON PAGE 6)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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ADDRESS REPLY TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

DPC_0285995

REV: 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03262

Jolly - Fisher Exh 940-0316

7330914149 SM WGM V#90520801 0T50 EU76 STK JLR/GGC/G

9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A45924-77

ORDER DATE

PAGE 6

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			QUALITY ASSURANCE REQUIRED COMMERCIAL GRADE: N PROTECTION LEVEL: C CONDITION LEVEL: 1		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0285996

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03263

Jolly - Fisher Exh 940-0317

INDEX: 7330914149 SM WGM JLR/CJM

CHANGE ORDER

DUKE POWER COMPANY

PURCHASING DEPARTMENT
P.O. Box 1002
Charlotte, N. C. 28201-1002

1/9/92

FISHER CONTROLS
C/O R.E. MASON & CO.
PO BOX 33424
CHARLOTTE, N.C. 28233

CHANGE ORDER A45924-77-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. A45924-77 12/26/91 DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION PLEASE ADD THE FOLLOWING: THIS MATERIAL/SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS FACILITY AT 205 S. CENTER ST., MARSHALLTOWN, IA. 50158, OR 757 CLEMSON RD., COLUMBIA, S.C. 29223. THE QUALITY ASSURANCE REQUIREMENTS CONTAINED IN THE ORIGINAL PURCHASE ORDER REMAIN APPLICABLE IN ALL RESPECTS TO THIS CHANGE ORDER. ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME.		

CHANGE ORDER

Post-it™ brand fax transmittal memo 7671 # of pages ▸ 3

To Maureen Hagan	From Jonie & Donna
Co.	Co.
Dept. QA	Phone # 373-5251
Fax # 831-3506	Fax # 373-4912

SHIPPING TERMS | CASH TERMS

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R. F. SMITH GENERAL MANAGER PURCHASES.
BY J. L. ROSEMAN CJM BUYER
704-373-605

DPC_0285997

FILE COPY

ROA_03264

Jolly - Fisher Exh 940-0318

FISHER

FISHER SERVICE COMPANY - COLUMBIA, SOUTH CAROLINA

Customer Order Number	Fisher / Agent Order Number	Invoice Date	Invoice Number
044988-15	033 -017024279	01/27/92	K026716

Sold To: DUKE POWER COMPANY
P O BOX 1002
CHARLOTTE N.C.
28201

REMIT TO:
FISHER CONTROLS INTL INC.
P.O. BOX 459F
ST. LOUIS, MO. 63150

PAGE 1

(Same as "Sold To" Unless Otherwise Indicated)

Ship To: DUKE POWER/JW HAMPTON
CATAWBA NUCLEAR STATION
4800 CONCORD RD
YORK, SC
29745

TERMS:
IN U.S. FUNDS
NET 030 DAYS
F.O.B. COLUMBIA, SOUTH CAROLINA

Date Shipped		
Mo.	Day	Year
1	24	92

Via: UPS

Item No.	Description	Quantity	Unit Price	Net Amount
	JOB NO. T184150S			
000001	1H7369X0012 - GASKET,TO 302F/150C TAG: ALL 25511437	4	9.77	39.08
	SUBTOTAL			39.08
	INVOICE TOTAL			39.08

DUKE POWER RECEIVED JAN 29 1992 MAIL DEPT. PURCHASING

DPC 028605

No credit will be allowed for material returned without our permission. This material was carefully packed and delivered to the transportation company in good condition. All claims for loss or damage in transit should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended. If items covered by this invoice are for ultimate export an export license may be required.

Form FG 7165

COPY OF INVOICE

Invoice

Fisher Controls

FISHER

Please remit to:
Fisher Controls
P.O. Box 96143
Chicago, IL 60693

Fisher Controls International, Inc.
Routes 49 & US 95
North Stonington, CT 06359
Phone 203/599-1140
Fax 203/599-3892

Invoice Number: S263352

Bill To:
DUKE POWER CO.
PURCHASING DEPT.
P.O. BOX 1002
CHARLOTTE NC 28201
Attn.

Ship To:
DUKE POWER CO.
CMO/CENTRAL
4900 CONCORD ROAD
YORK, SC 29745
Mark For

PO # A40546-77

13905 14664

Carrier	Freight Terms	B/L No.	Pkg. List No.	Ship Date	Invoice Date
YELLOW FRT	COLLECT	51932	0423205	92/04/23	92/04/24

Ref. No.	Terms	Order Date	Customer P.O. No.	Quote No.	Page
59787	NET-30 DAYS	91/11/18	A40546-77	N/A	1

Line Item	Quantity	Description / Remarks	Net Price
001A	6	Z47918 18-150 W S/S E/ G MODEL NO.-A11 FIGURE # 18-131-22051-F0-2-01-59787001 ACT 6000 0210 TAX-N MAT. CWP-150	$89046.00
001A	2	Z47918 18-150 W S/S E/ G MODEL NO.-A11 FIGURE # 18-131-22051-F0-2-01-59787001 ACT 6000 0210 TAX-N MAT. CWP-150	$29682.00
002A	4	Z47917 20-150 W S/S E/* G MODEL NO.-A11 FIGURE # 20-131-22051-F0-2-01-59787002 ACT 6000 0210 TAX-N MAT. CWP- 150	$66476.00
003A02		SEISMIC ANALYSIS CHARGE ACT 6000 0150 TAX-N NET PRICE	$4800.00
		TOTAL NET SALES	$190004.00
		LESS .00% COMMISSION	$.00

REFER QUESTIONS TO- GLENN SCOTT

DPC 0285188

$190,004.00

ORIGINAL

B3371205.02-00-0064-00 CAH RJB CWB V290520801 0150 EU20 STK JLR/CJM/

22541 PCC2630

185204.00

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE 11-06-91

B17C 22489
CNS#001

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO
DUKE POWER CO.
CMD/CENTRAL A40546-77
RECEIVING DEPT.(803) 831-3789
4900 CONCORD ROAD

YORK, SC 29745
YELLOW FRT-COLLECT

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26-SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CATAWBA NUCLEAR STATION THE FOLLOWING ITEMS TO BE FURNISHED IN ACCORDANCE WITH SPECIFICATION CNS-1205.02-00-0006, REVISION 5, DATED DECEMBER 15, 1987.		
1	8	EA	VALVE, BUTTERFLY, SIZE: 18", DE ITEM NUMBER: 05B-481, RATING: 150 PSIG AT 150 DEGREE F, OPERATED: ELECTRIC MOTOR, CONNECTION: WAFER, BODY MATERIAL: SS, TRIM: SS, SOFTGOODS: EPR, MFR SPECIFIC INFO: ACTIVE VALVE, OPERATOR SPEED 60 SEC. MAX.	2541350487N	14,841.00 EA
			PROCUREMENT: REFERENCE SPECIFICATION CNS-1205.02-00-0006 AND VALVE LIST CN-0150-36. MANUFACTURER: FISHER CONTROLS CO. DUKE POWER WILL SUPPLY THE LIMITORQUE SMB-000-5/H2BC MOTOR OPERATORS COMPLETE WITH MOUNTING BRACKETS FOR THESE VALVES. ADDITIONAL INFORMATION FOR 05B-481: (CONT. ON PAGE 2)		

SHIPPING TERMS: FOB N. STONINGTON, CT. CASH TERMS: NET 30 DAYS

*NOTICE TO SELLER
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.

THREE COPIES OF INVOICE WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: J. L. ROSEMAN (704) 373-6059

PC 0286189

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298 FILE COPY

Jolly - Fisher Exh 940-0321

		DATE	INVOICE AMOUNT
12/19 P/C to Vendor (Ann) Sch wh 5-1-92	12/20		
Flt rec'd 7/23/91 Sch to ship 5-1-92	3/5/92		
Flt rec'd 3/5/92 Sch to ship wh 5-1-92	3/3		
	3/4		
	5/7/92		
	5/7		

DPC_0286190

83371205.02-00-0064-00 CAH BJB CWB V#90520801 DT50 EU20 STK JLR/CJM/

SC2541 PC02630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES: A40546-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			*VALVES MUST BE FABRICATED SUCH THAT THE CUSTOMER SUPPLIED LIMITORQUE SMB-000-5/H2BC OPERATOR AND MOUNTING BRACKET TAKEN FROM POSI-SEAL ITEM NUMBER 02B-573 (POSI-SEAL DRAWING NUMBER 42663, ITEM NUMBER 1) CAN BE READILY TRANSFERRED BACK AND FORTH BETWEEN VALVES 02B-573 AND 05B-481. *THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 05B-481 MUST BE WITHIN +/- 10% OF THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 02B-573 (780 LBS). *THE END TO END DIMENSION OF VALVE ITEM 05B-481 MUST BE THE SAME AS THAT OF VALVE ITEM 02B-573 (5.0 INCHES).		
2	4	EA	VALVE, BUTTERFLY, SIZE: 20", DE ITEM NUMBER: 05B-482, RATING: 150 PSIG AT 150 DEGREE F, OPERATED: ELECTRIC MOTOR, CONNECTION: WAFER, BODY MATERIAL: SS, TRIM: SS, SOFTGOODS: EPR, MFR SPECIFIC INFO: ACTIVE VALVE; OPERATOR SPEED 60 SEC. MAX.; ASME SECTION 3 CLASS 3 (DUKE CLASS 'C') (CONT. ON PAGE 3)	2541350489N	16,619.00 EA

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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4. Show ID numbers on boxes and invoices if shown on this order.
5. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.E. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

PC_0286191

ROA_03269

Jolly - Fisher Exh 940-0323

83371205.02-00-0064-00 CAH BJB CWB V#90520801 QT50 EU20 STK JLR/CJM/

02541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			PROCUREMENT: REFERENCE SPECIFICATION CNS -1205.02-00-0006 AND VALVE LIST CN-0150-36 MANUFACTURER: FISHER CONTROLS CO. DUKE POWER WILL SUPPLY THE LIMITORQUE SMB-00-10/H3BC MOTOR OPERATORS COMPLETE WITH MOUNTING BRACKETS FOR THESE VALVES. ADDITIONAL INFORMATION FOR 05B-482: *VALVES MUST BE FABRICATED SUCH THAT THE CUSTOMER SUPPLIED LIMITORQUE SMB-00-10/H3BC OPERATOR AND MOUNTING BRACKET TAKEN FROM POSI-SEAL ITEM NUMBER 02B-574 (POSI-SEAL DRAWING NUMBER 42663, ITEM NUMBER 2) CAN BE READILY TRANSFERRED BACK AND FORTH BETWEEN VALVES 02B-574 AND 05B-482. *THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 05B-482 MUST BE WITHIN +/- 10% OF THE TOTAL ASSEMBLY WEIGHT OF VALVE ITEM 02B-574 (1040 LBS). *THE END TO END DIMENSION OF VALVE ITEM 05B-482 MUST BE THE SAME AS THAT OF (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. *Show ID numbers on boxes and invoices if shown on this order.*
4. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286192

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03270

Jolly - Fisher Exh 940-0324

83371205.02-00-0064-00 CAH BJB CWB V#90520801 OT50 EU20 STK JLR/CJM/

C2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

PAGE 4

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			VALVE ITEM 02B-574 (5 1/4 INCHES).		
			ALL MATERIAL FOR VALVE ITEM 05B-481 AND 05B-482 SHALL BE FURNISHED AND CERTIFIED IN ACCORDANCE WITH DUKE POWER SPECIFICATION CNS-1205.02-00-0006, REVISION 5.		
			THE KEY MATERIAL FOR VALVE ITEMS 05B-481 AND 05B-482 IS TO BE 17-4PHC-H1075.		
			COATING REQUIREMENTS DO NOT APPLY TO STAINLESS STEEL BODY VALVES.		
			ADDITIONAL REQUIREMENTS FOR BOTH LINE ITEMS:		
			*THE ENTIRE LOT OF 12 VALVES MUST BE ON SITE AT CATAWBA NUCLEAR STATION BY MONDAY, MAY 04, 1992.		
			*DRAWINGS FOR VALVE ITEMS 05B-481 AND 05B-482 MUST BE RECEIVED BY FRIDAY, JANUARY 17, 1992.		
			*THE SEISMIC REPORTS AND STATIC DEFLECTION CERTIFICATES OF COMPLIANCE FOR VALVE ITEMS 05B-481 AND 05B-482 MUST		

(CONT. ON PAGE 5)

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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THREE COPIES OF INVOICE, WITH FREIGHT BILL, OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286193

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2296

FILE COPY

ROA_03271

Jolly - Fisher Exh 940-0325

B3371205.02-00-0064-00 DAH BJB CWB V#90520801 0T50 EU20 STK JLR/CJMX

C2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE.

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			BE RECEIVED BY FRIDAY, JANUARY 24, 1992. ALL TECHNICAL DOCUMENTATION SHALL BE PROVIDED IN ACCORDANCE WITH CNS-1205.02-00-0006, REVISION 5, SECTION 12 AND 13. DOCUMENTATION SHOULD BE SENT TO: DUKE POWER COMPANY P. O. BOX 1006 500 SOUTH CHURCH STREET CHARLOTTE, NC 28201-1006 ATTENTION: C. A. HELMERS ATTACHMENTS TO ORDER: 1. VALVE LIST CN-0150-36, REV. 27 2. A REVISION INFORMATION SHEET 3. DATA SHEET FOR EACH INDIVIDUAL VALVE FORM 930.1A. IN ADDITION TO THE MATERIALS THAT ARE REQUIRED AS A PART OF SUPPLYING LINE ITEMS 1 AND 2, IN REFERENCE TO RFQ 01948-A-77, THE FOLLOWING WILL BE REQUIRED FOR SUBMISSION AT A FUTURE DATE THAT IS AGREED UPON BY DUKE POWER COMPANY AND FISHER CONTROLS COMPANY. (CONT. ON PAGE 6)		

SHIPPING TERMS | CASH TERMS

***NOTICE TO SELLER**

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4. THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS, ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY PURCHASING DEPARTMENT PO BOX 1002 CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336, POWER GROUP (704) 382-2298

FILE COPY

PC_0286194

Jolly - Fisher Exh 940-0326

83371205.02-00-0064-00 CAH BJB CWB V#90520801 OT50 EU20 STK JLR/GJM/

C2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020560

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			1. A CALCULATION FOR EACH ITEM NUMBER DOCUMENTING THE TORQUE REQUIREMENTS AT THE VALVE STEM FOR EACH FLOW CONDITION PROVIDED ON THE ATTACHED DATA SHEETS FOR PURPOSES OF MOTOR OPERATOR SIZING. THE CACULATION IS TO INCLUDE MAX. TORQUE REQUIREMENT DATA FOR BOTH THE OPENING AND CLOSING DIRECTIONS.		
			2. A WEAK-LINK ANALYSIS FOR EACH ITEM NUMBER (05B-481, 05B-482) DOCUMENTING THE MAXIMUM TORQUE THAT MAY BE APPLIED TO THE VALVE STEM FOR BOTH OPENING AND CLOSING DIRECTIONS. THE WEAK-LINK ANALYSIS IS TO ALSO INCLUDE WHAT THE LIMITING COMPONENT IS FOR EACH CASE. THE ANALYSIS FOR EACH ITEM NUMBER IS TO BE BASED ON CODE ALLOWABLES FOR THE BODY AND THE DISC. THE ANALYSIS FOR THE REMAINDER OF THE VALVE IS TO BE BASED ON 0.9 OF YIELD STRENGTH AT DESIGN TEMPERATURE.		
			THE CALCULATIONS ARE TO BE FORWARDED AT THE AGREED UPON DATE TO:		
			DUKE POWER COMPANY		
			(CONT. ON PAGE 7)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286195

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298 FILE COPY

83371205.02-00-0064-00 CAH BJB CWB V#90520801 0T50 EU20 STK JLR/CJM/

02541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

PAGE 7

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER: VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES:

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			P. O. BOX 1006 500 SOUTH CHURCH STREET CHARLOTTE, NC 28201-1006 ATTENTION: C. A. HELMERS (EC07A) DELIVERY COMMITMENT: 5/1/92, AS REQ. PLEASE CONFIRM THAT SOFTWARE NEED DATES WILL BE MET. PRICE & DELIVERY COMMITMENT PER WYLIE BERRY WRITTEN PROPOSAL DATED 8/6 AND 10/10/91 IN RESPONSE TO OUR INQUIRY NO. 01948-A-77 DATED 7/23/91. THIS MATERIAL AND/OR SERVICE SHALL BE FURNISHED UNDER THE QUALITY ASSURANCE PROGRAM OF THE FISHER CONTROLS, INTERNATIONAL, INC. FACILITY AT RT. 49 & I-95, N. STONINGTON, CT. 06359. FORMS ATTACHED AS PART OF THIS ORDER: 930.1A. DELIVERY REQUIRED: 5-01-92 DUKE POWER COMPANY FORM 930.1 (SUPPLIER QA CERTIFICATION), OR APPROVED EQUIVALENT SUPPLIER C OF C IN ADDITION (CONT. ON PAGE 8)		

SHIPPING TERMS | CASH TERMS

*NOTICE TO SELLER
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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.E. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286196

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03274

Jolly - Fisher Exh 940-0328

83371205 02-00-0064-00 CAH BJB CWB V#90520801 OT50 EU20 STK JLR/CJM/

C2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

PAGE 8

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			TO ANY QA DOCUMENTATION REQUIRED BY REFERENCED SPECIFICATION(S) OR CODE(S), IS REQUIRED TO ACCOMPANY EACH SHIPMENT. DOCUMENTS ARE TO BE ADDRESSED TO: QA DIRECTOR, OPERATIONS DUKE POWER COMPANY. AT THE MATERIAL RECEIVING LOCATION. ABSENCE OF ANY REQUIRED DOCUMENTATION WILL RESULT IN MATERIAL / ITEM BEING PLACED IN QA HOLD. (5Q) ********** * * * NUCLEAR SAFETY RELATED * * * ********** MATERIALS/ITEMS ARE 'NUCLEAR SAFETY RELATED' AND SHALL BE SUPPLIED UNDER THE SUPPLIER'S QUALITY ASSURANCE PROGRAM THAT HAS BEEN APPROVED BY THE DUKE POWER QA DEPARTMENT. NON-ASME ITEMS SHALL BE (CONT. ON PAGE 9)		

SHIPPING TERMS

CASH TERMS

*NOTICE TO SELLER
1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents.
Show ID numbers on boxes and invoices if shown on this order:
THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:
DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0286197

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY.

ROA_03275

Jolly - Fisher Exh 940-0329

83371205.02-00-0064-00 CAH BUB CWB V$90520801 OT50 EU20 STK JLR/CJM/

PCC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			SUPPLIED UNDER AN ANSI N45.2/10CFR50 APPENDIX B PROGRAM AS A MINUMUM. ANY QUESTIONS CONCERNING PROGRAM APPLICATION SHOULD BE ADDRESSED TO C.A. ROBINSON AT 704-373-4368. IF LOWER TIER PROCUREMENT IS REQUIRED, THEN APPLICABLE QUALITY ASSURANCE REQUIREMENTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS AND VENDORS. THE PRODUCT/SERVICE PROCURED BY THIS PURCHASE ORDER IS SUBJECT TO SOURCE INSPECTION/AUDIT BY THE BUYER'S QUALITY ASSURANCE DEPARTMENT PRIOR TO SHIPMENT. THE SUPPLIER WILL BE CONTACTED BY DUKE POWER'S VENDORS-NUCLEAR DIVISION WHEN SOURCE INSPECTION/AUDIT OF THE PRODUCT/SERVICE IS REQUIRED. (6Q) ********** * * * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER * * (4G) * ********** (CONT. ON PAGE 10)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286198

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336
POWER GROUP (704) 382-2298

FILE COPY

ROA_03276

Jolly - Fisher Exh 940-0330

B3371205.02-00-0064-00 CAH BJB CWB V#90520801 OT50 EU20 STK JLR/CJM/

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. A40546-77

ORDER DATE

PAGE 10

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-10
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS; PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED. QUALITY ASSURANCE REQUIRED COMMERCIAL GRADE: N PROTECTION LEVEL: C CONDITION LEVEL: 1 ON ALL DRAWINGS/CORRESPONDENCE, CONTRACTOR MUST SHOW THE FOLLOWING: STATION CATAWBA D.E.FILE # CN-1205.02 DUKE ORDER # A40546-77		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0286199

REV. 09/90

TELEX 57-2346 TELECOPIER: CUSTOMER GROUP (704) 373-3336 POWER GROUP (704) 382-2298 FILE COPY

ROA_03277

Jolly - Fisher Exh 940-0331

INDEX: 83371205.02-00-0064-00 CAH BUB CWB JLR/CJM

CHANGE ORDER

DUKE POWER COMPANY

PURCHASING DEPARTMENT
P.O. Box 1002
Charlotte, N. C. 28201-1002

5/12/92

FISHER CONTROLS CO.
C/O R.E. MASON & CO.
PO BOX 33424
CHARLTOTE, N.C. 28233

CHANGE ORDER A40546-77-001

THIS CHANGE ORDER APPLIES TO OUR PURCHASE ORDER

No. A40546-77 11/6/92 DATE

All Invoices and Correspondence Should Show Purchase No. as Reference.

THE PURCHASING DEPARTMENT HAS MADE THE FOLLOWING CHANGES IN THE ABOVE PURCHASE ORDER

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			CMD/CENTRAL		
			ADD THE FOLLOWING:		
3	1	LT	SEISMIC ANALYSIS		4800.00/LOT
			ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME.		

CHANGE ORDER

SHIPPING TERMS

CASH TERMS

NO CHANGES IN OR CANCELLATIONS OF PURCHASE ORDERS WILL BE RECOGNIZED UNLESS AUTHORIZED BY THIS CHANGE ORDER, ISSUED ONLY BY PURCHASING DEPARTMENT.

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R. F. SMITH GENERAL MANAGER PURCHASES

BY J. L. ROSEMAN CJM BUYER

704-373-6059 DPC_0286200

FILE COPY

733030677 EHH EHH V890520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

B09030465
#1-13,15
G17C30550
#14

SC2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

3799.74

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C29375-C2 **EDI**

ORDER DATE
8-14-92

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FILE
D. McALLISTER

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
RECEIVING DEPT/CATAWBA C29375-C2
CATAWBA SITE
PHONE 803-831-3459 / 3460
4800 CONCORD ROAD
YORK, SC 29745

VIA UPS BROWN

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
1	2	EA	GASKET, , TYPE: GLOBE VALVE APPLICATION: FOR FISHER GLOBE STYLE VALVE BODY SIZE 12X16 INCHES, DUKE TAG NO. 1HW43 DUKE SPEC MCS 1205.06-3 MFR: FISHER PRODUCTS INC. PART #: 12A1413X012 DWG #: MCM1205.06-184 COMPANY DWG #: MCM 1205.06-184	244400913	258.30 EA
2	2	EA	RING, , TYPE: SEAL, MFR SPECIFIC INFO: (CONT. ON PAGE 2)	2546352064	119.70 EA

SHIPPING TERMS FOB SP

CASH TERMS NET 30 DAYS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: C.M. BALLARD
PC 0296379
(704) 373-6244
(704) 373-7869

FILE COPY

REV. 08/91

ROA_03279

Jolly - Fisher Exh 940-0333

		DATE	INVOICE AMOUNT
flet rec'd 9/7 Item 3 S/O W/O 9/8; Bal Item 9 S/O W/O 8/31, Item 14 S/O 9/12	T 9/10 (5) T 9/24		
flet rec'd 9/15 S/O Item 14 shpd 9/10	T 9/17		

D. MONTGOMERY
JULY
REGISTRATION

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

:C2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C29375-C2 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			FOR 6" CONTROL VALVE TYPE 667-4-ET APPLICATION: FOR S/N 6431254 THRU 261 MFR: FISHER CONTROLS CO. PART #: 10A5411X022 UNIT OF PURCHASE: COMPANY DWG #: CNM-1205.06-100		
3	1	EA		244400912	368.55 EA
			RING, , TYPE: SEAL APPLICATION: FOR FISHER GLOBE STYLE VALVE BODY SIZE 12X16 INCHES DUKE DWG NO. MCM 1205.06-184 DUKE TAG NO. 1HW43 DUKE SPEC NO. MCS 1205.06-3 SERIAL NO. 5999476 MFR: FISHER PRODUCTS INC. PART #: 12A1416X022 COMPANY DWG #: MCM1205.06-184		
4	2	EA		244402439	52.29 EA
			STEM, VALVE, VALVE STYLE: GLOBE CONTROL, VALVE SIZE: 20"		
			(CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296381

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0335

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

C2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			APPLICATION: FOR FISHER 20 INCH GLOBE CONTROL VALVE MFR: FISHER PRODUCTS INC. PART #: 1L996435162		
5	2	EA		244400570	78.75 EA
			GASKET, , TYPE: GLOBE VALVE APPLICATION: FOR FISHER GLOBE VALVE TYPE ET SIZE 3 INCH MFR: FISHER PRODUCTS INC. PART #: 10A4154X012		
6	2	EA		244400572	94.50 EA
			GASKET, , TYPE: GLOBE VALVE APPLICATION: FOR FISHER GLOBE VALVE TYPE ET SIZE 6 INCH FURNISHED TO D.P.CO. SPEC. CNS-1205.06-3 MFR: FISHER PRODUCTS INC. PART #: 10A5412X012		
7	3	EA		244400573	154.35 EA
			GASKET, , TYPE: GLOBE VALVE (CONT. ON PAGE 4)		

SHIPPING TERMS | CASH TERMS

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PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0296382

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0336

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

:C2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			APPLICATION: FOR FISHER GLOBE VALVE TYPE ET SIZE 6 INCH FURNISHED TO D.P.CO. SPEC. CNS-1205.06-3 MFR: FISHER PRODUCTS INC. PART #: 10A5413X012		
8	1	EA		244402366	308.70 EA
			SEAL, , TYPE: RING APPLICATION: FOR FISHER 20 INCH GLOBE CONTROL VALVE MFR: FISHER CONTROLS CO. PART #: 12A1415X022		
9	3	EA		244400449	129.15 EA
			RING, , TYPE: SPRING LOADED SEAL APPLICATION: FOR FISHER GLOBE VALVE TYPE EWT SIZE 8,10,20,12X20&18X20 INCH FURNISHED TO D.P.CO. SPEC. CNS-1205.06-1 MFR: FISHER PRODUCTS INC. PART #: 10A2643X022		
10	2	EA		244400571	78.75 EA
			(CONT. ON PAGE 5)		

SHIPPING TERMS | CASH TERMS

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PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0296383

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0337

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

:C2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
11	13	EA	GASKET, , TYPE: CAGE APPLICATION: FOR 3 INCH LEVER CONTROL GLOBE VALVE DUMP TYPE 657-ED MFR: FISHER PRODUCTS INC. PART #: 10A4155X012 DWG #: 4635D56	244401993	2.68 EA
12	13	EA	STUD, , TYPE: VALVE APPLICATION: FOR 4 INCH GLOBE TYPE ED CONTROL VALVE MFR: FISHER PRODUCTS INC. PART #: 1R369031012	244401994	.54 EA
13	3	EA	NUT, , TYPE: GLOBE VALVE, DIAMETER: 3/4", THREADS: 10 APPLICATION: FOR FISHER 2 1/2 INCH RAISED FACE FLANGE GLOBE VALVE MFR: FISHER CONTROLS CO. PART #: 1A352024072	244401666	141.75 EA

(CONT. ON PAGE 6)

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296384

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0338

733030677 EHH EHH V#90520801 OT01 EU76. STK CMB/GGC/
733030677-001 EHH EHH

C2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C29375-C2 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			RING, PISTON, SIZE: 7-1/4" ID X 8-3/32" OD X 3/8" THK APPLICATION: FOR THE FEEDWATER VALVE 16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA MANUFACTURED ON WESTINGHOUSE SHOP ORDER 220 FURNISHED ON WESTINGHOUSE PURCHASE ORDER 546-178317 WESTINGHOUSE E. SPEC/DRAWING 952730 MFR: WESTINGHOUSE PART #: 1U7677X0012 DWG #: 952730 VENDOR: RE MASON VENDOR ADDRESS: FISHER CONTROLS		
14	2	EA		244402365	122.50 EA
			SEAL, , TYPE: RING APPLICATION: FOR FISHER 3 INCH GLOBE CONTROL VALVE MFR: FISHER CONTROLS CO. PART #: 12A3531X052		
15	2	EA		244401662	97.65 EA
			GASKET, FLANGED FITTING, TYPE: SPIRAL (CONT. ON PAGE 7)		

SHIPPING TERMS

CASH TERMS

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THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0296385

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0339

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

32444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C29375-C2 **EDI**

PURCHASE ORDER

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			WOUND, PRESSURE RATING: 900 LB, MATERIAL: 316 SS WITH NON-ASBESTOS, SIZE: 10.81" ID X 11.81" OD X .175" THK APPLICATION: FOR THE FEEDWATER GLOBE VALVE, FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA SHOP ORDER 220 MFR: FISHER PRODUCTS INC. PART #: 1V1054X0012. DWG #: 952730. PRICE AND DELIVERY PER RE MASON QUOTE DATED 8-5-92 TO DUKE RFQ 2801-C-C2 DELIVERY COMMITMENT: 6-9 WKS (10-23-92) DELIVERY REQUIRED: 9-25-92 PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05) *ALL INSIDE PACKAGING AND/OR PACKING MATERIAL MUST BE BIODEGRADABLE, (CONT. ON PAGE 8)		

SHIPPING TERMS | CASH TERMS

*NOTICE TO SELLER
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PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296386

FILE COPY

REV. 08/91

ROA_03286

Jolly - Fisher Exh 940-0340

733030677 EHH EHH V#90520801 OT01 EU76 STK CMB/GGC/
733030677-001 EHH EHH

22444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C29375-C2 **EDI**

ORDER DATE

PAGE 8

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			I.E., NO PLASTICS OR STYROFOAM.* (2F)		
			SHIPMENTS WILL BE ACCEPTED MONDAY THROUGH THURSDAY, 7:00 AM - 4:30 PM EXCEPT HOLIDAYS (INCLUDING EASTER MONDAY, DAY AFTER THANKSGIVING, AND CHRISTMAS EVE.) IN INSTANCES WHERE SHIPMENTS ARE NOT SO ENDORSED, ALL EXCESS CHARGES FOR DETENTION OR REDELIVERY WILL BE REBILLED TO THE SUPPLIER. (2J)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			********** * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER * * (4G) * **********		

SHIPPING TERMS	CASH TERMS

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CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296387

FILE COPY

REV. 06/91

ROA_03287

Jolly - Fisher Exh 940-0341

733042816 EHH EHH V#90520801 0T04 EU76 STK CMB/FBS/

PCC2541 PCC2630 45280.00 63670

DUKE POWER COMPANY
PURCHASING DEPARTMENT

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. ! C34843-C2 **EDI**

PURCHASE ORDER

G17031706

ORDER DATE 9-28-92

FILE
D. McALLISTER

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
RECEIVING DEPT/CATAWBA C34843-C2
CATAWBA SITE
PHONE 803-831-3459 / 3460
4800 CONCORD ROAD
YORK, SC 29745

VIA ROADWAY EXP-FRT COLLECT

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES:

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
			********** NUCLEAR SAFETY RELATED **********		
1	4	EA		2541363594N	11,320.00 EA
			VALVE, BUTTERFLY, TYPE: HIGH PERFORMANCE, SIZE: 8", DE ITEM NUMBER: 05B-490, RATING: 150 LB ASME/ANSI B16.34, OPERATED: MANUAL, CONNECTION: WAFER, BODY MATERIAL: SS, TRIM: SS, SOFTGOODS: EFR SEAL RING/BACKUP RING, GRAPHITE PACKING, MFR SPECIFIC INFO: SEISMIC DESIGN REPORT IS REQUIRED FOR VALVE/ OPERATOR ASSEMBLY.		
			(CONT. ON PAGE 2)		

SHIPPING TERMS: FOB: STONINGTON, CT
CASH TERMS: NET 30 DAYS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: C.M. BALLARD
(803) 831-3309
(803) 831-3408

DPC-0296247

FILE COPY

REV 08/91

Jolly - Fisher Exh 940-0342

		DATE	INVOICE AMOUNT
9/29 P/c to Ann w/ expedite Critical			
10/13 P/c to Mitch Hearn W/C/B	T 10/13		
10/15 left mess for Mitch	T 10/15		
10/26 left mess for Ann	T 10/26		
P/c from Ann W/C/B	T 10/27		
Order on sch for 1/93	T 10/28		
ack recd 11/19 S/O 2/15/93 filed	T 11/23		
12/15 P/c to Ann w/o 1/11	T 1/7 (4)		
12/16 " from " S/O 1/4	T 1/6		
1/5 P/c to Ann W/C/B	T 1/6		
1/6 " " " " Duke	T 1/5		
to inspect 1/7 or 1/8 if everything passes w/ ladw.	T 1/11		
1/6 sent proj to QA Jeff Jungson			
1/11 left mess for Ann	T 1/12		
P/c from Ann W/C/B			
QA inspected but bracket was missing S/O 1/12	T 1/13		
1/13 P/c to Ann W/C/B	T 1/14		
ship'd 1/12 via Roadway from CT	T 1/19		
	T 1/21		

DPC_0296248

733042816 EHH EHH V#90520B01 OT04 EU76 STK CMB/PBS/

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C34843-C2 **EDI**.

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			APPLICATION: ASME SECTION III, CLASS 3; CATAWBA/MCGUIRE CLASS C; OCONEE CLASS C OR F; VALVE BUTTERFLY, TYPE: HIGH PERFORMANCE, SIZE: 8", OPERATED: MANUAL, RATED: 150 LB CLASS ANSI B16.5,; MANUFACTURER TO SUPPLY SPLINE ADAPTER AND MOUNTING KIT FOR MANUAL LIMITORQUE HOBC GEARBOX.(HOBC GEARBOX TO BE SUPPLIED BY DUKE POWER COMPANY). SEND ALL OUTLINE DRAWING(S), SEISMIC REPORTS AND INSTRUCTION MANUALS TO : CATAWBA NUCLEAR STATION, 4800 CONCORD ROAD, YORK SC 29745, ATTENTION: C A HELMERS (CN04B) MFR: FISHER CONTROLS CO. PACKAGING: EACH VALVE MUST BE IDENTIFIED AS ITEM# 05B-490 ON A PERMANENTLY ATTACHED CORROSION RESISTANT NAMETAG MATERIAL SHALL MEET ALL REQUIREMENTS OF DUKE POWER COMPANY ... SPEC#: CNS -1205.02-00-0006 ,RVSN#: 005 (CONT. ON PAGE 3)		

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296249

FILE COPY

REV. 08/81

733042816 EHH EHH V#90520801 OT04 EU76 STK CMB/FBS/

CC2541 PCC2630

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

PAGE 3

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			**********		
			QA COND: 1 CG (Y/N): N PL: C		
			**********		
			DE FILE #: DN-1205.02		
			CATALOG #: 05B-490		
			VENDOR SHOP #:0329 EXP DATE:08 07 95		
			FISHER CONT. INTL., INC.		
			RT. 49 & I-95		
			N. STONINGTON CT 06359		
			ITEM IS "NUCLEAR SAFETY RELATED" AND SHALL BE SUPPLIED UNDER THE SUPPLIER'S QA PROGRAM THAT HAS BEEN APPROVED BY DUKE POWER COMPANY. IF LOWER TIER PROCUREMENT IS REQ'D, THEN APPLICABLE QA REQMTS MUST BE INVOKED ON LOWER TIER SUBCONTRACTORS/VENDORS.		
			THIS COMMODITY IS SUBJECT TO SOURCE INSPECTION, AUDIT OR TEST TO CONFIRM THE VALIDITY OF THE CERTIFICATE OF CONFORMANCE. THE SUPPLIER WILL BE CONTACTED BY DPC SUPPLIERS DIVISION WHEN THIS IS REQUIRED. CALL (704) 382-4754 FOR INFORMATION.		
			(CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

***NOTICE TO SELLER**

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PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0296250

FILE COPY

REV. 08/91

ROA_03291

Jolly - Fisher Exh 940-0345

733042816 EHH EHH V#90520801 0T04 EU76 STK CMB/PBS/

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C34843-C2 **EDI**

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			DOCUMENTS SHALL BE SHIPPED WITH ITEMS. EVERY PAGE OF EACH DOCUMENT SHALL BE TRACEABLE TO THE DUKE POWER PURCHASE ORDER AND ITEM(S) NUMBER. A SUPPLIER C OF C OR DUKE POWER CO. FORM 930.1, ALONG WITH ALL QA DOCUMENTATION REQUIRED BY THE REFERENCED SPECIFICATION(S) IS REQUIRED TO ACCOMPANY EACH SHIPMENT OF THIS ITEM. SHIPPING CONTAINERS/CARTONS ARE TO BE MARKED OR TAGGED WITH THE P.O. NO. AND ALL ITEMS ARE TO BE PACKAGED INDIVIDUALLY AND IDENTIFIED BY SPECIFIC PART NO., OR ALL ITEMS OF A GIVEN PART NO. TO BE PACKAGED TOGETHER AND IDENTIFIED BY SPECIFIC PART NO. ITEMS TO BE PACKAGED AND SHIPPED IN ACCORDANCE WITH ANSI N45.2.2 LEVEL C. ONLY NEW MATERIALS SHALL BE SUPPLIED. REFURBISHED OR USED ITEMS, COMPONENTS AND/OR ACCESSORIES ARE NOT ACCEPTABLE. MATERIAL SPECIFIED SHALL BE IN FULL COMPLIANCE WITH THE LATEST EDITION OF REFERENCED CODES, STANDARDS AND SPECIFICATIONS UNLESS OTHER SPECIFIED.		SEISMIC ANALYSIS
			(CONT. ON PAGE 5)		

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296251

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0346

733042816 EHH EHH V#90520801 OT04 EU76 STK CMB/PBS/

C2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
					2400.00 LOT
			DELIVERY COMMITMENT: 1-22-93		ANI INSPECTION PER TRIP 1500.00
			PRICE AND DELIVERY PER R.E. MASON QUOTE DATED 9-10-92 TO C.M. BALLARD		
			DELIVERY REQUIRED: 1-11-93		
			PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05)		
			*** PLEASE EXPEDITE ALL POSSIBLE ***(13)		
			"ALL INSIDE PACKAGING AND/OR PACKING MATERIAL MUST BE BIODEGRADABLE, I.E., NO PLASTICS OR STYROFOAM." (2F)		
			SHIPMENTS WILL BE ACCEPTED MONDAY THROUGH THURSDAY, 7:00 AM - 4:30 PM EXCEPT HOLIDAYS (INCLUDING EASTER MONDAY, DAY AFTER THANKSGIVING, AND CHRISTMAS EVE.) IN INSTANCES WHERE		
			(CONT. ON PAGE 6)		

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0296252

FILE COPY

REV. 06/91

Jolly - Fisher Exh 940-0347

733042816 EHH EHH V#90520B01 OT04 EU76 STK CMB/FBS/

CC2541 PCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			SHIPMENTS ARE NOT SO ENDORSED, ALL EXCESS CHARGES FOR DETENTION OR REDELIVERY WILL BE REBILLED TO THE SUPPLIER. (2J)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		
			THE PROVISIONS OF TITLE 10, CODE OF FEDERAL REGULATIONS, PART 21 APPLY TO THIS PURCHASE. THE SIGNER OF THIS PURCHASE ORDER SHALL BE NOTIFIED IF THIS REGULATION IS INVOKED.		
			QUALITY ASSURANCE REQUIRED COMMERCIAL GRADE: N PROTECTION LEVEL: CONDITION LEVEL: 1		
			ON ALL DRAWINGS/CORRESPONDENCE, CONTRACTOR MUST SHOW THE FOLLOWING: STATION		
			(CONT. ON PAGE 7)		

SHIPPING TERMS | CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0296253

FILE COPY

REV. 08/91

Jolly - Fisher Exh 940-0348

733042816 EHH EHH V#90520801 DT04 [redacted] CMB/PBS/

72541 FCC2630

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. C34843-C2 **EDI**

ORDER DATE

PAGE 7

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			D.E.FILE # CN-1205.02 DUKE ORDER # C34843-C2		

SHIPPING TERMS | CASH TERMS

***NOTICE TO SELLER**

1. ACKNOWLEDGE ORDER BY PROMPT ACCEPTANCE AND GIVE DATE ORDER WILL BE SHIPPED.
2. Acceptance is expressly limited to terms and conditions set forth herein and on reverse side.
3. If freight is prepaid and added to invoice, attach freight bill or other appropriate shipping documents. Show ID numbers on boxes and invoices if shown on this order.

THREE COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO:
DUKE POWER COMPANY
PURCHASING DEPARTMENT
PO BOX 1002
CHARLOTTE NC 28201-1002

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

DPC_0296254

FILE COPY

REV. 08/91.

ROA_03295

Jolly - Fisher Exh 940-0349

733072575 CDS CDS V#90520801 OT01 ! EU76 STK CMB/CMB/

B09036335

C9410 PCC9410 1718.01

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2 **EDI**

ORDER DATE 3-10-93

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

FILE
D. McALLISTER

SHIP TO
DUKE POWER CO.
RECEIVING DEPARTMENT E12077-C2
C/O CATAWBA SITE
PHONE 803-831-3460
4800 CONCORD ROAD
YORK, SC 29745
UPS BROWN

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*
BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
1	2	EA		2546364409	30.87 EA
			O-RING, , TYPE: SEAL RETAINER, MATERIAL: ETHYLENE PROPYLENE APPLICATION: FOR 6" CONTROL VALVE TYPE 667-ET		
			MFR: FISHER CONTROLS CO. PART #: 12A1298X052 DWG #: 53A8397		
			PROTECTION LEVEL: C COMPANY DWG #: CNM-1205.06-0100		
2	1	EA		2546364410	30.87 EA
			O-RING, , TYPE: SEAL RETAINER, MATERIAL: (CONT. ON PAGE 2)		

3/17
3/31

SHIPPING TERMS: FOB: SHIPPING POINT
CASH TERMS: NET 30 DAYS

NOTE
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SELLER
5. TWO COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY INVOICE OPERATIONS - PB02G PO BOX 1015 CHARLOTTE NC 28201-1015
6. ALL CATAWBA NUCLEAR STATION PURCHASING DEPARTMENT CORRESPONDENCE IS TO BE MAILED TO: DUKE POWER COMPANY CATAWBA NUCLEAR STATION PURCHASING DEPARTMENT 4800 CONCORD ROAD YORK, SC 29745

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases
C.M. BALLARD

ADDRESS REPLY TO: (803) 831-3309 (803) 831-3408

DPC 0256276

FILE COPY

363863 CAT REV.09/92

ROA_03296

Jolly - Fisher Exh 940-0350

733072575 CDS CDS V#90520001 0T01 EU76 STK CMB/CMB/

CC9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			ETHYLENE PROPYLENE APPLICATION: FOR 6" CONTROL VALVE TYPE 667-ET MFR: FISHER CONTROLS CO. PART #: 12A1299X052 DWG #: 53A8397 PROTECTION LEVEL: C COMPANY DWG #: CNM-1205.06-0100		
3	3	EA		244400572	94.50 EA
			GASKET, , TYPE: GLOBE VALVE APPLICATION: FOR FISHER GLOBE VALVE TYPE ET SIZE 6 INCH FURNISHED TO D.P.CO. SPEC. CNS-1205.06-3 MFR: FISHER PRODUCTS INC. PART #: 10A5412X012		
4	1	EA		244401666	141.75 EA
			RING, PISTON, SIZE: 7-1/4" ID X 8-3/32" OD X 3/8" THK APPLICATION: FOR THE FEEDWATER VALVE (CONT. ON PAGE 3)		

SHIPPING TERMS

CASH TERMS

NOTE

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SELLER

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0256278

FILE COPY

363853 CAT REV.09/92

ROA_03297

Jolly - Fisher Exh 940-0351

733072575 CDS CDS V#90520801 0T01 EU76 STK CMB/CMB/

PCC9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2 **EDI**

ORDER DATE

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			16FA37RG FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA MANUFACTURED ON WESTINGHOUSE SHOP ORDER 220 FURNISHED ON WESTINGHOUSE PURCHASE ORDER 546-178317 WESTINGHOUSE E. SPEC/DRAWING 952730 MFR: FISHER CONTROLS PART #: 1U7677X0012 DWG #: 952730		
5	1	EA		25510485	28.35 EA
			BUSHING, , TYPE: ACTUATOR SEAL APPLICATION: FOR DIAPHRAGM ACTUATOR FISHER TYPE 667 SIZE 70 MFR: FISHER CONTROLS CO. PART #: 1E6828140 12		
6	4	EA		244401660	97.65 EA
			GASKET, , TYPE: CAGE, SIZE: 9.62" ID X 10.62" OD X 3/4" THK APPLICATION: FOR THE FEEDWATER GLOBE VALVE, FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA SHOP ORDER 220 MFR: FISHER PRODUCTS INC. (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0256279

FILE COPY

SB3663 CAT REV.08/92

Jolly - Fisher Exh 940-0352

733072575 CDS CDS V#90520801 OT01 EU76 STK CMB/CMB/

PCC9410 PCC9410

DUKE POWER COMPANY
PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
7	4	EA	PART #: 1U6534X0012 DWG #: 952730 GASKET, FLANGED FITTING, TYPE: SPIRAL WOUND, PRESSURE RATING: 900 LB, MATERIAL: 316 SS WITH NON-ASBESTOS, SIZE: 10.56" ID X 10.60" OD X .175" THK APPLICATION: FOR THE FEEDWATER GLOBE VALVE, FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA, SHOP ORDER 220	244401661	97.65 EA
8	4	EA	MFR: FISHER PRODUCTS INC. PART #: 1V2653X0012 DWG #: 952730 GASKET, FLANGED FITTING, TYPE: SPIRAL WOUND, PRESSURE RATING: 900 LB, MATERIAL: 316 SS WITH NON-ASBESTOS, SIZE: 10.81" ID X 11.81" OD X .175" THK APPLICATION: FOR THE FEEDWATER GLOBE VALVE, FURNISHED UNDER WESTINGHOUSE SPIN NUMBER GAVAFWAA SHOP ORDER 220	244401662	97.65 EA

(CONT. ON PAGE 5)

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0256280

FILE COPY

353653 CAT REV.09/92

Jolly - Fisher Exh 940-0353

733072575 CDS CDS V#90520801 0T01 EU76 STK CMB/CMB/

CC9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2 **EDI**

ORDER DATE

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

SHIP TO

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			MFR: FISHER PRODUCTS INC. PART #: 1V1054X0012 DWG #: 952730 ITEMS 1,2 PRICED PER STUART MIRANDA FAXED QUOTE 3/10/93 DELIVERY COMMITMENT: 3 WKS (4/26/93) BALANCE OF ORDER PRICED PER 1/22/93 PRICE LIST DELIVERY REQUIRED: 4-26-93 PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05) "ALL INSIDE PACKAGING AND/OR PACKING MATERIAL MUST BE BIODEGRADABLE, I.E., NO PLASTICS OR STYROFOAM." (2F) SHIPMENTS WILL BE ACCEPTED MONDAY THROUGH THURSDAY, 7:00 AM - 4:30 PM (CONT. ON PAGE 6)		

SHIPPING TERMS

CASH TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

C_0256281

FILE COPY

363863 CAT REV.09/92

ROA_03300

Jolly - Fisher Exh 940-0354

733072575 CDS CDS V#90520801 OT01 EU76 STK CMB/CMB/

CC9410 PCC9410

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E12077-C2. **EDI**

ORDER DATE

PAGE 6

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			EXCEPT HOLIDAYS (INCLUDING EASTER MONDAY, DAY AFTER THANKSGIVING, AND CHRISTMAS EVE.) IN INSTANCES WHERE SHIPMENTS ARE NOT SO ENDORSED, ALL EXCESS CHARGES FOR DETENTION OR REDELIVERY WILL BE REBILLED TO THE SUPPLIER. (2J)		
			IF PART NUMBER FOR THE MATERIAL COVERED BY THIS ORDER DIFFERS FROM THOSE SPECIFIED, A STATEMENT OF EQUIVALENCE MUST BE FURNISHED. SUBSTITUTION OF EQUIVALENT OR SIMILAR PARTS BY THE SAME OR DIFFERENT MANUFACTURER IS NOT ALLOWED (65)		

SHIPPING TERMS

CASH TERMS

NOTE TO SELLER

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

PC_0256282

FILE COPY

363863 CAT REV.09/92

ROA_03301

Jolly - Fisher Exh 940-0355

731077644
731077432

ENC ENC ENC ENC V#90520801 OT04 EU76 STK JLR/TLC/

CC2444 PCC9370

DUKE POWER COMPANY
PURCHASING DEPARTMENT
PURCHASE ORDER

FILE

2541:97

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E14357-K2 **EDI**

ORDER DATE
3-24-93

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

SHIP TO
DUKE POWER CO.
OCONEE NUCLEAR STATION E14357-K2
C/O H.A. HEDDEN
HIGHWAY 183

SENECA, SC 29678

VIA DELIVER

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			********** EDI ORDER THIS ORDER HAS BEEN TRANSMITTED ELECTRONICALLY TO THE VENDOR. PLEASE SEND ORIGINAL COPY TO THE EDI COORDINATOR FOR VERIFICATION. **********		
			PLEASE RUSH - ITEMS 1 AND 2 NEEDED FOR UPCOMING OUTAGE.		
1	1	EA	GASKET, ; TYPE: BONNET APPLICATION: FOR FISHER GLOBE VALVE MODEL 475-DBQ 2.0 INCH MFR: FISHER GOVERNOR CO. PART #: 1L120899442	244401187	16.45 EA
2	5	EA	O-RING, MFR: FISHER CONTROLS CO. PART #: 1H849806992 (CONT. ON PAGE 2)	254101840	.60 EA

SHIPPING TERMS FOB: DEST

CASH TERMS NET 30 DAYS

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6. ALL OCONEE NUCLEAR STATION PURCHASING DEPARTMENT CORRESPONDENCE IS TO BE MAILED TO: DUKE POWER COMPANY OCONEE NUCLEAR STATION PURCHASING DEPARTMENT PO BOX 219 SENECA, SC 29678

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO: J.L. ROSEMAN
(803) 885-3551
(803) 885-3558

FILE COPY

ROA_03302

Jolly - Fisher Exh 940-0356

731077644
731077432

ENC ENC ENC ENC V#90520801 OT04 EU76 STK JLR/TLC/

BC2444 PDC9370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E14357-K2 **EDI**

ORDER DATE

PAGE 2

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
3	1	EA	ASSEMBLY, , SHAFT AND DISC, TYPE: BUTTERFLY VALVE APPLICATION: BUTTERFLY VALVE 8 INCH TYPE 9110 MFR: FISHER CONTROLS CO. PART #: H11780X0032	254102550	1,493.10 EA
4	2	EA	PACKING, RING, MATERIAL: TEFLON APPLICATION: FOR 24 INCH TYPE 7640 BUTTERFLY VALVE MFR: FISHER CONTROLS CO. PART #: G1860401302	254102508	25.20 EA
5	5	EA	PACKING, , MATERIAL: TEFLON APPLICATION: FOR VEE-BALL VALVE SIZE 6 INCH 657-8-U MFR: FISHER CONTROLS CO. PART #: 1R516001012	254202275	19.53 EA
6	1	EA		254200670	54.81 EA

(CONT. ON PAGE 3)

SHIPPING TERMS

CASH TERMS

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6. ALL OCONEE NUCLEAR STATION PURCHASING DEPARTMENT CORRESPONDENCE IS TO BE MAILED TO: DUKE POWER COMPANY OCONEE NUCLEAR STATION PURCHASING DEPARTMENT PO BOX 219

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

FILE COPY

ROA_03303

Jolly - Fisher Exh 940-0357

731077644
731077432

ENC ENC ENC ENC V#90520801 OT04 EU76 STK JLR/TLC/

GC2444 FCC9370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

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ORDER DATE

PAGE 3

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER: NC26 SC1002-19
EIN NUMBER: 56-020550

MAIL INVOICE AS DIRECTED UNDER NOTICE TO SELLER*

BUYER, WHOSE ADDRESS AND SIGNATURE APPEAR BELOW, AGREES TO PURCHASE FROM SELLER THE GOODS AND/OR SERVICES DESCRIBED BELOW UPON THE TERMS AND CONDITIONS SET FORTH ON BOTH THE FRONT AND REVERSE SIDES OF THIS PURCHASE ORDER. SELLER SHALL TRANSFER AND DELIVER TO BUYER OR TO PERSON HEREIN DESIGNATED AT THE LOCATION AT THE TIME OR TIMES AND BY THE MEANS HEREIN SPECIFIED THE FOLLOWING GOODS AND/OR SERVICES.

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
7	1	EA	SEAL, , TYPE: BALL APPLICATION: FOR 6 INCH TYPE 657-8-U CONTROL VALVE MFR: FISHER CONTROLS CO. PART #: 1R9703-36142 DWG #: CU5686	254200671	308.70 EA
8	2	ST	RING, BACK-UP APPLICATION: FOR FISHER 6 INCH BALL VALVE MFR: FISHER CONTROLS CO. PART #: 1P5698-36042 DWG #: CU5686	254600596	25.83 ST
9	3	EA	PACKING SET, APPLICATION: FOR FISHER VALVE 6 INCH TYPE EHT AND SIZE 16 INCH VALVE MFR: FISHER CONTROLS CO. PART #: 1R290801012	244400529	44.10 EA
			GASKET, FLANGED FITTING, TYPE: SPIRAL WOUND, MATERIAL: 316 SS WITH ASBESTOS, (CONT. ON PAGE 4)		

SHIPPING TERMS

CASH TERMS

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4. Show ID numbers on boxes and invoices if shown on this order.
5. TWO COPIES OF INVOICE, WITH FREIGHT BILL OR OTHER SHIPPING DOCUMENTS ATTACHED, ARE TO BE MAILED TO: DUKE POWER COMPANY INVOICE OPERATIONS - PB02G PO BOX 1015 CHARLOTTE NC 28201-1015
6. ALL OCONEE NUCLEAR STATION PURCHASING DEPARTMENT CORRESPONDENCE IS TO BE MAILED TO: DUKE POWER COMPANY OCONEE NUCLEAR STATION PURCHASING DEPARTMENT PO BOX 219 SENECA, SC 29679

DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

FILE COPY

ROA_03304

Jolly - Fisher Exh 940-0358

731077644
731077432

ENC ENC
ENC ENC

V#90520801 OT04

EU76 STK JLR/TLC/

SC2444 PC09370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES.

E14357-K2 **EDI**

ORDER DATE

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
0	2	EA	SIZE: 1-13/16" ID X 1-15/16" OD X .175" THK APPLICATION: FOR GLOBE VALVE TYPE DBQ SIZE 1 INCH MFR: FISHER CONTROLS CO. PART #: 1N297999102	254101906	166.95 EA
			LINER, , TYPE: VALVE APPLICATION: FOR TYPE 9110 VALVE MFR: FISHER CONTROLS CO. PART #: F262280678 2 DWG #: F11733 IT. 197 DELIVERY COMMITMENT: ITEMS 1 & 2 - STOCK PER S. MIRANDA ITEMS 3 & 4 - 2-3 WEEKS (04/15/93) BALANCE - 4-6 WEEKS (05/06/93) NEED DATE: ITEMS 1 & 2 - 03/31/93 BALANCE - ON OR BEFORE 05/30/93 PRICE AND DELIVERY PER PRICE LIST DATED 03/03/93. PRICED BY B. PARKER (CONT. ON PAGE 5)		

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

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ROA_03305

Jolly - Fisher Exh 940-0359

731077644
731077432

ENC ENC V#90520801 OT04 EU76 STK JLR/TLC/
ENC ENC

CC2444 FCC9370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

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E14357-K2 **EDI**

ORDER DATE

PAGE 5

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			03/22/93.		
			********** * CONFIRMATION-DO NOT DUPLICATE (01) * **********		
			PURCHASE ORDER NUMBER, ID NUMBER, AND PART(S) NUMBER (AS APPLICABLE) MUST BE SHOWN ON ALL PACKING LISTS, BOXES, CARTONS, REELS, PART(S) TAGS, AND INVOICES. (05)		
			SHIPMENTS WILL BE ACCEPTED MONDAY THRU THURSDAY, 8:00 AM TILL 11:30 AM AND 12:30 PM TILL 4:30 PM, EXCEPT HOLIDAYS (INCLUDING EASTER MONDAY, DAY AFTER THANKSGIVING AND CHRISTMAS EVE). IN INSTANCES WHERE SHIPMENTS ARE NOT SO ENDORSED, ALL EXCESS CHARGES FOR DETENT ION OR REDELIVERY WILL BE REBILLED TO TH SUPPLIER. (82)		
			********** * PLEASE CONFIRM SHIP DATE UPON * * RECEIPT OF THIS ORDER *		
			(CONT. ON PAGE 6)		

SHIPPING TERMS

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

ADDRESS REPLY TO:

FILE COPY

Jolly - Fisher Exh 940-0360

731077644
731077432

ENC ENC V#90520801 OT04 EU76 STK JLR/TLC/
ENC ENC

GC2444 PCC9370

DUKE POWER COMPANY

PURCHASING DEPARTMENT

PURCHASE ORDER

THIS PURCHASE ORDER NUMBER MUST APPEAR ON ALL COPIES OF THE INVOICE AND ON ALL PACKAGES. E14357-K2 **EDI**

ORDER DATE

PAGE 6

SHIP TO

FISHER CONTROLS COMPANY
% ROBERT E MASON & CO
P O BOX 33424
CHARLOTTE N C 28233

HEREIN DESIGNATED SELLER

VIA

TAX CERTIFICATE NUMBER:
NC26 SC1002-19
EIN NUMBER: 56-020550

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ID NUMBER	PRICE
			* (4G) * **********		

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DUKE POWER COMPANY
PURCHASING DEPARTMENT
R.F. SMITH
General Manager, Purchases

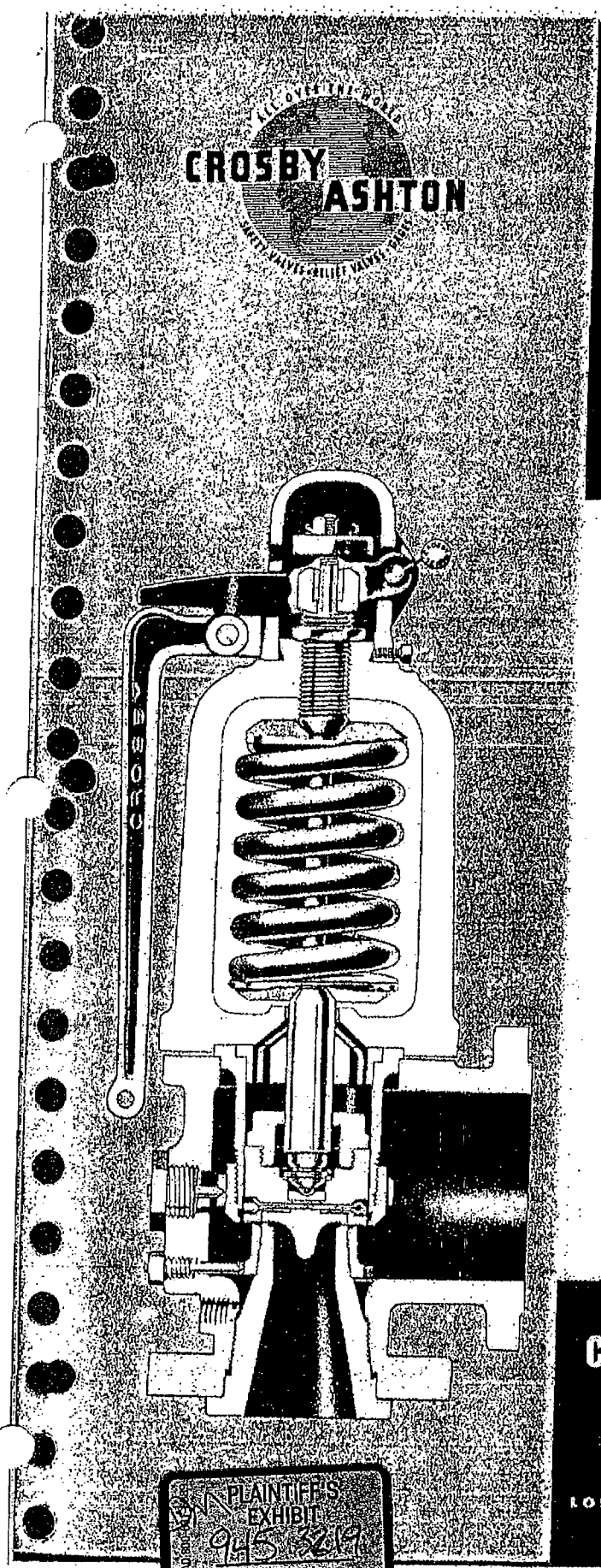
ADDRESS REPLY TO:

FILE COPY

ROA_03307

Jolly - Fisher Exh 940-0361

		DATE	INVOICE AMOUNT
6/3/93 Sch to ship wk of 7/8	7/19		



PLAINTIFF'S EXHIBIT
JHR 318

INSTRUCTIONS FOR THE OPERATION AND MAINTENANCE OF

CROSBY SAFETY VALVES

These instructions are compiled to assist operating engineers in the servicing of their safety valves. By following these recommendations it will be found easy to keep the valves in good condition so that they will...

- Stay tight
- Pop at their set pressures
- Open sharply without any simmer or warn
- Blow down not more than 4% of the set pressure
- Close tight without chatter

CROSBY VALVE & GAGE COMPANY

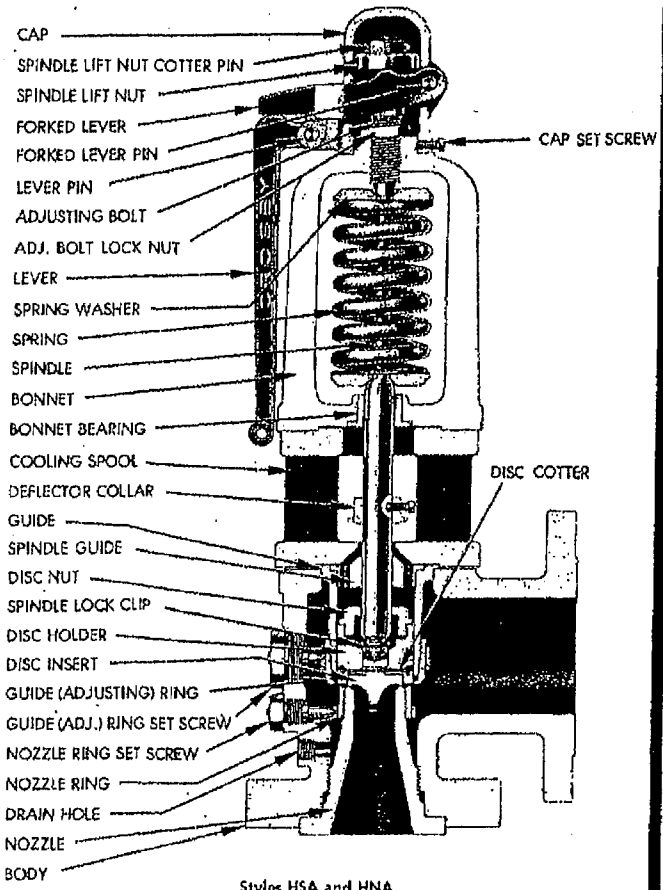
WRENTHAM, - MASS.

BOSTON • NEW YORK • CHICAGO • DALLAS
HOUSTON • LOS ANGELES

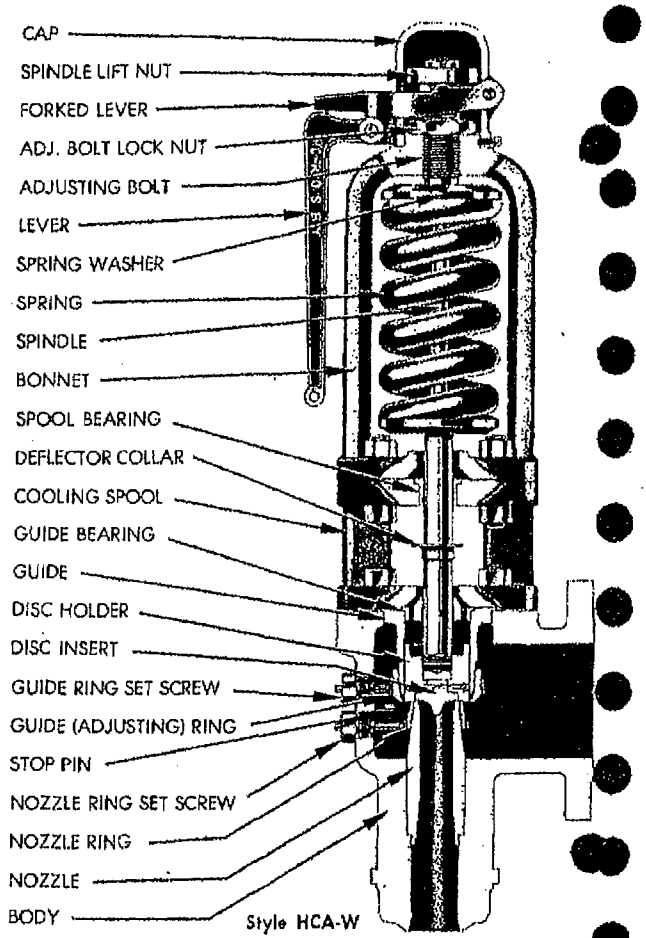
LONDON • PARIS • TORONTO • BALLARAT (AUSTRALIA)

PLAINTIFF'S EXHIBIT
945 3219

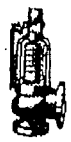
PART NAMES



Styles HSA and HNA
(Styles HS and HN do not have cooling spools)



Style HCA-W
(Styles HC and HCA have flanged inlet and Styles HC and HC-W have no cooling spool)



DESIGN

Many thousands of Crosby Nozzle Safety Valves are now in use, giving uniformly successful performance on all classes of service. They are handling the highest temperatures and pressures encountered in modern central stations and in marine power plants, providing the same trouble-free performance they give at more modest temperatures and pressures.

Crosby Nozzle Safety Valves have been chosen for these modern installations because of their freedom from the performance faults of other safety valves. They have high discharge capacities, stay tight over long periods of time, operate accurately and surely, have minimum blowdown, and low maintenance costs. Designs particularly adapted to meet the ASME and various other existing codes are regularly furnished. Crosby valves for "Marine Service" meet the latest rules of The United States Coast Guard, American Bureau of Shipping and Lloyds Register.

Crosby Nozzle Valves employ the reaction principle (see Figure 1) to obtain the great capacity, precise control, low blowdown, smooth operation and other features of Crosby valves.

The valve opens to—and closes from—a moderate lift. The high capacity of the Crosby Nozzle Safety Valve, is produced by a secondary, progressively increasing lift which is distinct from the initial opening. After the valve has popped to a moderate lift, a slight accumulation of pressure lifts the disc higher. This movement progressively exposes an upper adjusting ring which deflects the steam flow in a downward direction through an angle of approximately 180°. The reactionary force resulting from this deflection is transmitted to the face of the disc lifting it to a higher position. The higher lift in turn increases the rate of flow which subsequently increases the lifting force until "full bore" lift is attained, this lift being readily attained at 3 percent accumulation (overpressure) above the set pressure.

Thermal and mechanical distortion of the valve body is undesirable and often results in leakage. Crosby valves are designed to minimize the effect of body distortion on the operation of the valves by the use of full nozzle construction, and by the use of "synchro-discs."

Full Nozzles used in flanged inlet valves are screwed into the body from the inlet end until the top of the nozzle flange makes up against the face of the body. As the bottom of the nozzle flange is in contact with the face of the boiler nozzle flange it is evident that tightening of the inlet flange bolts will result in positive clamping with a minimum tendency to distort alignment of the nozzle in the body.

In valves for higher pressures having either welding-end or flanged inlet, the nozzle is screwed into the body from the top and seal-welded in place before the nozzle is perfectly contoured to provide maximum discharge capacity. This seal-weld design prevents transmission of strain or distortion which might be introduced when field welding the valve in place.

The full nozzle construction and the seal-welded nozzle construction eliminates threaded joints under pressure. Nozzles and synchro-disc inserts (made from the same material) are so designed with respect to their mass distribution, that they expand and contract together thereby eliminating the galling of the seating surfaces which would be caused by unequal mass distribution. Seating surfaces are flat and of equal width thereby preventing indentation of one another and are easy to maintain.

A frequent cause of faulty operation is eliminated by the use of top guided discs. There are no feather guides below the disc to obstruct flow or stick as a result of expansion or scale formation.

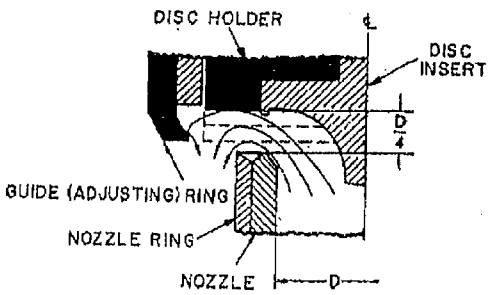


Fig. 1.

INSTALLATION

Safety valves are set to open and close within narrow pressure limits, therefore installations require careful planning. Restrictions in either the inlet or outlet connections will affect the normal operation of the valve. Valves are sometimes badly damaged just as they go into service because of failure to clean the connections. It is essential that the boiler, valve inlet, and all connections be cleaned thoroughly before the valve is mounted.

Inlet Side— Safety valves connected with pipe or fittings between the boiler and the valve are likely to chatter, that is, open and close rapidly because of the drop in pressure under the valve seat caused by the restriction to flow offered by the piping. For this reason, Code requirements limit the distance between valve inlet and the boiler to the length of a standard tee fitting. Whenever it is necessary to install a valve on the end of a pipe it is recommended that a pipe size larger than the inlet size of the valve be used and that this pipe be reduced down to the valve size just below the valve. The approach line should have well rounded entrances to permit unrestricted flow.

It is recommended that the inlet connection bolts or studs be drawn down evenly to avoid as much as possible the straining of the valve body. This simple precaution assures a tighter joint, minimum body distortion and equal bolt stresses, all contributing to trouble-free performance.

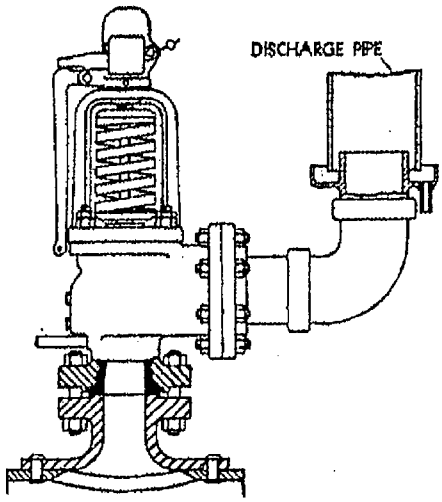


Fig. 2.

Discharge Side— The discharge piping from the safety valves should be arranged to reduce back pressure to a minimum. Back pressures affect the operation of safety valves and where several valves discharge into a common header, back pressure from one valve blowing may cause the other valves to open at pressures other than those for which they are set, unless great care is used to introduce the individual lines at an angle as close as possible to parallel with the common header and in the direction of flow. It is better to pipe the discharge from each valve separately to the atmosphere. Discharge lines should have separate supports (see Figure 2) so designed that the weight of the piping will at no time be taken up by the valve body. Strain on the valve, caused either by pipe expansion or by unsupported weight is often the cause of leakage.

During the initial hydrostatic test on a boiler it is recommended that blank flanges be used on the boiler connection in place of the safety valves. Where welding-end connections are used on higher pressure boilers and reheaters it is recommended that test plugs be installed in the safety valve nozzles. Safety valves are often injured due to unduly severe gagging resulting in bent spindles and damage to the seats. This causes unnecessary delay in starting up and becomes a source of annoyance until valves can be reconditioned.

If it is absolutely necessary to gag the safety valves for hydrostatic tests, or during the testing of the safety valves themselves the gagging should be done with extreme care. See Figure 5. It is not necessary to tighten the gag screw with great force. A wing nut type screw head is used on the gags to permit finger tightening, which is all that is required. **Do not use a wrench.**

When the normal boiler pressure is reached in starting up it is recommended that each valve be lifted, by use of the hand levers, before they are subjected to operating tests to allow blowing out of any chips, scale, welding beads or other foreign matter which might cause injury to the valve.

Always use a recently calibrated test gage when setting the valves. Place the gage connection as close to the valve as possible.

OPERATION

The valve will open with a sharp, clear pop at the pressure for which it is set, with practically no preliminary warm, or simmering. If the pressure accumulates above the set pressure, the lift will increase until the maximum lift and rated

valve capacity are obtained at a pressure 3 percent above the set pressure. When the pressure drops below the set pressure, the lift gradually diminishes until the valve closes sharply, with a blowdown of not more than 4 percent of the set pressure and with no simmering or leakage after closing.

Unless a safety valve is allowed a proper blowdown, its operation will be uncertain. The disc moves up or down when the force of the steam under it becomes greater or less than the force of the spring. The greater the blowdown the greater the operating forces and the more positive the valve operation. 3 percent should be considered a safe minimum blowdown. If the valve is set for less blowdown it may not develop its rated capacity within 3 percent accumulation of pressure. A valve is not defective if it will not operate properly on 2 percent blowdown.

The normal working pressure must always be below the pressure at which the lowest set valve closes. At the set or popping pressure of a valve, the steam load under the disc balances the spring load on top. Therefore the closer the boiler pressure is to the popping pressure of the valve, the smaller the load holding the disc down and the more possibility there is of leakage, with the consequent damage to seats.

Springs are designed to cover definite ranges of pressure. If used outside these ranges, the proper adjustment of the valve becomes difficult or impossible.

VALVE TROUBLES

Troubles occurring in the safety valve may be grouped under three general headings (a) Leakage (b) Incorrect Popping Pressure, (c) Faulty Operation.

Leakage at normal working pressure is usually caused by damaged seats or by lodged scale. It is sometimes possible to blow out lodged scale by giving several quick pulls on the lifting gear. If this does not stop the leakage, the seats are probably damaged and they should be repaired as soon as possible.

Strains set up in the valve body, either by pipe expansion or by weight of unsupported discharge piping also cause leakage. Such leakage can be stopped by relieving these strains.

Under normal operating conditions, a safety valve should pop consistently within the tolerances allowed by the Code. However, if under these same conditions the valve should fail to pop within the allowable tolerances, dirt or scale wedged between the disc holder and the guide or a deposit of hardened boiler compound on the nozzle under the seat may be causing it to stick. The valve should therefore be dismantled for cleaning.

If the valve pops too low, the seats may have become damaged. Low popping pressure is seldom caused by spring set, although this is considered a common cause.

Excessive warm, failure to close sharply, or too long blowdown, indicate improper adjustment, damaged seats or sticking. If adjustment does not remedy the trouble, the valve should be dismantled and examined.

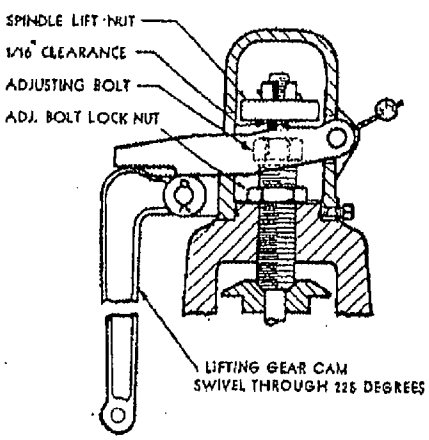


Fig. 3.

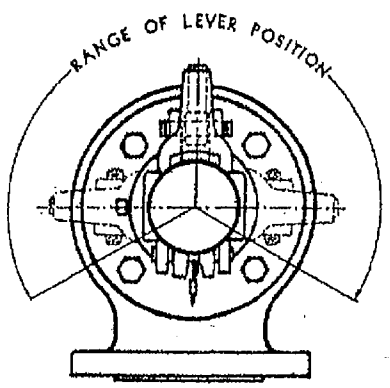


Fig. 4.

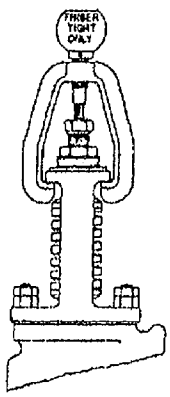


Fig. 5.

ADJUSTMENT

Before making any adjustments care should be taken to comply with the local rules and regulations which may require an inspector to un-seal and to re-seal the valve.

To Change The Popping Pressure

Remove forked lever pin and forked lever, loosen cap set-screw and remove cap. Loosen the adjusting bolt lock nut (see Figures 3 and 4).

Important— The disc should never be turned on the seat. For this reason, the popping pressure should be adjusted while the valve is blowing or when the pressure under the seat is at least 5% below the actual popping pressure of the valve. Raise the boiler pressure until the valve pops. Allow the valve to close, then make adjustment. Raise the pressure again to determine whether the valve is set to the desired popping pressure. If not, repeat the process. The adjusting bolt lock nut must be securely tightened after each popping pressure adjustment to prevent turning of the bolt while valve is blowing.

Unless the change in popping pressure is slight, blowdown adjustment may be necessary. Raising the popping pressure lengthens the blowdown, lowering it shortens the blowdown.

To Adjust Blowdown

The Guide (Adjusting) Ring, shown in Figure 6, is the principal means of blowdown adjustment. Lowering the ring increases and raising it decreases the blowdown.

To change the guide (adjusting) ring position, remove the guide (adjusting) ring set screw (upper set screw). Insert a screw driver or similar tool and engage the notches of the guide (adjusting) ring.

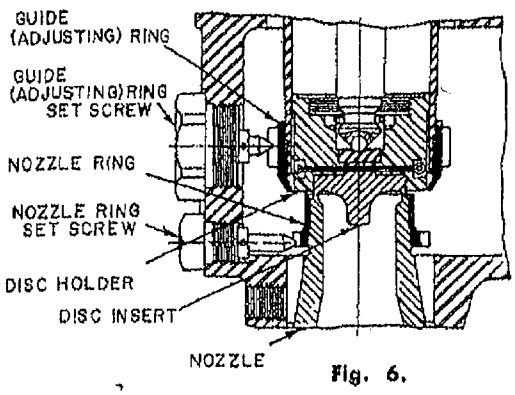


Fig. 6.

Pushing the notches to the right raises the ring and shortens the blowdown.

Pushing the notches to the left lowers the ring and lengthens the blowdown.

If the guide (adjusting) ring is raised too high in the attempt to shorten the blowdown, it will not control the valve—the opening lift will be very low and the closing will be indistinct and dragged out. In such a case move the ring down until positive action is obtained.

Do not move the guide (adjusting) ring more than ten notches without retesting. Always replace and tighten the set screw, being careful that it engages one of the ring notches and does not bear on top of a tooth.

Precision Adjustment

The precision adjustment (setting of the nozzle ring) is made at the factory and resetting in service is seldom necessary. The nozzle ring should not be moved more than five notches from its original position and not more than two notches before retesting the valve.

To adjust the nozzle ring (see Figure 6) remove the lower set screw and insert screw driver to engage the notches thereon.

Turning the ring to the right raises it thereby increasing its power, eliminating warm (simmer) and increasing the blowdown.

Turning the ring to the left lowers it thereby decreasing its power, increasing warm and decreasing the blowdown.

When making adjustments, always keep count of the number of notches and the direction each ring is moved. This will permit returning to the original settings in case of error and thereby prevent getting the valve badly out of adjustment.

DISASSEMBLING

First remove the cap and lever (see "Adjustment"). Remove the spindle lift nut and before releasing the tension on the spring by unscrewing the adjusting bolt, spot the top and bottom spring washer with a center punch and measure the compression of the spring with a pair of dividers. When the valve is reassembled, the spring should be compressed the same amount.

Next remove the body nuts and lift the bonnet over the spindle. The working parts can then be taken out for inspection or cleaning.

Valves with cooling spools have a deflecting collar held

to the spindle by a set screw. Loosen the collar before removing bonnet and cooling spool. It is not necessary to break the joint between bonnet and cooling spool.

A special wrench is necessary to remove nozzle. If the nozzle should stick due to accumulation of deposit in the threads, soak in penetrating oil or heat the body adjacent to the threads.

CONDITIONING SEATS

The tightness of the valve and its proper operation depend directly on the condition of the seats. Many safety valve troubles are due to worn or damaged seats.

The nozzle seat is on the top of the nozzle being 1/16" wide in most valve sizes. The disc seat is of the same diameter and width. Both seats are flat and it is important that both surfaces be true, without irregularities or scratches. See Figures 7 and 8.

Unless the seats have been damaged by dirt or scale, lapping the surfaces occasionally should keep the valve in good condition. Lapping must be very carefully done--the seats must be kept perfectly true.

Never lap the disc against its seat. Lap each part separately using a cast iron lapping block. After the rough lapping polish the seating surfaces by using a small amount of fine compound spread evenly on the truest side of the block. Continue to lap, occasionally wiping seat clean until block is practically dry. This produces a very smooth polished finish. In lapping use a semi-rotary motion, turning the block occasionally to another position.

The lapping block should be checked frequently on a surface plate. Do not use a lapping block which is not perfectly true.

The nozzle seat can be lapped in position after the top structure of the valve has been disassembled. Boiler compound, or any other deposit, should be scraped off lightly before lapping.

The conical disc insert must be removed from the disc holder before lapping. Upon reassembly, the disc insert should be free to tilt slightly in any direction and must project slightly beyond the recess in the disc holder. Do not attempt to machine the disc insert or the disc holder. Carry spare disc inserts.

REMACHINING

If remachining or other major repairs are necessary, it is strongly recommended that the valve be returned to the factory, because all parts must be accurately centered and the work carefully done. No safety valve will be tight or will operate properly unless all parts line up exactly.

The simplest and most satisfactory way to remachine the nozzle seat is by means of the reseating machine, (illustrated in Figure 9) and cutters specially designed for this purpose. This method eliminates breaking the connections or removing the valve from the boiler.

If a Crosby reseating machine is not available the nozzles can be removed from the body or the body (with the nozzle in place) may be mounted in a lathe to effect the necessary machining. It is vitally important that the part to be machined must run absolutely true before machining is done and that the proper seat contours be machined. Remachining templates are available for this purpose and are highly recommended.

Some types of Crosby valves, for lower pressures and temperatures, use what is termed a "solid one-piece" disc instead of the "disc-holder and disc insert". These discs may be machined to their proper contours, using a similar template gage as used for machining the nozzle seat contours.

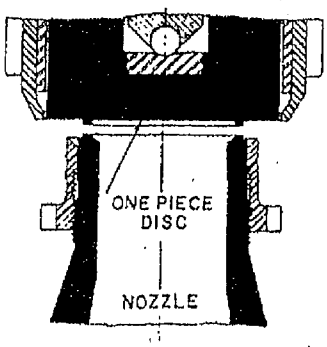


Fig. 7.

The machining is best accomplished by the use of a tool having a pointed nose like a threading tool with a downward rake of 15 degrees and a back rake 15 degrees. Take very light cuts using white lead and lard oil as lubricants.

After machining the seat to a fine finish it must be lapped as suggested under the heading "Conditioning Seats".

REASSEMBLING

Before reassembling check the following points:–

(1) See that nozzle ring is below the seating surface of the nozzle. Leave the nozzle ring set screw out until valve is completely assembled.

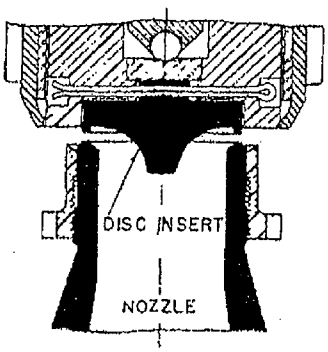


Fig. 8.

(2) Check the height from the seat to the top of the valve body with a combination square and see that the distance from the underside of the guide flange to the bottom of the guide (adjusting) ring is the same. This "LEVEL" setting of the ring is illustrated in Figure 11.

(3) See that the surface under the guide flange is clean so that the guide will not be "cocked."

(4) Make sure that the guiding surfaces on the spindle and the bearings themselves are properly cleaned with fine sand paper or emery cloth. WIPE THOROUGHLY CLEAN.

(5) Inspect conical disc insert after it has been assembled into the disc holder to see that it tilts freely in all directions. Watch out that the cotter pin does not bind it in any way.

(6) Make certain that the disc holder spins freely on the spindle when held in upright position with disc holder at the top. If the top part of the spindle has become damaged due to excessive gagging it is very important that the spindle be straightened so that the middle and the ends run true within .002".

(7) Insert the complete disc holder and spindle assembly into the guide and place the guide into the body. Leave the guide (adjusting) ring set screw out of the valve until valve is completely assembled.

(8) Replace the bonnet (or in the case of valves with cooling spools and bonnets, both of these) making sure that the surface which fits the guide is perfectly clean. Before tightening the nuts inspect closely to see that spindle is free to spin when spinning action is applied to the spring. Push the bonnet assembly around until the greatest freedom is obtained, then tighten the nuts **evenly** so as not to cramp the assembly. After tightening check freedom by again turning the spindle.

(9) Compress the spring until the same measurement taken with the dividers when valve was disassembled is obtained. This will give the approximate popping pressure from which adjustments may be varied slightly to conform as desired. Be sure to tighten adjusting bolt nut.

(10) To adjust the nozzle ring, insert a screw driver or similar tool into the lower set screw hole and turn the ring upward (to the right) until it touches the disc holder. Then turn it down 5 or 6 notches or as stamped in the machined surface directly under the cap. The figure following the letters "NR" indicates the location of the nozzle ring as obtained on factory test.

(11) The guide (adjusting) ring may be returned to the position "as found" upon dismantling the valve or if this is lost it may be placed in the "level" position (see Figure 11) and then adjusted up or down as indicated by the number appearing after the letters "GR" stamped in the machined surface of the bonnet directly under the cap. A plus sign or minus sign preceding the number indicates how many notches the adjusting ring was located above or below the level position on factory test.

(12) After satisfactory setting has been obtained make sure that all set screws and lock nuts are tight, then attach the spindle nut and lifting gear as shown by Figure 3.

The safety of lives and property depends on the proper operation of safety valves. Consequently the valves should be kept clean and should be popped by hand occasionally to make sure they function properly.

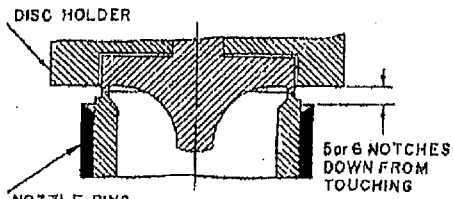


Fig. 10.

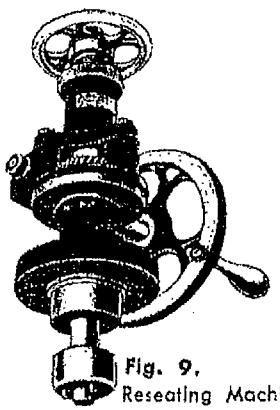


Fig. 9. Reseating Machine

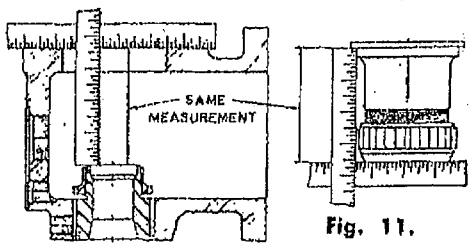


Fig. 11.

CONTROL VALVE HANDBOOK

Second Edition
First Printing

Price $5.00

FISHER CONTROLS COMPANY
Marshalltown, Iowa

PLAINTIFF EXHIBIT
FC 5003

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Preface to Second Edition

The first edition of this handbook has enjoyed considerable popularity for the last dozen years. As a source of reference material for those in the control valve industry, it has been well received and has been reprinted some eight times. Naturally, during the course of those years, control valve technology has changed and hardware designs have been improved. This edition attempts to document some of those changes, while retaining the general style and usefulness of the original work.

The general scope of this book is unchanged. The subject matter deals only with commonly used automatic control valves, primarily pneumatically operated. Valve accessories, sizing procedures, leakage criteria, fluid velocity, and standard reference tables are included. The industry standards referenced are the latest available at the time of this publication, and the information is presented in a manner intended to represent general practice in the control valve industry. The emphasis on cage-style control valve trim and on rotary-shaft control valves reflects the growing role these constructions are taking in modern industry applications. Also, this edition includes much more metric conversion information than did the first and acknowledges increased industry consciousness of environmental impact with an enlarged section on control valve noise abatement.

We are indebted to the many individuals who contributed to the preparation of this book. Also, we appreciate the cooperation of the Instrument Society of America, publishers of Standard S51.1, *Process Instrumentation Terminology*, and the Crane Company, publishers of Technical Paper No. 410, *Flow of Fluids Through Valves, Fittings, and Pipe*, in permitting us to quote portions of their respective documents.

While we hope this volume is found to be of merit, we welcome suggestions and comments on future additions and improvements. As advancements are made in control valve technology and hardware, further revisions of this book will be forthcoming and will include changes suggested by users of this edition.

Marshalltown, Iowa
October, 1977

Fisher Controls Company

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Section 1

Actuators and Valve Bodies

The following terminology section applies to the physical and operating characteristics of standard sliding-stem control valves with diaphragm or piston actuators. Some of the terms, particularly those pertaining to actuators, are also appropriate for rotary-shaft control valves. Many of the definitions presented are in accordance with ASME Standard 112, *Diaphragm Actuated Control Valve Terminology*, although other popular terms are also included. Additional parenthetical explanation is provided for some of the more complex terms. Component part names are called out on accompanying Figures 1-1 through 1-7. Separate sections follow that define specific rotary-shaft control valve nomenclature, control valve functions and characteristics terminology, and miscellaneous control terminology.

Control Valve Nomenclature

Actuator Spring: A spring, enclosed in the yoke, to move the actuator stem in a direction opposite to that created by diaphragm pressure.

Actuator Stem: A rod-like extension of the diaphragm plate or piston to permit convenient connection to the valve plug stem.

Actuator Stem Extension: An extension of the piston actuator stem to provide a means of transmitting piston motion to the valve positioner. *(See Figure 1-7.)*

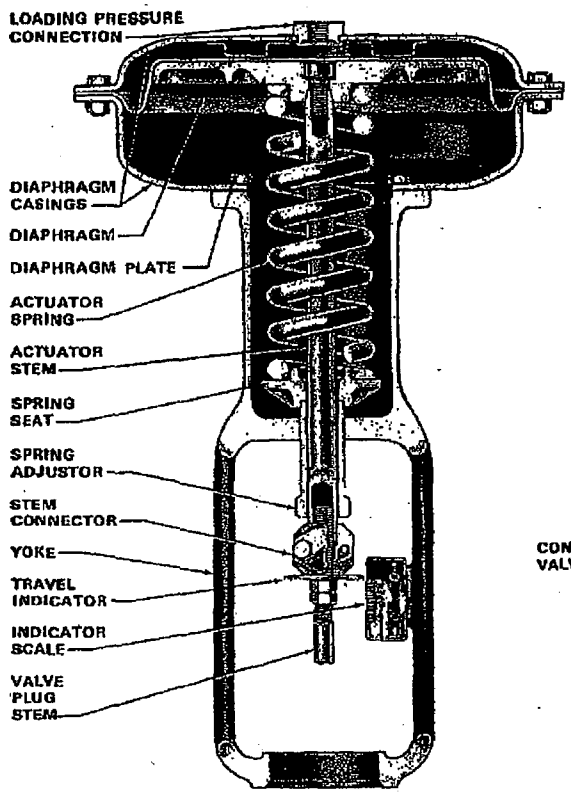
Angle Valve: A valve construction having inlet and outlet line connections on different planes, usually perpendicular to each other. *(See also Globe Valve.)*

Bellows Seal Bonnet: A bonnet which uses a bellows for sealing against leakage around the valve plug stem.

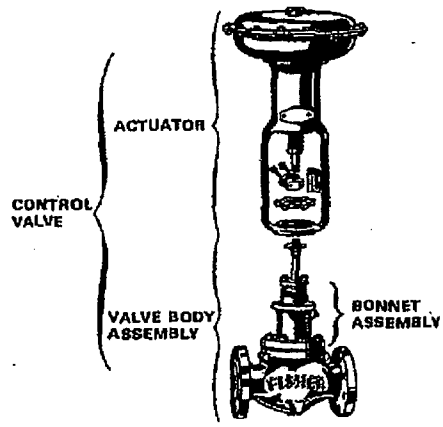
Bonnet: The major part of the bonnet assembly, excluding the sealing means. *(This term is often used in referring to the bonnet and its included packing parts. More properly, this group of component parts should be called the Bonnet Assembly.)*

Bonnet Assembly (Commonly *Bonnet*, more properly *Bonnet Assembly*): An assembly including the part through which a valve plug stem moves and a means for sealing against leakage along the stem. It usually provides a means for mounting the actuator.

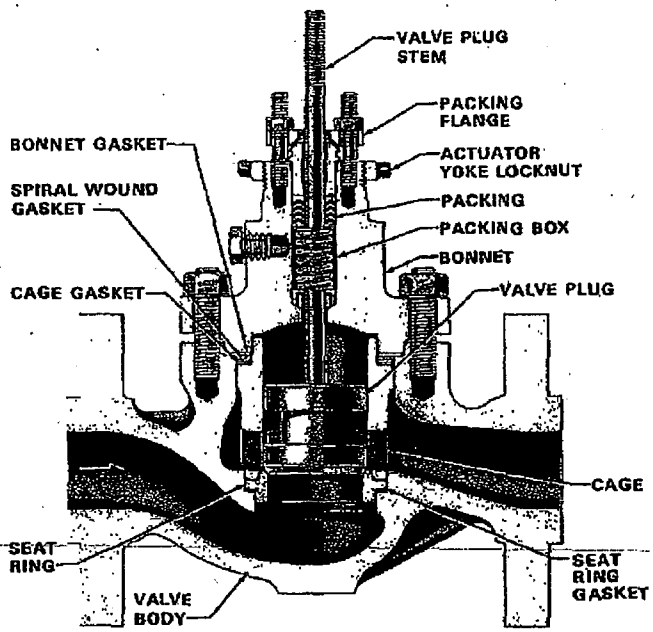
Bottom Flange: A part which closes a valve body opening opposite the bonnet assembly. In a three-way valve, it may provide an additional flow con-



DIRECT-ACTING ACTUATOR



RELATIONSHIP OF MAJOR COMPONENTS



PUSH-DOWN-TO-CLOSE VALVE BODY ASSEMBLY

Figure 1-1. Major Components of Typical Control Valve Assembly

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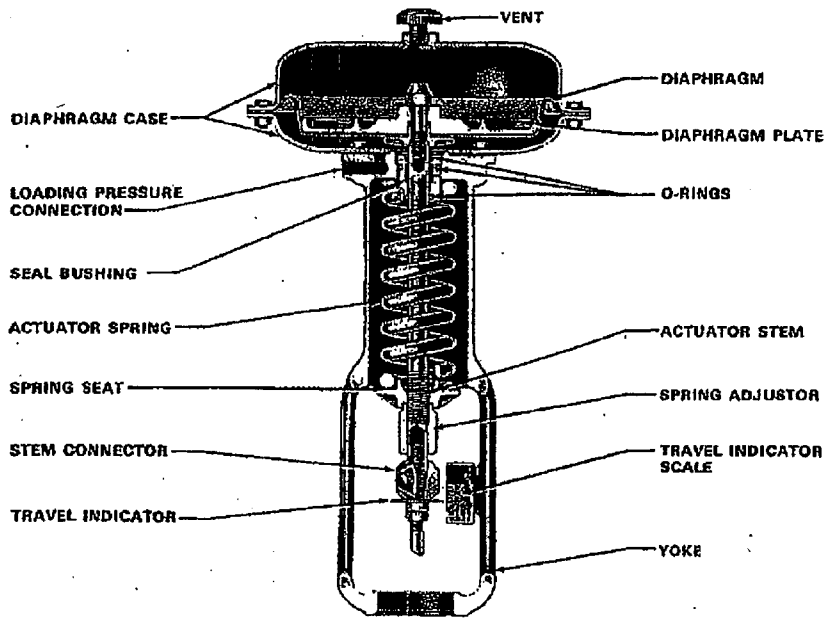

Figure 1-2. Typical Reverse-Acting Diaphragm Actuator

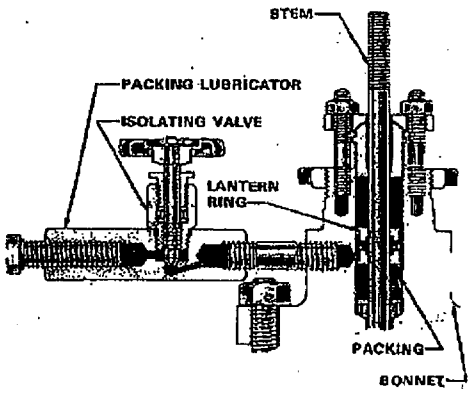

Figure 1-3. Packing Lubricator and Isolating Valve

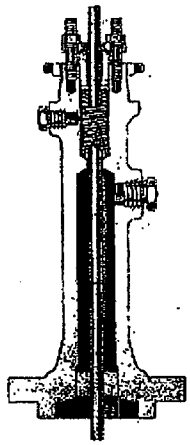

Figure 1-4. Extension Bonnet

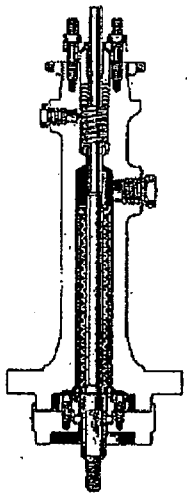

Figure 1-5. Bellows Seal Bonnet

nection. (See typical bottom flange in Figure 1-23.)

Cage: A hollow cylindrical trim element that is a guide to align the movement of a valve plug with a seat ring and/or retains the seat ring in the valve body. *(The walls of the cage contain openings which usually determine the flow characteristic of the control valve. Various cage styles are shown in Figure 1-37.)*

Cylinder: The chamber of a piston actuator in which the piston moves. *(See Figure 1-7.)*

Cylinder Closure Seal: The sealing element at the connection of the piston actuator cylinder to the yoke.

Diaphragm: A flexible pressure responsive element which transmits force to the diaphragm plate and actuator stem.

Diaphragm Actuator: A fluid pressure operated spring opposed or fluid pressure opposed diaphragm assembly for

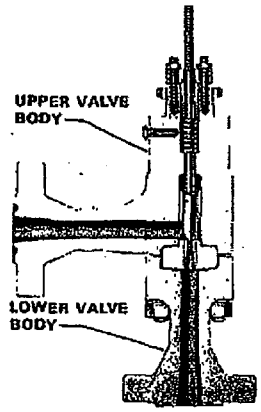

Figure 1-6. Typical Split Valve Body

positioning the actuator stem in relation to the operating fluid pressure or pressures.

Diaphragm Case: A housing, consisting of top and bottom sections, used for supporting a diaphragm and establishing one or two pressure chambers.

Diaphragm Plate: A plate concentric with the diaphragm for transmitting force to the actuator stem.

Direct Actuator: A diaphragm actuator in which the actuator stem extends with increasing diaphragm pressure.

Extension Bonnet: A bonnet with an extension between the packing box and bonnet flange for hot or cold service.

Globe Valve: A valve construction style with a linear motion flow controlling member with one or more ports, normally distinguished by a globular-shaped cavity around the port region. *(Globe valves can be further classified as: Two-way single-ported, Figure 1-16; Two-way double-ported, Figure 1-24; Angle-style, Figure 1-17; Three-way, Figure 1-26; Split-style, Figure 1-6; Unbalanced cage-guided, Figure 1-1; and Balanced cage-guided, Figure 1-21.)*

Guide Bushing: A bushing in a bonnet, bottom flange, or body to align the movement of a valve plug with a seat ring.

Isolating Valve: A hand-operated valve between the packing lubricator and the packing box to shut off the fluid pressure from the lubricator.

Lower Valve Body: A half housing for internal valve parts having one flow connection. *(The seat ring is normally clamped between the upper valve body and the lower valve body in split valve constructions such as that shown in Figure 1-6.)*

Packing Box (Assembly): The part of the bonnet assembly used to seal against leakage around the valve plug stem. Included in the complete packing box assembly are various combinations of some or all of the following component parts: Packing, Packing Follower, Packing Nut, Lantern Ring, Packing Spring, Packing Flange, Packing Flange Studs or Bolts, Packing Flange Nuts, Packing Ring, Packing Wiper Ring, Felt Wiper Ring. *(Individual packing parts are shown in Figure 1-34.)*

Packing Lubricator: An optional part of the bonnet assembly used to inject lubricant into the packing box.

Piston: A movable pressure responsive element which transmits force to the piston actuator stem. *(See Figure 1-7.)*

Piston Actuator: A fluid pressure operated piston and cylinder assembly for positioning the actuator stem in relation to the operating fluid pressure. *(Most piston actuators, such as that shown in Figure 1-7, are double-acting so that full power can be developed in either direction.)*

Port: A fixed opening, normally the inside diameter of a seat ring, through which fluid passes.

Retaining Ring: A split ring that is used to retain a separable flange on a valve body.

Reverse Actuator: A diaphragm actuator in which the actuator stem

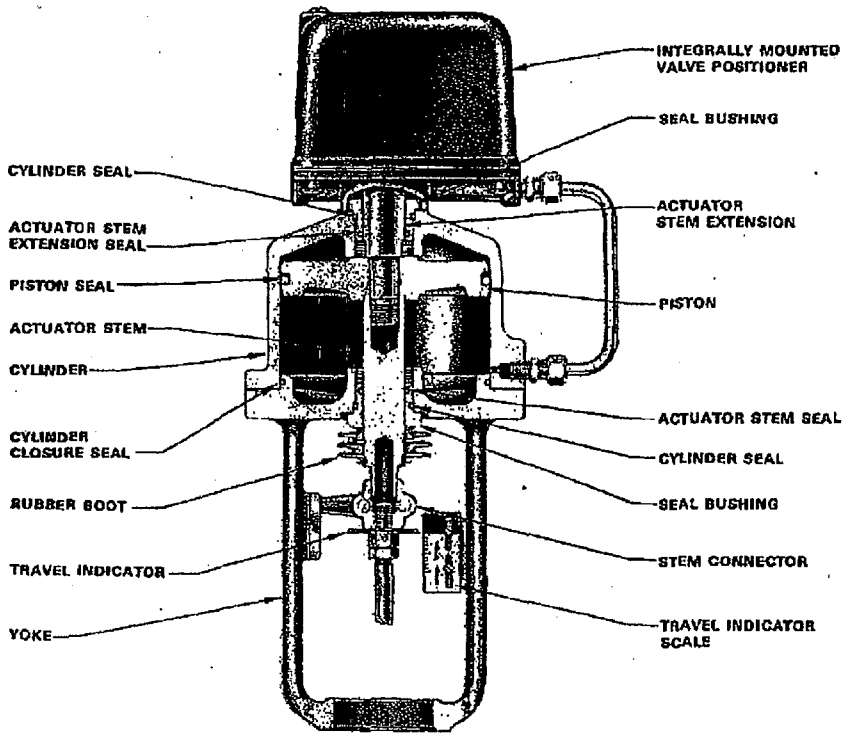

Figure 1-7. Typical Double-Acting Piston Actuator

retracts with increasing diaphragm pressure. *(Reverse actuators have a seal bushing installed in the upper end of the yoke to prevent leakage of the diaphragm pressure along the actuator stem. The seal bushing is shown in Figure 1-2.)*

Rubber Boot: A protective device to prevent entrance of damaging foreign material into the piston actuator.

Seal Bushing: Top and bottom bushings that provide a means of sealing the piston actuator cylinder against leakage. *(Synthetic rubber O-rings are used in the bushings to seal the cylinder, the actuator stem, and the actuator stem extension as shown in Figure 1-7.)*

Seat: That portion of the seat ring or valve body which a valve plug contacts for closure.

Seat Ring: A separate piece inserted in a valve body to form a valve body port.

Separable Flange: A flange which fits over a valve body flow connection. It is generally held in place by means of a retaining ring.

Spring Adjustor: A fitting, usually threaded on the actuator stem or into the yoke, to adjust the spring compression.

Spring Seat: A plate to hold the spring in position and also to provide a flat surface for the spring adjustor to contact.

Stem Connector: A clamp, in two pieces, to connect the actuator stem to the valve plug stem.

Travel Indicator: A pointer, attached near the stem connector, to indicate the travel of the valve plug.

Travel Indicator Scale: A graduated scale attached to the yoke for indication of valve travel.

Trim: The internal parts of a valve which are in flowing contact with the controlled fluid. *(In a globe valve body, trim would typically include valve plug, seat ring, cage, stem, and stem pin.)*

Trim, Soft-seated: Globe valve trim with an elastomer, plastic, or other readily deformable material used as an insert, either in the valve plug or seat ring, to provide very tight shutoff with minimal actuator force.

Upper Valve Body: A half housing for internal valve parts and having one flow connection. *(It usually includes a means for sealing against leakage along the stem and provides a means for mounting the actuator on the split valve body. See Figure 1-6.)*

Valve Body: A housing for internal parts having inlet and outlet flow connections. Among the most common valve body constructions are: a) Single-ported valve bodies having one port and one valve plug, b) Double-ported valve bodies having two ports and one valve plug, c) Two-way valve bodies having two flow connections, one inlet and one outlet, d) Three-way valve bodies having three flow connections, two of which may be inlets with one outlet (for converging or mixing flows), or one inlet and two outlets (for diverging or diverting flows). *(The term* Valve Body, *or even just* Body, *frequently is used in referring to the valve body together with its bonnet assembly and included trim parts. More properly, this group of components should be called the* Valve Body Assembly.*)*

Valve Body Assembly (Commonly *Valve Body* or *Body*, more properly *Valve Body Assembly*): An assembly of a body, bonnet assembly, bottom flange (if used), and trim elements. The trim includes the valve plug which opens, closes, or partially obstructs one or more ports.

Valve Plug: A movable part which provides a variable restriction in a port.

Valve Plug Guide: That portion of a valve plug which aligns its movement in either a seat ring, bonnet, bottom flange, or any two of these.

Valve Plug Stem: A rod extending through the bonnet assembly to permit positioning the valve plug.

Yoke: A structure by which the diaphragm case or cylinder assembly is supported rigidly on the bonnet assembly.

Rotary-Shaft Control Valve Nomenclature

The definitions that follow apply specifically to rotary-shaft control valves. Component part names or installation locations are shown in Figure 1-8.

Actuator Lever: Arm attached to rotary valve shaft to convert linear actuator stem motion to rotary force to position disc or ball of rotary-shaft valve. *(The lever normally is positively connected to the rotary shaft by close tolerance splines or other means to minimize play and lost motion.)*

Ball, Full: The flow-controlling member of rotary-shaft control valves utilizing a complete sphere with a flow passage through it. *(Many varieties use trunnion-mounted, single-piece ball and shaft to reduce torque requirements and lost motion.)(Not illustrated.)*

Ball, V-notch: The flow-controlling member for the most popular styles of throttling ball valves. The V-notch ball includes a polished or plated partial-sphere surface that rotates against the seal ring throughout the travel range. The V-shaped notch in the ball permits wide rangeability and produces an equal percentage flow characteristic.

Note:

The balls mentioned above, and the discs which follow, perform a function comparable to the valve

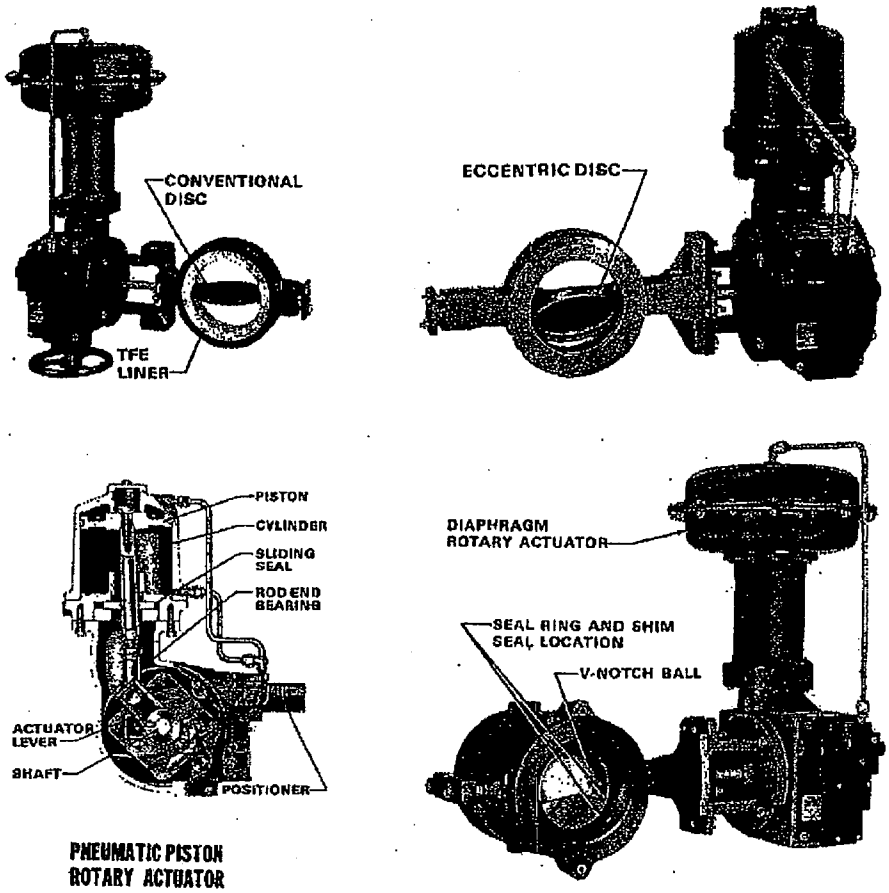

Figure 1-8. Typical Rotary-Shaft Control Valve Constructions

plug in a globe-style control valve. That is, as they rotate they vary the size and shape of the flowstream by opening more or less of the seal area to the flowing fluid.

Disc, Conventional: The flow-controlling member used in the most common varieties of butterfly rotary valves. High dynamic torques normally limit conventional discs to 60 degrees maximum rotating in throttling service.

Disc, Dynamically Designed: A butterfly valve disc *(such as Fisher's patented* **Fishtail®** *disc)* contoured to reduce dynamic torque at large increments of rotation, thereby making it suitable for throttling service with up to 90 degrees of disc rotation.

Disc, Eccentric: Common name for valve design in which the positioning of the valve shaft/disc connections causes the disc to take a slightly eccentric path on opening. *(This allows the disc to be swung out of contact with the seal as soon as it is opened, thereby reducing friction and wear.)*

Flangeless Body: Body style common to rotary-shaft control valves. Flangeless bodies are held between ANSI-class flanges by long through-bolts. *(Sometimes also called wafer-style valve bodies.)*

Flow Ring: Heavy-duty ring used in place of ball seal ring for V-notch rotary valves in severe service applications where some leakage can be tolerated.

Reverse Flow: Flow of fluid in the opposite direction from that normally considered the standard direction. *(Some rotary-shaft control valves, such as conventional-disc butterfly valves, are capable of handling flow equally well in either direction. Other rotary designs may require modification of actuator linkage to handle reverse flow. Capacity and allowable working pressures are often lowered to maintain allowable leakage limits with flow in the reverse direction.)*

Rod End Bearing: The connection often used between actuator stem and actuator lever to facilitate conversion of linear actuator thrust to rotary force with minimum of lost motion. *(Use of a standard reciprocating actuator on a rotary-shaft valve body commonly requires linkage with two rod end bearings; however, selection of an actuator specifically designed for rotary-shaft valve service requires only one such bearing and thereby reduces lost motion.)*

Rotary-Shaft Control Valve: A valve style in which the flow closure member (full ball, partial ball, or disc) is rotated in the flowstream to modify the amount of fluid passing through the valve. *(Typical rotary-shaft control valves are shown in Figure 1-8.)*

Seal Ring: The portion of a rotary-shaft control valve assembly corresponding to the seat ring of a globe valve. Positioning of the disc or ball relative to the seal ring determines the flow area and capacity of the unit at that particular increment of rotational travel. As indicated above, some seal ring designs permit bi-directional flow.

Shaft: The portion of a rotary-shaft control valve assembly corresponding to the valve stem of a globe valve. Rotation of the shaft positions the disc or ball in the flowstream and thereby controls the amount of fluid which can pass through the valve.

Shim Seals: Thin, flat, circular metal gaskets, usually 0.005-inch (0.125 mm) thick, used in varying numbers to adjust seal deflection in V-notch ball rotary control valves. *(Adding more shim seals reduces the amount of seal deflection; reducing the number of shim seals used increases the amount of seal deflection obtained.)*

Sliding Seal: The lower cylinder seal in a pneumatic piston-style actuator designed for rotary valve service. *(This seal permits the actuator stem to move both vertically and laterally without leakage of lower cylinder pressure.)*

Standard Flow: For those rotary-shaft control valves having a separate seal ring or flow ring, the flow direction in which fluid enters the valve body through the pipeline adjacent to the seal ring and exits from the side opposite the seal ring. *(Sometimes called* Forward Flow. *See also* Reverse Flow.)

Trunnion Mounting: A style of mounting the disc or ball on the valve shaft or stub shaft with two bushings diametrically opposed.

Wafer-style Valve Body: A flangeless type of butterfly or gate, short face-to-face, valve body. Also called a flangeless valve body; it is clamped between pipeline flanges.

Zero Deflection: The point at which the addition of one 0.005-inch (0.125 mm) thick shim seal causes contact between the V-notch ball and the ball seal ring to be broken. *(This is the point from which proper ball seal ring deflection is established. All parts must be held tightly together to properly determine the point of zero deflection.)*

Control Valve Functions and Characteristics Terminology

Capacity: Rate of flow through a valve under stated conditions.

Dead Band: The range through which an input can be varied without initiating observable response. *(In a diaphragm-actuated control valve, dead band is the amount the diaphragm pressure can be changed without initiating valve stem movement. It is usually expressed as a percent of diaphragm pressure span.)*

Diaphragm Pressure Span: Difference between the high and low values of the diaphragm pressure range. This may be stated as an inherent or installed characteristic.

Double-Acting Actuator: An actuator including a switching mechanism to permit powered operation in either direction, extending or retracting the actuator stem as dictated by the controller. *See Piston Actuator.*

Dynamic Unbalance: The net force produced on the valve plug in any stated open position by the fluid pressure acting upon it.

Effective Area: In a diaphragm actuator, the effective area is that part of the diaphragm area which is effective in producing a stem force. *(The effective area of a diaphragm may change as it is stroked, usually being a maximum at the start and a minimum at the end of the travel range. Molded diaphragms have less change in effective area than flat sheet diaphragms, and are recommended.)*

Equal Percentage Flow Characteristic: An inherent flow characteristic which for equal increments of rated travel, will ideally give equal percentage changes of the existing flow.

Fail-Closed: A condition wherein the valve port remains closed should the actuating power fail.

Fail-Open: A condition wherein the valve port remains open should the actuating power fail.

Fail-Safe: A characteristic of a particular type of actuator, which upon loss of power supply, will cause the valve plug, ball, or disc to fully close, fully open, or remain in fixed position. *(Fail-safe action may involve the use of auxiliary controls connected to the actuator.)*

Flow Characteristic: Relationship between flow through the valve and percent rated travel as the latter is varied from 0 to 100 percent. This is a special term. It should always be designated as either inherent flow characteristic or installed flow characteristic.

High-Recovery Valve: A valve design that dissipates relatively little flowstream energy due to streamlined internal contours and minimal flow turbulence. Therefore, pressure downstream of the valve vena contracta recovers to a high percentage of its inlet value. *(Straight-through flow valves, such as rotary-shaft ball valves, are typically high-recovery valves.)*

Inherent Diaphragm Pressure Range: The high and low values of pressure applied to the diaphragm to produce rated valve plug travel with atmospheric pressure in the valve body. *(This range is often referred to as a "bench set" range since it will be the range over which the valve will stroke when it is set on the work bench.)*

Inherent Flow Characteristic: Flow characteristic when constant pressure drop is maintained across the valve.

Inherent Rangeability: Ratio of maximum to minimum flow within which the deviation from the specified inherent flow characteristic does not exceed some stated limit. *(A control valve that still does a good job of controlling when flow increases to 100 times the minimum controllable flow has a rangeability of 100 to 1. Rangeability might also be expressed as the ratio of the maximum to minimum controllable flow coefficients.)*

Installed Diaphragm Pressure Range: The high and low values of pressure applied to the diaphragm to produce rated travel with stated conditions in the valve body. *(It is because of the forces acting on the valve plug that the inherent diaphragm pressure range*

can differ from the installed diaphragm pressure range.)

Installed Flow Characteristic: Flow characteristic when pressure drop across the valve varies as dictated by flow and related conditions in the system in which the valve is installed.

Leakage: Quantity of fluid passing through an assembled valve when the valve is in the closed position under stated closure forces, with pressure differential and pressure as specified. *(ANSI leakage classifications are outlined on page 50 of this book.)*

Linear Flow Characteristic: An inherent flow characteristic which can be represented ideally by a straight line on a rectangular plot of flow versus percent rated travel. *(Equal increments of travel yield equal increments of flow at a constant pressure drop.)*

Low-Recovery Valve: A valve design that dissipates a considerable amount of flowstream energy due to turbulence created by the contours of the flowpath. Consequently, pressure downstream of the valve vena contracta recovers to a lesser percentage of its inlet value than is the case with a valve having a more streamlined flowpath. *(Although individual designs vary, conventional globe-style valves generally have low pressure recovery capability.)*

Normally Closed Control Valve: One which closes when the diaphragm pressure is reduced to atmospheric.

Normally Open Control Valve: One which opens when the diaphragm pressure is reduced to atmospheric.

Push-Down-to-Close Construction: A globe-style valve construction in which the valve plug is located between the actuator and the seat ring, such that extension of the actuator stem moves the valve plug toward the seat ring, finally closing the valve. *(Also called* Direct Acting. *See Figure 1-1.) (The term may also be applied to rotary-shaft valve constructions where linear extension of the actuator stem moves the ball or disc toward the closed position.)*

Push-Down-to-Open Construction: A globe-style valve construction in which the seat ring is located between the actuator and the valve plug, such that extension of the actuator stem moves the valve plug away from the seat ring, opening the valve. *(Also called* Reverse Acting. *See Figure 1-23.) (The term may also be applied to rotary-shaft valve constructions where linear extension of the actuator stem moves the ball or disc toward the open position.)*

Quick Opening Flow Characteristic: An inherent flow characteristic in which there is maximum flow with minimum travel.

Rated C_v: The value of C_v at the rated full-open position.

Rated Travel: Linear movement of the valve plug from the closed position to the rated full-open position. *(The rated full-open position is the maximum opening recommended by the manufacturer.)*

Seat Load: The contact force between the seat and the valve plug. *(In practice, the selection of an actuator for a given control valve will be based on how much force is required to overcome static, stem, and dynamic unbalance with an allowance made for seat load.)*

Spring Rate: Force change per unit change in length. *(In diaphragm control valves, the spring rate is usually stated in pounds force per inch compression.)*

Static Unbalance: The net force produced on the valve plug in its closed position by the fluid pressure acting upon it.

Stem Unbalance: The net force produced on the valve plug stem in any position by the fluid pressure acting upon it.

Valve Flow Coefficient (C_v): The number of U.S. gallons per minute of 60°F water that will flow through a valve with a one pound per square inch pressure drop.

Vena Contracta: The location where cross-sectional area of the flowstream is at its minimum size, where fluid velocity is at its highest level, and fluid pressure is at its lowest level. *(The vena contracta normally occurs just downstream of the actual physical restriction in a control valve.)*

Miscellaneous Control Terminology

The following terms and definitions are frequently encountered by people associated with control valves and control valve accessories. Some of the terms (indicated with an asterisk) are quoted from the Instrument Society of Amercia standard, *Process Instrumentation Terminology,* ISA 51.1-1976. Others included are also popularly used throughout the control valve industry. Again, parenthetical explanatory notes are included to help in understanding some of the terms.

Actuator Stem Force: The net force from an actuator that is available for actual positioning of the valve plug.

ANSI: Abbreviation for *American National Standards Institute.*

API: Abbreviation for *American Petroleum Institute.*

ASME: Abbreviation for *American Society of Mechanical Engineers.*

ASTM: Abbreviation for *American Society for Testing and Materials.*

Automatic Control System*: A control system which operates without human intervention.

Bode Diagram*: A plot of log amplitude ratio and phase angle values on a log frequency base for a transfer function. *(It is the most common form of graphically presenting frequency response data. See Figure 1-9.)*

Calibration Curve*: A graphical representation of the calibration report. *(Steady state output of a device plotted as a function of its steady state input. The curve is usually shown as percent output span versus percent input span. See Figure 1-9.)*

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Calibration Cycle*: The application of known values of the measured variable and the recording of corresponding values of output readings, over the range of the instrument, in ascending and descending directions. *(A calibration curve obtained by varying the input of a device in both increasing and decreasing directions. It is usually shown as percent output span versus percent input span and provides a measurement of hysteresis. See Figure 1-9.)*

Clearance Flow: That flow below the minimum controllable flow with the valve plug not seated.

Controller*: A device which operates automatically to regulate a controlled variable.

Control Valve*: A final controlling element, through which a fluid passes, which adjusts the size of flow passage as directed by a signal from a controller to modify the rate of flow of the fluid.

Enthalpy: A thermodynamic quantity that is the sum of the internal energy of a body and the product of its volume multiplied by the pressure: $H = U + pV$. *(Also called heat content.)*

Entropy: The theoretical measure of energy which cannot be transformed into mechanical work in a thermodynamic system.

Feedback Signal*: The return signal which results from a measurement of the directly controlled variable. *(For a control valve with a positioner, the return signal is usually a mechanical indication of valve plug stem position which is fed back into the positioner.)*

Frequency Response Characteristic*: The frequency-dependent relation, in both amplitude and phase, between steady-state sinusoidal inputs and the resulting fundamental sinusoidal outputs. *(Output amplitude and phase shift are observed as functions of the input test frequency and used to describe the dynamic behavior of the control device.)*

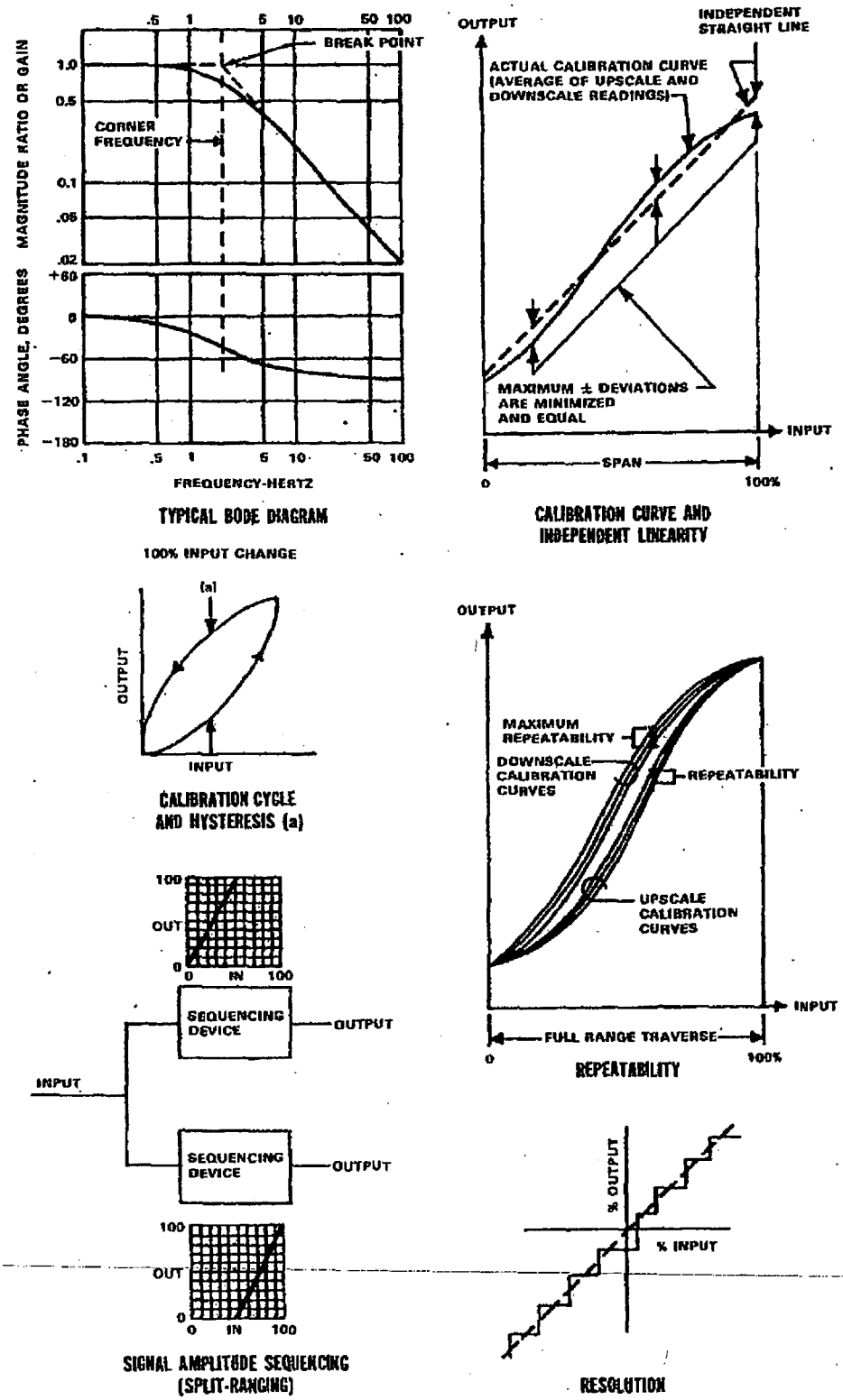

Figure 1-9. Graphic Representation of Various Control Terms

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Gain, Closed Loop*: The gain of a closed loop system, expressed as the ratio of the output change to the input change at a specified frequency.

Gain, Dynamic*: The magnitude ratio of the steady-state amplitude of the output signal from an element or system to the amplitude of the input signal to that element or system, for a sinusoidal signal.

Gain, Open Loop: The gain of the loop elements measured by opening the loop. *(The product of all the individual gains in the forward and feedback paths.)*

Gain, Static*: Of gain of an element, or loop gain of a system, the value approached as a limit as frequency approaches zero. *(The ratio of a change in output to a change in input.)*

Hardness: Metallic material hardness is commonly expressed by either a Brinell number or a Rockwell number. *(In either case, the higher the number, the harder the material. For example, a material with a Rockwell "C" hardness of 60 is file hard while a hardness of 20 is fairly soft. Elastomer hardness is determined by a Durometer test.)*

Hunting*: An undesirable oscillation of appreciable magnitude, prolonged after external stimuli disappear. *(Sometimes called* cycling, *hunting is evidence of operation at or near the stability limit. In control valve applications, hunting would appear as an oscillation in the loading pressure to the actuator caused by instability in the control system or the valve positioner.)*

Hysteresis*: That property of an element evidenced by the dependence of the value of the output, for a given excursion of the input, upon the history of prior excursions and the direction of the current traverse. *(Hysteretic error is usually determined by subtracting the value of dead band from the maximum measured separation between upscale going and downscale going indications of the measured variable. Some reversal of output may be expected for any small reversal of input, which distinguishes hysteresis from dead band. See Figure 1-9.)*

ISA: Abbreviation for *Instrument Society of America.*

Independent Linearity*: The maximum deviation of the calibration curve (average of upscale and downscale readings) from a straight line so positioned as to minimize the maximum deviation. *(In control valve operation with a valve positioner, linearity generally means the closeness with which the valve stem position agrees with the instrument pressure input to the positioner. See Figure 1-9.)*

Instrument Pressure: The output pressure from an automatic controller that is used to operate a control valve.

Loading Pressure: The pressure employed to position a pneumatic actuator. *(This is the pressure that actually works on the actuator diaphragm or piston and it may be the "Instrument Pressure" if a valve positioner is not used.)*

NACE: Abbreviation for *National Association of Corrosion Engineers.* (U.S.A.)

OSHA: Abbreviation for *Occupational Safety and Health Act.* (U.S.A.)

Operating Medium: This is the fluid, generally air or gas, used to supply the power for operation of a valve positioner or automatic controller.

Operative Limits*: The range of operating conditions to which a device may be subjected without permanent impairment of operating characteristics.

Range: The region between the limits within which a quantity is measured, received, or transmitted, expressed by stating the lower and upper range values. *(For example: 3 to 15 psi; −40 to +212°F; −40 to +100°C.)*

Repeatability*: The closeness of agreement among a number of consecutive measurements of the output for the same value of the input under the same operating conditions, ap-

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proaching from the same direction, for full range traverses. *(It is usually measured as a non-repeatability and expressed as repeatability in percent of span. It does not include hyesteresis. See Figure 1-9.)*

Resolution*: The least interval between two adjacent discrete details which can be distinguished one from the other. *(Output resolution is the minimum possible output change which a device can produce. Input resolution is the corresponding change required in the input. Resolution is preferably expressed as a percent of span. See Figure 1-9.)*

Sensitivity*: The ratio of the change in output magnitude to the change of the input which causes it after the steady-state has been reached.

Set Point*: An input variable which sets the desired value of the controlled variable. *(Set point should be expressed in the same terms as the controlled variable.)*

Signal*: A physical variable, one or more parameters of which carry information about another variable (which the signal represents).

Signal Amplitude Sequencing (Split Ranging)*: Action in which two or more signals are generated or two or more final controlling elements are actuated by an input signal, each one responding consecutively, with or without overlap, to the magnitude of that input signal. See Figure 1-9.

Span*: The algebraic difference between the upper and lower range-values. *(For example: Range = 0 to 150°F, Span = 150°F; Range = 3 to 15 psig, Span = 12 psig.)*

Speed of Response (Stroking Speed): In control valve operation, this term describes the rate of travel of the actuator.

Supply Pressure*: The pressure at the supply port of a device. *(Common values of control valve supply pressure are 20 psig for a 3 to 15 psig range and 35 psig for a 6 to 30 psig range.)*

Valve Positioner: A control valve accessory which transmits a loading pressure to an actuator to position a valve plug stem exactly as dictated by the instrument pressure signal from an automatic controller.

Zero Error*: Error of a device operating under specified conditions of use, when the input is at the lower range value. *(It is usually expressed as percent of ideal span.)*

Control Valve Actuators

Pneumatically operated control valve actuators are the most popular type in use, but electric, hydraulic, and manual actuators are also widely used. The spring-and-diaphragm pneumatic actuator is most commonly specified, due to its dependability and its simplicity of design. Pneumatically operated piston actuators provide integral positioner capability and high stem force output for demanding service conditions. Adaptations of both spring-and-diaphragm and pneumatic piston actuators are available for direct installation on rotary-shaft control valves.

Electric and electro-hydraulic actuators are more complex and more expensive than pneumatic actuators. They offer advantages where no air supply source is available, where low ambient temperatures could freeze condensed water in pneumatic supply lines, or where unusually large stem forces are needed. A summary follows, discussing the design and characteristics of the popular actuator styles.

Diaphragm Actuators

- Pneumatically operated, using low-pressure air supply from controller, positioner, or other source.

- Various styles include: Direct-acting *(increasing air pressure pushes down diaphragm and extends actuator stem)*; Reverse-acting *(increasing air pressure pushes up diaphragm and retracts actuator stem)*; Reversible *(some small-sized actuators can be assembled for either direct or reverse action)*; Direct-acting unit for rotary valves *(increasing air pressure pushes*

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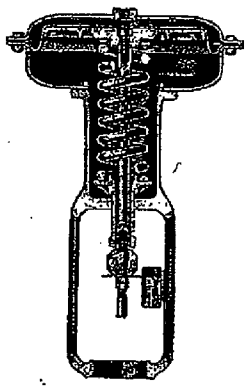
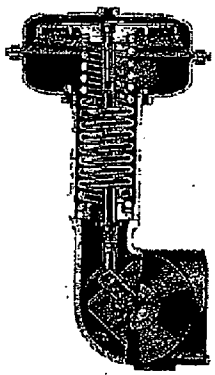


FOR SLIDING-STEM VALVES



FOR ROTARY-SHAFT VALVES

Figure 1-10. Direct-Acting Diaphragm Actuators
(Actuator stem moves upward with loss of operating air supply pressure. Not reversible.)

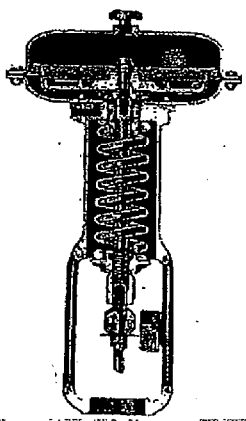


Figure 1-11. Reverse-Acting Diaphragm Actuator
(Actuator stem moves downward with loss of operating air supply pressure. Not reversible.)

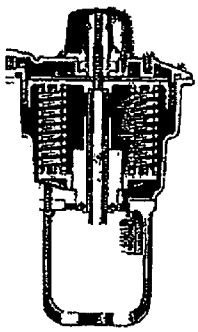


Figure 1-12. Reversible Diaphragm Actuator
(Air pressure may move stem up or down, opposing the springs. Can be assembled to move the actuator stem upward or downward with loss of operating air supply pressure.)

down on diaphragm, which may either open or close the valve, depending on orientation of the actuator lever on the valve shaft).

- Net output thrust is the difference between diaphragm force and opposing spring force.
- Molded diaphragms are used to provide linear performance and increased travels.
- Size is dictated by output thrust required and supply air pressure available.
- Simple, dependable, and economical.

Piston Actuators

- Pneumatically operated using high pressure plant air to 150 psig, often eliminating the need for supply pressure regulator.
- Furnish maximum thrust output and fast response.
- Easily reversible by changing action of the integral valve positioner.
- Best designs are double-acting to give maximum force in both directions.
- Various accessories can be incorporated to position the actuator piston

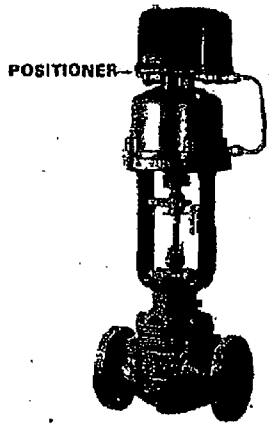


Figure 1-13. Control Valve with Double-Acting Piston Actuator (Positioner is used for throttling service, but omitted for on/off service.)

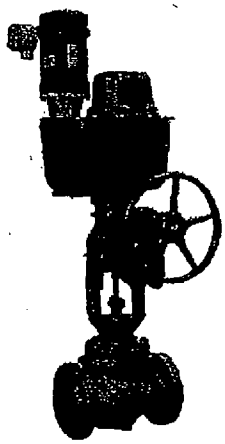


Figure 1-14. Control Valve with Double-Acting Electro-Hydraulic Actuator and Handwheel

in the event of supply pressure failure. These include spring-return units, and pneumatic trip valves and lock-up systems.

- Also available are hydraulic snubbers, handwheels, and units without yokes, which can be used to operate butterfly valves, louvers, and similar industrial equipment.

- Other versions for service on rotary-shaft control valves include a sliding seal in the lower end of the cylinder. This permits the actuator stem to move laterally as well as up and down without leakage of cylinder pressure. *(This feature permits direct connection of the actuator stem to the actuator lever mounted on the rotary valve shaft, thereby eliminating much of the lost motion common to jointed leakage.)*

Electro-Hydraulic Actuators

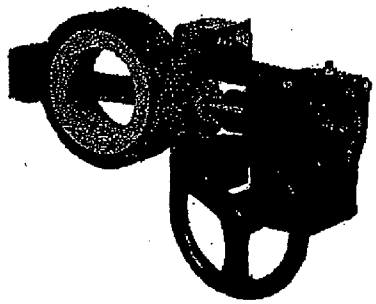
- Require only electrical power to the motor and an electrical input signal from the controller.

- Ideal for isolated locations where pneumatic supply pressure is not available but where precise control of valve plug position is needed.

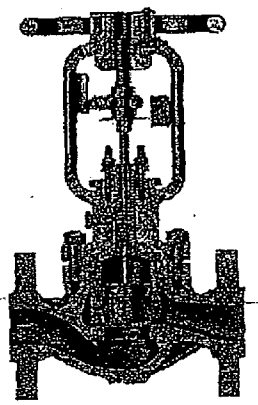
- Units are normally reversible by making minor adjustments and are usually self-contained, including motor, pump, and double-acting hydraulically operated piston within a weatherproof or explosionproof casing.

Manual Actuators

- Useful where automatic control is not required, but where ease of opera-



FOR ROTARY-SHAFT VALVES



FOR SLIDING-STEM VALVES

Figure 1-15. Typical Manual Actuators

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tion and good throttling control is still necessary. Often used to actuate the bypass valve in a three-valve bypass loop around control valves for manual control of the process during maintenance or shutdown of the automatic system.

- Available in various sizes for both globe-style valves and rotary-shaft valves.
- Dial-indicating devices available for some models to permit accurate repositioning of the valve plug or disc.
- Much less expensive than automatic actuators.

Control Valve Bodies

The control valve body regulates the rate of fluid flow as the position of the valve plug or disc is changed by force from the actuator. To do this, the valve body must contain the fluid without external leakage, must have adequate capacity for the intended service, must be capable of withstanding the erosive, corrosive, and temperature influences of the process, and must incorporate appropriate end connections to mate with adjacent pipelines and actuator attachment means to permit transmission of actuator thrust to the valve plug stem or rotary shaft.

Many styles of control valve bodies have been developed through the years. Some have found wide application; others have been designed for meeting specific service conditions and their usage is less frequent. The following summary describes some of the more popular control valve body styles in use today.

Single-Port Valve Bodies

- Most common body style, simple in construction.
- Available in various forms, such as globe, angle, bar stock, forged, and split constructions.
- Generally specified for applications with stringent shutoff requirements. Metal-to-metal seating surfaces or "soft-seating" with nitrile or other elastomeric materials forming the seal, can handle most service requirements.
- Since high-pressure fluid is normally loading the entire area of the port, the unbalance force created must be considered in selecting actuators for single-port control valve bodies.
- Though most popular in the smaller sizes, single-port bodies can often be used in 4-inch to 8-inch sizes with high-thrust actuators.
- Many modern single-seated valve bodies use cage-style construction to retain the seat ring, provide valve plug guiding, and provide a means for establishing a particular flow characteristic. Cage-style trim offers advantages in ease of maintenance and in interchangeability of cages to alter valve flow characteristics.
- Cage-style single-seated valve bodies can also be easily modified by change of trim parts to provide reduced-capacity flow, noise attenuation, or reduction or elimination of cavitation.

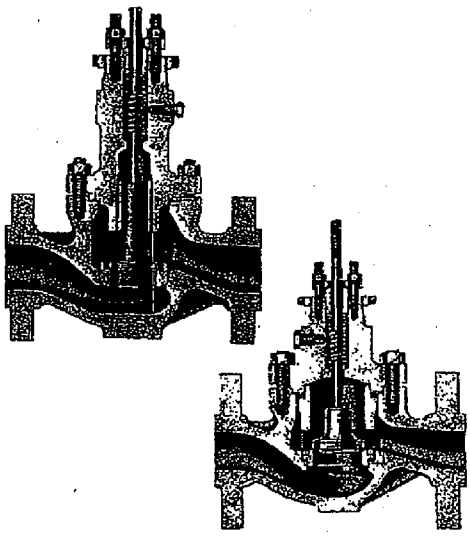


Figure 1-16. Popular Single-Ported Globe-Style Valve Bodies (Valve on left has conventional top-guided trim with screwed-in seat ring; valve on right has cage-guided trim.)

Figure 1-16 on the preceding page shows two of the more popular styles of single-ported or single-seated globe-type control valve bodies. They are widely used in process control applications, particularly in sizes from 1-inch through 3-inch. Normal flow direction is most often up through the seat ring and, in the case of valves with cage-style trim, out through the openings in the cage wall.

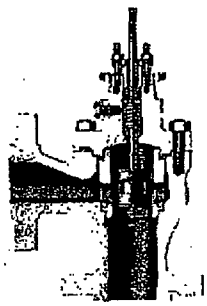


Figure 1-17. Flanged Angle-Style Control Valve Body

Angle valves are nearly always single-ported. They are commonly used in boiler feedwater and heater drain service and in piping schemes where space is at a premium and the valve can also serve as an elbow. The valve shown has cage-style construction. Others may have screwed-in seat rings, expanded outlet connections, restricted trim, and outlet liners for reduction of erosion damage.

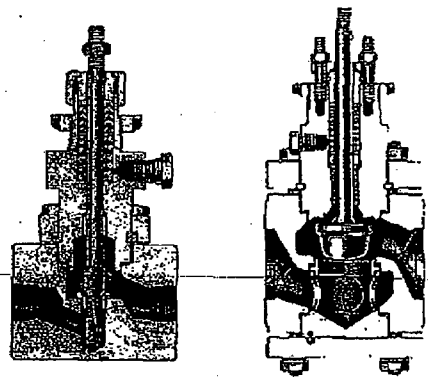


Figure 1-18. Two Popular Varieties of Bar Stock Valve Bodies

Bar stock bodies are often specified for corrosive applications in the chemical industry. They can be machined from any metallic bar stock material and from some plastics. When exotic metal alloys are required for corrosion resistance, a bar stock body is normally less expensive than a body produced from a casting. Some bar stock bodies, available in sizes through 3-inch, have cage-guided trim parts which can be removed for service without removing the body from the pipeline. Others are also available in angle-valve style.

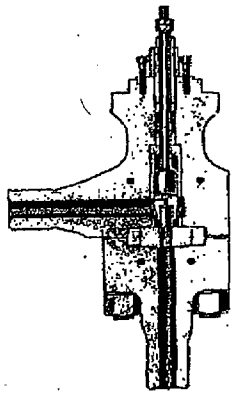


Figure 1-19. Forged High Pressure Control Valve Body

Forged single-ported bodies, generally angle-style, are used for high pressure service. Working pressures to 50,000 psig (3450 bar) are not uncommon in polyethylene production. Port sizes are normally limited to one inch diameter or less for pressures above 10,000 psig (690 bar) due to high unbalance forces involved. Forged bodies are also available with high pressure flanged end connections for less demanding service conditions.

High-pressure single-ported globe bodies are often used in production of gas and oil. Variations available include cage-guided trim, bolted body/bonnet connection, and self-draining angle versions. Flanged versions are available with ratings to ANSI Class 2500.

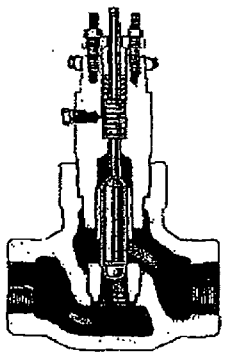


Figure 1-20. High Pressure Globe-Style Control Valve Body

Balanced-Plug Cage-Style Valve Bodies
This popular body style, single-ported in the sense that only one seat ring is used, provides the advantages of a balanced valve plug often associated

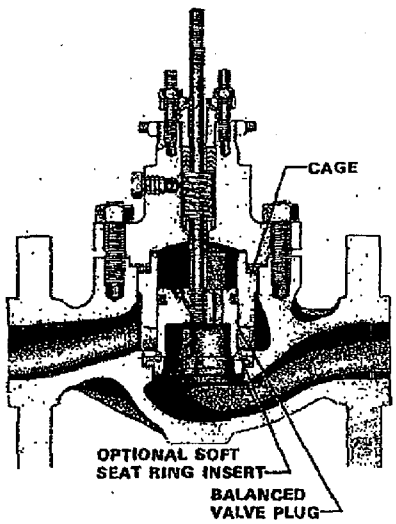


Figure 1-21. Valve Body with Cage-Style Trim, Balanced Valve Plug, and Soft Seat

only with double-ported bodies. Cage-style trim is used to provide valve plug guiding, seat ring retention, and flow characterization. In addition a sliding piston ring-type seal between the upper portion of the valve plug and the wall of the cage cylinder virtually eliminates leakage of the upstream high pressure fluid into the lower pressure downstream system. Downstream pressure acts on both the top and bottom sides of the valve plug, thereby nullifying most of the static unbalance force. Reduced unbalance permits operation of the valve with smaller actuators than those necessary for conventional single-ported bodies. Interchangeability of trim permits choice of several flow characteristics or of noise attenuation or anti-cavitation components. For most available trim designs, the standard direction of flow is in through the cage openings and down through the seat ring. Available in various material combinations, sizes through 16-inch, and pressure ratings to ANSI Class 2500.

High Capacity, Cage-Guided Valve Bodies
This adaptation of the cage-guided bodies mentioned above was designed for noise applications such as high pressure gas reducing stations where sonic gas velocities are often encountered at the outlet of conventional valve bodies. The design incorporates over-

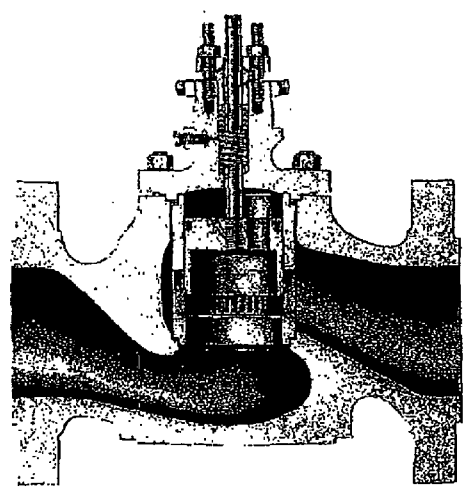


Figure 1-22. High Capacity Valve Body with Cage-Style Noise Abatement Trim

size end connections with a streamlined flow path and the ease of trim maintenance inherent with cage-style constructions. Use of noise abatement trim can reduce overall noise levels by as much as 35 decibels. Also available

in cageless versions with screwed-in seat ring, end connection sizes through 12-inch, ANSI Class 600, and versions for liquid service. Flow direction depends on the intended service and trim selection, with unbalanced constructions normally flowing "up" and balanced constructions normally flowing "down".

Reverse-Acting Cage-Guided Valve Bodies

This modification of the cage-guided body permits it to be used when push-down-to-open valve plug action is desired. As shown in Figure 1-23, the body is inverted from its more customary position and a threaded bonnet is installed in the "bottom" of the body.

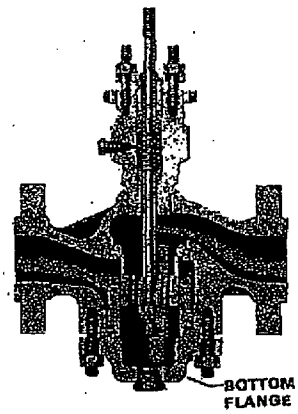


Figure 1-23. Reverse-Acting Valve Body with Balanced, Cage-Guided Valve Plug

A bottom flange provides cage and seat ring alignment and loading. Removal of the bottom flange permits inspection or removal of all trim parts without removing the actuator or taking the body out of the pipeline. Interchangeability of cages can provide flow characteristic variety equal to direct-acting cage-guided valves. Available with metal-to-metal or soft seating, balanced or unbalanced valve plug styles, and a variety of material combinations in sizes through 4-inch ANSI Class 600. In conjunction with a direct-acting diaphragm actuator, this body style provides "Fail-Closed" operation in case of loss of actuator supply pressure.

Double-Ported Valve Bodies

- Dynamic force on plug tends to be balanced as flow tends to open one port and close the other.
- Reduced dynamic forces acting on plug may permit choosing a smaller actuator than would be necessary for a single-ported body with similar capacity.
- Usually furnished only in the larger sizes—6-inch or larger.
- Normally have higher capacity than single-ported valves of the same line size.
- Many double-ported bodies are reversible, so valve plug can be installed as either "push-down-to-open" or "push-down-to-close."
- Metal-to-metal seating usually provides only Class II shutoff capability, although Class III capability is also possible.
- Port-guided valve plugs are often used for on-off or low pressure throttling service. Top-and-bottom-guided valve plugs furnish stable operation for severe service conditions.

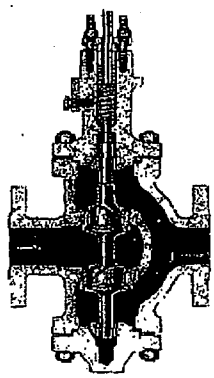


Figure 1-24. Reversible Double-Ported Globe-Style Valve Body

The control valve body shown above is assembled for push-down-to-open valve plug action. The valve plug is essentially balanced and a relatively small amount of actuator force is required to operate the valve. Consequently, this design can often be use-

ful on high-pressure drop applications where dynamic forces on a conventional single-ported valve plug would necessitate use of a very large actuator.

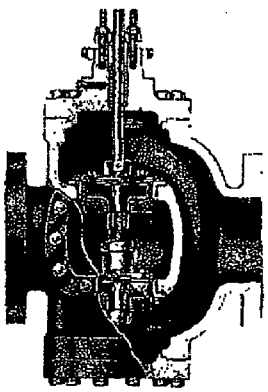


Figure 1-25. Double-Ported Valve Body with Adjustable Soft-Seated Trim

This reversible double-ported control valve body is assembled for push-down-to-close valve plug action. The unit shown has rubber O-ring seating surfaces on the port-guided plug to provide shutoff for stringent leakage requirements. The seat-to-seat distance between the two seats can be adjusted through a handhole plate on the side of the body. This construction is often used in natural gas distribution systems and for process gases and liquids up to 250 psig (17.2 bar) and 150°F (66°C).

Three-Way Valve Bodies

- Three pipeline connections to provide general converging (flow-mixing) or diverging (flow-splitting) service.
- Best designs utilize cage-style trim for positive valve plug guiding and ease of maintenance.
- Variations available with trim materials selected for high temperature service. Standard end connections (flanged, screwed, butt weld, etc.) can be specified to mate with most any piping scheme.

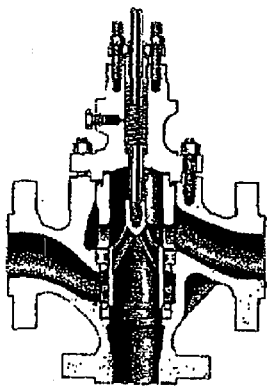


Figure 1-26. Three-Way Valve with Balanced Valve Plug

- Actuator selection demands careful consideration, particularly for constructions with unbalanced valve plug.

Balanced valve plug-style three-way valve body shown with cylindrical valve plug in the "down" postion. This position opens the bottom "common" port to the right-hand port and shuts off the left-hand port. The construction can be used for throttling mid-travel position control of either converging or diverging fluids.

Boot-Style Valve Bodies

- Used on applications handling corrosive chemicals and slurries.
- Elastomer boot provides high rangeability and good shutoff capability.
- Design minimizes number of pressure-retaining and "wetted" parts.

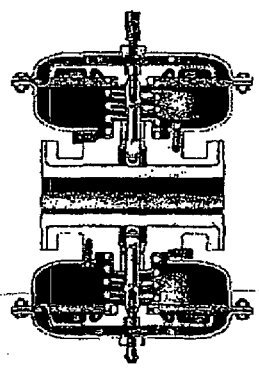


Figure 1-27. Valve Body with Flexible Elastomer Boot

• Operating temperature range limited by capability of boot materials.

• Provides throttling control in either direction up to 100 psig (6.89 bar).

• Alternate design available to provide closure of boot on loss of supply pressure.

Dual-loading of boot by opposed actuators provides throttling control with standard diaphragm actuator loading pressures. Reduced-bore boots are available for best throttling control in installations where normal flow rates are low.

Butterfly Valve Bodies

• Require minimum space for installation.

• Provide high capacity with low pressure loss through the valve.

• Very economical, particularly in larger sizes and in terms of flow capacity per investment dollar.

• Conventional contoured discs provide throttling control for up to 60-degree disc rotation. Patented, dynamically streamlined discs available for applications requiring 90-degree disc rotation.

• Mates with standard raised-face pipeline flanges.

• May require high-output or large actuators if the valve is big or the pressure drop is high, since operating torques may be quite large.

• Units are available for service in nuclear power plant applications with very stringent leakage requirements.

• Standard line can provide good shutoff and corrosion protection with nitrile or TFE liner.

Standard butterfly valves are available in sizes through 72-inch for miscellaneous control valve applications. Smaller sizes can use versions of traditional diaphragm or piston pneumatic actuators, including the modern rotary actuator styles. Larger sizes may require high-output electric or long-stroke pneumatic cylinder actuators.

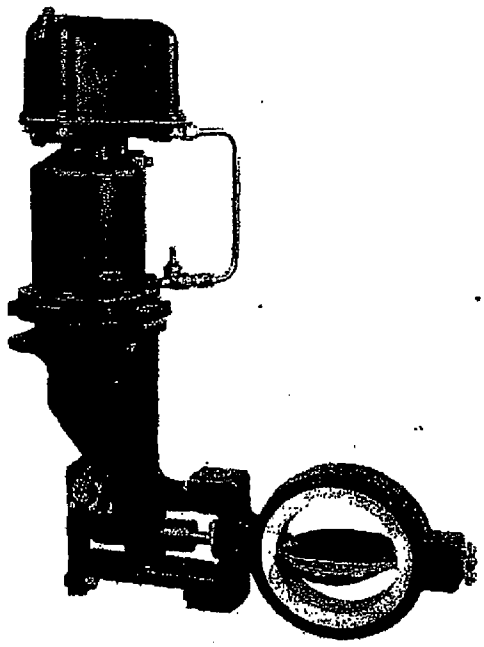


Figure 1-28. Typical Butterfly Control Valve

Butterfly valves exhibit an approximately equal percentage flow characteristic. They can be used for throttling service or for on-off control. Soft-seat construction can be obtained by the liner method or by including an adjustable soft ring in the body or on the face of the disc.

A dynamically contoured disc, such as the patented **Fishtail®** disc shown, permits control through full 90 degrees of disc rotation, while conventional discs are usually limited to rotation of 60 degrees.

V-Notch Ball Control Valve Bodies

• Straight-through flow design produces little pressure drop.

• Suited to control of erosive or viscous fluids, paper stock, or other slurries containing entrained solids or fibers.

• Uses standard diaphragm or piston rotary actuators, or conventional linear-travel actuators with minor modifications.

• Ball remains in contact with seal during rotation, which produces a

shearing effect as the ball closes and minimizes clogging.

- Available with either metal or heavy-duty TFE-filled composition ball seal ring to provide excellent rangeability in excess of 300:1.
- Bolts between ANSI Class flanges with long through-bolts.

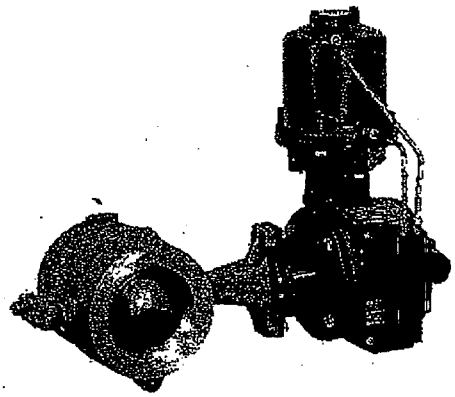


Figure 1-29. Rotary-Shaft Control Valve with V-Notch Ball

This construction is similar to a conventional ball valve, but with patented, contoured V-notch in the ball. The V-notch produces an equal percentage flow characteristic. Vee-Ball® control valves have good rangeability, control, and shutoff capability. They are widely used in the paper industry, chemical plants, sewage treatment plants, the power industry, and petroleum refineries.

Eccentric-Disc Control Valve Bodies

- Effective throttling control for pressure drops up to 740 psig (51 bar).
- Provides linear flow characteristic through 90 degrees of disc rotation.
- Eccentric mounting of disc pulls it away from seal after it begins to open, minimizing seal wear.
- Available in sizes through 24-inch compatible with standard ANSI flanges.
- Uses standard pneumatic diaphragm or piston rotary actuators.
- Standard flow direction is into the concave side of the disc; reverse flow results in reduced capacity.

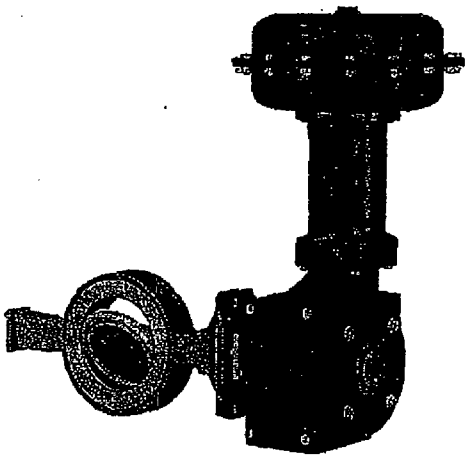


Figure 1-30. Eccentric-Disc Rotary-Shaft Control Valve

The unit shown is easily field-reversible between push-down-to-open and push-down-to-close operation. Eccentric-disc rotary shaft control valves can handle a wide range of control valve applications at temperatures to 1000°F (540°C). Splined shaft-actuator lever connection prevents lost motion and improper positioning of disc. This design is typical of the rotary-shaft styles of control valves that are rapidly gaining in popularity among control valve users. Generally speaking, the modern high-performance rotary-shaft control valves are proving themselves adaptable to many control requirements and are usually less costly than conventional globe-style valves of equal capability.

Control Valve End Connections

The three common methods of installing control valves in pipelines are by means of screwed pipe threads, bolted gasketed flanges, and welded end connections.

Screwed Pipe Threads

Screwed end connections are quite popular in small control valves and are more economical than flanged ends.

The threads usually specified are tapered female NPT (National Pipe Thread) on the valve body. They form a metal-to-metal seal by wedging over the mating male threads on the pipeline ends. This connection style is usually limited to valves not larger than 2-inch and is not recommended for elevated temperature service. Valve maintenance may be complicated by screwed end connections if it is necessary to take the body out of the pipeline, since the valve cannot be removed without breaking a flanged joint or union connection to permit unscrewing the valve body from the pipeline.

Bolted Gasketed Flanges

Flanged end valves are easily removed from the piping and are suitable for use through the range of working pressures for which most control valves are manufactured. Flanged end connections can be used in a temperature range from absolute zero to approximately 1500°F (815°C). They are used on all valve sizes. The most common flanged end connections are flat face, raised face, and ring type joint.

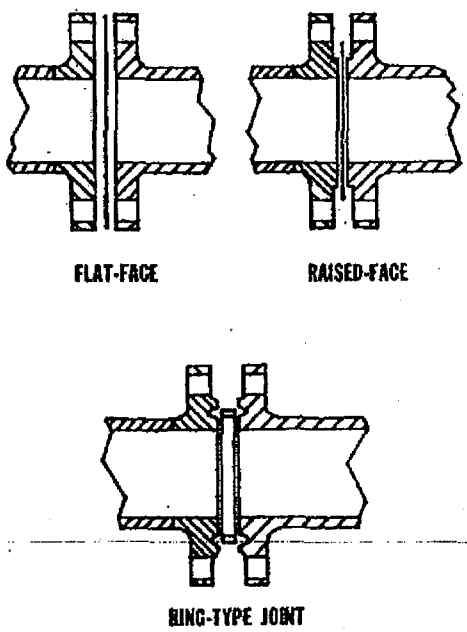


Figure 1-31. Popular Varieties of Bolted Flange Connections

The flat face variety allows the matching flanges to be in full face contact with the gasket clamped between them. This construction is commonly used in low pressure, cast iron and brass valves and has the advantage of minimizing flange stresses caused by initial bolting up force.

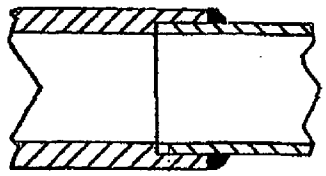
The raised face flange has a circular raised face with inside diameter the same as the valve opening and with the outside diameter something less than the bolt circle diameter. The raised face is finished with concentric circular grooves for good sealing and resistance to gasket blowout. This kind of flange is used with a variety of gasket materials and flange materials for pressures through the 6000 psig (414 bar) pressure range and for temperatures through 1500°F (815°C). This style of flanging is normally standard on ANSI Class 250 cast iron bodies and all steel and alloy steel bodies.

The ring-type joint flange is similar in appearance to the raised face flange except that a U-shaped groove is cut in the raised face concentric with the valve opening. The gasket consists of a metal ring with either an eliptical or octagonal cross section. When the flange bolts are tightened, the gasket is wedged into the groove of the mating flange and a tight seal is made. The gasket is generally soft iron or Monel* but is available in almost any metal. This is an excellent joint at high pressure and is used up to 15,000 psig (1034 bar), but is generally not used at high temperatures. It is furnished only on steel and alloy valve bodies when specified.

Welding End Connections

Welding ends on control valves have the advantage of being leak-tight at al pressures and temperatures and are economical in first cost. Welding end valves are more difficult to take from the line and they are obviously limited to weldable materials. Welding ends are manufactured in two styles, socke and butt.

*Trademark of International Nickel Co.



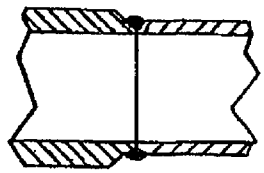


Figure 1-32. Common Welded End Connections

The socket welding ends are prepared by boring in each end of the valve a socket with an inside diameter just slightly larger than the pipe outside diameter. The pipe is slipped into the socket where it butts against a shoulder and is then joined to the valve with a fillet weld. Socket welding ends in a given size are dimensionally the same regardless of pipe schedule. They are usually furnished in small sizes through 2-inch.

The butt welding ends are prepared by bevelling each end of the valve to match a similar bevel on the pipe. The two ends are then butted to the pipeline and joined with a fillet weld. This style of joint is used on all valve styles and the end preparation must be different for each schedule of pipe. Generally furnished for control valves in sizes 2-1/2-inch and larger.

Valve Body Bonnets

The bonnet of a control valve is that part of the body assembly through which the valve plug stem or rotary shaft moves. On globe or angle bodies, it is the pressure retaining component for one end of the valve body. The bonnet normally provides a means of mounting the actuator to the body and houses the packing box. (On some rotary-shaft valves, the packing is housed within an extension of the body itself, or the packing box is a separate component bolted between the body and bonnet.)

On a typical globe-style control valve body, the bonnet is made of the same material as the body, since it is a pressure-containing member, and since it is subject to the same temperature and corrosion effects as the body. In the figures shown on earlier pages of this chapter several styles of body-to-bonnet connections can be seen. The most common is the bolted flange type shown in several figures including Figure 1-1 showing a bonnet with an integral flange and Figure 1-18 showing a bonnet with a separable, slip-on flange held in place with a split ring. Figure 1-19 shows an angle-style valve with an integral bonnet. The bonnet used on the high pressure globe body in Figure 1-20 is screwed into the body, as is the bonnet for the reverse-acting cage-guided body shown in Figure 1-23. Figure 1-8 is typical of rotary-shaft control valves where the packing is housed within the body and a bonnet, per se, is not used. (The actuator linkage housing is not a pressure-containing part and, though it performs as a bonnet in connecting the actuator cylinder to the body, it is usually made from cast aluminum to minimize control valve weight.)

On control valve bodies with cage-style trim, the bonnet furnishes loading force to prevent leakage between the bonnet flange and the body and also between the seat ring and the body. The tightening of the body-bonnet bolting compresses a flat sheet gasket to seal the body-bonnet joint, compresses a spiral-wound gasket on top of the cage, and compresses another flat sheet gasket below the seat ring to provide the seat ring-body seal. The bonnet also provides alignment for the cage (which in turn guides the valve plug) to ensure proper valve plug-seat ring alignment.

As mentioned, the conventional bonnet on a globe-type control valve houses the packing. As shown in Figure 1-1, the packing is most

often retained by a packing follower held in place by a flange on the yoke boss area of the bonnet. An alternate packing retention means is shown in Figure 1-18, where the packing follower is held in place by a screwed gland. This alternate is compact, so it is often used on small control valves, but it has a disadvantage in that the user cannot always be sure of thread engagement. Therefore, caution should be used in adjusting packing compression when the control valve is in service.

Standard bolted-flange bonnets have an opening in the side of the packing box. This opening is closed with a standard pipe plug unless: (1) a lubricator or lubricator/isolating valve is required to lubricate the valve stem packing, in which case the lubricator is nipple-mounted to the bonnet opening; (2) it is necessary to purge the valve body and bonnet of process fluid, in which case the opening can be used as a purge connection; or (3) the bonnet opening is being used as a vent connection in conjunction with a bellows seal bonnet, in which case leakage out the vent would indicate that the bellows seal was broken.

Extension Bonnets

Extension bonnets are used for either high or low temperature service to protect valve stem packing from the extreme temperatures. Standard TFE valve stem packing is generally useful for most applications up to 450°F (232°C). However, it is susceptible to damage at low process temperatures if frost forms on the valve stem. The frost crystals can cut grooves in the TFE, forming leakage paths for process fluid along the stem. Extension bonnets can remove the packing box of the bonnet far enough from the extreme temperature of the process that the packing temperature remains within the recommended range.

Extension bonnets are either cast (Figure 1-4) or fabricated (Figure 1-33). Cast extensions are better for high temperature service because of greater

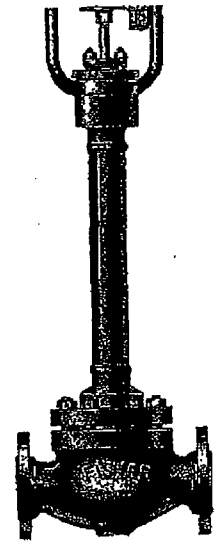


Figure 1-33. Valve Body with Fabricated Extension Bonnet

heat emissivity which provides better cooling effect. Conversely, smooth surfaces, such as can be fabricated from stainless steel tubing, are preferred for cold service since heat influx is normally the major concern. In either case, extension wall thickness should be minimized to cut down heat transfer. Stainless steel is usually preferable to carbon steel because of its lower coefficient of thermal conductivity. On cold service applications, insulation can be added around the extension to protect further against heat influx.

Bellows Seal Bonnets

Bellows seal bonnets (Figure 1-5) are used when no leakage along the stem can be tolerated. They are often used when the process fluid is toxic, volatile, radioactive, or highly expensive. This special bonnet construction protects both the stem and the valve packing from contact with the process fluid. Standard packing box construction above the bellows seal unit will prevent catastrophic failure in the event of rupture or failure of the bellows.

Due to the severity of the service conditions in which they normally operate; control valves with bellows seal bon-

nets are usually rated at only 300 psig (20.7 bar) at 70°F (21°C). As with other control valve pressure/temperature limitations, these pressure ratings decrease with increasing temperature. Selection of a bellows seal bonnet should be carefully considered, and particular attention should be paid to proper inspection and maintenance after installation.

Control Valve Packing

Most control valves use packing boxes with the packing retained and adjusted by a flange and stud bolts (Figure 1-1). Several packing materials are available that can be used depending on the service conditions to be encountered. Brief descriptions and service condition guidelines follow for several of the more popular materials and typical packing material arrangements are shown in Figure 1-34.

TFE V-Ring

- Plastic material with inherent ability to minimize friction.
- Molded in V-shaped rings which are spring loaded and self-adjusting in the packing box. Packing lubrication is not required.
- Resistant to most known chemicals except molten alkali metals.
- Requires extremely smooth (2 to 4 micro-inches RMS) stem finish to seal properly. Will leak if stem or packing surface is damaged.

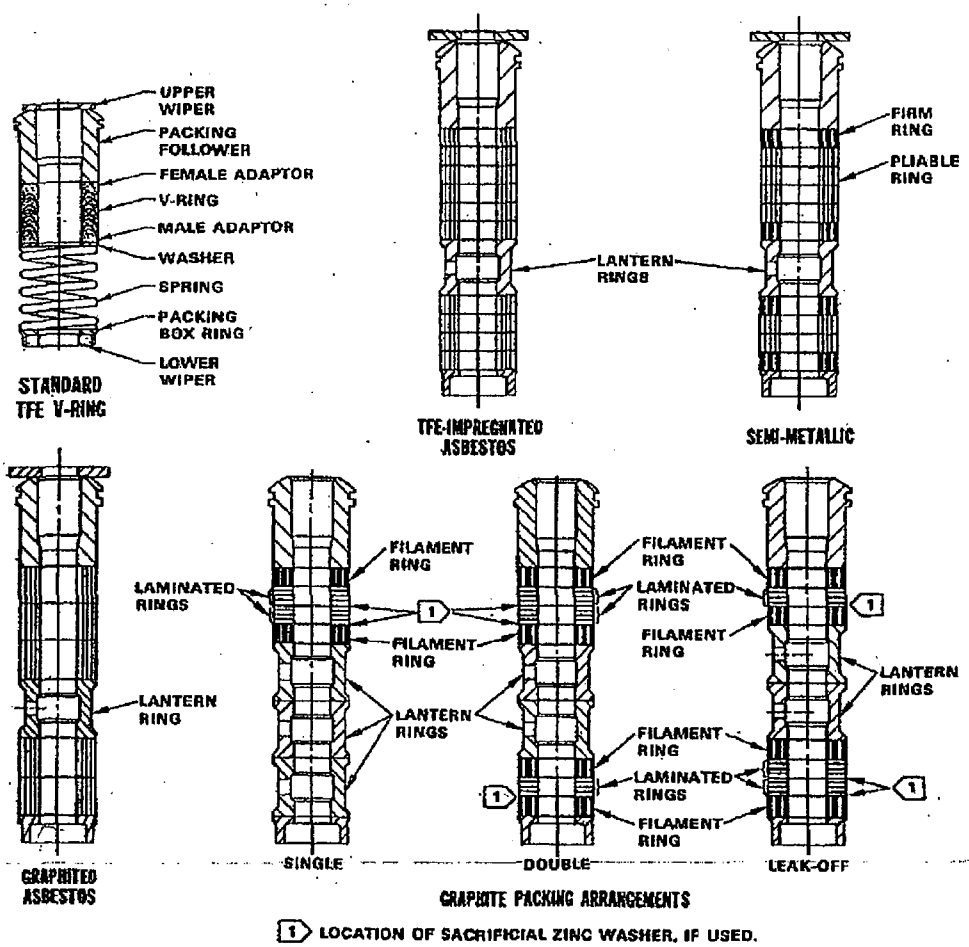


Figure 1-34. Comparative Packing Material Arrangements for Globe-Style Valve Bodies with 1/2-Inch Diameter Stems

• Recommended temperature limits: −40 to +450°F (−40 to +232°C)

• Not suitable for nuclear service, since TFE is easily destroyed by radiation.

TFE-Impregnated Asbestos

• Composed of braided asbestos fibers impregnated with TFE. Molded into rings with square cross-section.

• Has much of the ability of TFE to minimize friction, but can be tightened to stop leakage caused by minor stem damage or imperfection.

• Suggested service temperature limits: −100 to +450°F (−73 to +232°C).

• Packing lubrication is suggested, except when used in oxygen service.

Graphited Asbestos

• Formed ring packing composed of asbestos fiber, lead wool, flake graphite, metal particles, and a small amount of neoprene as a binder.

• Useful on petroleum distillate, steam, oil, and air service to 450°F (232°C).

• Can be adjusted to stop leakage, but provides more friction than TFE packings.

• Packing box lubrication is recommended to reduce friction and improve sealing.

Laminated and Filament Graphite

• Suitable for high temperature nuclear service or where low chloride content is desirable (Grade GTN).

• Provides leak-free operation, high thermal conductivity, and long service life, but produces high stem friction and resultant hysteresis.

• Impervious to most hard-to-handle fluids and high radiation.

• Suitable temperature range: Cryogenic temperatures to 1200°F (649°C).

• Lubrication is not required, but an extension bonnet or steel yoke should be used when packing box temperature exceeds 800°F (427°C).

Semi-Metallic

• Packing rings have asbestos core covered with shredded or braided aluminum foil.

• Used for high temperature and pressure applications where stem surface may not be perfect. Stem should be hardened or chrome plated to reduce wear.

• Suitable for service temperatures up to 900°F (482°C).

• Lubrication is recommended, and an extension bonnet or steel yoke should be used when packing box temperatures exceed 800°F (427°C).

Valve Stem Packing Lubrication

Lubrication is recommended for several of the popular packing materials mentioned above. The preferred lubricant is silicone grease, which provides improved valve stem action and reduces friction at temperatures up to 500°F (260°C). At higher temperatures this lubricant may oxidize and cause a problem in obtaining a tight packing seal. For temperatues within the service limits of the lubricant, performance of graphited asbestos, TFE-impregnated asbestos, and semi-metallic packings can be improved by routine injection of a small amount of silicone grease into the packing box. This is accomplished by means of a lubricator assembly such as that shown in Figure 1-3. By turning the screw of the lubricator, grease is forced into the packing box of the valve. An isolating valve is included with the lubricator on all high-pressure control valves. The isolating valve is closed at all times except when actually lubricating the packing.

Packing should not be lubricated for control valves in oxygen service, since many lubricants, particularly petroleum-base lubricants, are hazardous because of their high heat of combustion and high rate of reaction.

Conventional Characterized Valve Plugs

The valve plug is the movable part of a globe-style control valve assembly which provides a variable restriction to fluid flow. Several valve plug styles are available, each designed to provide a specific flow characteristic, permit a specified manner of guiding or alignment with the seat ring, or have a particular shutoff or damage-resistance capability.

Valve plugs are designed for either two-position or throttling control. In two-position applications, the valve plug is positioned by the actuator at either of two points within the travel range of the assembly. In throttling control, the valve plug may be positioned at any point within the travel range as dictated by the process requirements. Although some valve plugs are reversible, most are designed for either "push-down-to-open" or "push-down-to-close" action. Selection of proper valve plug action must take into consideration the type of actuator being used, the required "fail-safe" position the valve plug should assume in the event of actuator supply pressure failure, and whether fluid pressure tends to open the valve in normal operation or tends to close the valve.

The contour of the valve plug surface adjacent to the seat ring is instrumental in determining the inherent flow characteristic of a conventional globe-style control valve. As the valve plug is moved through its travel range by the actuator, the unobstructed flow area changes in size and shape dependent on the contour of the valve plug. When a constant pressure differential is maintained across the valve, the changing relationship between percentage of maximum flow capacity and percentage of total travel range can be portrayed, as in Figure 1-35, and is designated as the inherent flow characteristic of the valve.

Commonly specified inherent flow characteristics include:

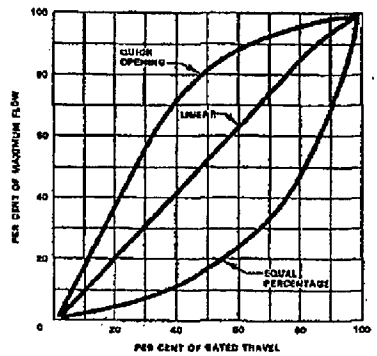


Figure 1-35. Inherent Flow Characteristic Curves

Linear Flow Characteristic— A valve with an ideally linear inherent flow characteristic produces flow rate directly proportional to the amount of valve plug travel, throughout the travel range. For instance, at 50 percent of rated travel, flow rate is 50 percent of maximum flow; at 80 percent of rated travel, flow rate is 80 percent of maximum; etc. Change of flow rate is constant with respect to valve plug travel. Valves with a linear characteristic are often specified for liquid level control and for flow control applications requiring constant gain.

Equal Percentage Flow Characteristic—Ideally, for equal increments of valve plug travel, the change in flow rate with respect to travel may be expressed as a constant percent of the flow rate at the time of the change. The change in flow rate observed with respect to travel will be relatively small when the valve plug is near its seat and relatively high when the valve plug is nearly wide open. Therefore, a valve with an inherent equal percentage flow characteristic provides precise throttling control through the lower portion of the travel range and rapidly increasing capacity as the valve plug nears the wide-open position. Valves with equal percentage flow characteristics are used on pressure control applications, on applications where a large percentage of the pressure drop is normally absorbed by the system itself with only a relatively small percentage available at the control

valve, and on applications where highly varying pressure drop conditions can be expected.

Quick-Opening Flow Characteristic—A valve with a quick opening flow characteristic provides a maximum change in flow rate at low travels. The curve is basically linear through the first 40 percent of valve plug travel, then flattens out noticeably to indicate little increase in flow rate as travel approaches the wide open position. Control valves with quick-opening flow characteristics are often used for on/off applications where significant flow

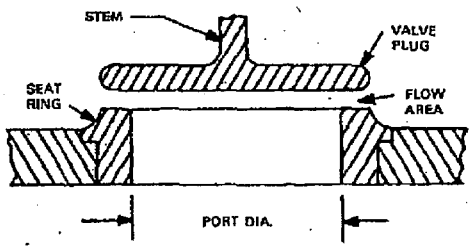


Figure 1-36. Typical Construction to Provide Quick-Opening Flow Characteristic

rate must be established quickly as the valve begins to open. Consequently, they are often used in relief valve applications. (Quick-opening valves can also be selected for many of the same applications for which linear flow characteristics are recommended, since the quick-opening characteristic is linear up to about 70 percent of maximum flow rate. Linearity decreases sharply after flow area generated by valve plug travel equals the flow area of the port. For a typical quick-opening valve, such as that shown in Figure 1-36, this occurs when valve plug travel equals one-fourth of port diameter.)

Characterization of Cage-Guided Valve Bodies

In valve bodies with cage-guided trim, flow characterization is determined by the shape of the flow openings or "windows" in the wall of the cylindrical cage. As the valve plug is moved away from the seat ring, the cage windows are "opened" to permit flow through the valve. Standard cages have been designed to produce linear, equal percentage, and quick opening inherent flow characteristics. Note the differences in the shapes of the cage windows shown in Figure 1-37. The flow rate/travel relationship provided by valves using these cages is equivalent to the linear, quick opening, and equal percentage curves shown for contoured valve plugs in Figure 1-35.

Cage-guided trim in a control valve provides a distinct advantage over conventional valve body assemblies in that maintenance and replacement of internal parts is much simplified. The inherent flow characteristic of the valve can be easily changed by installing a different cage. Interchange of cages to provide a different inherent

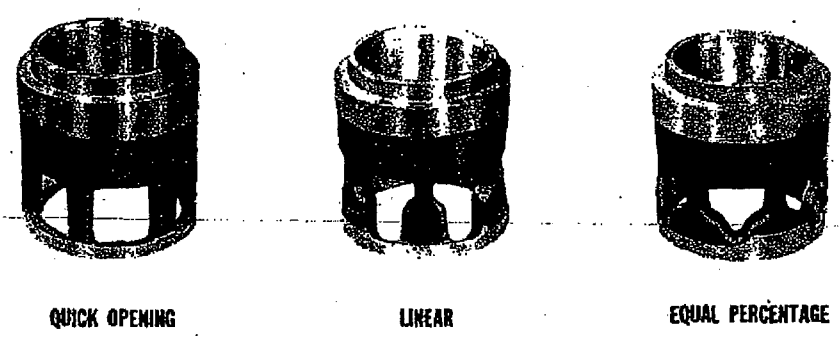


Figure 1-37. Characterized Cages for Globe-Style Valve Bodies

flow characteristic does not require changing valve plug or seat ring. The standard cages shown can be used with either balanced or unbalanced trim constructions. Soft-seating, when required, is available in the form of a retained insert in the seat ring and is independent of cage or valve plug selection. (Cage interchangeability can be extended to specialized cage designs which provide noise attenuation or combat cavitation. These cages furnish a modified linear inherent flow characteristic, but require flow to be in a specific direction through the cage openings. Therefore, it could be necessary to reverse the valve body in the pipeline to obtain proper flow direction.)

Valve Plug Guiding

Accurate guiding of the valve plug is necessary for proper alignment with the seat ring and efficient control of the process fluid. The common methods used are listed below and their names are generally self-descriptive.

- **Top-and-Bottom Guiding:** Valve plug is aligned by guide bushings in the bonnet and bottom flange in the manner shown in Figure 1-24.
- **Cage Guiding:** The outside diameter of the valve plug is in close proximity to the inside wall surface of the cylindrical cage throughout the travel range. Since bonnet, cage, and seat ring are self-aligning on assembly, correct valve plug/seat ring alignment is assured when valve closes. Figure 1-1 illustrates cage guiding.
- **Top Guiding:** Valve plug is aligned by a single guide bushing in the bonnet or valve body, as shown in Figure 1-20.
- **Top-and-Port Guiding:** Valve plug is aligned by a guide bushing in the bonnet or body and also by the valve body port. This construction is typical for control valves using small-diameter valve plugs with fluted skirt projections to control low flow rates. (See Figure 1-18, left view.)
- **Stem Guiding:** Valve plug is aligned with the seat ring by a guide bushing in the bonnet that acts on the valve plug stem. (See Figure 1-18, right view.)

Restricted-Capacity Control Valve Trim

Most control valve manufacturers can provide valves with reduced or restricted-capacity trim parts. The reduced flow rate may be desirable for any of the following reasons: (1) Restricted capacity trim may make it possible to select a valve body large enough for increased future flow requirements, but with trim capacity properly sized for present needs; (2) Valves can be selected for adequate structural strength, yet retain reasonable travel/capacity relationship; (3) Large bodies with restricted capacity trim can be used to reduce inlet and outlet fluid velocities; (4) Purchase of expensive pipeline reducers can be avoided; (5) Over-sizing errors may be corrected by use of restricted capacity trim parts.

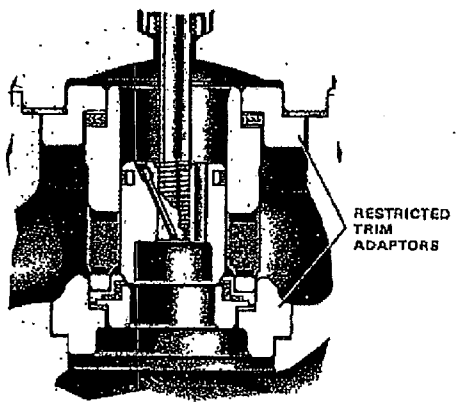


Figure 1-38. Adaptor Method for Providing Reduced Flow Capacity

Conventional globe-style valve bodies can be fitted with seat rings with smaller port-size than normal and valve plugs sized to fit those smaller ports. Valves with cage-guided trim

often achieve the reduced capacity effect by utilizing valve plug, cage, and seat ring parts from a smaller valve size of similar construction and adaptor pieces above the cage and below the seat ring to mate those smaller parts with the valve body, as shown in Figure 1-38. Since reduced capacity service is not at all unusual, leading manufacturers provide readily available trim part combinations to perform the required function. Many restricted capacity trim combinations are designed to furnish approximately 40 percent of full-size trim capacity.

Section 2

Valve Positioners, Boosters, and Other Accessories

The Old Guidelines

The selection of the proper equipment for acceptable performance of a control system requires an analysis of the static and dynamic characteristics of each available component in relation to the process being controlled. In the forty years or so since the first availability of pneumatic valve positioners, many manufacturers have adopted "rules of thumb" regarding positioner application. These "rules" dictated positioner usage to counteract such factors as packing box friction, valve plug unbalance, and spring and diaphragm hysteresis. The "rules" suggested that use of a valve positioner was the best way to ensure maintaining a valve plug position proportional to the instrument signal from the controller.

Toward that end, many valve positioners have been developed and are presently available. In function, they are alike, although there are various shapes, styles, and operating principles. Positioners are generally mounted on the side of diaphragm actuators and on the top of piston actuators. They are connected mechanically to the valve stem or piston so that stem position can be compared with the position dictated by the controller. Schematic drawings are shown in Figures 2-1 and 2-2 for two styles of commonly used positioners.

Extensive Fisher Controls Company research on application of positioners has produced some interesting and surprising results in terms of the "rules of thumb" mentioned above. The research included analog computer simulation of a variety of process control loops, an experimental testing program to verify the conclusions drawn from the computer simulation, and an analytical study of the non-linearity of valve plug travel due to packing friction. Several varieties of positioners were considered in the research.

The analog simulations of fast control systems indicated that greater packing friction made the use of a positioner *less* desirable and that the better the positioner accuracy and response, the *poorer* the system control. Intentionally degrading positioner performance by reducing positioner-actuator loop gain provided progressively more stability, allowed tighter controller settings, and provided better process control for fast systems. Including a pneumatic isolating amplifier (volume booster) in the system provided still better performance. The booster, such as that shown

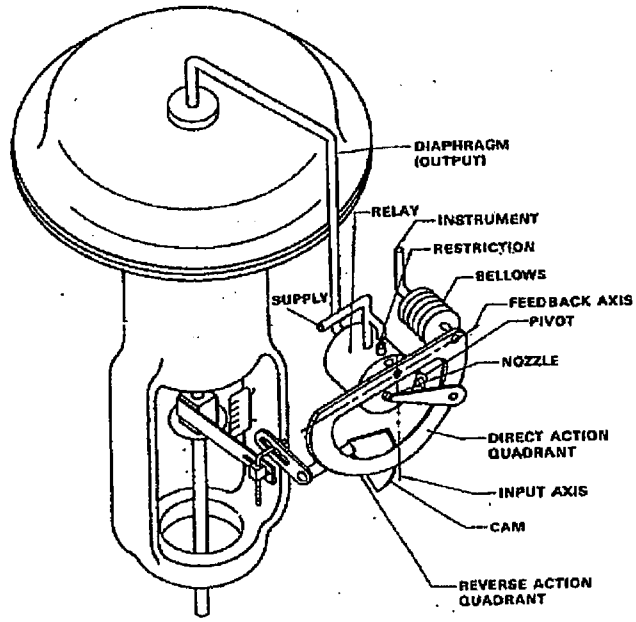


Figure 2-1. Positioner Schematic for Diaphragm Actuator

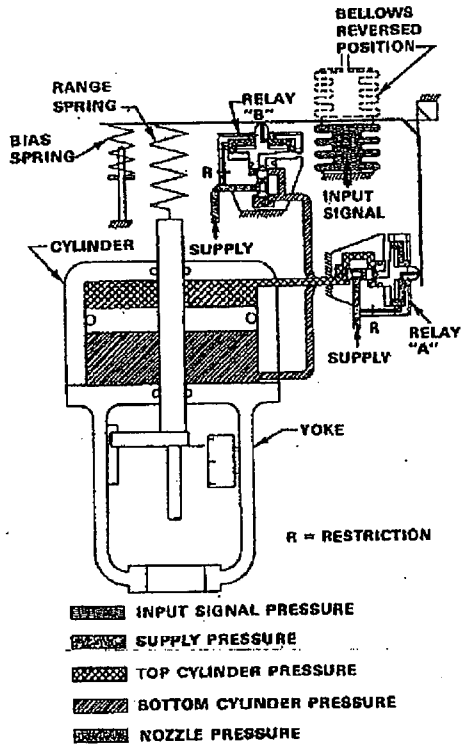


Figure 2-2. Positioner Schematic for Piston Actuator

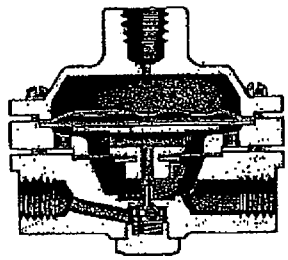


Figure 2-3. Typical Booster

in Figure 2-3, was representative of a positioner with the poorest possible positioning accuracy. Since the stroking speed of the actuator was not affected, the improved performance apparently resulted from the ability of the booster to isolate the controller from the large capacitive load of the actuator.

The computer study indicated that use of positioners is clearly beneficial on relatively slow systems and clearly detrimental on relatively fast systems. The need for using or not using a positioner is completely independent of the old "rules of thumb" with one exception. If stem friction or stickiness is unusually high, it becomes increasingly important to ignore the old "rules" and follow fast system/slow system principle for positioner application.

The experimental verification phase of the research program bore out the conclusions reached in the computer simulation phase. Liquid pressure control systems were used to evaluate conclusions relating to fast systems and liquid level control systems were used to evaluate slow system conclusions. Theoretical analysis of packing friction non-linearity again reinforced the new guidelines.

The New Guidelines

The testing program and analysis lead to the following conclusions and guidelines for application of auxiliary positioners or boosters for control systems.

A. Previous "rules" based on actuator loading, valve unbalance, and stem friction should be discarded.

B. In many control systems, a properly sized spring-and-diaphragm actuator will do an excellent job without the use of either a positioner or a booster.

C. An auxiliary positioner or booster should be considered for systems where it is necessary to:

1. Split-range the controller output to more than one valve.

2. Amplify the controller output signal pressure above the standard range in order to provide increased actuator thrust or stiffness.

3. Provide the best possible control with minimum overshoot and fastest possible recovery following a disturbance or load change where long controller instrument lines are involved.

Determination of which auxiliary device (positioner or booster) to use for the above situations is dependent on the speed of system response. If the system is relatively fast, such as is typical of liquid pressure control loops, some gas pressure control loops, and most flow control loops, the proper choice is a booster. If the system is relatively slow, such as is typical of liquid level, blending, temperature, and some reactor control loops, the proper choice is a positioner. Fortunately, for those in-between cases when it is difficult to determine if a system is fast or slow, the choice has little effect on performance.

Springless piston actuators are used to operate valves when high forces are needed. They require the use of positioners since no inherent restoring mechanism is provided. For slow loops where positioners are normally beneficial, this presents no problem. For fast systems, where positioners should be avoided but thrust requirements necessitate spring-less actuators, there may be no alternative but to operate with relatively loose controller settings.

Motion transmitters are available for use with pneumatically actuated control valves. They are used in conjunction with indicating or recording instruments for remote indication of valve stem position. A pneumatic output pressure signal is transmitted that is directly proportional to valve stem position.

Other Control Valve Accessories
Handwheels and Manual Operators

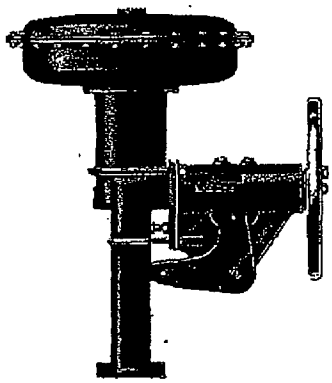


Figure 2-4. Side-Mounted Handwheel for Diaphragm Actuators

Used with either direct-acting or reverse-acting actuators, this unit acts as an adjustable travel stop to limit either full opening or full closing of the valve or to position the valve manually.

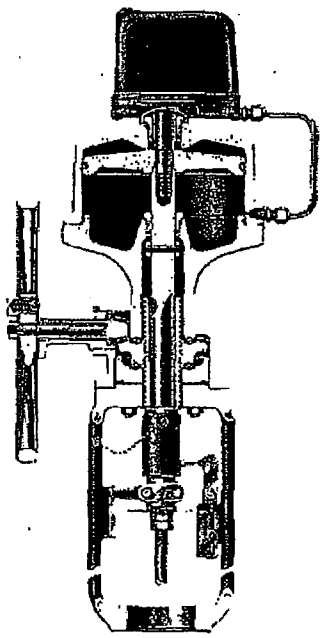


Figure 2-5. Side-Mounted Handwheel for Piston Actuators

Used to manually position the valve, this unit also acts as an adjustable travel stop to limit either full opening or full closing of the valve.

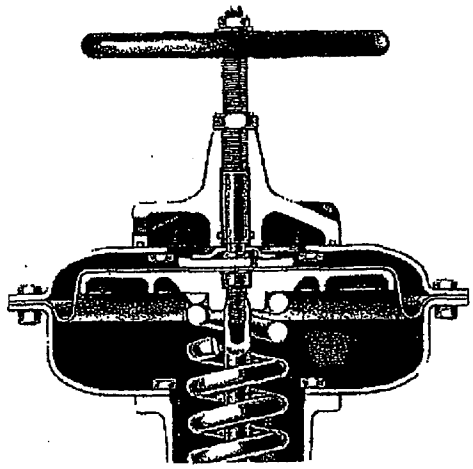


Figure 2-6. Top-Mounted Handwheel for Direct-Acting Diaphragm Actuator

This unit can be used as an adjustable travel stop to limit travel in the upward direction or to manually close push-down-to-close valves.

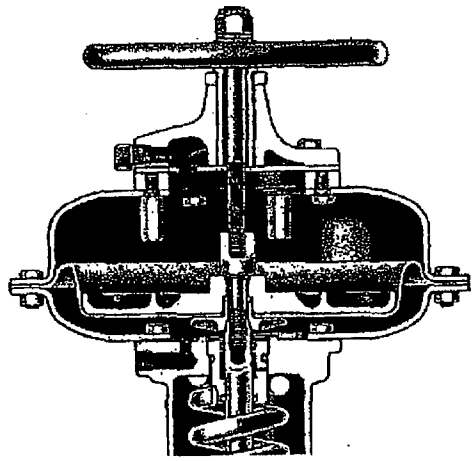


Figure 2-7. Top-Mounted Handwheel for Reverse-Acting Diaphragm Actuator

This unit can be used as an adjustable travel stop to limit travel in the downward direction or to manually close push-down-to-open valves.

Hydraulic Snubber

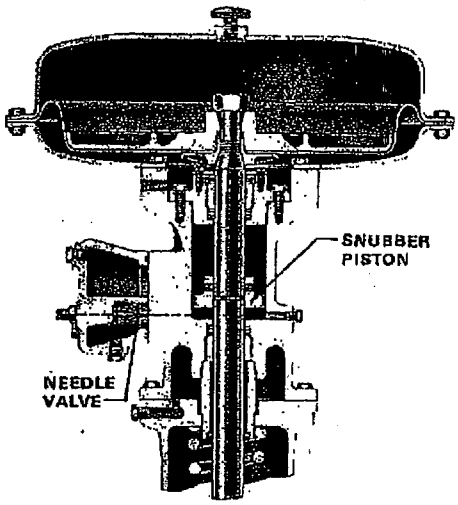


Figure 2-8. Hydraulic Snubber Installed on Reverse-Acting Diaphragm Actuator

Dampens vertical instability of the valve plug on severe control valve applications. Piston moving in an oil-filled cylinder provides the damping action, which is adjustable by changing needle valve position in the oil flow passage. Similar units are also available for use on direct-acting diaphragm actuators and for piston actuators.

Limit Switches

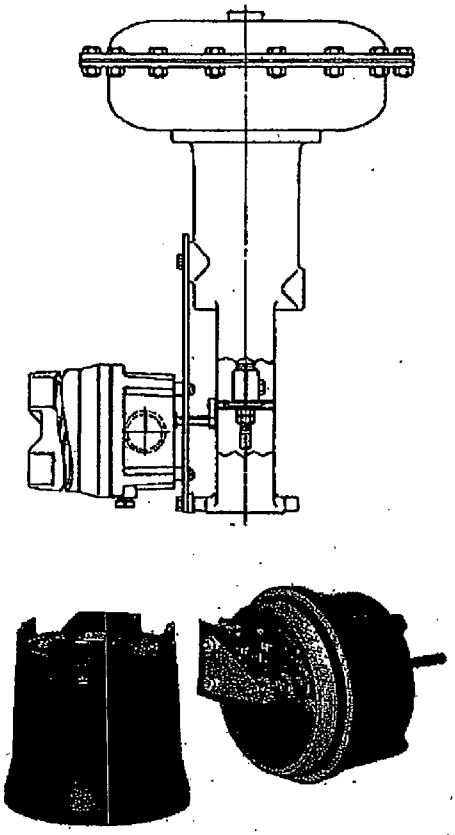


Figure 2-9. Cam-Operated Limit Switches

Limit switches are used to operate signal lights, small solenoid valves, electric relays, or alarms. The cam-operated type shown is available with from two to six individual switches operated by movement of the valve stem. The switches are housed in an assembly that mounts on the side of the actuator. Each switch is individually adjustable and can be supplied for either alternating current or direct current systems. Other styles of valve-mounted limit switches are also available for service where electrical specifications exceed the capabilities of the cam-operated design.

Solenoid Valve Manifold

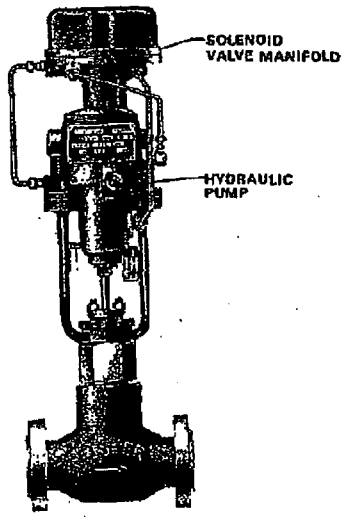


Figure 2-10. Solenoid Valve Manifold

A solenoid valve manifold can be used on a double-acting piston actuator to permit hydraulic operation of the actuator. The manifold mounts on top of the actuator cylinder and, by means of the making or breaking of an electric current signal, switches output of a connected hydraulic pump to either above or below the actuator piston. Precise control of valve plug position can be achieved with a unit such as that shown above.

Supply Pressure Regulator

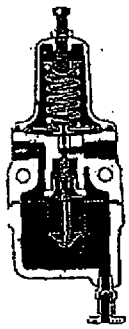


Figure 2-11. Supply Pressure Regulator with Filter and Moisture Trap

Supply pressure regulators are used to reduce plant air supply to valve positioners and other control equipment. Common reduced air supply pressures are 20 and 35 psi. The regulator can be nipple-mounted or bolted to the actuator.

Pneumatic Lock-Up Systems

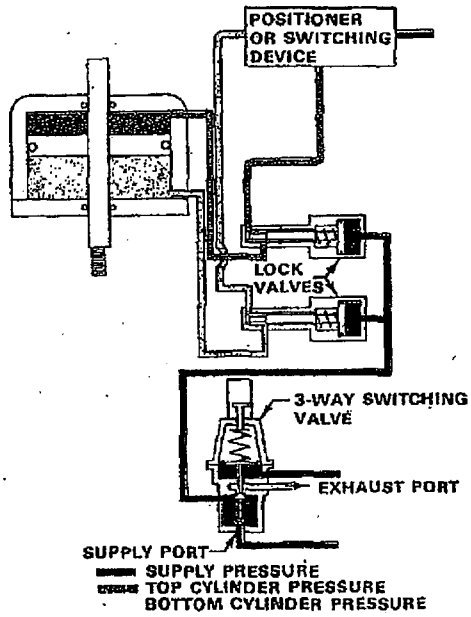


Figure 2-12. Lock-Up System Schematic for Piston Actuator

Pneumatic lock-up systems are used with control valves to lock in existing actuator loading pressure in the event of supply pressure failure. Normal operation resumes automatically when supply pressure is restored. Functionally similar arrangements are available for control valves using diaphragm actuators.

Fail-Safe Systems for Piston Actuators

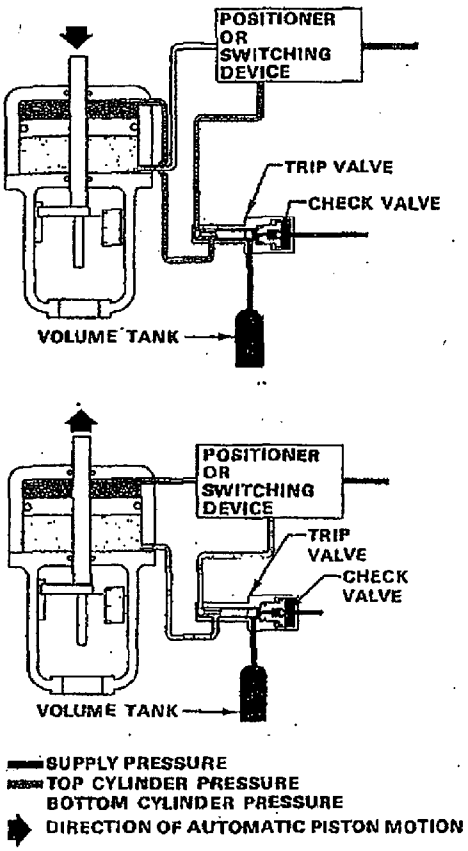


Figure 2-13. Schematics of "Fail-Safe" Systems

In these "fail-safe" systems, the actuator piston is moved to the top or bottom of the cylinder when supply pressure falls below a pre-determined value. The volume tank, which is charged with supply pressure, provides loading pressure for the actuator piston when supply pressure fails, thus moving the piston to the desired position. Automatic operation resumes, and the volume tank is recharged, when supply pressure is restored to normal.

Electro-Pneumatic Transducers

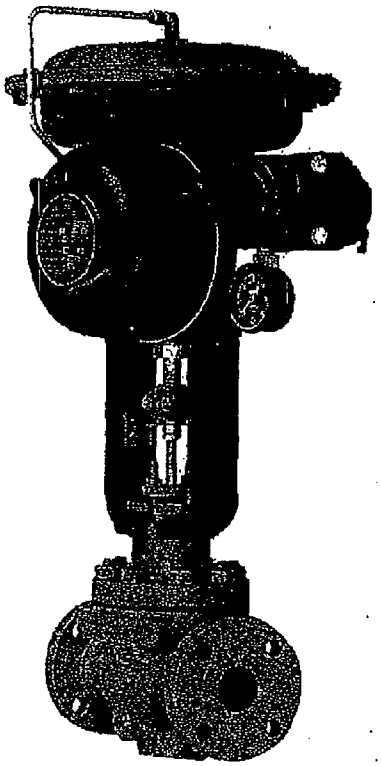


Figure 2-14. Electro-Pneumatic Transducer with Supply Regulator for Operation of Diaphragm-Actuated Control Valve

The transducer receives a direct current input signal and uses a torque motor, nozzle-flapper, and pneumatic relay to convert the electric signal to a proportional pneumatic output signal. Nozzle pressure operates the relay and is piped to the torque motor feedback bellows to provide a comparison between input signal and nozzle pressure. As shown, the transducer can be mounted directly on a control valve and operate the valve without need for additional boosters or relays. On/off electro-pneumatic transducers are also available and are commonly used to replace solenoid valves in intrinsically safe systems.

Electro-Pneumatic Valve Positioners

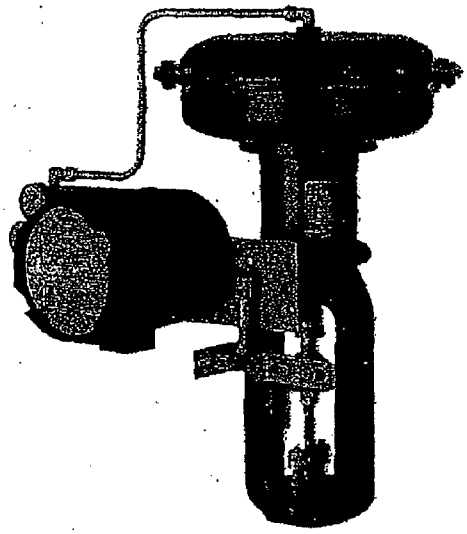


Figure 2-15. Electro-Pneumatic Positioner on Diaphragm Actuator

Electro-pneumatic positioners are used in electronic control loops to operate pneumatic diaphragm control valve actuators. The positioner receives a direct current input signal, and uses a torque motor, nozzle-flapper, and pneumatic relay to convert the input signal to a pneumatic output signal. The output signal is applied directly to the actuator diaphragm, producing a valve plug position that is proportional to the input signal. Valve plug position is mechanically fed back to the torque motor to provide for error correction by comparison of plug position and input signal. Split-range operation capability can provide full travel of the actuator with only a portion of the input signal range.

Section 3

Control Valve Selection

Considerations Required

Control valves are called on to handle all kinds of fluids at temperatures from the cryogenic range to well over 1000°F *(538°C)*. So selection of a control valve body assembly requires particular consideration to provide the best available combination of valve body style, material, and trim construction design for the intended service. Capacity requirements and system operating pressure ranges must also be considered in selecting a control valve to insure satisfactory operation without undue initial expense.

Reputable control valve manufacturers and their representatives are dedicated to helping the customer select the control valve most appropriate for the existing service conditions. Since there are frequently several possible "correct" choices for an application, it is important that all the following information be provided by the customer:

- Type of fluid to be controlled
- Temperature of fluid
- Viscosity of fluid
- Specific gravity of fluid
- Flow capacity required (Maximum and Minimum)
- Inlet pressure at valve (Maximum and Minimum)
- Outlet pressure (Maximum and Minimum)
- Pressure drop during normal flowing conditions
- Pressure drop at shutoff
- Maximum permissible noise level, if pertinent, and the measurement reference point
- Degrees of superheat or existence of flashing, if known
- Inlet and outlet pipeline size and schedule

Typical ordering specifications should also include the following information relating to the control valve:

- Item number
- Valve type number
- Quantity required
- Valve size
- Special tagging information required
- Valve body construction (angle, double-port, butterfly, etc.)

- Body material (ASTM A126 Class B cast iron, ASTM A216 Grade WCB, etc.)
- End connections and rating (screwed, ANSI Class 600 RF flanged, ANSI Class 1500 RTJ flanges, etc.)
- Valve plug or disc style (quick opening, edisc™, Micro-Flute™, Fishtail®, etc.)
- Valve plug guiding (cage-style, port-guided, etc.)
- Valve plug action (push down to close or push down to open)
- Port size (full or restricted)
- Valve trim materials required
- Action desired on air failure (valve to open, close, or retain last controlled position)
- Flow action (flow tends to open valve or flow tends to close valve)
- Actuator size required
- Instrument air supply available
- Bonnet style (plain, extension, etc.)
- Packing material (TFE V-ring, laminated graphite, etc.)
- Accessories required (positioner, handwheel, etc.)
- Instrument signal (3 to 15 psi, 4 to 20 mA, etc.)

From the foregoing list, it's easy to see there are quite a few things to specify in ordering a control valve. Some of the options have been discussed in previous chapters of this book and others will be explored in this and following chapters.

Valve Body Materials

Body material selection is usually based on the pressure, temperature, corrosive properties, and erosive properties of the flow media. Sometimes a compromise must be reached in selecting a material. For instance, a material with good erosion resistance may not be satisfactory because of poor corrosion resistance when handling a particular fluid.

Some service conditions require use of exotic alloys and metals to withstand particular corrosive properties of the flowing fluid. Naturally these materials are much more expensive than more common metals and so economy may also be a factor in material selection. Fortunately, the majority of control valve applications handle relatively non-corrosive fluids at reasonable pressures and temperatures. Therefore, cast iron and cast carbon steel are the most commonly used valve body materials and can provide satisfactory service at much lower cost than the exotic alloy materials.

The following thumbnail descriptions will provide some basic information on various popular castable materials used for control valve bodies. ASTM material designations are included. Use of proper ASTM designations is considered good practice and is encouraged in specifying materials, particularly for pressure-containing parts. Additional engineering data on these and other materials appears on pages 123 through 129.

Cast carbon steel (ASTM A216 Grade WCB)—Most popular steel material is used for valve bodies in moderate services such as control of air, saturated or superheated steam, non-corrosive liquids and gases. Casting cost per pound is roughly four times that of cast iron, but WCB is useful at much higher pressures and temperatures than cast iron, as is shown in Figures 3-1 and 3-6. (Check applicable codes for suitability of WCB for prolonged usage at temperatures above 775°F (413°C), as carbon phase may be converted to graphite.) Can be welded without heat treatment unless nominal thickness exceeds 1-1/4 inches (32 mm).

Cast chrome-moly steel (ASTM A217 Grade WC9)—Addition of chromium and molybdenum provide corrosion and creep resistance. Rough castings may be 1-1/2 times as costly as WCB, but can be used to 1050°F (566°C). WC9 requires pre-heating

before welding and heat treatment after welding. See Figures 3-2 and 3-6 for pressure-temperature rating curve.

Cast chrome-moly steel (ASTM A217 Grade C5)—Popular steel alloy for use up to 1100°F (593°C) on high pressure steam, oils, gases, petroleum vapors, sea water, and other mildly corrosive fluids. Also resistant to erosion at high temperature and to creep. Weldable, with heat treatment. Figures 3-3 and 3-6 provide pressure-temperature rating. Casting cost normally somewhat higher than WCB.

Cast Type 304 stainless steel (ASTM A351 Grade CF8)—Heat treated stainless material for valves controlling oxidizing or very corrosive fluids. Frequently used above 1000°F (538°C) and below minus 150°F (−101°C). Rough casting cost is approximately 2-1/2 times that of WCB. Pressure-temperature ratings are shown in Figures 3-4 and 3-6. Type 304 is readily weldable without heat treatment.

Cast Type 316 stainless steel (ASTM A351 Grade CF8M)—Useful for many of same services as Type 304, but addition of molybdenum gives Type 316 greater resistance to corrosion pitting, creep, and oxidizing fluids. Raw material is heat-treated to provide maximum corrosion resistance. Castings are slightly more expensive than Type 304, but provide greater strength than 304. Pressure-temperature ratings appear in Figures 3-5 and 3-6.

Cast iron (ASTM A126)—Inexpensive, non-ductile material used for valve bodies controlling steam, water, gas, and non-corrosive fluids. See Figure 3-7 for pressure-temperature ratings.

Cast bronze (ASTM B61 and ASTM B62)—B62 is the "standard" valve body bronze and is slightly less expensive than B61 in the rough state. B61 is more frequently used for valve trim parts. Both materials are satisfactory for steam, air, water, oil, non-corrosive gas, and some dilute acid services. Good resistance to some types of corrosion, and suitable for cryogenic temperatures. ANSI pressure-temperature rating curves shown in Figure 3-8.

Pressure-Temperature Ratings for Standard Class Valves
(In accordance with ANSI B16.34-1977)

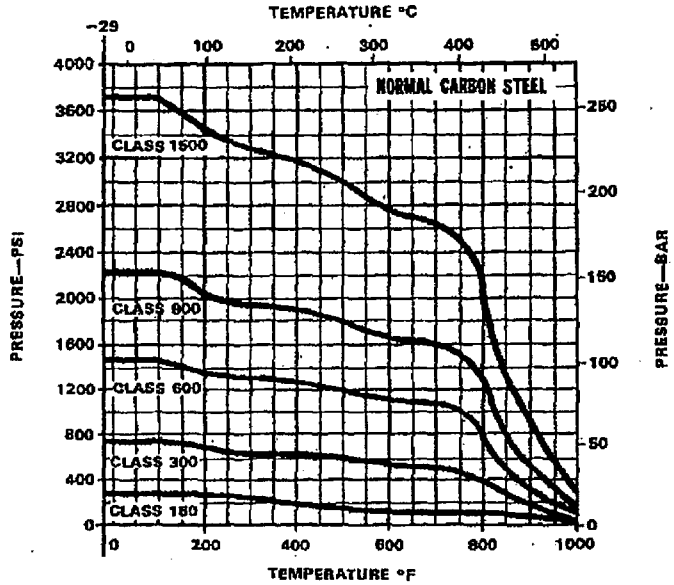


Figure 3-1. Ratings for Normal Carbon Steel Valves
[Fisher Controls Company recommends limiting ASTM A216 Grade WCB valves to 800°F (427°C).]

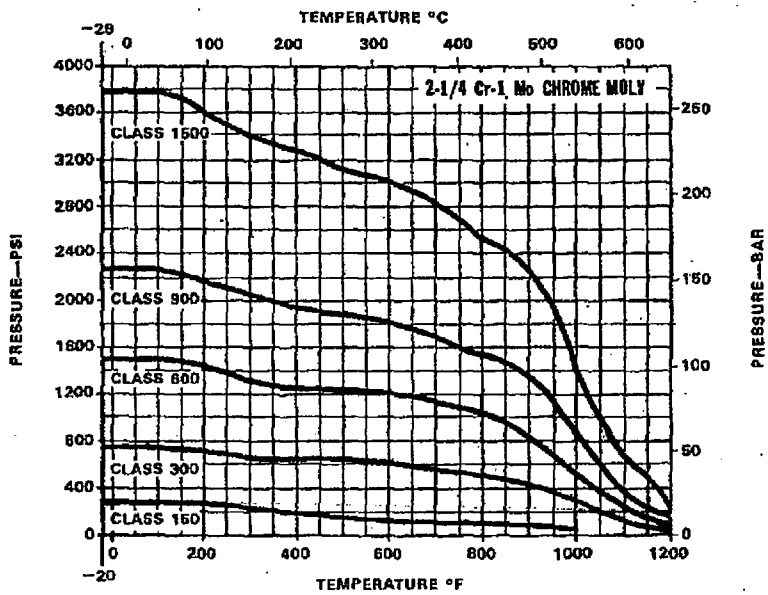


Figure 3-2. Ratings for 2 1/4 Cr-1 Mo Chrome Moly Alloy Steel Valves
[ASTM A217 WC9 valves should be limited to 1050°F (566°C).]

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Pressure-Temperature Ratings for Standard Class Valves
(in accordance with ANSI B16.34-1977)

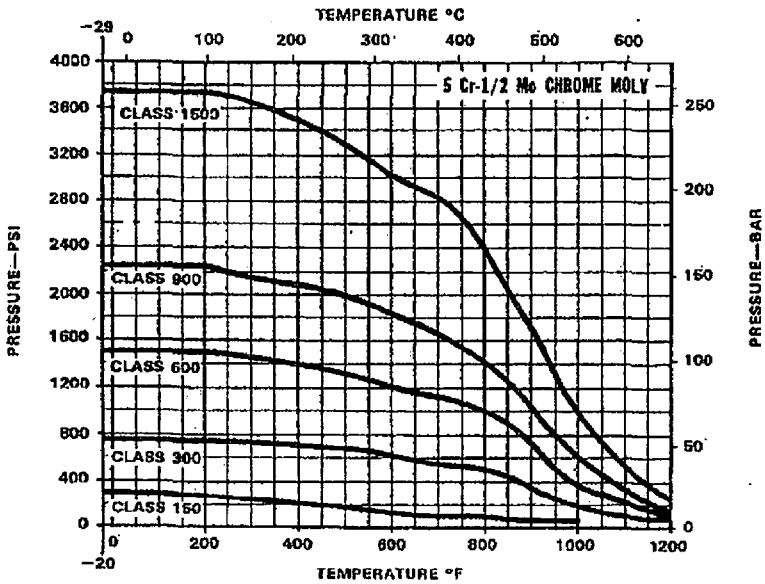

Figure 3-3. Ratings for 5 Cr-1/2 Mo Chrome Moly Alloy Steel Valves
[ASTM A217 Grade C5 valves should be limited to 1100°F (593°C).]

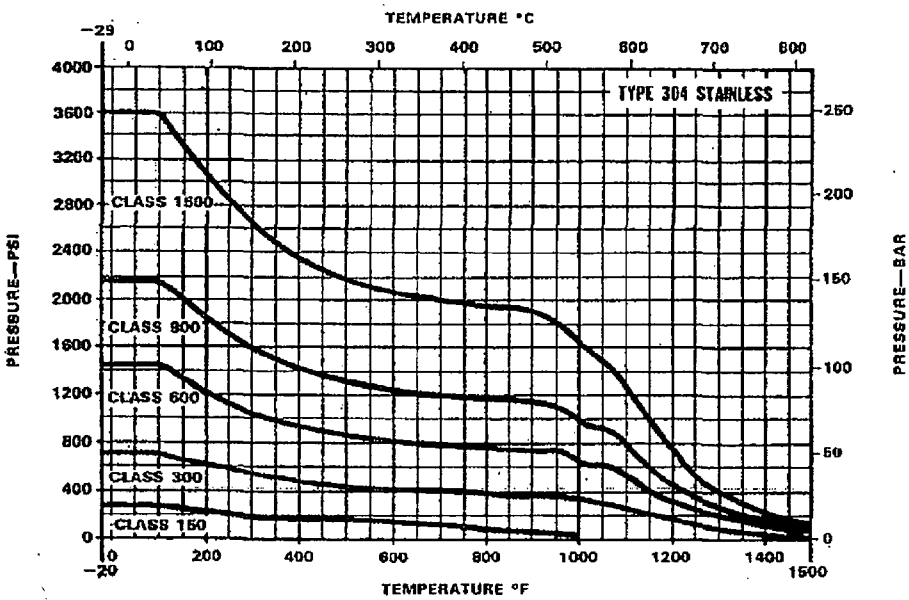

Figure 3-4. Ratings for Type 304 Stainless Steel Valves

Pressure-Temperature Ratings for Standard Class Valves
(In accordance with ANSI B16.34-1977)

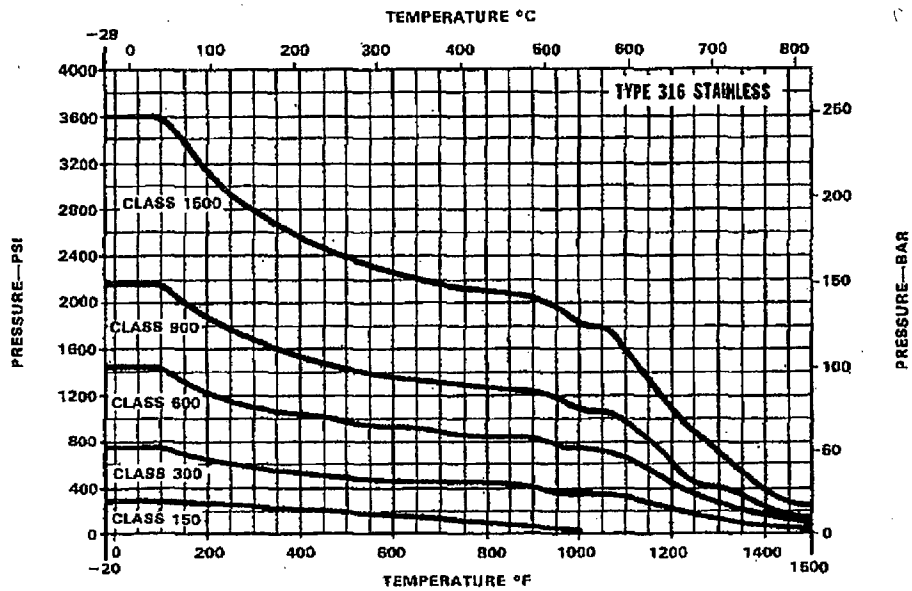

Figure 3-5. Ratings for Type 316 Stainless Steel Valves

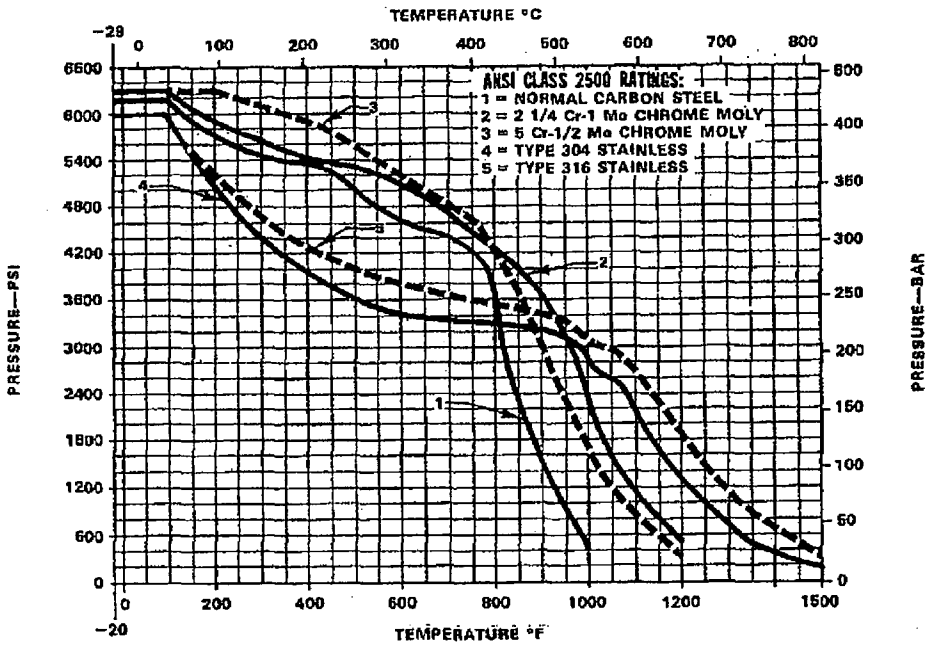

Figure 3-6. Ratings for Standard ANSI Class 2500 Valves

[Fisher Controls Company recommends limiting Curve 1 to 800°F (427°C) for ASTM A216 Grade WCB, Curve 2 to 1050°F (566°C) for ASTM A217 WC9, and Curve 3 to 1100°F (593°C) for ASTM A217 Grade C5.]

Pressure-Temperature Ratings ASTM A126 Cast Iron Valves
(In accordance with ANSI B16.1-1975.)

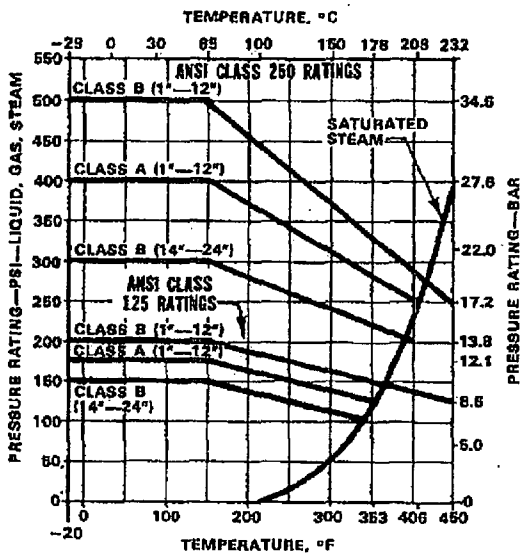

Figure 3-7. Ratings for ASTM A126 Cast Iron Valves

ASTM B61 and B62 Cast Bronze Valves
(In accordance with ANSI B16.24-1971.)

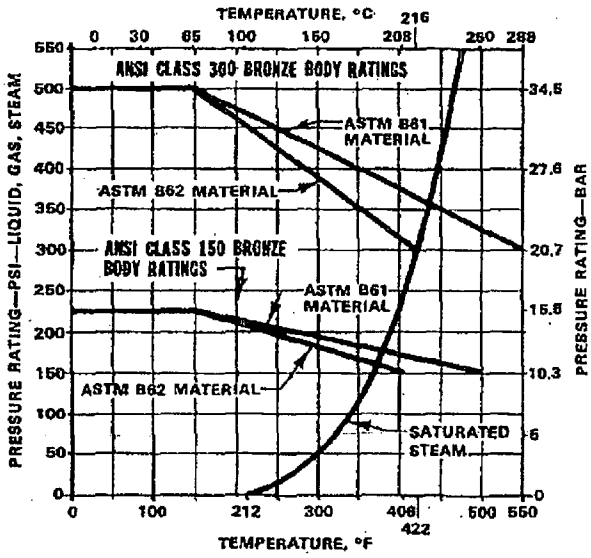

Figure 3-8. Ratings for ASTM B61 and B62 Cast Bronze Valves

Face-To-Face Dimensions for Flanged, Globe-Style Control Valves
(Inch Dimensions are in accordance with ISA S4.01.1-1977.)

BODY SIZE (INCHES)	ANSI CLASS AND END CONNECTIONS											
	125 FF (CI) 150 RF (Steel)		250 RF (CI) 300 RF (Steel)		150 RTJ (Steel)		300 RTJ (Steel)		600 RF (Steel)		600 RTJ (Steel)	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	7.25	184	7.75	197	7.75	197	8.25	210	8.25	210	8.25	210
1-1/4	7.88	200	8.38	213	8.38	213	8.88	225	9.00	229	9.00	229
1-1/2	8.75	223	9.25	235	9.25	235	9.75	248	9.88	251	9.88	251
2	10.00	254	10.50	267	10.50	267	11.12	283	11.25	286	11.38	289
2-1/2	10.88	276	11.50	292	11.38	289	12.12	308	12.25	311	12.38	314
3	11.75	299	12.50	318	12.25	311	13.12	333	13.25	337	13.38	340
4	13.88	352	14.50	368	14.38	365	15.12	384	15.50	394	15.62	397
6	17.75	451	18.62	473	18.25	464	19.25	489	20.00	508	20.12	511
8	21.38	543	22.38	568	21.88	556	23.00	584	24.00	610	24.12	613
10	26.50	673	27.88	708	27.00	686	28.50	724	29.62	752	29.75	756
12	29.00	737	30.50	775	29.50	749	31.12	790	32.25	819	32.38	822
16	40.00	1016	41.62	1057	40.50	1029	42.25	1073	43.62	1108	43.75	1111

Abbreviations used above: FF—Flat Face; RF—Raised Face; RTJ—Ring-Type Joint; CI—Cast Iron

Face-to-Face Dimensions for Single Flange and Flangeless Wafer-Style Butterfly Control Valves
(In accordance with MSS-SP67-1976)

BODY SIZE (INCHES)	NARROW VALVE BODY INSTALLED FACE-TO-FACE DIMENSIONS*			
	†		‡	
	In.	mm	In.	mm
1-1/2	1.31	33.3	1.38	35.1
2	1.69	42.9	1.75	44.5
2-1/2	1.81	46.0	1.88	47.8
3	1.81	46.0	1.88	47.8
4	2.06	52.3	2.12	53.8
6	2.19	55.6	2.25	57.2
8	2.38	60.5	2.50	63.5
10	2.69	68.3	2.81	71.4
12	3.06	77.7	3.19	81.0
14	3.06	77.7	3.19	81.0
16	3.12	79.2	3.25	82.6
18	4.00	101.6	4.12	104.6
20	4.38	111.2	4.50	114.3

*Bodies compatible with ANSI Class 125 or 250 cast iron flanges or ANSI Class 150 or 300 steel flanges through 12-inch size; dimensions shown for 14-inch and larger sizes apply to Class 150 or lower pressure class only.

†Those valves having sleeves or liners which extend over the body face and/or auxiliary seals contained in the body faces; when the body is bolted between flanges, the sleeve, liner, or auxiliary seals are compressed and act as a flange gasket.

‡Those valves not having sleeves or liners which extend over the body faces. This type valve may or may not have auxiliary seals in the body faces and may require separate flange gaskets. If separate gaskets are required, the thickness of the gaskets used must be added to the dimensions shown to determine the installed length.

Face-to-Face Dimensions for Flangeless, Partial-Ball Valves*

(In accordance with ISA S4.01.2-1977)

BODY SIZE (INCHES)	FACE-TO-FACE	
	In.	mm
3/4	3.00	76
1	4.00	102
1-1/2	4.50	114
2	4.88	124
3	6.50	165
4	7.62	194
6	9.00	229
8	9.56	243
10	11.69	297
12	13.31	338
16	15.75	400

*ANSI Classes 150 through 600.

Wear & Galling Resistance Chart Of Material Combinations

	304 SST	316 SST	Bronze	Inconel	Monel	Hastelloy B	Hastelloy C	Titanium 75A	Nickel	Alloy 20	Type 416 Hard	Type 440 Hard	17-4PH	Alloy 6 (co-cr)	ENC*	Cr Plate	Al Bronze
304 SST	P	P	F	P	P	P	F	P	P	P	F	F	F	F	F	F	F
316 SST	P	P	F	P	P	P	F	P	P	P	F	F	F	F	F	F	F
Bronze	F	F	S	S	S	S	S	S	S	S	F	F	F	F	F	F	F
Inconel	P	P	S	P	P	P	F	P	F	F	F	F	F	F	F	F	S
Monel	P	P	S	P	P	P	F	F	F	F	F	F	F	S	F	F	S
Hastelloy B	P	P	S	P	P	P	F	F	S	F	F	F	F	S	F	S	S
Hastelloy C	F	F	S	F	F	F	F	F	F	F	F	F	F	S	F	S	S
Titanium 75A	P	P	S	P	F	F	F	P	F	F	F	F	F	S	F	F	S
Nickel	P	P	S	F	F	S	F	F	P	P	F	F	F	S	F	F	S
Alloy 20	P	P	S	F	F	F	F	F	P	P	F	F	F	S	F	F	S
Type 416 Hard	F	F	F	F	F	F	F	F	F	F	F	F	F	S	S	S	S
Type 440 Hard	F	F	F	F	F	F	F	F	F	F	S	F	S	S	S	S	S
17-4 PH	F	F	F	F	F	F	F	F	F	F	F	S	P	S	S	S	S
Alloy 6 (co-cr)	F	F	F	F	S	S	S	S	S	S	S	S	S	F	S	S	S
ENC*	F	F	F	F	F	F	F	F	F	F	S	S	S	S	P	S	S
Cr Plate	F	F	F	F	F	S	S	F	F	F	S	S	S	S	S	P	S
Al Bronze	F	F	F	S	S	S	S	S	S	S	S	S	S	S	S	S	P

*Electroless nickel coating.
S—Satisfactory
F—Fair
P—Poor

Control Valve Seat Leakage Classifications
(In accordance with ANSI B16.104-1976)

Leakage Class Designation	Maximum Leakage Allowable	Test Medium	Test Pressures	Testing Procedures Required for Establishing Rating
I	...	...	...	No test required provided user and supplier so agree.
II	0.5% of rated capacity	Air or water at 50-125°F (10-52°C)	45-60 psig or max. operating differential, whichever is lower	Pressure applied to valve inlet, with outlet open to atmosphere or connected to a low head loss measuring device, full normal closing thrust provided by actuator.
III	0.1% of rated capacity	As above	As above	As above
IV	0.01% of rated capacity	As above	As above	As above
V	0.0005 ml per minute of water per inch of port diameter per psi differential	Water at 50-125°F (10-52°C)	Max. service pressure drop across valve plug, not to exceed ANSI body rating. (100 psi pressure drop minimum)	Pressure applied to valve inlet after filling entire body cavity and connected piping with water and stroking valve plug closed. Use net specified max. actuator thrust, but no more, even if available during test. Allow time for leakage flow to stabilizer.
VI	Not to exceed amounts shown in following table based on port diameter	Air or Nitrogen at 50-125°F (10-52°C)	50 psig or max. rated differential pressure across valve plug, whichever is lower.	Actuator should be adjusted to operating conditions specified with full normal closing thrust applied to valve plug seat. Allow time for leakage flow to stabilize and use suitable measuring device.

Class VI Seat Leakage Allowable
(In accordance with ANSI B16.104-1976)

NOMINAL PORT DIAMETER		LEAK RATE	
Inches	Millimeters	ml Per Minute	Bubbles Per Minute*
1	25	0.15	1
1-1/2	38	0.30	2
2	51	0.45	3
2-1/2	64	0.60	4
3	76	0.90	6
4	102	1.70	11
6	152	4.00	27
8	203	6.75	45

* Bubbles per minute as tabulated are an easily measured suggested alternative based on a suitable calibrated measuring device such as a 1/4-inch O.D. x 0.032-inch wall tube submerged in water to a depth of 1/8-inch to 1/4-inch. The tube end shall be cut square and smooth with no chamfers or burrs and the tube axis shall be perpendicular to the surface of the water. Other apparatus may be constructed and the number of bubbles per minute may vary from those shown, as long as they correctly indicate the flow in ml per minute.

Valve Trim Material Temperature Limits

MATERIAL	LOWER		UPPER	
	°F	°C	°F	°C
Type 304 Stainless Steel	−450	−268	600	316
Type 316 Stainless Steel	−450	−268	600	316
Bronze	−460	−273	450	232
Inconel[1]	−400	−240	1200	649
K Monel[1]	−400	−240	900	482
Monel	−400	−240	900	482
Hastelloy B[2]			700	371
Hastelloy C[2]			1000	538
Titanium			600	316
Nickel	−325	−198	600	316
Alloy 20	−50	−46	600	316
Type 416 Stainless Steel 40RC	−20	−29	800	427
CA-6NM	−20	−29	800	427
Nitronic 50[3]	−325	−198	1000	538
Type 440 Stainless Steel 60RC	−20	−29	800	427
17-4 PH (CB-7CU)	−40	−40	800	427
Alloy 6 (co-cr)	−460	−273	1500	816
Electroless Nickel Plating	−450	−268	800	427
Chrome Plating	−450	−268	1100	593
Aluminum Bronze	−460	−273	800	316
Nitrile	−40	−40	200	93
Fluoroelastomer (Viton[4] and Fluorel[5])	−10	−23	400	204
TFE	−450	−268	450	232
Nylon	−100	−73	200	93
Polyethylene	−100	−73	200	93
Neoprene	−40	−40	180	82

1. Trademark of International Nickel Co.
2. Trademark of Stellite Div., Cabot Corp.
3. Trademark of Armco Steel Corp.
4. Trademark of E.I. DuPont Co.
5. Trademark of 3M Co.

Corrosion Information

This corrosion table is intended to give only a general indication of how various materials will react when in contact with certain fluids. The recommendations cannot be absolute because concentration, temperature, pressure, and other conditions may alter the suitability of a particular material. There are also economic considerations that may influence material selection. Use this table as a guide only.

FLUID	MATERIAL													
	Carbon Steel	Cast Iron	302 or 304 Stainless Steel	316 Stainless Steel	Bronze	Monel*	Hastelloyt B	Hatelloyt C	Durimett 20	Titanium	Cobalt-Base Alloy 6	416 Stainless Steel	440C Hard Stainless Steel	17-4PH Hard Stainless Steel
Acetaldehyde	A	A	A	A	A	A	I.L.	A	A	I.L.	I.L.	A	A	A
Acetic Acid, Air Free	C	C	B	B	B	B	A	A	A	A	A	C	C	B
Acetic Acid, Aerated	C	C	A	A	A	A	A	A	A	A	A	C	C	B
Acetic Acid Vapors	C	C	A	A	B	B	I.L.	A	B	A	A	C	C	B
Acetone	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetylene	A	A	A	A	I.L.	A	A	A	A	I.L.	A	A	A	A
Alcohols	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aluminum Sulfate	C	C	A	A	B	B	A	A	A	A	I.L.	C	C	I.L.
Ammonia	A	A	A	A	C	A	A	A	A	A	A	A	A	I.L.
Ammonium Chloride	C	C	B	B	B	B	A	A	A	A	B	C	C	I.L.
Ammonium Nitrate	A	C	A	A	C	C	A	A	A	A	A	C	B	I.L.
Ammonium Phosphate (Mono-Basic)	C	C	A	A	B	B	A	A	B	A	A	B	B	I.L.
Ammonium Sulfate	C	C	B	A	B	A	A	A	A	A	A	C	C	I.L.
Ammonium Sulfite	C	C	A	A	C	C	I.L.	A	A	A	A	B	B	I.L.
Aniline	C	C	A	A	C	B	A	A	A	A	A	C	C	I.L.
Asphalt	A	A	A	A	A	A	A	A	A	I.L.	A	A	A	A
Beer	B	B	A	A	B	A	A	A	A	A	A	B	B	A
Benzene (Benzol)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzoic Acid	C	C	A	A	A	A	I.L.	A	A	A	I.L.	A	A	A
Boric Acid	C	C	A	A	A	A	A	A	A	A	A	B	B	I.L.

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Butane	A	A	A	A	A	A	A	A	A	I.L.	A	A	A	A
Calcium Chloride (Alkaline)	B	B	C	B	C	A	A	A	A	A	I.L.	C	C	I.L.
Calcium Hypochlorite	C	C	B	B	B	B	C	A	A	A	I.L.	C	C	I.L.
Carbolic Acid	B	B	A	A	A	A	A	A	A	A	A	I.L.	I.L.	I.L.
Carbon Dioxide, Dry	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Dioxide, Wet	C	C	A	A	B	A	A	A	A	A	A	A	A	A
Carbon Disulfide	A	A	A	A	C	B	A	A	A	A	A	B	B	I.L.
Carbon Tetrachloride	B	B	B	B	A	A	B	A	A	A	I.L.	C	A	I.L.
Carbonic Acid	C	C	B	B	B	A	A	A	A	I.L.	I.L.	A	A	A
Chlorine Gas, Dry	A	A	B	B	B	A	A	A	A	C	B	C	C	C
Chlorine Gas, Wet	C	C	C	C	C	C	C	B	C	A	B	C	C	C
Chlorine, Liquid	C	C	C	C	B	C	C	A	B	C	B	C	C	C
Chromic Acid	C	C	C	B	C	A	C	A	C	A	B	C	C	C
Citric Acid	I.L.	C	B	A	A	B	A	A	A	A	I.L.	B	B	B
Coke Oven Gas	A	A	A	A	B	B	A	A	A	A	A	A	A	A
Copper Sulfate	C	C	B	B	B	C	I.L.	A	A	A	I.L.	A	A	A
Cottonseed Oil	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Creosote	A	A	A	A	C	A	A	A	A	I.L.	A	A	A	A
Ethane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ether	B	B	A	A	A	A	A	A	A	A	A	A	A	A
Ethyl Chloride	C	C	A	A	A	A	A	A	A	A	A	B	B	I.L.
Ethylene	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A	A	I.L.	I.L.	A	I.L.	A	A	A	A
Ferric Chloride	C	C	C	C	C	C	C	B	C	A	B	C	C	I.L.
Formaldehyde	B	B	A	A	A	A	A	A	A	A	A	A	A	A
Formic Acid	I.L.	C	B	B	A	A	A	A	A	C	B	C	C	B
Freon, Wet	B	B	B	A	A	A	A	A	A	A	A	I.L.	I.L.	I.L.
Freon, Dry	B	B	A	A	A	A	A	A	A	A	A	I.L.	I.L.	I.L.
Furfural	A	A	A	A	A	A	A	A	A	A	A	B	B	I.L.
Gasoline, Refined	A	A	A	A	A	A	A	A	A	A	A	A	A	A

*Trademark of International Nickel Co.
†Trademark of Stellite Division, Cabot Corp.
‡Trademark of Duriron Co.
A—Recommended.
B—Minor to moderate effect, proceed with caution.
C—Unsatisfactory.
I.L.—Information lacking.

- Continued -

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FLUID	MATERIAL													
	Carbon Steel	Cast Iron	302 or 304 Stainless Steel	316 Stainless Steel	Bronze	Monel*	Hastelloy B	Hastelloy C	Durimetl 20	Titanium	Cobalt-Base Alloy 6	416 Stainless Steel	440C Hard Stainless Steel	17-4PH Hard Stainless Steel
Glucose	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrochloric Acid (Aerated)	C	C	C	C	C	C	A	B	C	C	B	C	C	C
Hydrochloric Acid (Air Free)	C	C	C	C	C	C	A	B	C	C	B	C	C	C
Hydrofluoric Acid (Aerated)	B	C	C	B	C	C	A	A	B	C	B	C	C	C
Hydrofluoric Acid (Air Free)	A	C	C	B	C	A	A	A	B	C	I.L.	C	C	I.L.
Hydrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen Peroxide	I.L.	A	A	A	C	A	B	B	A	A	I.L.	B	B	I.L.
Hydrogen Sulfide, Liquid	C	C	A	A	C	C	A	A	B	A	A	C	C	I.L.
Magnesium Hydroxide	A	A	A	A	B	A	A	A	A	A	A	A	A	I.L.
Mercury	A	A	A	A	C	B	A	A	A	A	A	A	A	B
Methanol	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Methyl Ethyl Ketone	A	A	A	A	A	A	A	A	A	I.L.	A	A	A	A
Milk	C	C	A	A	A	A	A	A	A	A	A	C	C	C
Natural Gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Nitric Acid	C	C	A	B	C	C	C	B	A	A	C	C	C	B
Oleic Acid	C	C	A	A	B	A	A	A	A	A	A	A	A	I.L.
Oxalic Acid	C	C	B	B	B	B	A	A	A	B	B	B	B	I.L.
Oxygen	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Petroleum Oils, Refined	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Phosphoric Acid (Aerated)	C	C	A	A	C	C	A	A	A	B	A	C	C	I.L.
Phosphoric Acid (Air Free)	C	C	A	A	C	B	A	A	A	B	A	C	C	I.L.
Phosphoric Acid Vapors	C	C	B	B	C	C	A	I.L.	A	B	C	C	C	I.L.
Picric Acid	C	C	A	A	C	C	A	A	A	I.L.	I.L.	B	B	I.L.
Potassium Chloride	B	B	A	A	B	B	A	A	A	A	I.L.	C	C	I.L.
Potassium Hydroxide	B	B	A	A	B	A	A	A	A	A	I.L.	B	B	I.L.

Propane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Rosin	B	B	A	A	A	A	A	A	A	I.L.	A	A	A	A
Silver Nitrate	C	C	A	A	C	C	A	A	A	A	B	B	B	I.L.
Sodium Acetate	A	A	B	A	A	A	A	A	A	A	A	A	A	A
Sodium Carbonate	A	A	A	A	A	A	A	A	A	A	A	B	B	A
Sodium Chloride	C	C	B	B	A	A	A	A	A	A	A	B	B	B
Sodium Chromate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium Hydroxide	A	A	A	A	C	A	A	A	A	A	A	B	B	A
Sodium Hypochloride	C	C	C	C	B-C	B-C	C	A	B	A	I.L.	C	C	I.L.
Sodium Thiosulfate	C	C	A	A	C	C	A	A	A	A	I.L.	B	B	I.L.
Stannous Chloride	B	B	C	A	C	B	A	A	A	A	I.L.	C	C	I.L.
Stearic Acid	A	C	A	A	B	B	A	A	A	A	B	B	B	I.L.
Sulfate Liquor (Black)	A	A	A	A	C	A	A	A	A	A	A	I.L.	IL.	I.L.
Sulfur	A	A	A	A	C	A	A	A	A	A	A	A	A	A
Sulfur Dioxide, Dry	A	A	A	A	A	A	B	A	A	A	A	B	B	I.L.
Sulfur Trioxide, Dry	A	A	A	A	A	A	B	A	A	A	A	B	B	I.L.
Sulfuric Acid (Aerated)	C	C	C	C	C	C	A	A	A	B	B	C	C	C
Sulfuric Acid (Air Free)	C	C	C	C	B	B	A	A	A	B	B	C	C	C
Sulfurous Acid	C	C	B	B	B	C	A	A	A	A	B	C	C	I.L.
Tar	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trichloroethylene	B	B	B	A	A	A	A	A	A	A	A	B	B	I.L.
Turpentine	B	B	A	A	A	B	A	A	A	A	A	A	A	A
Vinegar	C	C	A	A	B	A	A	A	A	I.L.	A	C	C	A
Water, Boiler Feed	B	C	A	A	C	A	A	A	A	A	A	B	A	A
Water, Distilled	A	A	A	A	A	A	A	A	A	A	A	B	B	I.L.
Water, Sea	B	B	B	B	A	A	A	A	A	A	A	C	C	A
Whiskey and Wines	C	C	A	A	A	B	A	A	A	A	A	C	C	I.L.
Zinc Chloride	C	C	C	C	C	C	A	A	A	A	B	C	C	I.L.
Zinc Sulfate	C	C	A	A	B	A	A	A	A	A	A	B	B	I.L.

*Trademark of International Nickel Co.
†Trademark of Stellite Division, Cabot Corp.
‡Trademark of Duriron Co.
A—Recommended.
B—Minor to moderate effect, proceed with caution.
C—Unsatisfactory.
I.L.—Information lacking.

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Elastomer Information

Elastomer Selection

Selection of a suitable elastomer material for use in control valve applications requires knowledge of the service conditions in which the material will be used, as well as knowledge of the general properties of the material itself. Service temperature, pressure conditions, rate of flow, type of valve action (throttling or on-off), and chemical composition of the flowing fluid should all be known. Usage ratings listed below (Good, Fair, etc.) should be used as a guide only. Specific compounds within any one material may vary, which could change the usage rating.

General Properties

Property		Natural Rubber	Buna-S	Nitrile	Neoprene	Butyl	Thiokol[1]	Silicone	Hypalon[2]	Viton[2,3,4]	Polyurethane[4]	Polyacrylic[5]	Ethylene Propylene[6]
Tensile Strength, Psi (Bar)	Pure Gum	3000 (207)	400 (28)	600 (41)	3500 (241)	3000 (207)	300 (21)	200-450 (14-31)	4000 (276)	...	...	100 (7)	...
	Reinforced	4500 (310)	3000 (207)	4000 (276)	3500 (241)	3000 (207)	1500 (103)	1100 (76)	4400 (303)	2300 (159)	6500 (448)	1800 (124)	2500 (172)
Tear Resistance		Excellent	Poor-Fair	Fair	Good	Good	Fair	Poor-Fair	Excellent	Good	Excellent	Fair	Poor
Abrasion Resistance		Excellent	Good	Good	Excellent	Fair	Poor	Poor	Excellent	Very Good	Excellent	Good	Good
Aging: Sunlight		Poor	Poor	Poor	Excellent	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent
Aging: Oxidation		Good	Fair	Fair	Good	Good	Good	Very Good	Very Good	Excellent	Excellent	Excellent.	Good
Heat (Max. Temp.)		200°F (93°C)	200°F (93°C)	250°F (121°C)	200°F (93°C)	200°F (93°C)	140°F (60°C)	450°F. (232°C)	300°F (149°C)	400°F (204°C)	200°F (93°C)	350°F (177°C)	350°F (177°C)
Static (Shelf)		Good	Good	Good	Very Good	Good	Fair	Good	Good	...	...	Good	Good
Flex Cracking Resistance		Excellent	Good	Good	Excellent	Excellent	Fair	Fair	Excellent	...	Excellent	Good	...
[illegible]		[illegible]	[illegible]	Very Good	Excellent	Fair	Poor	Good	Poor	Poor	Good	Good	Fair

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Solvent Resistance:												
Aliphatic Hydrocarbon	Very Poor	Very Poor	Good	Fair	Poor	Excellent	Poor	Fair	Excellent	Very Good	Good	Poor
Aromatic Hydrocarbon	Very Poor	Very Poor	Fair	Poor	Very Poor	Good	Very Poor	Poor	Very Good	Fair	Poor	Fair
Oxygenated Solvent	Good	Good	Poor	Fair	Good	Fair	Poor	Poor	Good	Poor	Poor	...
Halogenated Solvent	Very Poor	Very Poor	Very Poor	Very Poor	Poor	Poor	Very Poor	Very Poor	...	...	Poor	Poor
Oil Resistance:												
Low Aniline Mineral Oil	Very Poor	Very Poor	Excellent	Fair	Very Poor	Excellent	Poor	Fair	Excellent	...	Excellent	Poor
High Aniline Mineral Oil	Very Poor	Very Poor	Excellent	Good	Very Poor	Excellent	Good	Good	Excellent	...	Excellent	Poor
Synthetic Lubricants	Very Poor	Very Poor	Fair	Very Poor	Poor	Poor	Fair	Poor	...	...	Fair	Poor
Organic Phosphates	Very Poor	Very Poor	Very Poor	Very Poor	Good	Poor	Poor	Poor	Poor	Poor	Poor	Very Good
Gasoline Resistance:												
Aromatic	Very Poor	Very Poor	Good	Poor	Very Poor	Excellent	Poor	Poor	Good	Fair	Fair	Fair
Non-Aromatic	Very Poor	Very Poor	Excellent	Good	Very Poor	Excellent	Good	Fair	Very Good	Good	Poor	Poor
Acid Resistance:												
Diluted (Under 10%)	Good	Good	Good	Fair	Good	Poor	Fair	Good	Excellent	Fair	Poor	Very Good
Concentrated[6]	Fair	Poor	Poor	Fair	Fair	Very Poor	Poor	Good	Very Good	Poor	Poor	Good
Low Temperature Flexibility (Max.)	−65°F (−54°C)	−50°F (−46°C)	−40°F (−40°C)	−40°F (−40°C)	−40°F (−40°C)	−40°F (−40°C)	−100°F (−73°C)	−20°F (−29°C)	−30°F (−34°C)	−40°F (−40°C)	−10°F (−23°C)	−50°F (−46°C)
Permeability to Gases	Fair	Fair	Fair	Very Good	Very Good	Good	Fair	Very Good	Good	Good	Good	Good
Water Resistance	Good	Very Good	Very Good	Fair	Very Good	Fair	Fair	Fair	Excellent	Fair	Fair	Very Good
Alkali Resistance:												
Diluted (under 10%)	Good	Good	Good	Good	Very Good	Poor	Fair	Good	Excellent	Fair	Poor	Excellent
Concentrated	Fair	Fair	Fair	Good	Very Good	Poor	Poor	Good	Very Good	Poor	Poor	Good
Resilience	Very Good	Fair	Fair	Very Good	Very Good	Poor	Good	Good	Good	Fair	Very Poor	Very Good
Elongation (Max.)	700%	500%	500%	500%	700%	400%	300%	300%	425%	625%	200%	500%

1. Trademark of Thiokol Chemical Co.
2. Trademark of E.I. DuPont Co.
3. Do not use with steam.
4. Do not use with ammonia.
5. Do not use with petroleum base fluids. Use with ester base non-flammable hydraulic oils and low pressure steam applications to 300°F (149°C).
6. Except for nitric and sulfuric acid.

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Fluid Compatibility

The following table rates and compares the compatibility of elastomer material with specific fluids. Note that this information should be used as a guide only. An elastomer which is compatible with a fluid may not be suitable over the entire range of its temperature capability. In general, chemical compatibility decreases with an increase in service temperature.

Fluid	Natural Rubber	Neoprene	Nitrile	EPT	Poly-urethane	Viton*	Hypalon*	Butyl	Silicone
Acetic Acid (30%)	B	C	B	A+	C	B	B	A	A
Acetone	B	B	C	A	C	C	B	A	B
Air, Ambient	B	A	A	A	A	A	A	A	A
Air, Hot (200°F) (93°C)	C	C	A	A	B	A	A	A	C
Air, Hot (400°F) (204°C)	C	C	C	C	C	B	C	C	C
Alcohol, Ethyl	A	A	A	A	B	B	A	A	A
Alcohol, Methyl	A	A+	A	A	C	C	A	A	A
Ammonia, Anhydrous	C	A	C	A	C	C	B	A	C
Ammonia, Gas (Hot)	C	B	C	B	C	C	B	C	B
Beer (Beverage)	A	A	B	A	C	A	A	A	A
Benzene	C	C	C	C	C	A	C	C	C
Black Liquor	B	B	A	B	C	A+	C	C	C
Blast Furnace Gas	C	C	B	C	C	A	C	C	A
Brine (Calcium Chloride)	A	A	A	A	A	B	A	A	A
Butadiene Gas	C	B	C	C	C	B	B	C	C
Butane, Gas	C	A	A+	C	B	A	A	C	C
Butane, Liquid	C	B	A+	C	C	A	C	C	C
Carbon Tetrachloride	C	C	C	C	C	A	C	C	C
Chlorine, Dry	C	C	C	C	C	A	C	B	C
Chlorine, Wet	C	C	C	C	C	A	C	C	C
Coke Oven Gas	C	C	B	C	C	A+	B	C	B
Dowthermt A	C	C	C	C	C	A	C	C	C
Ethyl Acetate	C	C	C	B	C	C	C	B	B
Ethylene Glycol	A	A	A	A+	B	A	A	A	A
Freon 11	C	B	A	C	C	A+	A	C	C
Freon 12	B	A+	A	B	A	B	A	B	C
[illegible]	C	A+	C	A	C	C	A	A	C

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Freon 114	A	A	A	A	A	B	B	A	C
Gasoline	C	B	A+	C	B	A	B	C	C
Hydrogen Gas	B	A	A	A	A	A	A	A	C
Hydrogen Sulfide (Dry)	B	A	C	A+	B	C	A	A	C
Hydrogen Sulfide (Wet)	C	B	C	A+	C	C	C	A	C
Jet Fuel (JP-4)	C	C	A	C	B	A	C	C	C
Methylene Chloride	C	C	C	C	C	B	C	C	C
Milk	A	A	A+	A	C	A	A	A	A
Natural Gas	C	A	A+	C	B	A	A	C	C
Natural Gas + H_2S (Sour Gas)	C	A	B	C	B	C	A	C	C
Natural Gas, Sour + Ammonia	C	B	B	C	C	C	B	C	C
Naphthalene	C	C	C	C	B	A	C	C	C
Nitric Acid (10%)	C	B	C	B	C	A	B	B	B
Nitric Acid (50 to 100%)	C	C	C	C	C	A	C	C	C
Nitric Acid Vapor	C	B	C	B	C	A	B	B	C
Nitrogen	A	A	A	A	A	A	A	A	A
Oil (Fuel)	C	B	A+	C	C	A	A	C	C
Ozone	C	B	C	A	A	A	A	B	A
Paper Stock	C	B	B	B	C	A	B	B	C
Propane	C	A	A	C	B	A	A	C	C
Sea Water	B	B	A	A	B	A	B	A	B
Sea Water + Sulfuric Acid	C	B	C	B	B	A	B	B	C
Soap Solutions	B	A	A	A	A	A	A	A	A
Steam	C	C	C	B	C	C	C	B	C
Sulfur Dioxide	C	A	C	A+	B	A	C	B	A
Sulfuric Acid (to 50%)	C	B	C	B	B	A	B	B	C
Sulfuric Acid (50 to 100%)	C	C	C	B	C	A	C	B	C
Water (Ambient)	A	A	A	A	A	A	A	A	A
Water (200°F) (93°C)	C	C	B	A+	C	B	B	B	C
Water (300°F) (149°C)	C	C	C	B	C	C	C	B	C
Water (De-ionized)	A	A	A	A	A	A	A	A	A
Water, White	B	B	A	A	B	A	B	A	B

*Trademark of E.I. DuPont Co.
†Trademark of Dow Chemical Co.
A+—Best possible selection.

A—Recommended.
B—Minor to moderate effect. Proceed with caution.
C—Unsatisfactory.

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Service Temperature Limitations

Material	Low Limit °F	Low Limit °C	High Limit °F	High Limit °C
Natural Rubber	−60	−51	160	71
Neoprene	−40	−40	175	79
Nitrile	−20	−29	200	93
Polyurethane	−40	−40	200	93
Hypalon*	0	−18	225	107
Butyl	−20	−29	300	149
Ethylene Propylene (EPT)	−40	−40	300	149
Viton*	0	−18	400	204
Silicone	−65	−54	400	204

* Trademark of E.I. DuPont Co.

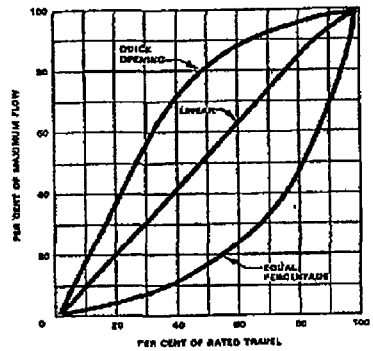


Figure 3-9. Typical Flow Characteristic Curves

Service Temperature Limitations for Elastomers

Temperature ranges indicated in the table above suggest limits within which the materials will function adequately. Temperatures shown are not necessarily inherent temperature limits. Dynamic forces imposed on the materials are also considered. Frequently, tear strength and other physical properties decrease rapidly as service temperature increases.

Control Valve Flow Characteristics

Introduction

The flow characteristic of a control valve is the relationship between the flow rate through the valve and the valve travel as the travel is varied from 0 to 100%. "Inherent flow characteristic" refers to the characteristic observed with a constant pressure drop across the valve. By "installed flow characteristic", we mean the one obtained in service where the pressure drop varies with flow and other changes in the system.

The purpose of characterizing control valves is to provide for a relatively uniform control loop stability over the expected range of system operating conditions. To establish the flow characteristic needed to "match" a given system requires a dynamic analysis of the control loop. Analysis of the more common processes have been performed, however, so we can establish some useful guidelines for the selection of the proper flow characteristic. But first, let's look briefly at the flow characteristics in use today.

Discussion of Flow Characteristics

Figure 3-9 illustrates typical flow characteristic curves. The quick opening flow characteristic provides for maximum change in flow rate at low valve travels with a fairly linear relationship. Additional increases in valve travel give sharply reduced changes in flow rate, and when the valve plug nears the wide open position, the change in flow rate approaches zero. In a control valve, the quick opening valve plug is used primarily for on-off service; but it is also suitable for many applications where a linear valve plug would normally be specified.

The linear flow characteristic curve shows that the flow rate is directly proportional to the valve travel. This proportional relationship produces a characteristic with a constant slope so that with constant pressure drop, the valve gain will be the same at all flows. (Valve gain is the ratio of an incremental change in flow rate to an incremental change in valve plug position. Gain is a function of valve size and configuration, system operating conditions and valve plug characteristic.) The linear valve plug is commonly specified for liquid level control and for certain flow control applications requiring constant gain.

In the equal percentage flow characteristic, equal increments of valve travel produce equal percentage changes in the existing flow. The change in flow rate is always proportional to the flow rate just before the change in valve plug, disc, or ball position is made. When the valve plug, disc, or ball is near its seat and the flow is small, the change in flow rate will be small; with a large flow, the change in flow rate will be large. Valves with an equal percentage flow characteristic are generally used on pressure control applications, and on other applications where a large percentage of the pressure drop is normally absorbed by the system itself, with only a relatively small percentage available at the control valve. Valves with an equal percentage characteristic should also be considered where highly varying pressure drop conditions can be expected. Fisher **Micro-Form,™ Micro-Flute™, V-Pup®**, and equal percentage valve plugs and cages all exhibit an equal percentage flow characteristic. Fisher rotary stem **Vee-Ball®, Hi-Ball®** and butterfly valves have flow characteristics which are approximately equal percentage.

Selection of Flow Characteristic

Here are some guidelines that will help in the selection of the proper flow characteristic. Remember, however, that there will be occasional exceptions to most of these "rules of thumb", and that a positive recommendation is possible only by means of a complete dynamic analysis. It should also be noted that where a linear characteristic is recommended, a quick opening valve plug could be used, and while the controller will have to operate on a wider proportional band setting, the same degree of control accuracy may be expected.

Liquid Level Systems

Control Valve Pressure Drop	Best Inherent Characteristic
Constant ΔP	Linear
Decreasing ΔP with Increasing Load, ΔP at Maximum Load > 20% of Minimum Load ΔP	Linear
Decreasing ΔP with Increasing Load, ΔP at Maximum Load < 20% of Minimum Load ΔP	Equal Percentage
Increasing ΔP with Increasing Load, ΔP at Maximum Load < 200% of Minimum Load ΔP	Linear
Increasing ΔP with Increasing Load, ΔP at Maximum Load > 200% of Minimum Load ΔP	Quick Opening

Flow Control Processes

FLOW MEASUREMENT SIGNAL TO CONTROLLER	LOCATION OF CONTROL VALVE IN RELATION TO MEASURING ELEMENT	BEST INHERENT CHARACTERISTIC	
		Wide Range of Flow Set Point	Small Range of Flow but Large ΔP Change at Valve with Increasing Load
Proportional To Flow	In Series	Linear	Equal Percentage
	In Bypass*	Linear	Equal Percentage
Proportional To Flow Squared	In Series	Linear	Equal Percentage
	In Bypass*	Equal Percentage	Equal Percentage

*When control valve closes, flow rate increases in measuring element.

Pressure Control Systems

Application	Best Inherent Characteristic
Liquid Process	Equal Percentage
Gas Process, Small Volume, Less Than 10 ft. (3 meters) of Pipe Between Control Valve and Load Valve	Equal Percentage
Gas Process, Large Volume (Process has a Receiver, Distribution System or Transmission Line Exceeding 100 ft. (30.5 meters) of Nominal Pipe Volume) Decreasing ΔP with Increasing Load, ΔP at Maximum Load > 20% of Minimum Load ΔP	Linear
Gas Process, Large Volume, Decreasing ΔP with Increasing Load, ΔP at Maximum Load < 20% of Minimum Load ΔP	Equal Percentage

Valve Sizing

While selection of appropriate control valve materials and pressure-temperature ratings warrant careful considerations, choosing the correct valve size is no doubt equally important. Simply specifying a valve size to match an existing pipeline size leaves much to chance and will likely create an impractical situation in terms of initial investment and adequacy of control. Obviously, a valve too small will not pass the required amount of flow. A valve too large will be unnecessarily expensive and may well create instability problems as it attempts to control at very low increments of travel. Naturally, knowledge of the process conditions mentioned earlier in this chapter is necessary to determine proper valve size.

Sizing for Liquid Service

Using the principle of conservation of energy, Daniel Bernoulli discovered that as a liquid flows through an orifice, the square of the fluid velocity is directly proportional to the pressure differential across the orifice and inversely proportional to the specific gravity of the fluid. Therefore, the greater the pressure differential, the higher the velocity; the greater the density, the lower the velocity. Logically, the volume flow rate for liquids can be calculated by multiplying the fluid velocity times the flow area.

By taking into account units of measurement, the proportionality relationship previously mentioned, energy losses due to friction and turbulence, and varying discharge coefficients for various types of orifices (or valve bodies), a basic liquid sizing equation can be written as follows:

$$Q = C_v\sqrt{\Delta P/G} \qquad (1)$$

where:

Q = Capacity in gallons per minute

C_v = Valve sizing coefficient determined experimentally for each style and size of valve, using water at standard conditions as the test fluid

ΔP = Pressure differential in psi

G = Specific gravity of fluid (water at 60°F = 1.0000)

Thus, C_v is numerically equal to the number of U.S. gallons of water at 60°F that will flow through the valve in one minute when the pressure differential across the valve is one pound per square inch. C_v varies with both size and style of valve, but provides an index for comparing liquid capacities of different valves under a standard set of conditions.

To aid in establishing uniform measurement of liquid flow capacity coefficients (C_v) among valve manufactures, the Fluid Controls Institute (FCI)

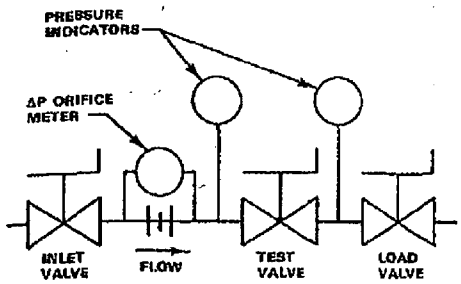


Figure 3-10. Standard FCI Test Piping for C_v Measurement

has developed a standard test piping arrangement, as shown in Figure 3-10. Using such a piping arrangement, most valve manufacturers develop and publish C_v information for their respective products, making it relatively easy to compare capacities of competitive products.

To calculate the expected C_v for a valve controlling water or other liquids that behave like water, the basic liquid sizing equation above can be re-written as follows:

$$C_v = Q\sqrt{\frac{G}{\Delta P}} \qquad (2)$$

Viscosity Corrections

Viscous conditions can result in significant sizing errors in using the basic liquid sizing equation, since published C_v values are based on test data using water as the flow medium. Although the majority of valve applications will involve fluids where viscosity corrections can be ignored, or where the corrections are relatively small, fluid viscosity should be considered in each valve selection.

Fisher Controls Company has developed a nomograph and procedure (Figure 3-11) that provides a viscosity correction factor (F_v). It can be applied to the standard C_v coefficient to determine a corrected coefficient (C_{vr}) for viscous applications.

Finding Valve Size

Using the C_v determined by the basic liquid sizing equation and the flow and viscosity conditions of the proposed installation, a fluid Reynolds number can be found by using the nomograph and procedure shown on the next page. The graph of Reynolds number vs. viscosity correction factor (F_v) is used to determine the correction factor needed. (If the Reynolds number is greater than 3500, the correction will be ten percent or less.) The actual required C_v (C_{vr}) is found by the equation:

$$C_{vr} = F_v C_v \qquad (3)$$

From the valve manufacturer's published liquid capacity information, select a valve having a C_v equal to or higher than the required coefficient (C_{vr}) found by the equation above.

Predicting Flow Rate

Select the required liquid sizing coefficient (C_{vr}) from the manufacturer's published liquid sizing coefficients (C_v) for the style and size valve being considered. Calculate the maximum flow rate (Q_{max}) in gallons per minute (assuming no viscosity correction required) using the following adaptation of the basic liquid sizing equation:

$$Q_{max} = C_{vr}\sqrt{\Delta P/G} \qquad (4)$$

Then incorporate viscosity correction by determining the fluid Reynolds number and correction factor F_v from the viscosity correction nomograph and the procedure included on it.

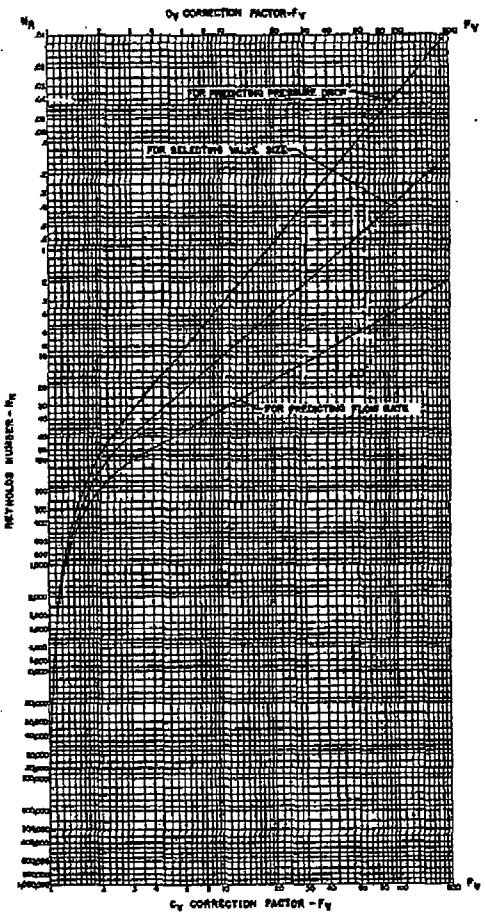
Calculate the predicted flow rate (Q_{pred}) using the formula:

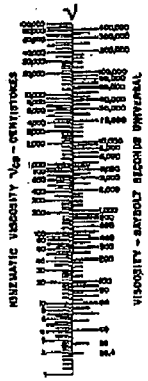
$$Q_{pred} = \frac{Q_{max}}{F_v} \qquad (5)$$

Predicting Pressure Drop

Select the required liquid sizing coefficient (C_{vr}) from the manufacturer's published liquid sizing coefficients (C_v) for the valve style and size being considered. Determine the Reynolds number and correct factor F_v from the nomograph and the procedure on it. Calculate the sizing coefficient (C_{vc}) using the formula:

$$C_{vc} = \frac{C_{vr}}{F_v} \qquad (6)$$





Procedure

1. Lay a straight edge on the liquid sizing coefficient on C_v scale and flow rate on Q scale. Mark intersection with index line. For Procedure A, use value of C_{ve}; for Procedures B and C, use value of C_{vr}.
2. Pivot the straight edge from this point of intersection with index line to liquid viscosity on proper $\sqrt{\nu}$ scale. Read Reynolds number on N_R scale.
3. Proceed horizontally from intersection on N_R scale to proper curve, and then vertically upward or downward to F_v scale. Read C_v correction factor on F_v scale.

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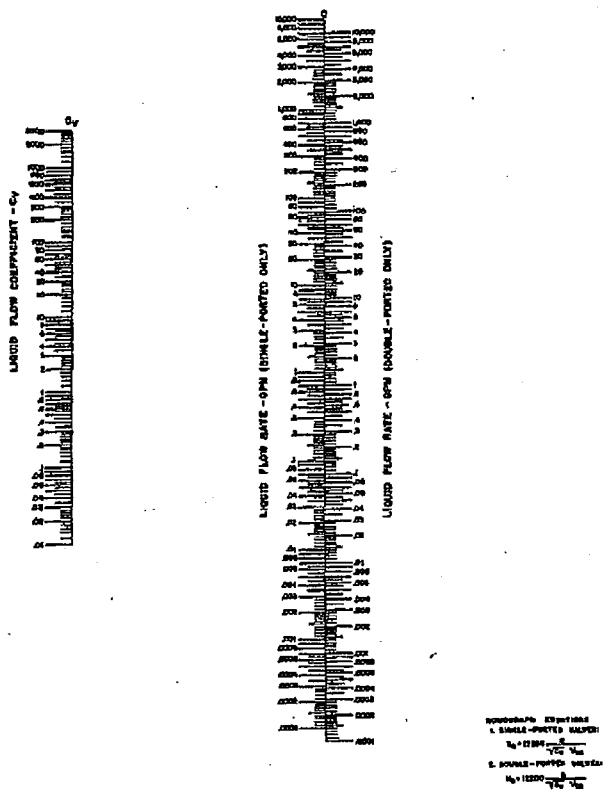
Nomograph Instructions

Use this nomograph in liquid sizing to correct for the effects of viscosity. When assembling data, all units must correspond to those shown on the nomograph. For high-recovery, ball-type valves, use the liquid flow rate Q scale designated for single-ported valves. For butterfly valves and eccentric disc rotary valves, use the liquid flow rate Q scale designated for double-ported valves.



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calafish_00153

Calculate the predicted pressure drop (ΔP_{pred}) using the formula:

$$\Delta P_{pred} = G\,(Q/C_{vc})^2 \qquad (7)$$

Flashing & Cavitation

The occurrence of either flashing or cavitation within a control valve can have a significant effect on the valve sizing procedure. These two related physical phenomena tend to limit flow through the control valve in many common applications and must, therefore, be taken into account in order to accurately size a valve. Structural damage to the valve and adjacent piping may also result. Knowledge of what is actually happening within the valve may permit selection of a size or style of valve which can reduce, or compensate for, the undesirable effects of flashing or cavitation.

The "physical phenomena" label is used to describe flashing and cavitation because these conditions represent actual changes in the form of the fluid media. The change is from the liquid state to the vapor state and results from the increase in fluid velocity at or just downstream of the greatest flow restriction, normally the valve port. As liquid flow passes through the restriction, there is a necking down, or contraction, of the flow stream. The minimum cross-sectional area of the flow stream occurs just downstream of the actual physical restriction at a point called the vena contracta, as shown in Figure 3-12.

To maintain a steady flow of liquid through the valve, the velocity must be greatest at the vena contracta, where cross sectional area is the least. The increase in velocity (or kinetic energy) is accompanied by a substantial decrease in pressure (or potential energy) at the vena contracta. Further downstream, as the fluid stream expands into a larger area, velocity decreases and pressure increases. But, of course, downstream pressure never recovers completely to equal the pressure that existed upstream of the valve. The pressure differential (ΔP) that exists

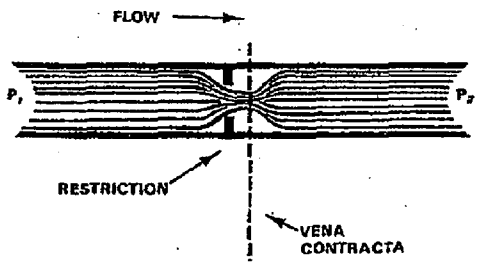


Figure 3-12. Vena Contracta Illustration

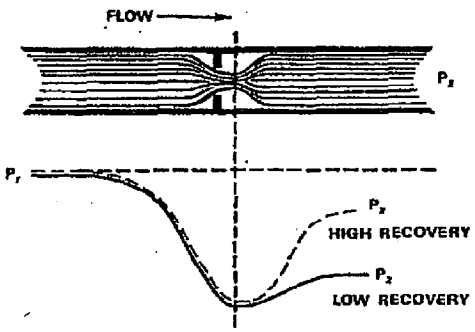


Figure 3-13. Comparison of Pressure Profiles for High and Low Recovery Valves

across the valve is a measure of the amount of energy that was dissipated in the valve. Figure 3-13 provides a pressure profile explaining the differing performance of a streamlined high recovery valve, such as a ball valve, and a valve with lower recovery capabilities due to greater internal turbulence and dissipation of energy.

Regardless of the recovery characteristics of the valve, the pressure differential of interest pertaining to flashing and cavitation is the differential between the valve inlet and the vena contracta. If pressure at the vena contracta should drop below the vapor pressure of the fluid (due to increased fluid velocity at this point) bubbles will form in the flow stream. Formation of bubbles will increase greatly as vena contracta pressure drops further below the vapor pressure of the liquid. At this stage, there is no difference between flashing and cavitation, but the potential for structural damage to the valve definitely exists.

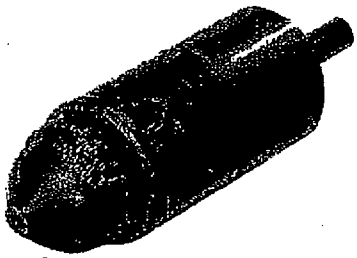


Figure 3-14. Typical Appearance Of Flashing Damage

Figure 3-15. Typical Appearance of Cavitation Damage

If pressure at the valve outlet remains below the vapor pressure of the liquid, the bubbles will remain in the downstream system and the process is said to have "flashed." Flashing can produce serious erosion damage to the valve trim parts and is characterized by a smooth, polished appearance of the eroded surface, as shown in Figure 3-14. Flashing damage is normally greatest at the point of highest velocity, which is usually at or near the seat line of the valve plug and seat ring.

On the other hand, if downstream pressure recovery is sufficient to raise the outlet pressure above the vapor pressure of the liquid, the bubbles will collapse, or implode, producing cavitation. Collapsing of the vapor bubbles releases energy and produces a noise similar to what one would expect if gravel were flowing through the valve. If the bubbles collapse in close proximity to solid surfaces in the valve, the energy released will gradually tear away the material leaving a rough, cinderlike surface as shown in Figure 3-15. Cavitation damage may extend to the adjacent downstream pipeline, if that is where pressure recovery occurs and the bubbles collapse. Obviously, "high recovery" valves tend to be more subject to cavitation, since the downstream pressure is more likely to rise above the liquid's vapor pressure.

Choked Flow

Aside from the possibility of physical equipment damage due to flashing or cavitation, formation of vapor bubbles in the liquid flowstream causes a crowding condition at the vena contracta which tends to limit flow through the valve. So, while the basic liquid sizing equation implies that there is no limit to the amount of flow through a valve as long as the differential pressure across the valve increases, the realities of flashing and cavitation prove otherwise. If valve pressure drop is increased slightly beyond the point where bubbles begin to form, a choked flow condition is reached. With constant upstream pressure, further increases in pressure drop (by reducing downstream pressure) will not produce increased flow through the valve. The limiting pressure differential is designated ΔP_{allow} and the valve recovery coefficient (K_m) is experimentally determined for each valve, in order to relate choked flow for that particular valve to the basic liquid sizing equation. K_m is normally published with other valve capacity coefficients. Figures 3-16 and 3-17 show these flow vs. pressure drop relationships.

Use the following equation to determine the maximum allowable pressure drop that is effective in producing flow. Keep in mind, however, that the limitation on the sizing pressure drop, ΔP_{allow}, does not imply a maximum pressure drop that may be controlled by the valve.

$$\Delta P_{allow} = K_m (P_1 - r_c P_v) \quad (8)$$

where:

ΔP_{allow} = maximum allowable differential pressure for sizing purposes, psi

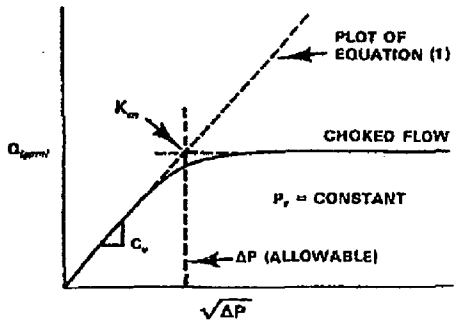


Figure 3-16. Flow Curve Showing C_v and K_m

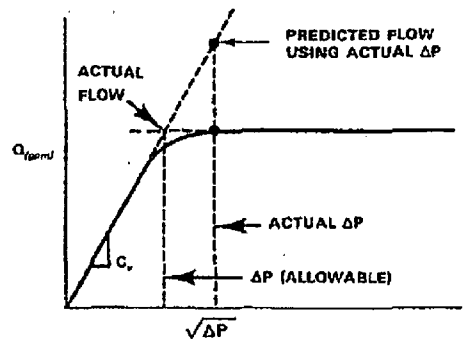


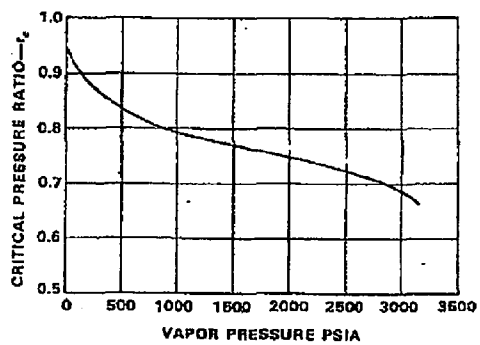
Figure 3-17. Relationship Between Actual ΔP and ΔP Allowable

K_m = valve recovery coefficient from manufacturer's literature

P_1 = body inlet pressure, psia

r_c = critical pressure ratio determined from Figures 3-18 and 3-19

P_v = vapor pressure of the liquid at body inlet temperature, psia (vapor pressures and critical pressures for many common liquids are provided in the tables on pages 130 through 134.)



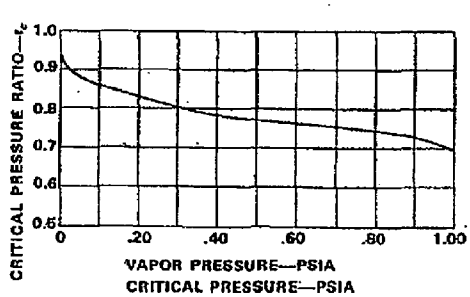
Use this curve for water. Enter on the abscissa at the water vapor pressure at the valve inlet. Proceed vertically to intersect the curve. Move horizontally to the left to read the critical pressure ratio, r_c, on the ordinate.

Figure 3-18. Critical Pressure Ratios for Water

After calculating ΔP_{allow}, substitute it into the basic liquid sizing equation $Q = C_v\sqrt{\Delta P/G}$ to determine either Q or C_v. If the actual ΔP is less than ΔP_{allow}, then the actual ΔP should be used in the sizing equation.

The equation used to determine ΔP_{allow} should also be used to calculate the valve body differential pressure at which significant cavitation can occur. Minor cavitation will occur at a slightly lower pressure differential than that predicted by the equation, but should produce negligible damage in most globe-style control valves.

Consequently, it can be seen that initial cavitation and choked flow occur nearly simultaneously in globe-style or low-recovery valves.



Use this curve for liquids other than water. Determine the vapor pressure/critical pressure ratio by dividing the liquid vapor pressure at the valve inlet by the critical pressure of the liquid. Enter on the abscissa at the ratio just calculated and proceed vertically to intersect the curve. Move horizontally to the left and read the critical pressure ratio, r_c, on the ordinate.

Figure 3-19. Critical Pressure Ratios for Liquids Other than Water

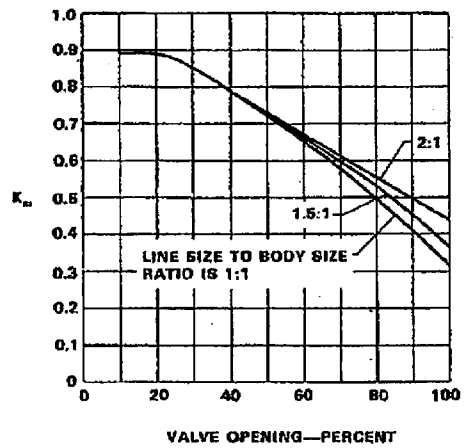


Figure 3-20. K_m Curves for Typical High Recovery Rotary Valves

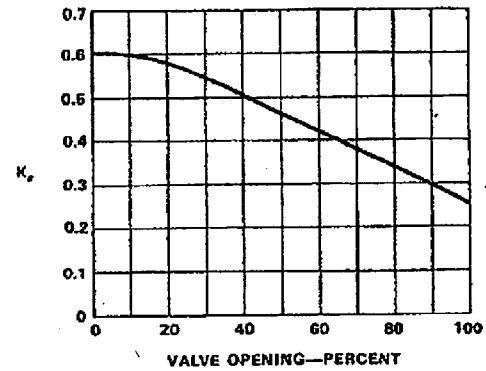


Figure 3-21. K_c Curves for Typical High-Recovery Rotary Valves

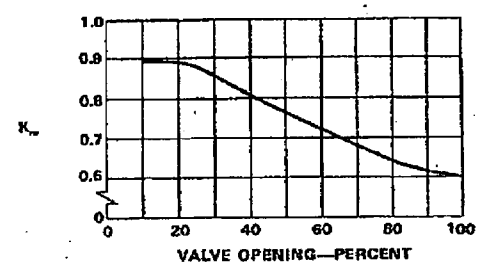


Figure 3-22. K_m Curve for High-Recovery Rotary Valve with Anti-Cavitation Trim

However, in high-recovery valves such as ball or butterfly valves, significant cavitation can occur at pressure drops below that which produces choked flow. So while ΔP_{allow} and K_m are useful in predicting choked flow capacity, a separate cavitation index (K_c) is needed to determine the pressure drop at which cavitation damage will begin (ΔP_c) in high-recovery valves.

The equation can be expressed.

$$\Delta P_c = K_c (P_1 - P_v) \qquad (9)$$

This equation can be used anytime outlet pressure is greater than the vapor pressure of the liquid. Figures 3-20 and 3-21 illustrate K_m and K_c curves for typical V-notch ball, high-recovery, rotary valves in liquid service. Note that K_m is considerably higher than K_c throughout the travel range of the valve.

Addition of anti-cavitation trim to the same high-recovery V-notch valve tends to increase the value of K_m in the upper two-thirds of the travel range as shown in Figure 3-22. In other words, choked flow and insipient cavitation will occur at substantially higher pressure drops than was the case without the anti-cavitation accessory.

Liquid Sizing Summary

The most common use of the basic liquid sizing equation is to determine the proper valve size for a given set of service conditions. The first step is to calculate the required C_v by using the sizing equation. The ΔP used in the equation must be the actual valve pressure drop or ΔP_{allow}, whichever is smaller. The second step is to select a valve, from the manufacturer's catalog, with a C_v equal to or greater than the calculated value.

Accurate valve sizing for liquids requires use of the dual coefficients of C_v and K_m. A single coefficient is not sufficient to describe both the capacity and the recovery characteristics of the valve. Also, use of the additional cavitation index factor K_c is appropriate in sizing high recovery

valves, which may develop damaging cavitation at pressure drops well below the level of the choked flow.

Summary of Liquid Sizing Nomenclature

C_v = valve sizing coefficient for liquid determined experimentally for each size and style of valve, using water at standard conditions as the test fluid

C_{vc} = calculated C_v coefficient including correction for viscosity

C_{vr} = corrected sizing coefficient required for viscous applications

ΔP = differential pressure, psi

ΔP_{allow} = maximum allowable differential pressure for sizing purposes, psi

ΔP_c = pressure differential at which cavitation damage begins, psi

F_v = viscosity correction factor

G = specific gravity of fluid (water at 60°F = 1.0000)

K_c = dimensionless cavitation index used in determining ΔP_c

K_m = valve recovery coefficient from manufacturer's literature

P_1 = body inlet pressure, psia

P_v = vapor pressure of liquid at body inlet pressure, psia

Q = flow rate capacity, gallons per minute

Q_{max} = designation for maximum flow rate, assuming no viscosity correction required, gallons per minute

Q_{pred} = predicted flow rate after incorporating viscosity correction, gallons per minute

r_c = critical pressure ratio

Summary of Liquid Sizing Equation Applications

(1)—Basic liquid sizing equation. Use to determine proper valve size for a given set of service conditions. (Remember that viscosity effects and valve recovery capabilities are not considered in this basic equation.)

(2)—Use to calculate expected C_v for valve controlling water or other liquids that behave like water.

(3)—Use to find actual required C_v for equation *(2)* after including viscosity correction factor.

(4)—Use to find maximum flow rate assuming no viscosity correction is necessary.

(5)—Use to predict actual flow rate based on equation *(4)* and viscosity factor correction.

(6)—Use to calculate corrected sizing coefficient for use in equation *(7)*.

(7)—Use to predict pressure drop for viscous liquids.

(8)—Use to determine maximum allowable pressure drop that is effective in producing flow.

(9)—Use to predict pressure drop at which cavitation will begin in a valve with high recovery characteristics.

Sizing for Gas or Steam Service

A sizing procedure for gases can be established based on adaptations of the basic liquid sizing equation. By introducing conversion factors to change flow units from gallons-per-minute to cubic-feet-per-hour and to relate specific gravity in meaningful terms of pressure, an equation can be derived for the flow of air at 60°F. Since 60°F corresponds to 520° on the Rankine absolute temperature scale, and since the specific gravity of air at 60°F is 1.0, an additional factor can be included to compare air at 60°F with specific gravity (G) and absolute temperature (T) of any other

Gas and Steam Sizing Summary

The Universal Gas Sizing Equation can be used to determine the flow of gas through any style of valve. Absolute units of temperature and pressure must be used in the equation. When the critical pressure drop ratio causes the sine angle to be 90 degrees, the equation will predict the value of the critical flow. For service conditions that would result in an angle of greater than 90 degrees, the equation must be limited to 90 degrees in order to accurately determine the critical flow that exists.

Most commonly, the Universal Gas Sizing Equation is used to determine proper valve size for a given set of service conditions. The first step is to calculate the required C_g by using the Universal Gas Sizing Equation. The second step is to select a valve from the manufacturer's catalog. The valve selected should have a C_g which equals or exceeds the calculated value. Be certain that the assumed C_1 value for the C_g calculation matches the C_1 value for the valve selected from the catalog.

It is apparent that accurate valve sizing for gases requires use of the dual coefficients C_g and C_1. A single coefficient is not sufficient to describe both the capacity and the recovery characteristics of the valve.

Proper selection of a control valve for gas service is a highly technical problem with many factors to be considered. Leading valve manufacturers provide technical information, test data, sizing catalogs, nomographs, sizing slide rules, and computer or calculator programs that make valve sizing a simple and accurate procedure.

Summary of Gas and Steam Sizing Nomenclature

$C_1 = C_g/C_v$

C_g = gas sizing coefficient

C_s = steam sizing coefficient

C_v = liquid sizing coefficient

d_1 = density of steam or vapor at inlet, pounds/cu. foot

G = gas specific gravity (air = 1.0)

P_1 = valve inlet pressure, psia

ΔP = pressure drop across valve, psi

$Q_{critical}$ = critical flow rate, scfh

Q_{scfh} = gas flow rate, scfh

$Q_{lb\ hr}$ = steam or vapor flow rate, pounds per hour

T = absolute temperature of gas at inlet, degrees Rankine

T_{sh} = degrees of superheat, °F

Summary of Gas and Steam Sizing Equation Applications

(A)—Use only at very low pressure drop ($\Delta P/P_1$) ratios of 0.02 or less.

(B)—Use only to determine critical flow capacity at a given inlet pressure.

(C) or *(D)*—Universal Gas Sizing Equation. Use to predict flow for either high or low recovery valves, for any gas adhering to the perfect gas laws, and under any service conditions.

(E)—Use to predict flow for perfect or non-perfect gas sizing applications, for any vapor including steam, at any service condition when fluid density is known.

(F)—Use only to determine steam flow when inlet pressure is 1000 psig or less.

Sizing for Liquid-Gas Mixtures

Procedure

Special consideration is required when sizing valves handling mixtures of liquid and gas or liquid and vapor. The equation for required valve C_v for liquid-gas or liquid-vapor mixtures is:

$$C_{vr} = (C_{vl} + C_{vg})(1 + F_m) \quad (I)$$

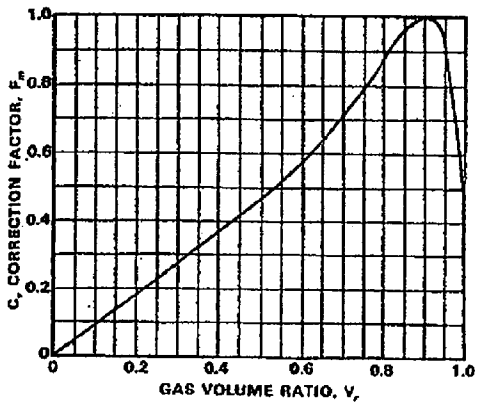


Figure 3-25. C_v Correction Factor, F_m

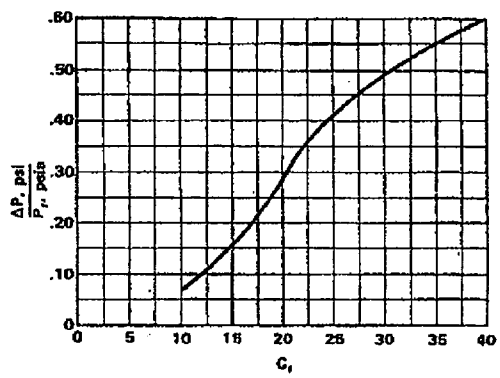


Figure 3-26. Pressure Drop Ratio Resulting in Critical Gas Flow

The value of the correction factor, F_m, is given in Figure 3-25 as a function of the gas volume ratio, V_r. The gas volume ratio for liquid-gas mixtures may be obtained by the equation:

$$V_r = \frac{V_g}{V_l + V_g} = \frac{Q_g}{\frac{284\, Q_l P_1}{T_1} + Q_g} \qquad (II)$$

or for liquid-vapor mixtures:

$$V_r = \frac{v_g}{v_g + v_l\left(\frac{1-x}{x}\right)} \qquad (III)$$

If the pressure drop ratio ($\Delta P/P_1$) exceeds the ratio required to give 100% critical gas flow as determined from Figure 3-26, the liquid sizing drop should be limited to the drop required to give 100% critical gas flow.

Because of the possibility of choked flow occurring, the liquid sizing drop may also have to be limited by the equation:

$$\Delta P_{allow} = K_m(P_1 - r_c P_v)^*$$

Summary of Liquid-Gas Mixture Sizing Nomenclature

C_v = Standard liquid sizing coefficient

C_{vr} = C_v required for mixture flow

C_{vl} = C_v for liquid phase

C_g = C_g for gas phase

C_{vg} = C_v required for gas phase = C_g/C_1

C_1 = C_g/C_v ratio for valve

F_m = C_v correction factor

K_m = Valve recovery coefficient

ΔP = Valve pressure drop, psi

P_1 = Valve inlet pressure, psia

P_v = Liquid vapor pressure, psia

Q_g = Gas flow, scfh

Q_l = Liquid flow, gpm

Q_s = Steam or vapor flow, lb/hr

r_c = Critical pressure ratio

T_1 = Inlet temperature, °Rankine (°R = °F + 460°)

V_g = Gas flow, ft³/sec

V_l = Liquid flow, ft³/sec

V_r = Gas volume ratio

v_g = Specific volume of gas phase, ft³/lb

v_l = Specific volume of liquid phase, ft³/lb

x = Quality, lb vapor/lb mixture

*Equation (8) from page 66.

Representative Sizing Coefficients for Single-Ported Globe-Style Valve Bodies

VALVE SIZE (INCHES)	VALVE PLUG STYLE	FLOW CHARACTERISTIC	PORT DIA. (IN.)	RATED TRAVEL (IN.)	SIZING COEFFICIENTS				
					C_v	C_g	C_s	K_m	C_1
1/2	1-Flute Micro-Flute™	Equal Percentage	1/4	3/4	0.31	10.0	0.50	.70	32.3
	2-Flute Micro-Flute	Equal Percentage	1/4	3/4	0.63	20.0	1.00	.70	31.7
	3-Flute Micro-Flute	Equal Percentage	1/4	3/4	0.95	32.0	1.60	.75	33.7
	Micro-Form™	Equal Percentage	1/4	3/4	1.40	48.0	2.40	.75	34.3
	Micro-Form	Equal Percentage	3/8	3/4	2.60	87.0	4.40	.80	34.8
	Micro-Flute	Equal Percentage	1/2	3/4	2.89	99.5	4.98	.89	34.4
	Top-Guided	Equal Percentage	1/2	3/4	4.20	145	7.25	.80	34.5
	Port-Guided	Quick Opening	3/4	7/16	4.06	147	7.35	.85	36.2
	Top-Guided	Quick Opening	3/4	3/4	6.27	227	11.4	.80	36.2
3/4	Micro-Flute	Equal Percentage	3/4	3/4	6.26	216	10.8	.87	34.5
	Top-Guided	Equal Percentage	3/4	3/4	8.65	304	15.2	.80	35.1
	Top-Guided	Quick Opening	3/4	3/4	9.08	322	16.1	.80	35.5
1	Micro-Flute	Equal Percentage	1	3/4	9.39	355	17.8	.83	37.8
	Micro-Form	Equal Percentage	1	3/4	12.2	467	23.3	.91	38.2
	Cage-Guided	Equal Percentage	1-5/16	3/4	17.4	591	29.6	.90	34.0
		Linear	1-5/16	3/4	20.1	668	33.4	.80	33.2
		Quick Opening	1-5/16	3/4	21.4	690	34.5	.79	32.2
1-1/4	Top-Guided	Equal Percentage	1-1/4	3/4	22.2	785	39.3	.80	35.4
	Top-Guided	Quick Opening	1-1/4	3/4	23.0	805	40.2	.80	35.0
1-1/2	Micro-Form	Equal Percentage	1	3/4	17.4	623	31.2	.85	35.8
	Top-Guided	Equal Percentage	1-1/2	3/4	29.1	1000	50.2	.75	34.5
	Top-Guided	Quick Opening	1-1/2	3/4	30.0	1070	53.4	.75	35.6
	Cage-Guided	Equal Percentage	1-7/8	3/4	33.4	1190	59.5	.89	35.6
		Linear	1-7/8	3/4	34.9	1220	61.0	.85	35.0
		Quick Opening	1-7/8	3/4	38.0	1350	67.5	.88	35.6
2	Cage-Guided	Equal Percentage	2-5/16	1-1/8	56.2	2070	104	.85	36.8
		Linear	2-5/16	1-1/8	65.3	2280	114	.83	34.9
		Quick Opening	2-5/16	1-1/8	67.2	2420	121	.86	36.0

2-1/2	Cage-Guided	Equal Percentage	2-7/8	1-1/2	87.2	3100	155	.87	37.4
		Linear	2-7/8	1-1/2	86.5	3220	161	.86	37.2
		Quick Opening	2-7/8	1-1/2	93.1	3470	174	.83	37.2
3	Cage-Guided	Equal Percentage	3-7/16	1-1/2	121	4210	211	.79	34.8
		Linear	3-7/16	1-1/2	135	4680	234	.80	34.7
		Quick Opening	3-7/16	1-1/2	150	5090	255	.76	33.9
4	Cage-Guided	Equal Percentage	4-3/8	2	203	7360	368	.82	36.2
		Linear	4-3/8	2	212	7540	377	.79	35.6
		Quick Opening	4-3/8	2	235	8300	415	.79	35.4
6	Cage-Guided	Equal Percentage	7	2	357	12,900	645	.74	36.1
		Linear	7	2	417	14,400	720	.66	34.5
		Quick Opening	7	2	469	15,700	785	.67	33.5
8	Port-Guided V-Pup® Top & Bottom Guided Throttle	Equal Percentage	8	2	587	20,400	1020	.80	34.8
		Modified Parabolic	8	2	602	20,100	1010	.75	33.4
	Cage-Guided	Equal Percentage	8	2	570	19,000	950	.72	33.3
		Linear	8	2	701	24,400	1220	.70	34.8
		Quick Opening	8	2	787	28,400	1420	.73	36.1
	Cage-Guided	Equal Percentage	8	3	808	29,400	1470	.72	36.4
		Linear	8	3	836	29,900	1500	.72	35.8
		Quick Opening	8	3	875	30,800	1540	.72	35.2
10	Port-Guided V-Port	Modified Parabolic	10	3	987	33,400	1670	.75	33.8
	Port-Guided	Quick Opening	10	3	1280	43,800	2190	.75	34.2
	Top & Bottom-Guided	Quick Opening	10	3	1360	46,500	2330	.75	34.2
12	Port-Guided V-Port	Modified Parabolic	12	3	1180	40,900	2050	.80	34.7
	Top & Bottom-Guided	Quick Opening	12	3	1660	55,300	2770	.75	33.3
	Port-Guided	Quick Opening	12	3	1700	56,600	2830	.75	33.3

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Representative Sizing Coefficients for Rotary-Shaft Valve Bodies

VALVE SIZE (INCHES)	VALVE AND TRIM STYLE	DEGREES OF VALVE OPENING	SIZING COEFFICIENTS					
			C_v	C_g	C_s	K_m	C_1	K_c
1	Rotary—V-Notch Ball	90	22.3	684	34.2	.74	30.7	.26
1-1/2	Butterfly—Conventional Disc	60	26.3	662	33.1	.55	25.2	.35
	Butterfly—Conventional Disc	90*	52.0	907	45.3	.30	17.2	.25
	Rotary—V-Notch Ball	90	88.9	2050	103	.55	23.1	.26
2	Rotary—Eccentric Disc	90	75.0	1810	90.6	.48	24.1	.26
	Butterfly—Conventional Disc	60	55.1	1390	69.4	.55	25.2	.35
	Butterfly—Conventional Disc	90*	110	1900	95.0	.30	17.2	.25
	Butterfly—Fishtail® Disc	90	91.0	1650	82.3	.43	18.1	.31
	Rotary—V-Notch Ball	90	158	3530	177	.46	22.3	.26
2-1/2	Butterfly—Conventional Disc	60	91.4	2300	115	.55	25.2	.35
	Butterfly—Conventional Disc	90*	182	3150	157	.30	17.2	.25
	Butterfly—Fishtail Disc	90	154	2790	139	.43	18.1	.31
3	Rotary—Eccentric Disc	90	193	4310	216	.42	22.3	.26
	Butterfly—Conventional Disc	60	136	3440	172	.55	25.2	.35
	Butterfly—Conventional Disc	90*	273	4710	235	.30	17.2	.25
	Butterfly—Fishtail Disc	90	234	4230	211	.43	18.1	.31
	Rotary—V-Notch Ball	90	372	7430	372	.46	20.0	.26
4	Rotary—Eccentric Disc	90	418	8640	432	.36	20.7	.26
	Butterfly—Conventional Disc	60	271	6820	341	.55	25.2	.35
	Butterfly—Conventional Disc	90*	542	9340	467	.30	17.2	.25
	Butterfly—Fishtail Disc	90	490	8870	443	.43	18.1	.31
	Rotary—V-Notch Ball	90	575	10,800	540	.37	18.8	.26
6	Rotary—Eccentric Disc	90	900	17,100	855	.33	19.0	.26
	Butterfly—Conventional Disc	60	768	18,800	941	.55	24.5	.35
	Butterfly—Conventional Disc	90*	1750	25,000	1,250	.30	14.3	.25
	Butterfly—Fishtail Disc	90	1410	22,500	1120	.43	16.0	.31
	Rotary—V-Notch Ball	90	944	18,100	905	.31	19.2	.26

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8	Rotary—Eccentric Disc	90	1920	35,300	1770	.31	18.4	.26
	Butterfly—Conventional Disc	60	1340	32,900	1640	.55	24.5	.35
	Butterfly—Conventional Disc	90*	3050	43,600	2180	.30	14.3	.25
	Butterfly—Fishtail Disc	90	2440	39,100	1950	.43	16.0	.31
	Rotary—V-Notch Ball	90	1770	28,900	1450	.28	16.3	.26
10	Rotary—Eccentric Disc	90	3390	60,000	3000	.28	17.7	.26
	Butterfly—Conventional Disc	60	2170	53,100	2650	.55	24.5	.35
	Butterfly—Conventional Disc	90*	4920	70,400	3520	.30	14.3	.25
	Butterfly—Fishtail Disc	90	4010	64,200	3210	.43	16.0	.31
	Rotary—V-Notch Ball	90	3160	58,900	2850	.33	18.0	.26
12	Rotary—Eccentric Disc	90	4890	84,100	4200	.27	17.2	.26
	Butterfly—Conventional Disc	60	3180	78,000	3900	.55	24.5	.35
	Butterfly—Conventional Disc	90*	7240	103,000	5180	.30	14.3	.25
	Butterfly—Fishtail Disc	90	5990	95,800	4790	.43	16.0	.31
	Rotary—V-Notch Ball	90	4620	83,200	4160	.33	18.0	.26
14	Rotary—Eccentric Disc	90	6800	117,000	5860	.27	17.2	.26
	Butterfly—Conventional Disc	60	3880	95,000	4750	.55	24.5	.35
	Butterfly—Conventional Disc	90*	8810	126,000	6300	.30	14.3	.25
	Butterfly—Fishtail Disc	90	7280	116,000	5820	.43	16.0	.31
16	Rotary—Eccentric Disc	90	9470	163,000	8150	.27	17.2	.26
	Butterfly—Conventional Disc	60	5210	127,000	6380	.55	24.5	.35
	Butterfly—Conventional Disc	90*	11,800	169,000	8460	.30	14.3	.25
	Butterfly—Fishtail Disc	90	9830	157,000	7860	.43	16.0	.31
	Rotary—V-Notch Ball	90	6760	125,000	6250	.33	18.5	.26
18	Rotary—Eccentric Disc	90	12,000	206,000	10,300	.27	17.2	.26
	Butterfly—Conventional Disc	60	6510	159,000	7980	.55	24.5	.35
	Butterfly—Conventional Disc	90*	14,800	212,000	10,600	.30	14.3	.25
	Butterfly—Fishtail Disc	90	12,300	197,000	9850	.43	16.0	.31
20	Rotary—Eccentric Disc	90	14,400	248,000	12,400	.27	17.2	.26
	Butterfly—Conventional Disc	60	8210	201,000	10,000	.55	24.5	.35
	Butterfly—Conventional Disc	90*	18,600	267,000	13,300	.30	14.3	.25
	Butterfly—Fishtail Disc	90	15,500	248,000	12,400	.43	16.0	.31

*For on/off service only. For throttling applications, size butterfly valves with conventional discs at 60 degrees open.

- Continued -

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Representative Sizing Coefficients for Rotary-Shaft Valve Bodies (Continued)

VALVE SIZE (INCHES)	VALVE AND TRIM STYLE	DEGREES OF VALVE OPENING	SIZING COEFFICIENTS					
			C_v	C_g	C_s	K_m	C_1	K_c
24	Rotary—Eccentric Disc	90	21,600	372,000	18,600	.27	17.2	.26
	Butterfly—Conventional Disc	60	12,200	298,000	14,900	.55	24.5	.35
	Butterfly—Conventional Disc	90*	27,700	396,000	19,800	.30	14.3	.25
	Butterfly—Fishtail Disc	90	23,100	370,000	18,500	.43	16.0	.31
	Rotary—V-Notch Ball	90	13,700	248,000	12,400	.33	18.1	.26
30	Butterfly—Conventional Disc	60	19,900	487,000	24,300	.55	24.5	.35
	Butterfly—Conventional Disc	90*	45,200	646,000	32,300	.30	14.3	.25
	Butterfly—Fishtail Disc	90	40,300	646,000	32,300	.43	16.0	.31
36	Butterfly—Conventional Disc	60	29,400	721,000	36,100	.55	24.5	.35
	Butterfly—Conventional Disc	90*	66,900	957,000	47,800	.30	14.3	.25
	Butterfly—Fishtail Disc	90	61,600	985,000	49,200	.43	16.0	.31
48	Butterfly—Conventional Disc	60	54,200	1,330,000	66,400	.55	24.5	.35
	Butterfly—Conventional Disc	90*	123,000	1,760,000	88,100	.30	14.3	.25
	Butterfly—Fishtail Disc	90	116,000	1,850,000	92,400	.43	16.0	.31
60	Butterfly—Conventional Disc	60	85,300	2,090,000	104,000	.55	24.5	.35
	Butterfly—Conventional Disc	90*	194,000	2,770,000	139,000	.30	14.3	.25
	Butterfly—Fishtail Disc	90	182,000	2,910,000	145,000	.43	16.0	.31
72	Butterfly—Conventional Disc	60	123,000	3,030,000	151,000	.55	24.5	.35
	Butterfly—Conventional Disc	90*	281,000	4,010,000	201,000	.30	14.3	.25
	Butterfly—Fishtail Disc	90	262,000	4,200,000	210,000	.43	16.0	.31

*For on/off service only. For throttling applications, size butterfly valves with conventional discs at 60 degrees open.

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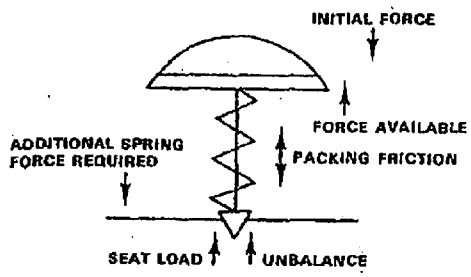

Figure 3-27. Free Body Diagram for Reverse-Acting, Spring-Opposed Diaphragm Actuator on Flow-Tends-To-Open Valve Body

Actuator Sizing

Use of too large an actuator adds unnecessary expense and increased response time to a control valve, while use of an undersized actuator might make it impossible to open the valve or close it completely. However, selection of an optimum-sized actuator for a given control valve application is a subject of greater scope than can be completely detailed here. Consequently, the information furnished is summarized to provide basic knowledge of the factors that must be considered. Complete information and assistance can be provided by representatives of leading valve manufacturers to permit choosing the correct actuator for any specific application.

Actuators for Sliding-Stem Valves

After a valve has been selected to meet given service conditions, the valve must be matched with an appropriate actuator to achieve maximum efficiency. The actuator must provide sufficient force to stroke the valve plug to the fully closed position with sufficient seat loading to meet the required leak class criteria. With spring-return actuators, the spring selected must be sized to properly oppose the force provided by the air supply pressure.

Sizing an actuator involves solving a problem in statics. The forces, and the direction in which each force acts, depend upon actuator design and flow direction through the valve. The free body diagram in Figure 3-27 illustrates the forces involved in achieving static equilibrium. The figure depicts a direct-acting (push-down-to-close) valve body where the flow tends to open the valve plug. The actuator is a reverse-acting spring-and-diaphragm construction that closes the valve in case of supply pressure failure.

To stroke the valve to the fully closed position, the actuator must provde enough force to overcome friction forces and to overcome the unbalance force due to the flow through the valve. The actuator force available is the product of the air supply pressure and the area against which that pressure is applied (i.e., the diaphragm area or piston area). Packing friction varies with stem size, packing material(s), and packing arrangement. Specific friction forces must be obtained from the packing manufacturer or the actuator manufacturer. Other friction forces, such as friction due to metal piston rings, depend on valve design and must be obtained from the valve manufacturer.

The unbalance force is the product of the force of the flowing medium and the area against which that force is applied (either the total port area or, in the case of a "balanced" construction, the specific unbalance area obtained from the valve manufacturer's specifications).

$$\text{Unbalance Force} = \Delta P_{shutoff} \times \text{Unbalance Area}$$

To meet required leakage criteria, the actuator must provide some seating force beyond that force required to stroke the valve to the fully closed position. The specific force required depends upon valve style and size. Seat load is usually expressed in pounds per lineal inch of port circumference. For a given leak class, valve designs with large ports usually require greater seating load than is required for valves with smaller ports. The seat load is the product of the port circumference and the pounds-per-lineal-inch force recommended by the valve manufacturer.

Seat Load = Port circumference (inches) x Recommended seating force (pounds per lineal inch)

The actuator force available must be greater than the sum of the forces which the actuator force must oppose to achieve static equilibrium. For a spring-opposed diaphragm actuator or a spring-return piston actuator, the spring force (spring rate X travel) must be considered in the equilibrium calculations.

Actuators for Rotary-Shaft Valves

The actuator selected must be capable of providing adequate torque output to overcome the dynamic torque forces on the disc or ball of the valve under flowing conditions. The actuator must also be capable of exceeding the "breakout" torque requirements of the disc or ball at shutoff, in order to initiate rotation of the rotary valve shaft.

Breakout torque requirement determination begins by multiplying the actual pressure drop across the closed valve times a tested breakout torque/pressure drop relationship provided by the valve manufacturer. Another factor is added that includes tested or predicted breakout torque for the body when it is not pressurized. Total calculated valve breakout torque must be less than the maximum allowable breakout torque limit of the actuator size being considered, as published by the actuator manufacturer.

By the same token, total calculated valve dynamic torque must not exceed the maximum allowable actuator dynamic torque limits published by the actuator manufacturer. Dynamic torque requirements are calculated by multiplying the pressure drop that produces critical (gas) or choked (liquid) flow times a pre-calculated effective pressure drop coefficient for the size and style of valve being considered.

Non-Destructive Test Procedures

Successful completion of specific non-destructive examinations is required for valves intended for nuclear service, and may be required by codes or customers in non-nuclear applications, particularly in the Power Industry. Also, successful completion of the examinations may permit uprating of ANSI Standard Class butt-welding end valves to a Special Class rating. The Special Class rating permits use of the butt-welding end valves at higher pressures than allowed for Standard Class valves. Procedures required for uprating to the Special Class are detailed in ANSI Standard B16.34-1977.

While it is certainly not feasible to present complete details of code requirements for non-destructive examinations in this book, we will attempt to summarize the principles and procedures of four major types of non-destructive examinations defined in ANSI, ASME, and ASTM standards.

Magnetic Particle (Surface) Examination

Magnetic particle examination can be used only on materials which can be magnetized. The principle includes application of a direct current across a piece to induce a magnetic field in the piece. Surface or shallow subsurface defects distort the magnetic field to the extent that a secondary magnetic field develops around the defect. If a magnetic powder, either dry or suspended in liquid, is spread over the magnetized piece, areas of distorted magnetic field will be visible, indicating a defect in the piece in the area of distortion. After de-magnetizing the piece by reversing the electric current, it may be possible to weld repair the defect (normal procedure with castings) or it may be necessary to replace the piece (normal procedure with forgings and bar stock parts). After repair or replacement, the magnetic particle examination must be repeated.

Liquid Penetrant (Surface) Examination

This examination method permits detection of surface defects not visible to the naked eye. The surface to be examined is cleaned thoroughly and dried. The liquid penetrant dye, either water or solvent soluble, is applied by

dipping, brushing, or spraying, and allowed time to penetrate. Excess penetrant is washed or wiped off (depending on the penetrant used). The surface is again thoroughly dried and a developer (liquid or powder) is applied. Inspection is performed under the applicable light source. (Some developers require use of an ultraviolet or "black" light to expose defective areas.) If defects are discovered and repaired by welding, the piece must be re-examined after repair.

Radiographic (Volumetric) Examination

Radiography of control valve parts works on the principle that X-rays and gamma rays will pass through metal objects which are impervious to light rays and will expose photographic film just as light rays will. The number and intensity of the rays passing through the metal object depend on the density of the object. Subsurface defects represent changes in density of the material and can therefore be photographed radiographically. The piece to be inspected is placed between the X-ray or gamma ray source and the photographic film. Detail and contrast sensitivity are determined by radiographing one or more small flat plates of specified thickness at the same time the test subject is exposed. The small flat plate, called a penetrameter, has serveral holes of specified diameters drilled in it. Its image on the exposed film, along with the valve body or other test subject, makes it possible to determine the detail and contrast sensitivity of the radiograph.

Radiography can detect such casting defects as gas and blowholes, sand spots, internal shrinkage, cracks, hot tears, and internal chills. In castings for nuclear service, some defects such as cracks and hot tears are expressly forbidden and cannot be repaired. The judgement and experience of the radiographer is important, because he must compare the radiograph with the acceptance criteria (American Society for Testing and Materials reference radiographs) to determine the adequacy of the casting. When weld repairs are required, the casting must be radiographed again after the repair.

Ultrasonic (Volumetric) Examination

This method monitors sound wave reflections from the piece being inspected to determine the depth and size of any defects. Ultrasonic examination can detect foreign materials and discontinuities in fine-grained metal and thus lends itself to volumetric examination of structures such as plate, bar, and forgings. The test is normally conducted either with a special oil called a coupler or under water to ensure efficient transmission of sound waves. The sound waves are generated by a crystal probe and are reflected at each interface in the piece being tested, that is, at each outer face of the piece itself and at each face of the damaged or malformed internal portion. These reflections are received by a special microphone and displayed on a cathode ray tube to reveal the location and severity of the defect.

Control Valve Noise

The U.S. Occupational Safety and Health Act of 1970 established maximum permissible noise levels for all industries whose business affects interstate commerce. These maximum sound levels, listed below, have become the accepted noise standard for most regulatory agencies.

Permissible Noise Exposures

Duration Per Day, Hr	Sound Level, dBA
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4 or less	115

The recognition that airborne sound criteria are here to stay has provided the impetus throughout all industry for the acute interest in noise abatement.

Control valves have long been recognized as a major source of excessive noise levels inherent to many fluid process and transmission systems.

Sources of Valve Noise

The major sources of control valve noise are:

1. Mechanical vibration of valve components
2. Hydrodynamic noise
3. Aerodynamic noise

Vibration of valve components is a result of random pressure fluctuations within the valve body and/or fluid impingement upon the movable or flexible parts. The most prevalent source of noise resulting from mechanical vibration is the lateral movement of the valve plug relative to the guide surfaces. Sound produced by this type of vibration will normally have a frequency less than 1500 Hertz and is often described as a metallic rattling. The physical damage incurred by the valve plug and associated guide surfaces is generally of more concern than the noise emitted.

A second source of mechanical vibration noise is a valve component resonating at its natural frequency. Resonant vibration produces a sound that is a single-pitched tone normally having a frequency between 3000 and 7000 Hertz. This type of vibration produces high levels of stress that may ultimately produce fatigue failure of the vibrating part. Valve components susceptible to natural frequency vibration include contoured valve plugs with hollow skirts and flexible members such as the metal seat ring of a ball valve.

Noise that is a by-product of the vibration of valve components is usually of secondary concern and may even be beneficial since it warns that conditions exist which could produce valve failure. Noise resulting from mechanical vibration has for the most part been eliminated by improved valve design and is generally considered a structural problem rather than a noise problem.

The major source of hydrodynamic noise (noise resulting from liquid flow) is cavitation. This noise is caused by the implosion of vapor bubbles that are formed in the cavitation process.

Cavitation occurs in valves controlling liquids when the service conditions are such that the static pressure downstream of the valve is greater than the vapor pressure and at some point within the valve the local static pressure is less than or equal to the liquid vapor pressure. Localized areas of low static pressures within the valve are a result of intense turbulence characterized by high velocity fluctuations or by high main-stream velocity at the vena contracta.

Cavitation may produce severe damage to the solid boundary surfaces that confine the cavitating fluid. Generally speaking, noise produced by cavitation is of secondary concern.

Test results indicate that noise levels from non-cavitating or flashing liquids are quite low and generally would not be considered a noise problem.

The third and major source of control valve noise is due to the Reynolds stresses or shear forces that are a property of turbulent flow. Because of the relative velocities, high intensity levels of noise resulting from turbulent flow are more common to valves handling gas than to those controlling liquids. Noise resulting from turbulent flow of a gas is called aerodynamic noise. Aerodynamic noise can be classified as a non-periodic or random noise with the predominant frequencies occurring between 1000 and 8000 Hertz as shown in Figure 3-28.

Sources of turbulence in gas transmission lines are: obstructions in the flow path, rapid expansion or deceleration of high velocity gas, and directional changes of the fluid stream. Specific areas that are inherently noisy are: headers, pressure regulators, line size expansions, and pipe elbows.

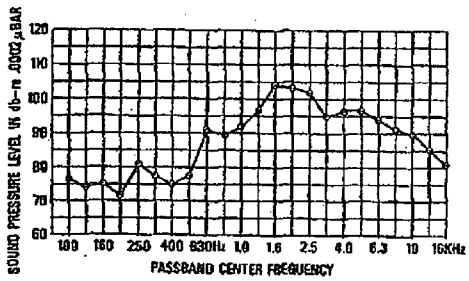

Figure 3-28. Typical Spectrum of Control Valve Noise

Noise Prediction

The establishment of an accurate technique for predicting noise is a prerequisite for good noise abatement programs. Fisher Controls Company has developed a fast and accurate technique for predicting the ambient noise resulting from flow of fluid thru a control valve for any given set of service conditions.

The technique gives consideration to flow parameters relevant to noise generation. These parameters are: pressure differential across the valve, flow coefficient, ratio of pressure differential to inlet pressure, valve geometry, and the size and schedule of adjacent piping. The general technique equation is:

$$SPL = A + B + C + D$$

where:

SPL = overall noise level in decibels (dBA) at a predetermined point in reference to the valve (48" downstream of the valve outlet and 29" from the pipe surface)

A = base SPL, in dBA, determined as a function of pressure differential

B = correction in dBA as a function of flow coefficient

C = correction in dBA for valve style and pressure ratio

D = correction in dBA for pipe size and schedule

Noise coefficients used in the equation above are unique values that must be determined by laboratory tests for both compressible and incompressible fluids as a function of valve geometry.

Noise Control

In closed systems (not vented to atmosphere) any noise produced in the process becomes airbone only by transmission through the valves and adjacent piping that contain the flowstream. The sound field in the flowstream forces these solid boundaries to vibrate. The vibrations cause disturbances in the ambient atmosphere that are propagated as sound waves.

Noise control employs either source treatment or path treatment, or both. Source treatment, preventing or attenuating noise at its source, is the most desirable approach, if economically and physically feasible. There are several manners of source treatment available for valves with cage-style trim. Some of them utilize stacked discs creating small, tortuous flow paths or staged pressure drops. These styles are susceptible to plugging as a result of solid particles in the flowstream. Also, multi-staging system pressure drops can result in formation of hydrates in the intermediate stages of pressure reduction and the plugging or blocking of the final stages. This phenomenon is common with hydrocarbons or vapor flow with high moisture content.

The cage-style source treatment approaches recommended by Fisher Controls Company are depicted in Figure 3-29. The upper view shows a cage with many narrow parallel slots designed to minimize turbulence and provide a favorable velocity distribution in the expansion area. This is an economical approach to quiet valve design and can provide 15 to 20 dBA noise reduction with little or no decrease in flow capacity.

The lower view in Figure 3-29 shows a single-stage, cage-style trim designed for optimum noise attenuation where pressure drop ratios ($\Delta P/P_1$) are high.

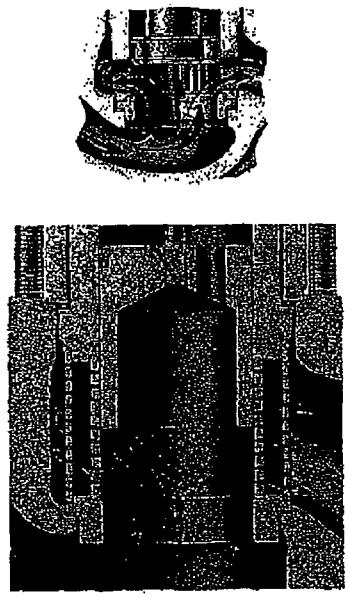

Figure 3-29. Valve Trim Designs for Reducing Aerodynamic Noise

To obtain the desired results, restrictions must be sized and spaced in the primary cage wall so that the noise generated by jet interaction is not greater than the summation of the noise generated by the jets individually.

The construction shown includes a baffle to minimize the noise created by jet interaction at pressure drop ratios of 0.85 or greater. (Baffle flow area is several times greater than the flow area of the primary cage and consequently the baffle creates little or no pressure drop.) For lower $\Delta P/P_1$ ratios (less than 0.85) the baffle is not required and the degree of noise attenuation provided depends on the size and spacing of the restrictions in the primary cage wall. Proper sizing and spacing of the restrictions provides equivalent or better noise attenuation results than the other methods discussed. Besides reducing valve noise by as much as 30 dBA, this design is less subject to plugging than some of the others mentioned.

For control valve applications operating at high pressure ratios ($\Delta P/P_1 > 0.8$) the series restriction approach, splitting the total pressure drop between the control valve and a fixed restriction (diffuser) downstream of the valve can be very effective in minimizing the noise. In order to optimize the effectiveness of a diffuser, it must be designed (special shape and sizing) for each given installation so that the noise levels generated by the valve and diffuser are equal. Figure 3-30 shows a typical installation.

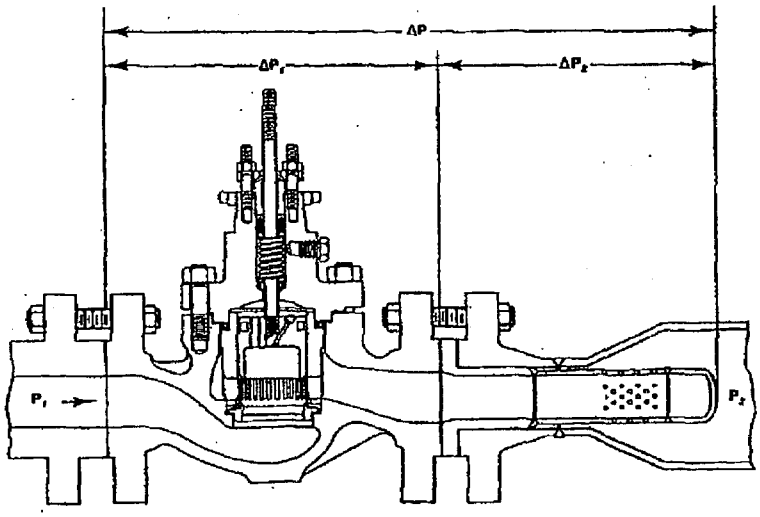

Figure 3-30. Valve and Inline Diffuser Combination

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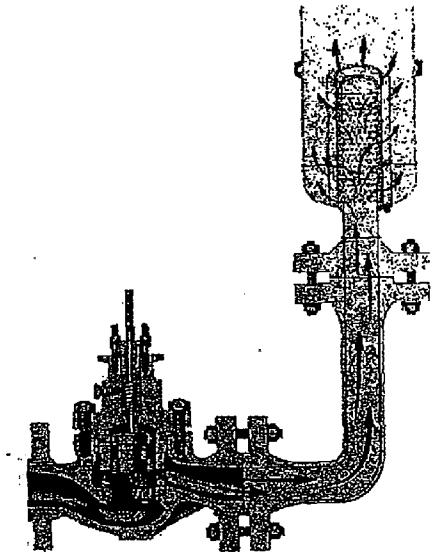


Figure 3-31. Valve and Vent Diffuser Combination

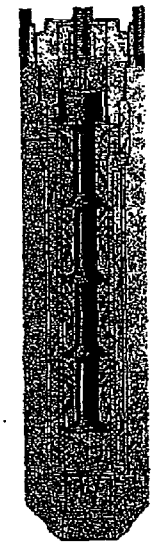


Figure 3-32. Special Valve Design to Eliminate Cavitation

Control systems venting to atmosphere are generally very noisy because of the high pressure ratios and high exit velocities involved. Dividing the total pressure drop between the actual vent and an upstream control valve, by means of a vent diffuser, quiets both the valve and the vent. A properly sized vent diffuser and valve combination, such as that shown in Figure 3-31, can reduce the overall system noise level as much as 40 dBA.

Source treatment for noise problems associated with control valves handling liquid is directed primarily at eliminating or minimizing cavitation. Because flow conditions that will produce cavitation can be accurately predicted, valve noise resulting from cavitation can be eliminated by application of appropriate limits to the service conditions at the valve by use of break-down orifices, valves in series, etc. Another approach to source treatment is use of special valve trim that utilizes the series restriction concept to eliminate cavitation as shown in Figure 3-32.

A second approach to noise control is that of path treatment. The fluid stream is an excellent noise transmission path. When critical flow exists (fluid velocity at the vena contracta is at least at the sonic level), the vena contracta acts as a barrier to the propagation of sound upstream via the fluid. At sub-critical flow, however, valve noise can be propagated in the upstream direction almost as efficiently as it is downstream. The impedance to the transmission of noise upstream at sub-critical flow is primarily a function of valve geometry. The valve geometry that provides a direct line of sight through the valve (i.e., ball valves and butterfly valves), offers little resistance to noise propagation. Glove style valves provide approximately 10 dB attenuation. In any path treatment approach to control valve noise abatement, consideration must be given to the amplitude of noise radiated by both the upstream and downstream piping. Path treatment consists of increasing the impedance of the transmission path to reduce the acoustic energy that is communicated to the receiver.

Dissipation of acoustic energy by use of acoustical absorbent materials is one of the most effective methods of

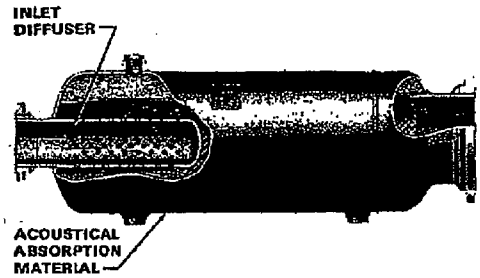


Figure 3-33. Typical In-line Silencer

path treatment. Whenever possible the acoustical material should be located in the flow stream either at or immediately downstream of the noise source. In gas transmission systems, inline silencers effectively dissipate the noise within the fluid stream and attenuate the noise level transmitted to the solid boundaries. Where high mass flow rates and/or high pressure ratios across the valve exist, inline silencers, such as that shown in Figure 3-33, are often the most realistic and economical approach to noise control. Use of absorption-type inline silencers can provide almost any degree of attenuation desired. However, economic considerations generally limit the insertion loss to approximately 25 dBA.

Noise that cannot be eliminated within the boundaries of the flow stream must be eliminated by external treatment. This approach to the abatement of control valve noise suggests the use of heavy walled piping, acoustical insulation of the exposed solid boundaries of the fluid stream, use of insulated boxes, buildings, etc. to isolate the noise source.

Path treatment such as heavy wall pipe or external acoustical insulation can be a very economical and effective technique for localized noise abatement. However, noise is propagated for long distances via the fluid stream and the effectiveness of the heavy wall pipe or external insulation ends where the treatment ends.

Noise Summary

The amount of noise that will be generated by a proposed control valve installation can be quickly and accurately predicted by use of documented procedures available from many valve manufacturers. Leading manufacturers can also provide computer programs for large or intermediate computers and pre-programmed tapes for hand-held programmable calculators to facilitate valve selection based on noise requirements. These aids permit proper selection of equipment (such as that shown in Figures 3-34 and 3-35) to provide solutions for most control valve noise problems.

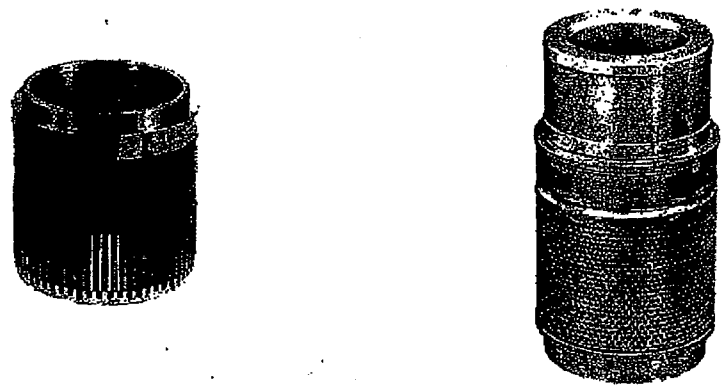


Figure 3-34. Noise Abatement Cages for Globe-style Valve Bodies

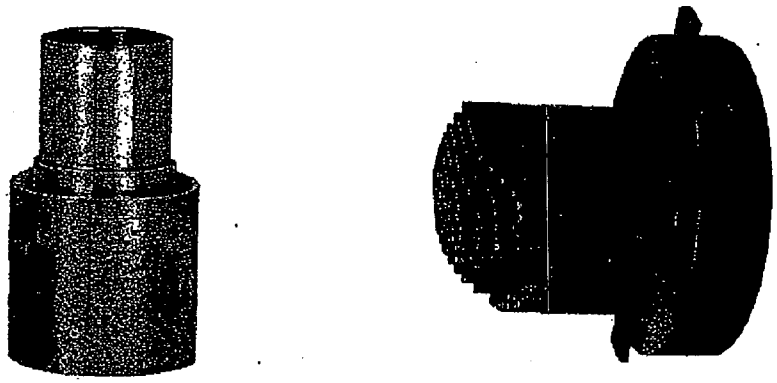


Figure 3-35. Cage and Tube Bundle to Reduce Hydrodynamic Cavitation Noise

With increasing interest on the environmental impact of all aspects of industry, there will be increasing demands for noise abatement procedures and equipment. The technology and hardware associated with noise abatement are continually being refined. Contacting a representative of one of the leading valve manufacturers is the best way to be assured of the latest noise abatement sizing and selection techniques.

Section 4

Special Control Valves

Valves for Special Applications

As discussed previously, "standard" control valves can be used to handle a very wide range of control applications. The range of "standard" applications can be defined as being encompassed by: atmospheric pressure and 6000 psig (414 bar), minus 150°F (−101°C) and 450°F (232°C), flow coefficient C_v values of 1.0 and 25,000, and the limits imposed by common industrial standards. Certainly corrosiveness and viscosity of the fluid, leakage rates, and the many other factors mentioned at the beginning of Part III of this book demand consideration even for "standard" applications. But perhaps the need for careful consideration of valve selection is even more critical for applications outside the "standard" limits mentioned above. This chapter discusses some of the "special" applications and control valve modifications useful in controlling them, designs and materials for severe service, and test requirements for control valves used in nuclear power plant service.

High Pressure Control Valves

Modern industrial processes frequently utilize working pressures above 6000 psig (414 bar). Widespread usage of plastic products has created an expanding market for high pressure valves used in production of polyethylene. Pressures up to 50,000 psig (3450 bar) are not unusual. At such high pressures, the techniques and methods used to seal valve bodies are very important. Usually the valve body is of two-piece angle design with the seat ring clamped between the two body halves. The seat ring-to-body seal is made with a retained, metallic, hollow O-ring. The inside diameter of the O-ring is perforated to allow line pressure to enter the hollow cross-section of the O-ring. As pressure builds up, the O-ring tends to "inflate", creating a tight seal between the body and seat ring. The exterior surface of the O-ring is usually plated with soft silver to assist in forming the seal.

Line connections for high pressure service also are normally "self-energizing" or pressure-assisted. They usually rely on the deformation of a ring at the gasket face to provide a tight seal. Three of the more common line connection seals are shown in Figure 4-1. The line connection used is at the buyer's option and is not furnished with the control valve. However, the intended connection style must be specified to the valve manufacturer so that the body ends can be properly machined and threaded. [For ratings up to 10,000 psig (690 bar), flanged end connections are available.]

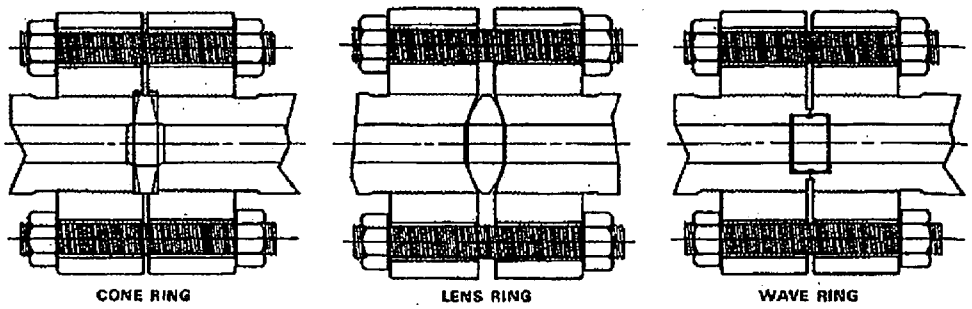


Figure 4-1. Typical Line Connections for High Pressure Valve Bodies

Valve stem packing tolerances become more critical for high-pressure units. At high pressures, elastomer packing can be extruded through very small clearances. Packing material is generally a TFE compound impregnated with glass to make it more resistant to extrusion. Valve stems are subject to much higher stresses than in standard control valve service, so they are made of higher strength material, such as hardened Type 4140 steel. The stem must be short and well guided to prevent column action and should be hard chrome plated to prevent galling caused by the high unit pressure contact with the packing.

Closed-die forgings are used for high pressure valve bodies. The material is usually heat-treated Type 4340 steel if the intended pressure rating is 50,000 psig (3450 bar). For ratings to 10,000 psig (690 bar), annealed Type 316 stainless steel can be used. The forging process provides bodies that are free of voids and that can be heat treated to high strength levels without losing ductility. Figure 4-2 shows an internal view of the components used in a high pressure valve body. Note that optional steam tracing lines are shown which permit raising the temperature of the body before admitting high pressure fluid. Steam tracing can increase the ductility and impact strength of the material.

Various trim materials are used in high pressure control valves. When pressure drops are low, hardened stainless steel or cobalt-chromium alloys are adequate. For higher pressure drops, the valve plug tip may be furnished in tungsten carbide for excellent resistance to abrasion and erosion.

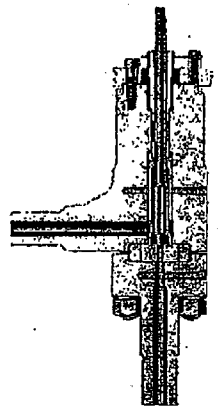


Figure 4-2. Forged Valve Body Assembly for Service to 50,000 PSIG (3450 Bar)

High pressure valves can be actuated by a variety of actuators ranging from standard piston or diaphragm models (Figure 4-3) to the more sophisticated pneumatic and electro-hydraulic actuators shown in Figure 4-4 and 4-5. The dual-piston pneumatic model (Figure 4-4) was specifically designed for polyethylene let-down service where very short overall valve plug travel was required. The actuator shown (Figure 4-4) provides precise control of valve stem movement through a crank and screw assembly. Each of the actuator cylinders includes its own positioner, making it easy to

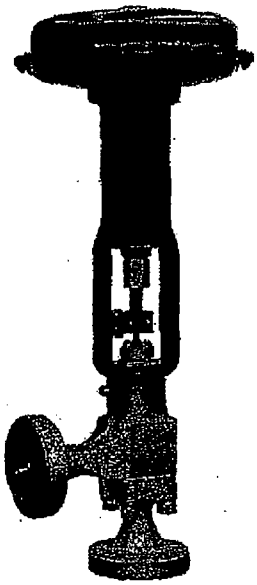


Figure 4-3. High Pressure Control Valve with Flanged End Connections and Diaphragm Actuator

split controller output so that one cylinder operates on the 3 to 9 psig (0.2 to 0.6 bar) portion and the other on the 9 to 15 psig (0.6 to 1.0 bar) portion.

High Temperature Control Valves

Control valves for service at temperatures above 450°F (232°C) must be designed and specified with the temperature conditions in mind. At elevated temperatures, such as may be encountered in boiler feedwater systems and superheater bypass systems, the standard materials of control valve construction may be inadequate. For instance, plastics, elastomers, and standard gaskets are generally unsuitable and must be replaced by more durable materials. Metal-to-metal seating materials are always used. Semi-metallic or laminated graphite packing materials are commonly used, and spiral-wound stainless steel and asbestos gaskets are necessary.

Chrome-moly steels are often used for the valve body castings for temperatures above 1000°F (538°C), but above 1050°F (566°C) ASTM A217

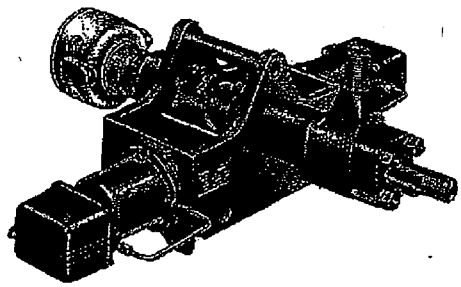


Figure 4-4. Control Valve Assembly Designed for Polyethylene Production

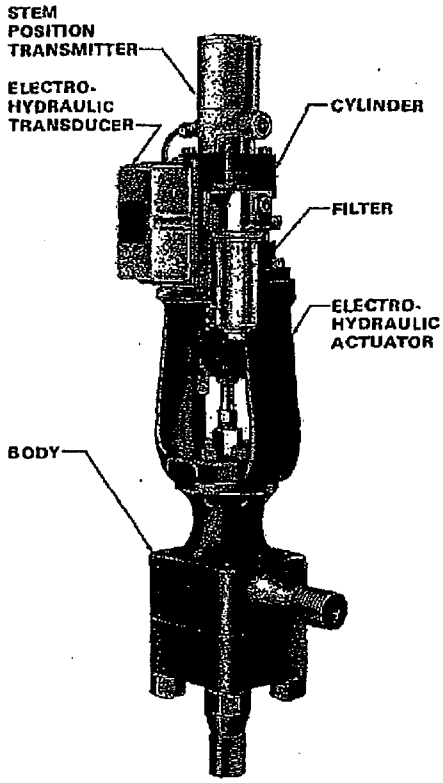


Figure 4-5. High Pressure Control Valve with Electro-Hydraulic Actuator

Grade WC9 is subject to oxidation and scaling. ASTM A217 Grade C5 has the same shortcoming above 1100°F (593°C). So for temperatures on up to 1500°F (816°C) the material usually selected is ASTM A351 Grade CF-8M, Type 316 stainless steel.

Extension bonnets are used to help protect packing box parts from

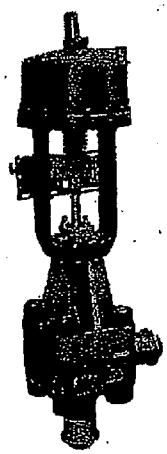


Figure 4-6. Control Valve for Service to 1500°F (816°C)

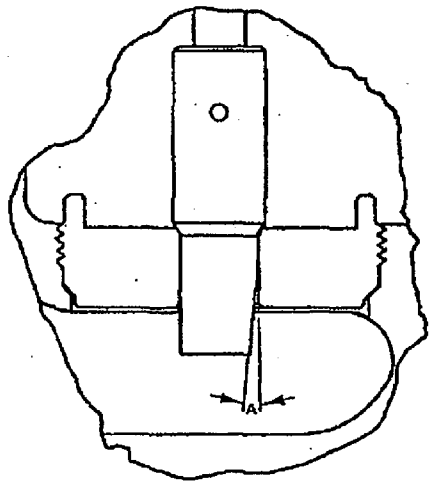


Figure 4-7. Angle of Flat "A" Determines Control of Small Flow Rates

extremely high temperatures. Some rotary-shaft control valves have optional refractory liners for additional heat resistance. A valve such as that shown in Figure 4-6 is suitable for high temperature service as well as for pressures above the limits of ANSI Class 2500 ratings. It incorporates the qualities mentioned above and also includes trim materials such as chrome-plated Type 316 stainless steel, cobalt-based Alloy 6, and high-vanadium, high-chromium steels for additional resistance to high working temperatures.

Small-Flow Control Valves

Many applications exist in laboratories, pilot plants, and the commerical process industries where control of extremely small flow rates is necessary. Using special trim in a standard control valve body is a common way of handling these situations, and provides economy in reducing need for spare parts inventory for special valves and actuators. By utilizing standard control valve travel ranges and accessories, accurate flow control can be maintained at very low rates. The special trim parts used are normally only two—a reduced-port seat ring and a valve plug with a tapered flat milled on one side—as shown in Figure 4-7. These parts are machined to very close tolerances and are usually made of a hardened stainless steel or hard faced with Alloy 6 to minimize erosion. Using a 3/16-inch diameter port, the construction shown can be provided with a C_v flow coefficient of only 0.075 at fully open 3/4-inch travel.

Large-Flow Control Valves

Generally speaking, globe-style valves larger than 12-inch, ball or eccentric disc valves larger than 24-inch, and butterfly valves larger than 72-inch fall in the "special valve" category. As valve sizes increase arithmetically, static pressure loads at shutoff increase geometrically. Consequently then, shaft strength, bearing loads, unbalance forces, and available actuator thrust all become of greater significance with increasing valve size. Normally maximum allowable pressure drop is reduced on large valves to keep design and actuator requirements within reasonable limits. Even with lowered working pressure ratings, the flow capacity of some of the large-flow valves is awesome. For instance, the 72-inch butterfly valve would deliver up to 281,000 gallons of water per minute per psi of differential pressure. Capacity of this magnitude could be applied in the circulating water systems of Power Industry installations.

Naturally, actuator requirements are severe, and long-stroke, double-acting pneumatic piston or electric actuators are usually specified for large-flow applications. Installation and maintenance procedures are complicated by the physical size and weight of the valve and actuator components. Heavy-duty hoists are required for installation of the valve body assembly into the pipeline and also for removal or replacement of major trim parts. Maintenance personnel must follow the manufacturers' instruction manuals closely to minimize risk of injury. Extra caution is required in adjustment of large butterfly valve seals for tight shutoff when those adjustments must be made from inside the pipeline downstream of the valve. Any such maintenance requires that the actuator linkage be positively blocked so that the valve remains closed.

Noise levels must be carefully considered in all large-flow installations since sound pressure levels increase in direct proportion to flow magnitude. To keep valve-originated noise within tolerable limits, large fabricated valve body designs, such as that shown in Figure 4-8, have been developed. These bodies are normally of cage-style construction, using unusually long valve plug travel, a great number of small flow openings through the wall of the cage, and an expanded outlet line connection to minimize noise output and reduce fluid velocity. Often the inlet connection and inlet portion of the fabricated valve body are designed for higher pressure than are the remainder of the body shell and the expanded outlet connection. When such a construction is used, the body is rated according to the maximum allowable working pressure of the outlet portion. Overpressure protection equipment must be included in the downstream system to ensure that the body shell and outlet connection are not subjected to pressure in excess of the rated capability.

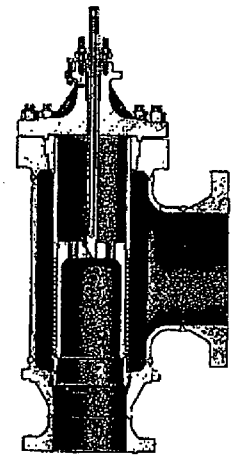


Figure 4-8. Large Flow Valve Body for Noise Attenuation Service

Cryogenic Service Valves

Cryogenics is the science dealing with materials and processes at temperatures below minus 150°F (−101°C). With increasing production and use of fluids such as liquefied hydrogen, oxygen, fluorine, nitrogen, and methane, the need for low-temperature fluid control has become commonplace. But standard control valves often cannot handle cryogenic applications satisfactorily.

To maintain cryogenic process efficiency, heat influx into the system must be kept at a minimum. Consequently, pipelines are usually heavily insulated and control valves are often placed inside insulated cold-boxes. A large portion of the heat influx that occurs is caused by conduction through control valve parts that extend beyond the insulated area. To minimize that heat influx, thin-walled bonnet extensions and small-diameter valve stems are used. Austenitic (300 Series) stainless steels are used for these parts to take advantage of the low conductivity of the material. Also, the extension bonnet is sometimes fabricated to keep wall section thickness to a minimum and the valve body itself is often of the weld-end variety to eliminate unnecessary weight common to flanged constructions. Keeping valve assembly weight to a minimum is advantageous in that the mass which must be cooled from ambient temperature to cryogenic

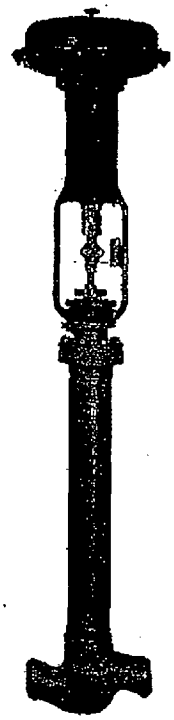


Figure 4-9. Control Valve for Cryogenic Service

operating temperature at start-up is lessened. Valve body walls are carefully contoured for the same purpose.

Gasketed joints are avoided whenever possible to avoid the possibility of leakage which would damage the insulation of the cold box and necessitate costly maintenance and downtime. A leak-tight stem seal is also important, but is often difficult to maintain since most elastomer and plastic materials become hard and brittle at temperatures below −50°F (−46°C). Use of a valve with a long extension bonnet, such as that shown in Figure 4-9, provides the solution. The extension bonnet, which should extend four to six inches beyond the cold-box as shown in figure 4-10, provides space for a slight boil-off of the cold liquid. When installed so that the extension bonnet slants at least 20 degrees above horizontal, the vapor pocket resulting from liquid boil-off prevents the cold liquid from contacting the stem seal packing area.

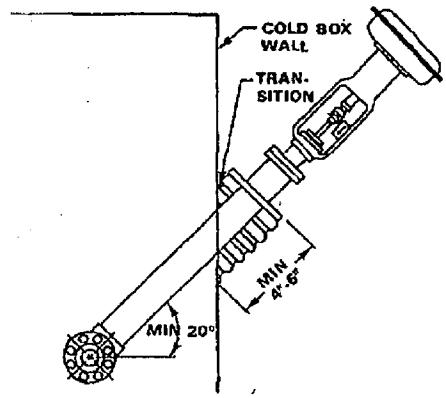


Figure 4-10. Cold Box Installation

Most valve manufacturers can provide valves, similar to that shown in Figure 4-9, designed specifically for cryogenic service. These valves are usually limited to 4-inch size due to high heat influx given by large warming extensions. For applications requiring larger valve sizes, ball and butterfly valves can be modified by the addition of fabricated extension bonnets. Both types are relatively economical and are suited to cryogenic service due to their low cool-down weights. To minimize gasketing problems, the gasket surfaces of the valve and pipeline must be provided with a better finish than on standard service valves. This helps to compensate for loss of gasket resilience at cryogenic temperatures.

Standard throttling globe-style control valves are also frequently used in cryogenic service. Normally they are used in insulated pipelines and include fabricated extension bonnets so that the actuator and packing box are outside the insulated area. Valve body material is most often ASTM A351 Grade CF8M Type 316 stainless steel. Internal parts must be made of materials compatible with the fluid controlled, and must also have rates of thermal contraction comparable to the body material to avoid internal leakage during cycling temperature conditions. A liquid seal may be used around the stem at the bottom of the bonnet extension to help maintain a pocket of insulating vapor within the bonnet

extension and keep the cryogenic liquid away from the packing area. Standard ANSI-class valves may have to be derated for cryogenic service due to reduced bonnet bolting strength at very low temperatures.

Control Valves for Nuclear Service

Since 1970 U.S. manufacturers and suppliers of components for nuclear power plants have been subject to the requirements of Appendix B, Title 10, Part 50 of the Code of Federal Regulations entitled "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." The enforcement agency for this regulation is the U.S. Nuclear Regulatory Commission. Ultimate responsibility of proof of compliance to Appendix B rests with the owner of the plant, but he must in turn rely on the manufacturers of the various plant components to provide documented evidence that the components were manufactured, inspected, and tested by proven techniques performed by qualified personnel according to documented procedures.

In keeping with the requirements of the Code of Federal Regulations, most nuclear power plant components are specified in accordance with Section III of the ASME Boiler and Pressure Vessel Code entitled "Nuclear Power Plant Components." All aspects of the manufacturing process must be documented in a quality control manual and audited and certified by ASME prior to actual manufacture of the components. All subsequent manufacturing materials and operations are to be checked by an authorized inspector. All valves manufactured in accordance with Section III requirements receive an ASME code nameplate and an "N" stamp symbolizing acceptability for service in nuclear power plant applications. The Code requirements ensure strength and pressure integrity of the pressure-retaining parts. Section III defines pressure-retaining parts as the body, bonnet, disc or valve plug, and bolting.

Section III does not apply to parts not associated with the pressure retaining function, to actuators and accessories unless they are pressure retaining parts, to deterioration of valve components due to radiation, corrosion, erosion, seismic or environmental qualifications, or to cleaning, painting, or packaging requirements. (However, customer specifications normally cover these areas.) Section III *does* apply to materials used for pressure retaining parts, to design criteria, to fabrication procedures, to non-destructive test procedures for pressure retaining parts, to hydrostatic testing, and to marking and stamping procedures. ASME Section III is revised by means of semi-annual addenda which may be used after date of issue, and which become mandatory six months after date of issue.

Valves Subject to Sulfide Stress Cracking

The National Association of Corrosion Engineers, recognizing the problems of sulfide stress cracking (SSC) and hydrogen embrittlement in gas and oil industry valves, have prepared NACE Standard MR-01-75 setting material guidelines for selection of valves to be used in "sour gas" service. The following statements, while based on the standard mentioned, cannot be presented in the detail furnished in the standard itself and do not guarantee suitability for any given material in hydrogen sulfide-containing sour environments. The reader is urged to refer to the complete standard prior to selecting control valves for "sour gas" service. Additionally, the reader should be aware that portions of this standard have been mandated by statute in many states of the U.S.A.

- Most ferrous metals can become susceptible to SSC due to hardening by heat treatment and/or cold work. Conversely, many ferrous metals can be heat treated to improve resistance to SSC.
- Carbon and low-alloy steels should be heat treated to a maximum hardness of HRC 22 (Rockwell "C" Hardness Scale) to improve resistance to SSC.
- Cast iron is not permitted for use as a pressure-containing member in

equipment covered by some American Petroleum Institute standards and should not be used in non-pressure containing internal valve parts without the approval of the purchaser.

- Austenitic stainless steels are most resistant to SSC in the annealed condition; some other stainless steels are acceptable up to HRC 35.
- Copper-base alloys are generally not to be used in critical parts of a valve without the approval of the purchaser.
- Some high-strength alloys are acceptable under specified conditions.
- Chrome, nickel, and cadmium plating offer no protection from SSC.
- Most weld repairs or fabrication welds require post-weld heat treatment to assure a maximum hardness of HRC 22.
- Conventional identification stamping is permissible in low stress areas, such as on the outside diameter of line flanges.
- The standard precludes using ASTM A193 Grade B7 bolting for some applications. Therefore, it may be necessary to derate valves originally designed to use this bolting.

Section 5

Installation and Maintenance

Control Valve Installation

Correct sizing and selection procedures, proper installation techniques, and periodic preventive maintenance are all factors that can lengthen control valve service life. Most valve manufacturers furnish detailed installation and operation instructions with each valve. These instruction sheets normally outline specific installation and maintenance procedures which apply to the particular valve described. Naturally, the specific instructions should be read by the purchaser prior to valve installation and closely followed during installation and operation. The suggestions furnished below are general in nature and should not take precedence over the valve manufacturer's detailed instructions for a particular valve.

Use a Recommended Piping Arrangement

The Instrument Society of America has published a Recommended Practice, ISA RP-4.2, on Standard Control Valve Manifold Designs to promote uniform control valve installations. Following one of the recommended practices, such as those described in Figures 5-1 and 5-2, will be of benefit in the event that piping components have to be replaced due to changing service requirements. The dimensions shown are for carbon steel valves and fittings, but the general arrangement of parts can be applied to installations with cast iron valves and fittings.

Be Sure the Pipeline is Clean

Foreign material in the pipeline could damage the seating surface of the valve, or even obstruct the movement of the valve plug or disc so that the valve could not shut off properly. To help reduce the possibility of a dangerous situation occurring, all pipelines should be blown out with air prior to valve installation. Make sure pipe scale, metal chips, welding slag, and other foreign materials are removed. Also, if the valve has screwed end connections, a good grade of pipe sealant compound should be applied to the male pipeline threads only. Do not use sealant on the female threads in the valve body because excess compound on the female threads would be forced into the valve body. This could cause sticking of the valve plug or accumulation of dirt which would prevent good valve shutoff.

Inspect the Control Valve Before Installation

While valve manufacturers take steps to prevent shipment damage, such damage is possible and should be discovered and reported before the valve is installed.

Type I Control Valve Manifold

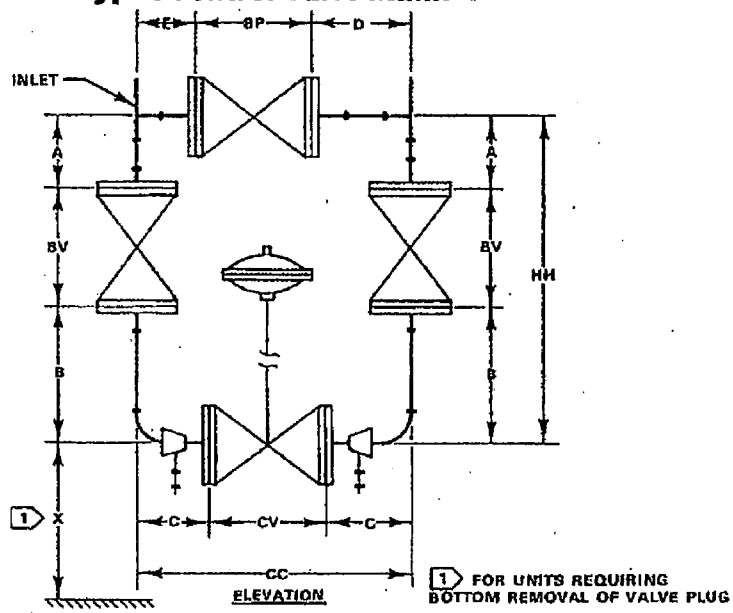


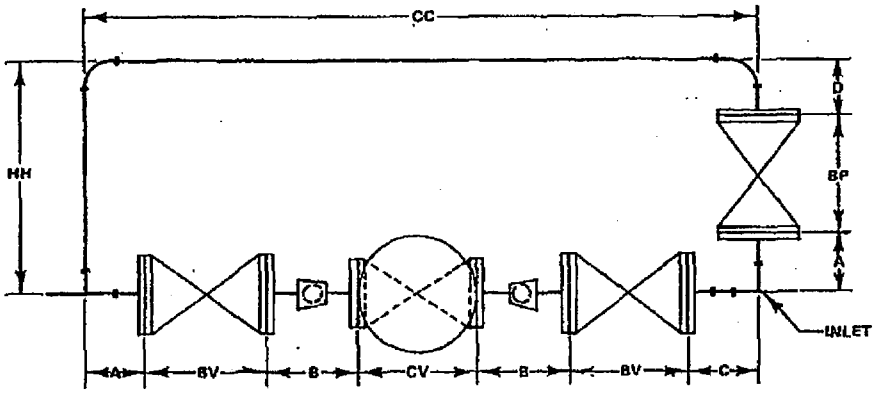
Figure 5-1. Control Valve Installation for Low Pressure Drop Applications

Table of Dimensions
(All Dimensions Given in Inches)

Manifold Rating	Manifold Size	Control Valve Size	CV*	BV	BP	CC	HH	A	B	C	D	E	X
With ANSI Class 300 Flanges	2	1-1/2	9.25	8.50	10.50	26.75	39.00	8.75	21.62	8.69	10.88	5.25	22.62
	3	2	10.50	11.12	12.50	29.12	41.50	9.50	20.75	9.25	10.00	6.50	26.62
	3	1-1/2	9.25	11.12	12.50	29.12	41.50	9.50	20.75	9.88	10.00	6.50	26.62
	4	3	12.50	12.00	14.00	34.88	42.12	10.88	19.12	11.12	13.25	7.50	29.50
	4	2	10.50	12.00	14.00	34.88	42.12	10.88	19.12	12.12	13.25	7.50	29.50
	6	4	14.50	15.88	15.88	44.38	53.50	17.12	20.38	14.88	18.88	9.50	39.00
	6	3	12.50	15.88	15.88	44.38	53.50	17.12	20.38	15.88	18.88	9.50	39.00
	8	6	18.62	16.50	16.50	54.50	56.62	22.00	18.00	17.88	26.50	11.38	45.50
	8	4	14.50	16.50	16.50	54.50	56.62	22.00	18.00	19.94	26.50	11.38	45.50
With ANSI Class 150 Flanges	2	1-1/2	9.25	7.00	8.00	26.75	39.00	10.25	21.62	8.69	13.62	5.00	22.62
	3	2	10.50	8.00	9.50	29.12	41.50	12.62	20.75	9.25	13.38	6.12	26.62
	3	1-1/2	9.25	8.00	9.50	29.12	41.50	12.62	20.75	9.88	13.38	6.12	26.62
	4	3	12.50	9.00	11.50	34.88	42.12	13.88	19.12	11.12	16.12	7.12	29.50
	4	2	10.50	9.00	11.50	34.88	42.12	13.88	19.12	12.12	16.12	7.12	29.50
	6	4	14.50	10.50	10.50	44.38	53.50	22.50	20.38	14.88	24.62	9.12	39.00
	6	3	12.50	10.50	10.50	44.38	53.50	22.50	20.38	15.88	24.62	9.12	39.00
	8	6	18.62	11.50	11.50	54.50	56.62	27.00	18.00	17.88	31.88	11.00	45.50
	8	4	14.50	11.50	11.50	54.50	56.62	27.00	18.00	19.94	31.88	11.00	45.50

*Control valve dimensions in accordance with ISA S4.01.1-1977. All control valve dimensions are ANSI Class 300 flanged.

Type VI Control Valve Manifold



X‡ CLEARANCE ABOVE CENTERLINE PIPE
Y‡ CLEARANCE BELOW CENTERLINE PIPE

PLAN VIEW

Figure 5-2. Control Valve Installation for High Pressure Drop Applications

Table of Dimensions
(All Dimensions Given in Inches)

Manifold Rating	Manifold Size	Control Valve Size	CV*	BV	BP	CC	HH	A	B	C	D	X†	Y‡
With ANSI Class 300 Flanges	2	1-1/2	9.25	8.50	10.50	57.50	20.62	5.25	8.44	8.75	4.75	22.62	36.62
	3	2	10.50	11.12	12.50	66.50	25.25	6.50	8.69	9.50	6.12	26.62	38.50
	3	1-1/2	9.25	11.12	12.50	66.50	25.25	6.50	9.31	9.50	6.12	26.62	38.50
	4	3	12.50	12.00	14.00	73.50	29.00	7.50	9.12	10.88	7.38	29.50	39.12
	4	2	10.50	12.00	14.00	73.50	29.00	7.50	10.12	10.88	7.38	29.50	39.12
	6	4	14.50	15.88	15.88	96.25	35.38	9.50	11.50	17.12	9.88	39.00	50.00
	6	3	12.50	15.88	15.88	96.25	35.38	9.50	12.50	17.12	9.88	39.00	50.00
	8	6	18.62	16.50	16.50	108.75	40.38	11.38	11.69	22.00	12.38	45.50	51.75
	8	4	14.50	16.50	16.50	108.75	40.38	11.38	13.75	22.00	12.38	45.50	51.75
With ANSI Class 150 Flanges	2	1-1/2	9.25	7.00	8.00	55.25	17.62	5.00	8.19	10.25	4.50	22.62	36.62
	3	2	10.50	8.00	9.50	62.25	21.50	6.12	8.31	12.62	5.75	26.62	38.50
	3	1-1/2	9.25	8.00	9.50	62.25	21.50	6.12	8.94	12.62	5.75	26.62	38.50
	4	3	12.50	9.00	11.50	69.38	25.75	7.12	8.75	13.88	7.00	29.50	39.12
	4	2	10.50	9.00	11.50	69.38	25.75	7.12	9.75	13.88	7.00	29.50	39.12
	6	4	14.50	10.50	10.50	89.75	29.25	9.12	11.12	22.50	9.50	39.00	50.00
	6	3	12.50	10.50	10.50	89.75	29.25	9.12	12.12	22.50	9.50	39.00	50.00
	8	6	18.62	11.50	11.50	102.62	34.62	11.00	11.31	27.00	12.00	45.50	51.75
	8	4	14.50	11.50	11.50	102.62	34.62	11.00	13.38	27.00	12.00	45.50	51.75

*Control valve dimensions in accordance with ISA S4.01.1-1977. All control valve dimensions are ANSI Class 300 flanged.
†Clearance above centerline of pipe for units requiring top removal of valve plug.
‡Clearance below centerline of pipe for units requiring bottom removal of valve plug.

DO NOT INSTALL A CONTROL VALVE KNOWN TO HAVE BEEN DAMAGED IN SHIPMENT. Before installation check for and remove all shipping stops and protective plastic plugs or gasket surface covers. Check inside the valve body to make sure no foreign objects are present.

Use Good Piping Practice

Most control valves can be installed in any position. However, the most common method is with the actuator vertical and above the valve body. If horizontal actuator mounting is necessary, consider the possibility of providing additional vertical support for the actuator. Be sure the body is installed so that fluid flow will be in the direction indicated by the flow arrow on the body.

Be sure ample room is allowed above and/or below the valve installation to permit easy removal of the actuator or valve plug for inspection and maintenance procedures. Clearance distances are normally available from the valve manufacturer in the form of certified dimension drawings. For flanged valve bodies, be sure the flanges are properly aligned to provide uniform contact on the gasket surfaces. Snug up the bolts gently in establishing proper flange alignment and then finish tightening them in a criss-cross pattern as depicted in Figure 5-3. This will avoid uneven gasket loading and will help in preventing leaks, as well as avoiding the possibility of damaging, or even breaking, the flange itself. This precaution is particularly important when connecting flanges of different materials, such as would be the case when a cast iron body is bolted between steel pipeline flanges.

Pressure taps installed upstream and downstream of the control valve are useful for checking flow capacity or pressure drop. Such taps should be located in straight runs of pipe, away from elbows, reducers, or expanders, to minimize inaccuracies resulting from fluid turbulence.

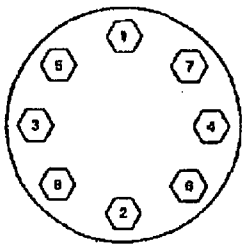


Figure 5-3. Recommended Bolt Tightening Sequence for Uniform Gasket Loading

Use 1/4-inch or 3/8-inch tubing or pipe from the pressure connection on the actuator to the controller. Try to keep this distance relatively short and try to minimize the number of fittings and elbows in order to reduce system time lag. If long distances are involved, a valve positioner or a booster should be used on the control valve.

Control Valve Maintenance

In order to perform even routine maintenance procedures on a control valve, it is important that the maintenance man have a thorough understanding of the fundamental construction and operation of the valve. Without this knowledge, the equipment could be damaged inadvertently, or could cause injury to the maintenance man and others in the area. Most valve manufacturers provide suggested safety measures in their detailed instruction and operation manuals. Usually, a sectional drawing of the equipment is also furnished to help in understanding the operation of the equipment as well as to provide identification of component parts.

In all major types of control valves, the actuator provides force to position a movable valve plug, disc, or ball in relation to a stationary seat ring or sealing surface. The moveable member should respond freely to changes in actuator loading pressure. If proper operation is not being received, service is indicated. Before any maintenance

procedures are started, be sure that all line pressure is shut off and released from the valve body and also that all pressure to the actuator is shut off and captive pressure gradually relieved. Failure to take adequate precautions could create a situation that would damage the equipment or injure personnel.

Often corporate maintenance policy or existing codes require preventive maintenance on a regular schedule. Usually such programs include inspection for damage of all major valve components and replacement of all gaskets, O-ring seals, diaphragms, and other elastomer parts. Following is a series of commonly performed maintenance procedures and some general instructions for performing each procedure. The reader is reminded that specific, detailed maintenance procedure instructions are normally furnished with control valve equipment and should be carefully followed.

Replacing Actuator Diaphragm

After isolating the valve from all pressure, relieve all spring compression in the main spring, if possible. (On some spring and diaphragm actuators for use on rotary-shaft valve bodies, spring compression is not externally adjustable. Initial spring compression is set at the factory and does not need to be released in order to change the diaphragm.) Remove the upper diaphragm case. On direct-acting actuators, the diaphragm can be lifted out and replaced with a new one. On reverse-acting actuators, the diaphragm head assembly must be dismantled to change the diaphragm.

Most pneumatic spring-and-diaphragm actuators utilize a molded diaphragm for control valve service. The molded diaphragm facilitates installation, provides a relatively uniform effective area throughout the valve's travel range, and permits greater travel than could be possible if a flat-sheet diaphragm were used. If a flat-sheet diaphragm is used in an emergency repair situation, it should be replaced with a molded diaphragm as soon as possible.

When re-assembling the diaphragm case, tighten the cap screws around the perimeter of the case firmly and evenly to prevent leakage.

Replacing Stem Packing

Bonnet packing, which provides the pressure seal around the stem of a globe-style or angle-style valve body, may need to be replaced if leakage develops around the stem, or if the valve is completely disassembled for other maintenance or inspection. Before starting to remove packing nuts, make sure there is no pressure in the valve body.

If the packing is of the split ring variety, it can be removed (with considerable difficulty) without removing the actuator by digging it out of the packing box with a narrow, sharp tool. This is not recommended, because the wall of the packing box or the stem could easily be scratched, thereby causing leakage when the new packing was installed.

Don't try to blow out the old packing rings by applying pressure to the lubricator hole in the bonnet. This can be dangerous and frequently doesn't work very well anyway. (Many packing arrangements have about half of the rings below the lubricator opening.)

The approved method is to:

1. Separate the valve stem and actuator stem connection.

2. Remove the actuator from the valve body.

3. Remove the bonnet and pull out the valve plug and stem.

4. Insert a rod (preferably slightly larger than the stem) through the bottom of the packing box and push or drive the old packing out the top of the bonnet. (Don't use the valve plug stem because the threads could be damaged in the process.)

5. Clean the packing box. Inspect the stem for scratches or imperfections that could damage new packing.

6. Check the valve plug, seat ring, and trim parts as appropriate.

7. Re-assemble the valve body and put the bonnet in position.

8. Tighten body/bonnet bolting in sequence similar to that described for flanges on page 100.

9. Slide new packing parts over the stem in proper sequence, being careful that the stem threads do not damage the packing rings.

10. Install the packing follower, flange, and packing nuts.

11. For spring-loaded TFE V-ring packing, tighten the packing nuts as far as they will go. For other varieties, tighten in service only enough to prevent leakage.

12. Replace and tighten the actuator onto the body. Position and tighten the stem connector to provide desired valve plug travel.

Replacing Threaded Seat Rings

Many conventional sliding-stem control valves use threaded-in seat rings. Severe service conditions can cause damage to the seating surface of the seat ring(s) so that the valve does not shut off satisfactorily. In that event, replacement of the seat ring(s) will be necessary.

Before trying to remove the seat ring(s), check to see if the ring has been tack-welded to the valve body. If so, cut away the weld and apply penetrating oil to the seat ring threads before trying to remove the ring. The following procedure for seat ring removal assumes that a seat ring puller, such as that shown in Figure 5-4, is being used. If a puller is not available, a lathe or boring mill may be used to remove the ring(s).

1. Place the proper size seat lug bar across the seat ring so that the bar contacts the seat lugs as shown.

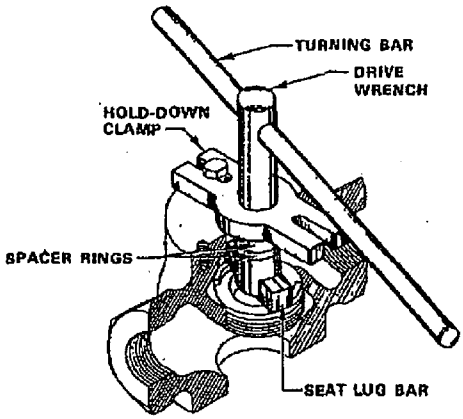


Figure 5-4. Seat Ring Puller

2. Insert drive wrench and place enough spacer rings over the wrench so that the hold-down clamp will rest about 1/4-inch above the body flange.

Slip hold-down clamp onto drive wrench and secure the clamp to the body with two cap screws (or hex nuts for steel bodies) from the bonnet. Do not tighten cap screws or nuts.

3. Use turning bar to unscrew the seat ring. Stuck seat rings may require additional force on the turning bar. Slip a 3- to 5-foot length of pipe over one end of the turning bar, and while applying a steady force, hit the other end of the bar with a heavy hammer to break the ring loose. In addition, a large pipe wrench can be used on the drive wrench near the hold-down clamp.

4. After the seat ring is loose, alternately unscrew the flange bolts (or nuts) on the hold-down clamp and continue to unscrew seat ring.

5. Before installing new ring(s), thoroughly clean threads in the body port(s). Apply pipe compound to the threads of the new seat ring(s).

Note

On double-port bodies, one of the seat rings is smaller than the other. On direct-acting valves (push-down-to-close action), install the smaller ring in the

body port farther from the bonnet before installing the larger ring. On reverse-acting valves (push-down-to-open action), install the smaller ring in the body port closer to the bonnet before installing the larger ring.

Screw the ring(s) into the body. Use the seat ring puller, lathe, or boring mill to tighten seat rings in the body. Remove all excess pipe compound after tightening. The seat ring can be spot welded in place to ensure that it does not loosen.

6. Reassemble the valve.

Grinding Metal Seats

A certain amount of leakage should be expected with metal-to-metal seating in any globe-style valve body. If the leakage becomes excessive, however, the condition of the seating surfaces of the valve plug and seat ring can be improved by grinding. Large nicks should be machined out rather than ground out. Many grinding compounds are available commercially. Use one of good quality or make your own with a mixture of 600-grit silicon carbide compound and solidified vegetable oil. White lead should be applied to the seat to prevent excessive cutting or tearing during grinding. In cage-style constructions the bonnet or bottom flange must be bolted to the body with the gaskets in place during the grinding procedure to position the cage and seat ring properly and to help align the valve plug with the seat ring. A simple grinding tool can be made from a piece of strap iron locked to the valve plug stem with nuts.

On double-port bodies, the top ring normally grinds faster than the bottom ring. Under these conditions, continue to use grinding compound and white lead on the bottom ring, but use only a polishing compound (rottenstone and oil) on the top ring. If either of the ports continues to leak, use more grinding compound on the seat ring that is not leaking and polishing compound on the other ring. This procedure grinds down the seat ring that is not leaking until both seats touch at the same time. Never leave one seat ring dry while grinding the other.

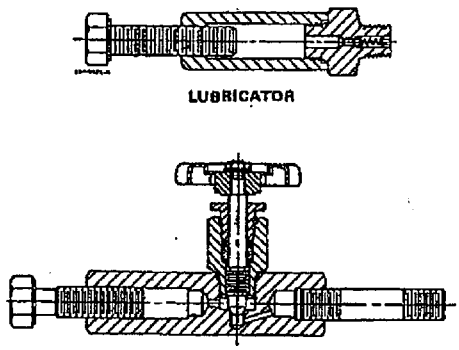


Figure 5-5. Lubricator and Lubricator/Isolating Valve

After grinding, remove bonnet or bottom flange, clean seating surfaces, and test for shutoff. Repeat grinding procedure if leakage is still excessive.

Lubricating Control Valve Packing

A lubricator or lubricator/isolating valve (as shown in Figure 5-5) is required for semi-metallic packing and is recommended for graphited asbestos and TFE-impregnated asbestos packing. The lubricator or lubricator/isolating valve combination should be installed on the side of the valve bonnet, replacing the pipe plug used with packing types not requiring lubrication. Use Dow Corning X-2 lubricant or equivalent for standard service up to 450°F (232°C) and Hooker Chemical Corporation Fluorolube lubricant or equivalent for chemical service up to 300°F (149°C). With lubricator, isolating valve, and pipe nipple (if used) completely filled with lubricant and installed on bonnet, open isolating valve (if used) and rotate lubricator bolt a full turn clockwise to force lubricant into the packing box. Close the isolating valve after each lubrication.

Adjusting Travel and Connecting Stem

Sliding-Stem Control Valves

Part names used throughout the following section are shown in Figure 5-6. The procedure is appropriate for sliding-stem valves with either spring-and-diaphragm or piston actuators. When performing the travel adjustment procedure, be careful to avoid damaging the valve plug stem. Scratches on the stem can lead to packing leakage. If the unit includes a bellows seal bonnet, the stem must not be rotated or the bellows will be damaged. On all other units, the stem may be rotated for minor travel adjustment, but the valve plug should not be in contact with the seat ring during rotation of the stem.

1. Assemble the body and mount the actuator. Screw the stem locknuts onto the valve plug stem and set the travel indicator disc on the locknuts with the "cupped" portion downward. Leave enough threads exposed above the disc for the stem connector.

2. Be sure the actuator stem is in the position that equates with the "closed" valve plug position—fully "down" for push-down-to-close valve styles; fully "up" for push-down-to-open valve styles. To achieve this condition, it will often be necessary to pressure load the actuator to properly position the stem.

3. Move the valve plug to the "closed" position, contacting the seat ring.

4. Change actuator loading pressure in order to move the actuator stem 1/8-inch. Install the stem connector, clamping the actuator stem to the valve plug stem.

5. Cycle the actuator to check availablity of desired total travel and that the valve plug seats before the actuator contacts the upper travel stop. Minor adjustments in total travel can be made, if necessary, by loosening the stem connector slightly, tightening the locknuts together, and screwing the stem either into or out of the stem connector by means of a wrench on the locknuts. If overall travel increase is desired, the increase must be less than the 1/8-inch the actuator rod was moved in step 4 above, or the valve will not shut off.

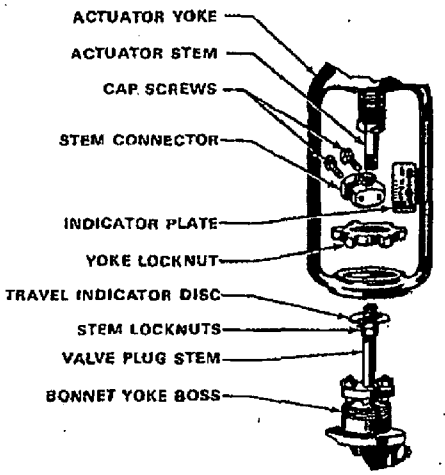


Figure 5-6. Exploded View of Stem Connection Components

6. If the total travel is adequate, tighten the stem connector securely, lock the travel indicator disc against the connector with the locknuts, and adjust the indicator plate on the yoke to show valve plug position.

7. Provide a gauge to measure the pressure to the actuator. Make a final adjustment on the actuator or its positioner to set the starting point of valve travel and to obtain full travel for the desired instrument range.

Rotary-Shaft Control Valves

As shown in Figures 5-7 and 5-8, there are a variety of actuator mounting styles and positions possible with rotary-shaft control valve bodies. Specific adjustment procedures vary depending on whether desired valve action is push-down-to-close or push-down-to-open. The connecting linkage between the actuator and the valve body normally includes a lever which is attached to the valve shaft by means of a key and keyway slot or by mating multiple cut splines on the lever and shaft. A rod end bearing and turnbuckle usually connect the lever to the

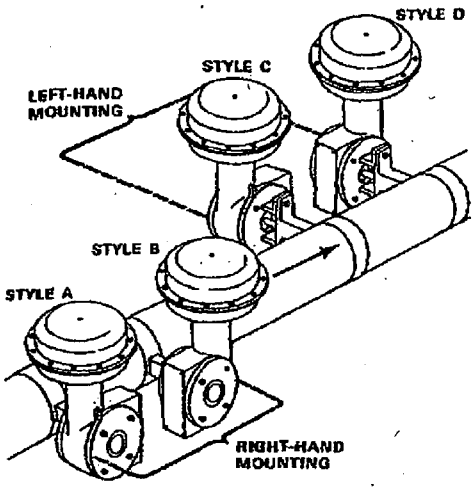


Figure 5-7. Mounting Styles for Actuators on Rotary-Shaft Control Valve Bodies

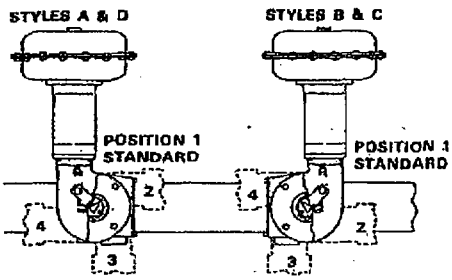
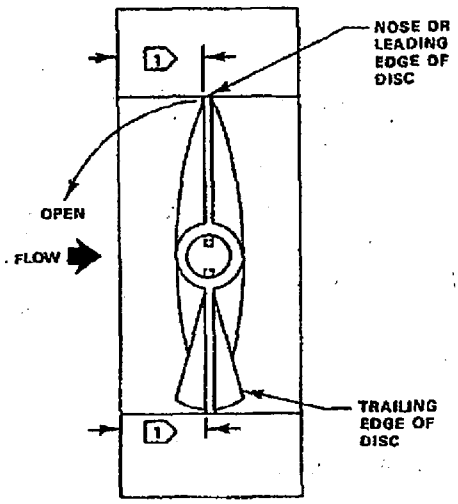


Figure 5-8. Mounting Positions for Actuators on Rotary-Shaft Control Valve Bodies

actuator stem. The valve shaft and disc or V-notched ball are stamped with indicating marks to show proper



1 EQUAL MEASUREMENTS BETWEEN VALVE FACE AND DISC EDGE AT TOP AND BOTTOM ENSURE FULLY CLOSED DISC.

Figure 5-9. Check for Proper Disc Closure

orientation for mating splines. Similar indicating marks are used to show shaft and lever orientation. Fine adjustment is accomplished by lengthening or shortening the turnbuckle to achieve full disc or V-notch ball closure at 0° indicated rotation.

For disc-style rotary valves, fine travel adjustment should be performed with the valve body out of the pipeline so that measurements can be made as suggested in Figure 5-9. Refer to the manufacturer's instruction manuals for specific adjustment details for the body and actuator being used.

Section 6

Conversions and Equivalents

Length Equivalents

To Obtain / by / Multiply Number of	Meters	Inches	Feet	Millimeters	Miles	Kilometers
Meters	1	39.37	3.2808	1000	0.0006214	0.001
Inches	0.0254	1	0.0833	25.4	0.00001578	0.0000254
Feet	0.3048	12	1	304.8	0.0001894	0.0003048
Millimeters	0.001	0.03937	0.0032808	1	0.0000006214	0.000001
Miles	1609.35	63,360	5,280	1,609,350	1	1.60935
Kilometers	1,000	39,370	3280.83	1,000,000	0.62137	1

1 meter = 100 centimeters = 1000 millimeters = 0.001 kilometers = 1,000,000 micrometers
To convert metric units, merely adjust the decimal point.
1 millimeter = 1000 microns = 0.03937 inches = 39.37 mils.

Whole Inch-Millimeter Equivalents

In.	0	1	2	3	4	5	6	7	8	9
	mm									
0	0.0	25.4	50.8	76.2	101.6	127.0	152.4	177.8	203.2	228.6
10	254.0	279.4	304.8	330.2	355.6	381.0	406.4	431.8	457.2	482.6
20	508.0	533.4	558.8	584.2	609.6	635.0	660.4	685.8	711.2	736.6
30	762.0	787.4	812.8	838.2	863.6	889.0	914.4	939.8	965.2	990.6
40	1016.0	1041.4	1066.8	1092.2	1117.6	1143.0	1168.4	1193.8	1219.2	1244.6
50	1270.0	1295.4	1320.8	1346.2	1371.6	1397.0	1422.4	1447.8	1473.2	1498.6
60	1524.0	1549.4	1574.8	1600.2	1625.6	1651.0	1676.4	1701.8	1727.2	1752.6
70	1778.0	1803.4	1828.8	1854.2	1879.6	1905.0	1930.4	1955.8	1981.2	2006.6
80	2032.0	2057.4	2082.8	2108.2	2133.6	2159.0	2184.4	2209.8	2235.2	2260.6
90	2286.0	2311.4	2336.8	2362.2	2387.6	2413.0	2438.4	2463.8	2489.2	2514.6
100	2540.0	2565.4	2590.8	2616.2	2641.6	2667.0	2692.4	2717.8	2743.2	2768.6

Note: All values in this table are exact, based on the relation 1 in = 25.4 mm. By manipulation of the decimal point any decimal value or multiple of an inch may be converted to its exact equivalent in millimeters.

calafish_00192.

Fractional Inches To Millimeters

(1 Inch = 25.4 Millimeters)

In.	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16
	mm															
0	0.0	1.6	3.2	4.8	6.4	7.9	9.5	11.1	12.7	14.3	15.9	17.5	19.1	20.6	22.2	23.8
1	25.4	27.0	28.6	30.2	31.8	33.3	34.9	36.5	38.1	39.7	41.3	42.9	44.5	46.0	47.6	49.2
2	50.8	52.4	54.0	55.6	57.2	58.7	60.3	61.9	63.5	65.1	66.7	68.3	69.9	71.4	73.0	74.6
3	76.2	77.8	79.4	81.0	82.6	84.1	85.7	87.3	88.9	90.5	92.1	93.7	95.3	96.8	98.4	100.0
4	101.6	103.2	104.8	106.4	108.0	109.5	111.1	112.7	114.3	115.9	117.5	119.1	120.7	122.2	123.8	125.4
5	127.0	128.6	130.2	131.8	133.4	134.9	136.5	138.1	139.7	141.3	142.9	144.5	146.1	147.6	149.2	150.8
6	152.4	154.0	155.6	157.2	158.8	160.3	161.9	163.5	165.1	166.7	168.3	169.9	171.5	173.0	174.6	176.2
7	177.8	179.4	181.0	182.6	184.2	185.7	187.3	188.9	190.5	192.1	193.7	195.3	196.9	198.4	200.0	201.6
8	203.2	204.8	206.4	208.0	209.6	211.1	212.7	214.3	215.9	217.5	219.1	220.7	222.3	223.8	225.4	227.0
9	228.6	230.2	231.8	233.4	235.0	236.5	238.1	239.7	241.3	242.9	244.5	246.1	247.7	249.2	250.8	252.4
10	254.0	255.6	257.2	258.8	260.4	261.9	263.5	265.1	266.7	268.3	269.9	271.5	273.1	274.6	276.2	277.8