VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba Nuclear Station 1 & 2

Title of Specification: Nuclear Safety Related Diaphragm Valves

Specification Number: CNS-1205.04-1

Revision: Addendum No. 3

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C. D. Barrett Date: 3-13-80

Checked By: Ed Lindsay Date: 3-13-80

Approved By: R. E. Miller Date: 3-13-80

Inspection Waived By: R. E. Miller Date: 3-13-80

Inspection Waived For: ELECTRICAL MECHANICAL X CIVIL

Inspected By: D. G. Allen Date: 3-17-80

Inspected By: Date:

QUALITY ASSURANCE C. A. Bell Date: 3-18-80

****

(FOR ASME CODE ITEMS)

Mechanical & Nuclear Division Date: 3-13-80
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1977 Edition including the Summer 1978 Addendum of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER R. E. MILLER NO. 4237 GENE MILLER

SIGNATURE: R. E. Miller

NAME: R. E. Miller
Registered Professional Engineer

No. South Carolina #4237

Form 301.2/Rev 2

SPECIFICATION NO. CNS-1205.04-1
Addendum No. 3
Date: March 11, 1980

DUKE POWER COMPANY

Catawba Nuclear Station

Units 1 & 2

Nuclear Safety Related Diaphragm Valves

Reference Paragraph 4.5.1.1:

Revise to read, "ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components (dated July, 1977 with all addenda mandatory through Winter, 1978). The use of non-mandatory addenda may be negotiated at the Owner's option. Code case special rulings shall not be used except where written approval is granted by the Owner."

Reference Paragraph 5.2:

Revise to read, "Standard Identification Tag and EMO Orientation", dated January 24, 1974."

Reference Paragraph 5.18:

Revise to read, "Duke Power Company Valve List Description, Revision B."

CDB/sf

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba Nuclear Station Units 1 & 2

Title of Specification: Nuclear Safety Related Diaphragm Valves

Specification Number: CNS-1205.04-1

Revision: #2

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C D Barnett **Date:** 4-9-80

Checked By: Ed Lindsay **Date:** 4-10-80

Approved By: R E Miller **Date:** 4-11-80

Inspection Waived By: R E Miller **Date:** 4-11-80

Inspection Waived For: ____ ELECTRICAL ____ MECHANICAL X CIVIL

Inspected By: B M Rice **Date:** 4/18/80

Inspected By: ____ **Date:** ____

QUALITY ASSURANCE Gary L Keese **Date:** 4-21-80

****

(FOR ASME CODE ITEMS)

Mechanical & Nuclear Division **Date:** 4-11-80
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1977 Edition including the Summer (1978) Addendum of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER ROBERT EUGENE MILLER NO. 4237

SIGNATURE: R E Miller

NAME: R. E. Miller
Registered Professional Engineer

No. South Carolina #4237

Form 301.2/Rev 2

Reference Paragraph 14.3:

Revise to read, "A seat leakage test shall be performed in accordance with MSS-SP-61. No seat leakage (0%) will be permitted. Bi-directional valves shall be tested in both directions. Uni-directional valves shall be tested in the designated direction of flow only."

Reference Paragraph 14.5:

Delete from specification.

Reference 4.5.1.9:

Add, "ASME Code Case 1335-10, Nuclear-Valves Section III, Division 1, Classes 1, 2, and 3. Use of ASME material SA-194 nuts with bolts and studs of ASME materials other than SA-193."

CDB/rb

SPECIFICATION NO CNS-1205.04-1

DATE February 10, 1975

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

UNIT 1 & 2

Title: Nuclear Safety Related Diaphragm Valves

REVISION LOG

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Form 301.1/Rev. 2

SPECIFICATION NO CNS-1205.04-1

DATE February 10, 1975

DUKE POWER COMPANY

Catawba Nuclear STATION

UNIT 1 & 2

Title: Nuclear Safety Related Diaphragm Valves

REVISION LOG

1	December 18, 1978	6	
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5		10	

Form 301.1/Rev. 2

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

Units 1&2

Nuclear Safety Related Diaphragm Valves

Reference Paragraph 4.5.1.1:

Revise to read, "ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components (dated July, 1977 with all addenda through Summer, 1978). The use of other addenda may be negotiated at the Owner's option. Code case special rulings shall not be used except where written approval is granted by the Owner."

Reference Paragraph 8.1.17:

Revise to read, "All valve items designated on Duke valve lists as 'CONTAINMENT ISOLATION REQUIRING TESTING PER CNS-1205.04-1' shall have seat leakage tests performed in accordance with Paragraph 14.3. Maximum allowable seat leakage shall be zero (0) cubic centimeters per minute per inch of nominal seat diameter at test pressure."

Reference Paragraph 8.1.27:

Add, "Valve sizes greater than two inches (2") and up through four inches (4") shall be radiographed a minimum distance from the final weld end equivalent to the design section thickness of the weld in accordance with Paragraph NC-2571 (b) of the ASME Code, Section III, Subsection NC. The 70% quality factor allowed by Paragraph NC-2571 (c) will not be used."

Reference Paragraph 8.3.9:

Revise to read, "Bolts and studs shall be SA-193, Grade B8 or SA453, Grade 660. Nut material shall be SA-194, Grade 8. Similar materials may be allowable if approved in writing by Owner in advance of incorporation by Contractor."

Reference Paragraph 10.2.1:

Revise to read, "Original mill test reports from material suppliers for all pressure boundary or pressure retaining materials on all Duke Class B and C valves."

SPECIFICATION NO: CNS-1205.04-1

DATE February 10, 1975

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

UNIT 1 & 2

Title: Nuclear Safety Related Diaphragm Valves

REVISION LOG

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Form 301.1/Rev. 2

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba Nuclear Station Units 1 & 2

Title of Specification: Nuclear Safety Related Diaphragm Valves

File Number: CNS-1205.04-1

Revision: Addendum #1

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C D Brandt Date: 1-15-79

Checked By: E D Lindsay Date: 1-15-79

Approved By: J K Berry Date: 1-16-79

Inspection Waived By: R E Miller Date: 1-16-79

Inspection Waived For: ____ ELECTRICAL ____ MECHANICAL X CIVIL

Inspected By: D J Owen Date: 1-26-79

Inspected By: ____ Date: ____

QUALITY ASSURANCE D S Miller Date: 1-31-79

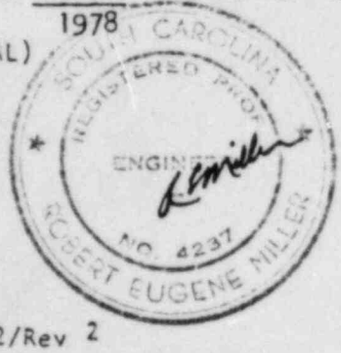
****

(FOR ASME CODE ITEMS)

Mechanical & Nuclear Division Date: 1-16-79
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1977 Edition including the Summer 1978 Addendum of ASME Code, Section III, Paragraph NA-3250

(SEAL)



SIGNATURE: R E Miller

NAME: R. E. Miller
Registered Professional Engineer

South Carolina #4237

Form 301.2/Rev 2

SPECIFICATION CSN-1205.04-1
Addendum #1
Date: December 18, 1978

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
Units 1 & 2

ASME Section III Diaphragm Valves

Reference Specification title:

Revise to read, "Nuclear Safety Related Diaphragm Valves".

Reference Paragraph 4.1:

Revise to read, "This specification covers the design, fabrication, testing, quality assurance requirements and delivery of both ASME Section III, Class 2 and Class 3 (Duke Classes B and C, respectively) diaphragm valves, Duke Class F diaphragm valves, and required operators, all important to the nuclear safety of Catawba Nuclear Station, Units 1 & 2."

Reference Paragraph 4.4:

Revise to read, "The attached 'General Conditions of Contract', Form 01126-1-8, revised December 1, 1977 shall form a part of this specification."

Reference Paragraph 4.5.1.1:

Revise to read, "ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components (dated July, 1977, with all addenda that are mandatory on the purchase order date). The use of non-mandatory addenda may be negotiated at the Owner's option. Code case special rulings shall not be used except where written approval is granted by the Owner."

Reference Paragraph 4.5.1.3:

Revise to read, "ASME Boiler and Pressure Vessel Code, Section IX, Welder Qualification (1977 Edition and all addenda in effect up to and including date of purchase order).

Reference Paragraph 4.5.1.4:

Revise to read, "Forged Steel Fittings, Socket-Welding and Threaded, ANSI B16.11-1973."

Reference Paragraph 4.5.1.5:

Revise to read, "Power Piping, ANSI B31.1-1977."

Reference Paragraph 4.5.1.6:

Revise to read, "Steel Pipe Flanges and Flanged Fittings, ANSI B16.5-1968."

Reference Paragraph 4.5.1.8:

Add, "Steel Butt-Welding End Valves, ANSI B16.34-1973."

Reference Paragraph 4.5.1.9:

Add, "ASME Boiler & Pressure Vessel Code, Section V, Nondestructive Examination, 1977 Edition and all addenda in effect up to and including date of purchase order."

Reference Paragraph 4.5.2.2:

Revise to read, "IEEE 117-1974, Test Procedure for Evaluation of Systems of Insulating Materials for Random - Wound Electric Machinery."

Reference Paragraph 4.5.2.3:

Revise to read, "IEEE 344-1975, Seismic Qualification for Class 1 Electrical Equipment for Nuclear Power Generating Stations."

Reference Paragraph 4.5.2.5:

Revise to read, "IEEE 323-1974, Standard for Qualifying Class 1 Electrical Equipment for Nuclear Power Generating Stations."

Reference Paragraph 4.5.2.6:

Delete from specification.

Reference Paragraph 5.1:

Revise to read, "Drawing Requirements, revised September 21, 1977."

Reference Paragraph 5.2:

Revise to read, "Standard Identification Tag and EM[illegible]rientation, dated January 15, 1977."

Reference Paragraph 5.4:

Revise to read, "'Representative Valve List, Diaphragm Valves', lists CN-150-30 and CN-150-32."

Reference Paragraph 5.5:

Add, "Duke Power Company Spare Parts and Instructions, Form SP-1, dated January 25, 1978."

Reference Paragraph 5.8:

Revise to read, "General Conditions of Contract, Equipment and Systems, Form Number 001126-1-8, revised December 1, 1977."

Reference Paragraph 5.10:

Revise to read, "Packaging and Shipping Requirements, Form 301.4, Revision 1."

Reference Paragraph 5.11:

Revise to read, "Duke Power Company Nuclear Coating Specification 5005-I, dated May 1, 1976. (Applicable for valve coatings inside Containment)."

Reference Paragraph 5.12:

Revise to read, "Duke Power Company Shop Coating Specification, 4003-I, dated June 1, 1976. (Applicable for valve coatings outside of Containment)."

Reference Paragraph 5.13:

Revise to read, "Duke Power Company Standard Coating Specification, CN-000-I-1, dated November 1, 1975 for Rotork Operators inside Containment."

Reference Paragraph 5.14:

Delete from specification.

Reference Paragraph 5.16:

Add, "Duke Power Company, All Stations, Instruction Manual Requirements for Mechanical Equipment, dated 10-28-77."

Reference Paragraph 5.17:

Add, "Duke Power Company - Quality Assurance Department Supplier Quality Assurance Certification, Form 930.1A."

Reference Paragraph 5.18:

Add, "Duke Power Company Valve List Description, dated Feb. 14, 1978, Revision 1."

Reference Paragraph 8.1.1:

Revise tabulation to read,

Duke Valve Class	Principal Design Criteria	Designed for Seismic Loading
B	ASME Section III, Class 2 (1977)	Yes
C	ASME Section III, Class 3 (1977)	Yes
F	ANSI B31.1	Yes

Reference Paragraph 8.1.3:

Revise to read, "Materials of construction for Duke Class B and C valves shall be as outlined in Paragraph 8.3 and as allowed by ASME Section III. Duke Class F valves' materials of construction shall be as outlined in Paragraph 8.3 and ANSI B31.1-1977."

Reference Paragraph 8.1.4:

Revise to read, "All valves located inside containment (noted on valve list by an asterisk after the item number) shall be suitable for high temperature service. Normal ambient conditions inside containment will be 110°F and 100% relative humidity; however, all active valves located inside containment must be capable of operation for a period of at least 30 minutes during which ambient conditions may reach 250°F and 100 percent steam saturation.

All passive valves located inside containment must be able to seal and maintain their pressure boundaries for periods when containment ambient conditions reach 250°F and 100 percent steam saturation. Also, passive valves with fail-open or fail-close operators must operate to their failed position under the same ambient conditions."

Reference Paragraph 8.1.13:

Revise to read, "All valves located outside containment and all passive valves located inside containment shall be capable of withstanding an integrated radiation dose of 1×10^6 rads without leakage or loss of function and tight shut ability. All active valves located inside containment shall be capable of withstanding an integrated radiation dose of 2×10^8 rads without leakage or loss of function and tight shut ability. All valves on the valve lists shall be passive unless indicated as being active.

Reference Paragraph 8.1.17:

Add, "All valve items designated on Duke valve lists as 'CONTAINMENT ISOLATION REQUIRING TESTING PER CNS1205.04-1' shall have seat leakage tests performed at 15 psig of air pressure. Maximum allowable seat leakage shall be zero (0) cubic centimeters per minute per inch of nominal seat diameter at both 15 psig air pressure and valve design pressure."

Reference Paragraph 8.1.18:

Add, "Valves are to be designed so as to allow periodic, field replacement of diaphragms and stem seals."

Reference Paragraph 8.1.19:

Add, "Bonnets shall be provided with V-notch vent plugs for checking diaphragm integrity while under pressure."

Reference Paragraph 8.1.20:

Add, "All valves shall be equipped with travel stops to prevent damage to diaphragm from over travel in closing operation."

Reference Paragraph 8.1.21:

Add, "All valves are to be designed so as to provide adequate support to diaphragm to prevent diaphragm ballooning on high line pressure, line pressure surges, or during system hydrotest."

Reference Paragraph 8.1.22:

Add, "Valves shall be capable of withstanding system hydrostatic test pressures equal to 1.5 times design pressure without loss of structural integrity or functional operability."

Reference Paragraph 8.1.23:

Add, "All valves not considering limitations on power operators shall be designed such that they may be applied in accordance with any of listed pressure and temperature rating combinations, or interpolated conditions given in design code for the primary pressure rating of valve. Exceptions to above requirement are acceptable when limited by non-metallic materials and approved by Owner. Valves shall be capable of safe, proper and continuous operation under the full range of pressure and temperature conditions without undue strain, corrosion, deterioration, leakage or other adverse effects on function or structural integrity."

Reference Paragraph 8.1.24:

Add, "For all manually operated valves, nameplate shall be stamped with pressure class rating in lieu of specified design conditons."

Reference Paragraph 8.1.25:

Add, "In order to minimize dynamic effects of heavy power operated valves on Owner's piping, design of valve/operator assembly shall include provisions for a designated secondary support point meeting these requirements:

8.1.25.1 Support point shall be capable of accommodating a bracket, lug, flange, or other member (supplied by Contractor) suitable for connecting to a support structure supplied by the Owner. As an alternate, member may be an integral part of valve/operator assembly.

8.1.25.2 Support point shall be as close as practical to center-of-gravity of operator. Typical locations would be operator center plane or operator top.

8.1.25.3 Support point and attaching member shall be capable of restraining the mass of the operator under accelerations defined by Attachment 5.3.

8.1.25.4 It is Owner's intention to use this external support design only for those valves which, in line-support mode, cause stress problems in piping which cannot be resolved by other means. Owner will be responsible for confirming that this support scheme is less severe in terms of effects on valve/operator assembly than line-supported scheme for which Contractor has qualified valve. In no case shall Contractor's analysis under Attachment 5.6 take credit for secondary support of the operator."

Reference Paragraph 8.1.26:

Add, "Valves and operators shall be capable of performing their intended function with valve and operator oriented at any angle."

Reference Paragraph 8.2.4:

Revise to read, " Air operators shall be the diaphragm type with removable bolted top works or Owner approved equal. Operator shall be designed to move the valve diaphragm to any position from fully open to fully closed within a specified time span when 70 psig to 80 psig air is supplied. Air operators shall be capable of withstanding without damage or loss of function a maximum operating air pressure of 140 psig."

Reference Paragraph 8.2.5:

Revise to read, "All ASME Section III, Class 2 and Class 3 (Duke Classes B and C) and Duke Class F valves shall have the capability for having a set of position limit switches mounted directly on the valve and actuated by the valve stem. These limit switches, when required on electric motor operated valves, shall be in addition to and physically, mechanically, and electrically separate from, and independent of, the switches in the operator. After award of order, the Owner will indicate on the valve list those valves requiring the extra stem mounted limit switch package.

The stem mounted switches, when required on valves designated on the valve lists for outside Containment service, shall be Namco Controls type EA 170-302 or Owner approved equal. Limit switches when required on valves designated on the valve lists as active or for inside Containment service, shall be Namco Control type EA 180-302 or Owner approved equal.

Where the Namco equipment is used, the valve shall have two limit switch assemblies, each having DPDT electrical switch contacts. One switch assembly shall be actuated at the fully open valve position; the other shall be actuated at the fully closed position."

Reference Paragraph 8.2.6:

Revise to read, "Air pressure reducing valves, solenoid valves, and filters shall be supplied by Owner."

Reference Paragraph 8.2.8:

Revise to read, "All EMO's and air operators located outside the Containment and all EMO's and air operators used to operate passive valves inside the Containment shall be capable of withstanding an integrated radiation dosage of 1×10^6 rads without loss of function or integrity. All operators used to operate active valves located inside the Containment shall be capable of withstanding an integrated radiation dose of 2×10^8 rads without loss of function or integrity. All operators are used to operate passive valves unless indicated on the valve list as being active. Operators located in the Containment are indicated by an asterisk adjacent to the valve item number on the valve list."

Reference Paragraph 8.2.9:

Revise to read, "Electric motor valve operators and associated stem mounted limit switches applied on all active valves and all valves in containment (so identified on valve lists) must have successfully met and passed IEEE Standard 382-1972, Trial-Use Guide for the Type Test of Class 1 Electrical Valve Operators for Nuclear Power Generating Stations. The seismic qualification and certification shall be in compliance with IEEE 382-1972 and IEEE 344-1975 and Attachment 5.6."

The following IEEE standards are invoked by IEEE 382-1972, and are applicable to in-containment electric motor operators.

IEEE 112A-1964, Test Procedure for Polyphase Induction Motors and Generators

IEEE 117-1974, Test Procedure for Evaluation of Systems of Insulating Materials for Random-Wound Electric Machinery

IEEE 323-1974, Standard for Qualifying Class 1 Electrical Equipment for Nuclear Power Generating Stations.

IEEE 344-1975, Seismic Qualification for Class 1 Electrical Equipment for Nuclear Power Generating Stations."

Reference Paragraph 8.2.10:

Revise to read, "Electric motor valve operators and associated stem mounted limit switch applied outside containment must have successfully met and passed the following IEEE standards identified in Paragraph 8.2.9:

IEEE 112A-1964
IEEE 117-1974
IEEE 344-1975

In addition these electric motor operators and limit switches must meet the seismic design requirements imposed in Attachment 5.6."

Reference Paragraph 8.2.11:

Revise to read, "Documented results shall be required for the applicable qualification test(s) necessary to meet the IEEE standards referenced in Paragraph 8.2.9 and Paragraph 8.2.10, as applicable. The performance test documentation shall demonstrate that the equipment meets the specified performance requirements.' (See Paragraph 10.4.)"

Reference Paragraph 8.2.14:

Revise to read, "Operators and topworks located inside containment (noted on valve lists by an asterisk after the item number) shall be suitable for high temperature service. Normal ambient conditions inside containment will be 110°F and 100% relative humidity; however, all active valve operators located inside containment must be capable of operation for a period of at least 30 minutes during which ambient conditions may reach 250°F and 100 percent steam saturation.

All passive valve operators located inside containment must be able to seal and maintain their integrity for periods when containment ambient conditions reach 250°F and 100 percent steam saturation. Also, passive valve operators with fail-open or fail-close modes must operate to their failed position under the same ambient conditions."

Reference Paragraph 8.2.16:

Add, "All operators shall be designed to operate against flow rates, differential pressure, specified leak rate, and within time span shown on valve list. Differential pressure equals design pressure given. Sizing of operators shall consider no special lubricants to reduce frictional coefficients of seating surfaces, stems, gearing, or any other part."

Reference Paragraph 8.2.17:

Add, "Handwheel or chainwheel operator rim pull shall not exceed 80 lbs. (Push/Pull - required input force) at center line of handwheel or chainwheel rim when sized to open or close against design pressure given on valve list. Handwheels or chainwheels equipped with impact devices are acceptable, however, limitation of rim pull is applicable. Unusually large or oversized handwheels or chainwheels will not be considered or accepted by Owner.

8.2.17.1 When rim pull exceeds above criteria, manual gear operators shall be furnished. Each operator shall have gearing totally enclosed. Operators shall be designed to produce a torque sufficient to open or close valve against design conditions shown on valve list, however, limitation of rim pull of 80 lbs. mentioned herein is applicable.

8.2.17.2 All valves are to close by a clockwise rotation of handwheel as viewed from operator end of handwheel shaft.

8.2.17.3 All valves requiring chainwheel operators shall be provided with chainwheel only. All chain will be supplied by Owner to fit Contractor's chainwheel."

Reference Paragraph 8.2.18:

Add, "Electric motor operators shall be furnished with integral 120 VAC, 60 hertz, single phase space heaters but without contactors or control switches."

Reference Paragraph 8.2.19:

Add, "Rotork operators shall be of the "Syncro Set 2 with Add-on-Pac 1" type with ten position limit switches and two torque switches. Operators shall be furnished with integral 120 VAC/60 Hz/single phase space heaters but without motor contactors or control switches.

Reference Paragraph 8.3.1:

Revise to read, "Stainless Steel Valves: with the exception of the diaphragm, all materials in contact with the working fluid shall be SA351 grade CF8 or CF8M. Similar materials may be allowable if approved in writing by Owner in advance of incorporation by Contractor."

Reference Paragraph 8.3.1.1:

Delete from specification.

Reference Paragraph 8.3.1.2:

Delete from specification.

Reference Paragraph 8.3.1.3:

Delete from specification.

Reference Paragraph 8.3.2:

Revise to read, "Carbon Steel Valves: with the exception of the diaphragm, all materials in contact with the working fluid shall be SA-216 grade WCB. Similar materials may be allowable if approved in writing by Owner in advance of incorporation by Contractor."

Reference Paragraph 8.3.2.1:

Delete from specification.

Reference Paragraph 8.3.2.2:

Delete from specification.

Reference Paragraph 8.3.3:

Revise to read, "Diaphragms and stem seals shall be of "EPT" or Owner approved equal."

Reference Paragraph 8.3.9:

Add, "Bolts and studs shall be SA-193 grade B8. Nut material shall be SA-194 grade 8. Similar materials may be allowable if approved in writing by Owner in advance of incorporation by Contractor."

Reference Paragraph 8.3.10:

Add, "All pressure boundary material for Duke Class B and C valves shall meet requirements of Section III of ASME Boiler and Pressure Vessel Code."

Reference Paragraph 8.3.11:

Add, "It is Bidder's responsibility to advise Owner if any of above materials will not satisfy requirements of code referenced in Paragraph 4.5.1.1 or are not suitable for intended service."

Reference Paragraph 8.3.12:

Add, "Valve stem materials shall be stainless steel suitable for intended service."

Reference Paragraph 8.3.13:

Add, "Aluminum is prohibited from use on any valve, operator or their components."

Reference Paragraph 8.3.14:

Add, "Teflon is prohibited from use as a seat or sealing material on any valve."

Reference Paragraph 9.1:

Revise to read, "All valves shall be tagged with stainless steel name tags showing Owner's valve item number, Purchaser's order number and Contractor's serial number. All tags shall be permanently secured to the valve bonnet as shown on Attachment 5.2. A National Board Registration Number shall also be affixed to each Duke Class B and C valve."

Reference Paragraph 9.2:

Revise to read, "All internal wetted surfaces shall be cleaned with demineralized water to a Class "C" cleanliness level as defined in ANSI N45.2.1. A corrosion inhibitor (i.e., Cimplus 22 or Owner approved equal) shall be added to demineralized water for final rinse of carbon steel valves."

Reference Paragraph 9.3:

Revise to read, "Care should be exercised to prevent damage to all seating surfaces after the hydro test. Immediately after final cleaning, end connections shall be sealed with plugs, caps or covers to prevent entry of contaminants and to prevent damage to facing. These caps are to be secured so as not to become detached during shipment or handling."

Reference Paragraph 9.8:

Revise to read, " Owner's Design Engineering Department requires submittal of various manufacturing procedures for approval prior to fabrication. Three copies of these procedures shall be submitted to address indicated in Paragraph 13. Procedures requiring approval are as follows:

9.8.1 Non-Destructive Examination Procedures

9.8.2 Hydrostatic or Pneumatic Testing Procedures

9.8.3 Cleaning Procedures

9.8.4 Packaging, Receiving and Storage Procedures

9.8.5 Wall Thickness Verification Procedures"

Reference Paragraph 9.9:

Revise to read, "Externally exposed surfaces of carbon steel valves or carbon steel parts on stainless steel valves located inside Containment

shall be coated in accordance with Attachment 5.11. Externally exposed surfaces of carbon steel valves or carbon steel parts on stainless steel valves located outside Containment shall be coated in accordance with Attachment 5.12. Stainless steel valves or parts shall not be coated.

Reference Paragraph 9.10:

Revise to read, "All externally exposed surfaces of valve operators shall be prepared and coated as follows:

9.10.1 Manual, gear, air actuators, etc. located inside containment shall be coated in accordance with Attachment 5.11.

9.10.2 Manual, gear, air actuators, etc. located outside containment shall be coated in accordance with Attachment 5.12.

9.10.3 Rotork operators located inside Containment shall be coated in accordance with Attachment 5.13. Rotork operators located outside Containment shall be coated in accordance with manufacturers standard procedure, P1666 for undercoating and YV8021 for topcoating.

9.10.4 Limitorque operators located inside containment shall be coated in accordance with Limitorque Procedure LPS-102A. For those located outside containment, Limitorque Procedure LPS-101 shall be used."

Reference Paragraph 10.2:

Revise to read, "The Contractor shall submit to the Owner no later than valve shipping date, a separate documentation package for the following:

(a) Each Duke Class B, C and F valve with an inlet piping connection greater than a four inch nominal pipe size.

(b) Each valve item of Duke Class B, C and F valves with an inlet piping connection equal to or less than a four inch nominal pipe size. The number of valves per package shall be limited to 25 per ASME Boiler and Pressure Vessel Code, Section III.

Each documentation package shall consist of one reproducible copy of the following:"

Reference Paragraph 10.2.1:

Revise to read, "Original mill test reports from material suppliers for all pressure boundary of pressure retaining material including valve stem material, on all Duke Class B and C valves."

Reference Paragraph 10.2.2:

Revise to read, "Documentation of all hydrostatic and operational tests showing their results. Documentation for air seat tests performed on containment isolation valves shall specifically indicate test leakage rates."

Reference Paragraph 10.2.3:

Revise to read, "Heat treatment certification for all Duke Class B and C valves."

Reference Paragraph 10.2.4:

Revise to read, "NDT (UT, PT, MT) on Duke Class B and C valves shall be done in accordance with specified requirements by ASNT qualified operators. Include a list of the equipment used."

Reference Paragraph 10.2.7:

Revise to read, "Required ASME Code data reports for Duke Class B and C valves."

Reference Paragraph 10.2.12:

Add, "Certification of coating as required by Paragraphs 9.9 and 9.10."

Reference Paragraph 10.2.13:

Add, "Contractor shall submit documentation required by IEEE standards referenced in this Specification as evidence that equipment meets its specified performance requirements."

Reference Paragraph 10.2.14:

Add, "Certification that power operators have been designed to operate valve within specified period of time and at design pressure and temperature shown on valve list. Required operator speed is shown on valve list."

Reference Paragraph 10.2.15:

Add, "Certification of water chemistry and cleaning to Reference 4.4.7, level C as required in Paragraph 9.2."

Reference Paragraph 10.3:

Revise to read, "Valve documentation packages shall be sent to Q.A. Manager, Engineering and Services, Duke Power Company, P. O. Box 33189, Charlotte, North Carolina 28242, Attention: Q.A. Supervisor, Records.

Reference Paragraph 10.4:

Revise to read, "The qualification tests for electric motor operators and stem mounted limit switches used in safety related applications (Duke classes B, C, and F) shall use the following values.

Location	Active Valve in Containment	Passive valves in containment and all valves outside containment
Radiation, Rads:	2×10^8	1×10^6
Pressure, psia:	30	15
Temperature, °F:	250	110
Environment	Saturated steam with boric acid spray	100% relative humidity

Seismic loading values shall be as shown in Attachment 5.6, "Seismic Design Requirements.'."

Reference Paragraph 10.6:

Add, "Contractor shall submit with each valve shipment to Owner's site the following documentation:

10.6.1 AMSE Code Data Report, NPV-1.

10.6.2 Vendor Quality Assurance Certification, Duke Power Form 930.1A, completed by Contractor.

Reference Paragraph 10.7:

Add, "Owner's inspection shall apply as follows:

10.7.1 Owner reserves right to enter Contractor's facility at any time during manufacture of an order for inspection of processes and procedures.

10.7.2 Owner's Quality Assurance Manager, Vendors, shall be notified at telephone number (704) 373-4299 or 373-4368 five days prior to hydrostatic test and shipment for possible Owner witness.

10.7.3 Tests and inspections shall be as specified in this Specification and applicable codes.

10.7.4 Requirements of this Specification shall apply to lower tier subcontractor and vendors, including Owner access accompanied by Contractor to facilities and records.

10.7.5 Contractor shall submit a list of inspection points to Owner's Quality Assurance Engineering and Service Division prior to fabrication in order that Owner may establish surveillance hold points.

10.7.6 Owner reserves right of approval of any subcontractor. Contractor will be notified in advance of Owner's inspection of subcontractor and may be in attendance with Owner at the subcontractor's location."

Reference Paragraph 10.8:

Add, "Contractor's inspection and test records shall, as a minimum, identify inspector, type observation and results, acceptability, and action taken with any deficiencies noted. Records shall be identifiable and retrievable."

Reference Paragraph 11:

Revise to read, "Delivery schedule for each valve item is included on the Duke valve lists, Attachment 5.4."

Reference Paeagraph 12:

Revise to read, "Drawings shall be submitted for Owner's approval in accordance with Attachment 5.1, "Drawing Requirements" within four (4) weeks after award of order." Material shall not be fabricated until such drawings have been approved and returned to Contractor or upon written authorization by Owner."

Reference Paragraph 12.1.7:

Revise to read, "Mounting position restrictions, including inlet and outlet piping arrangements, any limitations on flow directions, etc."

Reference Paragraph 12.1.8:

Revise to read, "Necessary dimensions: end to end, centerline of valve to end of open stem, stem dimensions, dismantling requirements for valve and operator, locations of centers of gravity of valve, operator, and combined valve and operator. Weld end details with dimensions for butt weld end valves."

Reference Paragraph 12.1.10:

Revise to read, "NUCLEAR SAFETY RELATED" shall be printed above title block and shall be printed in a character size equal to or larger than largest size used in the body of document. This requirement applies to all related drawings (i.e., wiring diagrams, instruction manuals, etc.)."

Reference Paragraph 12.1.14

Revise to read, "Pressure rating of valve or design pressure/temperature as applicable."

Reference Paragraph 12.1.15:

Add, "Torque necessary for proper tightening of nuts and bolts."

Reference Paragraph 12.1.16:

Add, "Full open Cv, also Cv vs number of turns open. State any throttling limitations."

Reference Paragraph 12.1.17:

Add, "Seat details clearly shown."

Reference Paragraph 12.1.18:

Add, "Reference of wiring diagrams shall be shown on each applicable valve outline drawing."

Reference Paragraph 12.1.19:

Add, "Control air pressure and volume of cylinder for air operated valves."

Reference Paragraph 12.1.20:

Add, "Flow direction arrows for uni-directional valves."

Reference Paragraph 12.1.21:

Add, "Maximum allowable weight of chain for valves with chainwheel operators."

Reference Paragraph 12.1.22:

Add, "Maximum allowable stem torque for manual valves."

Reference Paragraph 12.3:

Revise to read, "Only one valve list shall be assigned to one drawing; any number of valves may be shown on any one drawing as long as same valve list applies."

Reference Paragraph 12.4:

Revise to read, "Contractor shall also submit (per Paragraph 12.1) motor operator outline drawings and wiring diagrams covering each type of electric motor operator to be furnished with <u>each</u> valve drawings. Each

motor operator outline and wiring diagram shall have a complete certification showing each applicable Owner valve item number, valve list number, operator model number, and gear speed (RPM). Each shall state all electric motor characteristics required for ordering motor starters by Owner including motor horsepower, voltage, full load current, locked rotor current and service factor. Each operator wiring diagram shall show both opening and closing torque switches and indicate that these torque switches are supplied. Since many typical wiring diagrams do not show Owner's requirements that any factory adjusted limit switches be set at the full open or full closed position, approval of drawings is not intended to mean switches are to be set at any other place in lieu of full open or full closed unless otherwise stated by Owner."

Reference Paragraph 13:

Revise to read, "INSTRUCTION MANUALS."

Reference Paragraph 13.1:

Add, "Five (5) copies of complete installation, operation, and maintenance instructions shall be submitted for Owner's approval eight (8) weeks after award of order in accordance with Attachment 5.16. These instructions shall include, but not be limited to, a complete description of features necessitating design considerations or unusual operating requirements. Also, a program shall be submitted by Contractor, coincident with the above, giving recommended preventive maintenance procedures and time tables."

Reference Paragraph 13.2:

Add, "After Owner approval and prior to shipment, 16 copies of the final, complete installation, operation, and maintenance instructions with preventive maintenance procedures and time tables shall be submitted to Mr. S. K. Blackley, Jr., Chief Engineer, Attention: H. E. Edwards, Mechanical & Nuclear Division, Duke Power Company, P. O. Box 33189, Charlotte, N. C. 28242."

Reference Paragraph 14:

Revised to read, "Test reports and inspections shall be as specified in this Specification and applicable codes."

Reference Paragraph 14.1:

Revise to read, "For Class B and C valves, non-destructive and destructive testing of pressure boundary materials shall be in accordance with procedures and acceptance standards set forth in ASME Section III code. Required examinations, procedures and acceptance standards for each class of valves are defined in Sections NC2000, NC5000, ND2000 and ND5000 as applicable.

14.1.1 For Class B and C valves, pressure retaining boundaries shall be as defined in ASME Section III - 1977, Section NCA-3254.1a, Sub-Paragraph (1) and (2).

14.1.2 Impact testing of pressure retaining materials is required except as excluded by code referenced in Section 4.5.1.1."

Reference Paragraph 14.2:

Revise to read, "Pressure boundary hydrostatic testing of Duke Class B and C valves shall be in accordance with the ASME Section III code. Hydrostatic testing of Duke Class F valves shall be in accordance with ANSI B16.5-1968. Demineralized water as defined by ANSI N45.2.1-1973 shall be used as the hydrostatic test media. A rust inhibitor (Cimplus 22 or Owner approved equal) shall be added to the demineralized water used to test carbon steel valves. Carbon steel valves shall not be painted before shell hydrostatic test is complete. Valve stuffing box shall have packing removed and subjected to hydrostatic test pressure. Hydrostatic test shall be performed prior to seat leakage test(s)."

Reference Paragraph 14.5:

Add, "In addition to seat leakage tests performed in accordance with MSS-SP-61, valve items designated on Duke valve lists as 'CONTAINMENT ISOLATION REQUIRING TESTING PER SPECIFICATION CNS-1205.04-1' shall have seat leakage tests performed at 15 psig of air pressure. Minimum hold time shall be five (5) minutes. Maximum allowable seat leakage shall be zero (0) cubic centimeters per minute per inch of nominal seat diameter. Bi-directional valves shall be tested in both directions. Uni-directional valves shall be tested in the designated direction of flow only."

Reference Paragraph 14.6:

Add, "Contractor shall provide notification of hydrostatic test to Owner in accordance with requirements of Paragraph 10.7.2."

Reference Paragraph 14.7:

Add, "Owner shall be informed during manufacture of any major problems such as any rework of material or any major repair procedures."

Reference Paragraph 14.8:

Add, "Owner's inspection requirements are as outlined in Sub-Paragraphs 10.7 and 10.8.

Reference Paragraph 15.1:

Revise to read, "Bidder shall submit with proposal, a complete itemized parts list for each piece of equipment including part numbers and prices of each item for delivery with valves to site on the specified equipment delivery dates shown on attached "Spare Parts Form" SP-1 (Attachment 5.5)."

Reference Paragraph 15.2:

Revise to read, "Bidder shall recommend which parts should be stocked as spare parts by completing "Spare Parts Form" and returning with proposal. Bidder's recommendation for spare parts stock levels should take into consideration lead time for delivery of replacement parts after order, design life of part, wear-out rates of parts of similar pieces of equipment and operating conditions (reference Section 6) to which the equipment will be subjected. Owner will issue a separate purchase order for spare parts after review of Contractor's parts list and Form SP-1."

Reference Paragraph 15.3:

Add, "The Contractor shall clearly identify all spare parts as such. In addition, a metal tag shall be securely attached to each part or container for small parts and shall show the following information:

15.3.1 Equipment name (e.g., Diaphragm Valve - Spare Part).

15.3.2 Part name.

15.3.3 Drawing reference and part item number.

15.3.4 Purchaser's order number and Owner's valve item number."

Reference Paragraph 15.4:

Add, "QA Documentation, as applicable in Section 10 is required for each spare part."

Reference Paragraph 16.2:

Revise to read, "Weight of each valve, valve operator and combined weight of valve and operator."

Reference Paragraph 16.3:

Revise to read, "Materials of construction for pressure retaining parts and value trim."

Reference Paragraph 16.7:

Revise to read, "Bidder shall submit description of measures to be taken to protect Owner's delivery schedule, for example, advance ordering of castings or establishment of an inventory of castings. Bidder's ability to meet schedules shall be of major importance in Owner's evaluation of proposals. Bidder shall also discuss additional flexibility in terms of ability to respond to Owner's valve requirements on short notice."

Reference Paragraph 16.8:

Delete from specification.

Reference Paragraph 16.12:

Revise to read, "Information as requested in Section 10."

Reference Paragraph 16.13:

Add, "Spare parts information described in Section 15 of this Specification."

Reference Paragraph 16.14:

Add, "Identification of any parts, materials, or equipment contemplated for manufacture outside United States. If there are none, it shall be so stated in writing."

Reference Paragraph 16.15:

Add, "List of any and all exceptions to this Specification, or otherwise issue a statement of complete compliance to this Specification."

Reference Paragraph 16.16:

Add, "Any mounting or orientation restrictions."

Reference Paragraph 16.17:

Add, "Plots of flow rate and Cv versus percentage of opening (number of turns open). Note of any throttling restrictions."

Reference Paragraph 16.18:

Add, "List of special tools or maintenance parts required."

Reference Paragraph 16.19:

Add, "State recommended maintenance procedures."

Reference Paragraph 18:

Revise to read, "CONFORMANCE WITH SPECIFICATIONS"

Reference Paragraph 18.1:

Add, "Bidder must submit with proposal, a list of all major and minor exceptions to this Specification and obtain written approval from Owner prior to award of order. If there are no exceptions, it must be so stated in writing. It is particularly emphasized any unapproved nonconformity with Specification must be changed to complete conformity at Contractor's expense including cost of all labor and materials and all other related expenses by Owner or Contractor."

Reference Paragraph 18.2:

Add, "Attachment 5.8, "General Conditions of Contract, Equipment and Systems" shall form a part of this Specification.

Reference Paragraph 21:

Revise to read, "All proposals complete with prices FOB Newport, York County, South Carolina (Southern Railroad) and information requested shall be submitted to Mill Power Supply Company in accordance with the letter of inquiry.

For any technical information required to prepare his proposal, the Bidder may contact by phone C. D. Bennett, (704) 373-8652, or H. E. Edwards, (704) 373-8273."

DRAWING REQUIREMENTS

1.0 Requirements of Drawing Composition

All drawings will be microfilmed by Owner. Prints submitted by Contractor are to be full size and legible with uniform background density suitable for microfilming and subsequent reproduction from microfilm.

1.1 Lettering on all drawings shall conform to the following standards:

Minimum character height (A, B, C size dwgs)	- 0.125 in. (1/8)
Minimum character height (D, E size dwgs)	- 0.156 in. (5/32)
Minimum spacing between lines of characters	- height of characters
Machine and guide generated characters	- 12 point size min.

1.2 On all drawings larger than 11" x 17" in size, a blank space at least 4" x 6" in size located near title block shall be reserved for Owner's use.

1.3 All drawings shall contain the name of the equipment, the station name and applicable unit numbers, the Mill Power Supply Company purchase order number(s), and the Duke Power Company purchase requisition number(s).

1.4 All drawings submitted for equipment designated in specification as safety related (Duke classification A, B, C, D, and F) shall have the words "NUCLEAR SAFETY RELATED" located directly above the title block, printed in a character size equal to or larger than the largest size used on the drawing.

1.5 All drawings submitted for equipment designated in the specification as Duke classification "E" shall have the words "CLASS E" printed above the title block.

1.6 Drawings marked "Preliminary" will not be approved by Owner.

2.0 Information Required by Owner

Contractor shall furnish on drawings sufficient information for Owner to complete the design of foundations or support arrangements, primary and support fluid systems, piping layout, control systems, and electrical power systems related to the equipment furnished. Special information may be required for ventilation system design or modeling. The specification (Section 12) provides guidance on the types of drawings required for the subject equipment. As a minimum, for each piece of equipment or assembly of equipment, Contractor shall provide an outline drawing containing or referencing the following information:

2.1 Information Required for Foundation or Support Design

2.1.1 For equipment to be mounted on floor or foundation, the outline drawing shall include details of the mounting base including:

a) bolt hole sizes and locations;
b) required anchor bolt size, projection (per AISC criteria, including any limitations on maximum projection), and material

(bolt sizing should consider most severe combination of loads, including externally imposed loads);
c) grouting requirements and locations of grout and vent holes;
d) details of any other load bearing mechanism.

2.1.2 For equipment neither mounted on floor by anchor bolts nor completely supported by attached piping, the outline drawing shall include details of the support system provided or required including complete details of the method of attachment to Owner's supporting structure.

2.1.3 Outline drawings for all equipment shall include the following information required for support design:
a) weight under operating conditions and other possible conditions and center of gravity of each piece or assembly of equipment that will be independently supported (for valves, weight and center of gravity of valve and operator combined and separately);
b) dynamic loads;
c) total loads, resolved to each support element, transmitted to the supporting structure under each design condition.

2.2 Information Required for Piping System Design

2.2.1 Each Owner interface connection shall be shown and identified with a unique alphabetic or numeric designation. A table of all Owner connections (example table attached) shall be provided listing the following information for each connection:
a) connection designation (A, B, C, etc.);
b) connection use (if connection is plugged, it shall be indicated);
c) nominal size of connection;
d) type of connection (whether buttweld, socket weld, flanged, or threaded);
e) if welded, pipe schedule shall be given;
f) if flanged, class and type of flange shall be given;
g) material.

2.2.2 Each connection shall be located dimensionally on the outline drawing, referenced to the equipment centerline.

2.2.3 Maximum allowable concurrent piping loads on each nozzle for each design condition shall be tabulated for floor or foundation mounted equipment.

2.2.4 For buttwelded connections, details of the weld preparation shall be shown.

2.2.5 Support system requirements shall be stated, including:
a) allowable pressure, temperature, and flow ranges for support fluids;
b) heat rejection and pressure drops for cooling loops;
c) quality requirements for all support fluids;
d) quantity and composition of any fluids continuously or regularly drained from equipment.

2.3 General Information Required by Owner

2.3.1 Overall dimensions of equipment shall be shown. Space required for maintenance access including component pull space shall also be shown.

2.3.2 Design and test conditions and applicable design codes for the equipment or its subcomponents shall be shown.

2.3.3 Drawings shall clearly indicate Contractor's scope of supply. If equipment shown on drawing is not supplied in contract, it shall be designated "by others".

2.3.4 Because all equipment will be modeled by Owner, dimensional information is required for major subcomponents, Contractor supplied piping, manways, and inspection ports.

2.3.5 For skid mounted equipment assemblies, major components shall be identified and junction boxes located.

2.3.6 Any special provisions for lifting or moving equipment shall be shown in detail, with capacity of each lifting lug stated.

2.3.7 Any special ventilation requirements for the area in which the equipment is located shall be indicated on drawing.

2.3.8 Volumes of all flammable substances, such as lubricating oil, shall be indicated on drawing.

2.3.9 Any restrictions to mounting orientation shall be shown.

2.3.10 Electrical power requirements shall be stated.

2.3.11 The outline drawing shall reference, by manufacturer's drawing number, the location of the following information as applicable:
a) for multiple component packages, the flow diagram and control logic description;
b) wiring diagrams;
c) bill of materials and sectional drawing;
d) list and description of any special piping, valves, controls, instrumentation, etc., required to be furnished by Owner;
e) stress and seismic analyses or test reports;
f) torque requirements and limitations and tightening procedures for all bolts, including anchor bolts;
g) description of any special lifting, handling, or installation procedures.

3.0 Instructions for Drawing Submittal

Complete drawings shall be submitted to Owner for approval within the time frame allowed by the specification. Contractor should allow in his schedule at least ten weeks for drawing review by Owner.

3.1 Six prints of each drawing shall be submitted to Mr. S. K. Blackley, Jr., Duke Power Company, P. O. Box 33189, Charlotte, North Carolina 28242, to the attention of the person designated by Owner at time of contract award.

3.2 If any drawing is not acceptable to Owner for microfilming, Contractor shall furnish 15 copies of the drawing for Owner's records within two weeks of receipt of drawing approval.

1-31-74
12-13-74 CMM/sf
7-09-75 JKB/sr
4-28-77 TGF/kh
9-21-77 TGF/sh
9-25-78 JCR/as

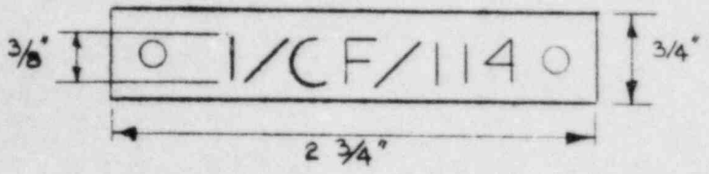
INFORMATION REQUIRED ON CONTRACTOR'S DRAWINGS

Listing of Nozzles for - (Name of Equipment)

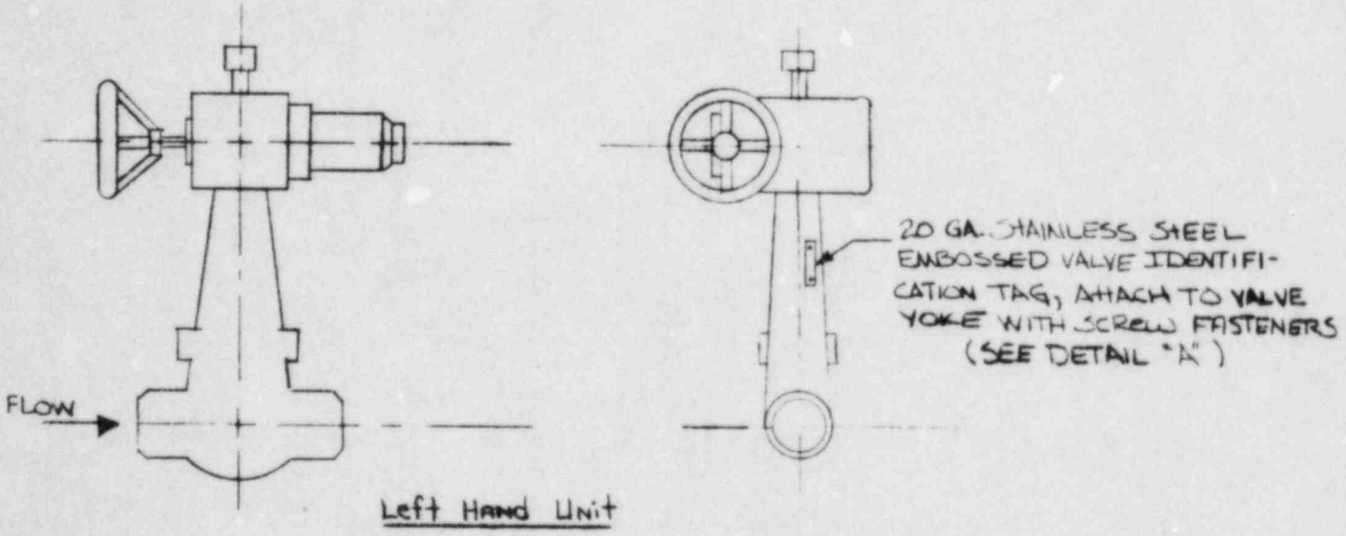
Nozzle Notation	Use (vent, drains, and spares, extra plugged connections, baseplate drains, etc.) (if connections are extra and/or plugged, so indicate)	Nominal size in inches	Type of Connection- Butt Weld, Socket Weld Flanged, or Threaded.	A.For butt welds list pipe sch. for which weld end preps are designed* B.Note type of thread for threaded connections C.For flanged connections note the pressure class and whether raised or flat face. Also note standard to which flange is layed out or note as special layout**	A. For butt and socket welds list ASME or ASTM specification and grade, of material. B. For flanged connections note whether flange is S.S., C.S., C.I., etc.
A	Inlet (Example)	6"	BW	Sch. 40	SA-106-B

For butt welds made to Contractor standard, (as approved by Owner) note the standard (drawing) to which the weld prep will be made. For butt welds made per Duke drawings, a sketch will be required for each different weld end preparation.

: For flanges made to a special layout, a sketch will be required for each different design noting the layout of the flange.



DETAIL "A" - SAMPLE VALVE TAG



Left Hand Unit

DUKE POWER COMPANY STANDARD

IDENTIFICATION TAG AND END ORIENTATION

SMH
1/24/74

DUKE POWER COMPANY
DESIGN ENGINEERING DATA BASE
CATAWBA NUCLEAR STATION
VALVE ITEM LIST

ITEM NUMBER	CLASS	TYPE	QUANTITY	SIZE	MANUFACTURES DRAWING NUMBER	OPERATOR TYPE	OPERATOR SPEED	ENDS	SEAL LEAK-OFF	LOCK & LOCKING DEVICE	DESIGN PRESS PSIG	DESIGN TEMP. DEG.F
VALVE LIST NUMBER CN-0150-32												
SPECIFICATION NUMBER												
028-473*	B	DP	4	4.00		EMO*	5 SEC. MAX.	A-40	NA	NA	150	260
RMKS:ACTIVE VALVE							-PIPE MATL. SMLS. SA-106 GR.B					
RMKS:CONTAINMENT ISOLATION VALVE					REQUIRES TESTING PER CNS-1205.04-01							
DELIVERY REQD: (004)09/01/79												

LIST NUMBER 3
PLANT CODE= CAT
FILE ID = B4

DUKE POWER COMPANY
DESIGN ENGINEERING DATA BASE
CATAWBA NUCLEAR STATION
VALVE ITEM LIST

REV # 00

VALVE LIST NUMBER CN-0150-30
SPECIFICATION NUMBER

ITEM NUMBER	CLASS	TYPE	QUANTITY	SIZE	MANUFACTURES DRAWING NUMBER	OPERATOR TYPE	OPERATOR SPEED	ENDS	SEAL LEAK-OFF	LOCK & LOCKING DEVICE	DESIGN PRESS PSIG	DESIGN TEMP. DEG.F
CSB-263*	B	DP	4	2.00		EM0*	10 SEC. MAX.	SW	NA	NA	150	260

RMKS:ACTIVE VALVE -PIPE MATL. SMLS. SA-312 TP 304
RMKS:CONTAINMENT ISOLATION VALVE REQUIRES TESTING PER CNS-1205.04-01
DELIVERY REQD: (004)06/15/79

FORM SP-1
Revision 1

DUKE POWER COMPANY
SPARE PARTS FORM

Plant: Catawba Units 1 & 2 SYSTEM IDENTIFICATION NO.: Various DATE:

Component: NSR Diaphragm Valves Specification No. CNS-1205.04-1 D.E. MPSCo Order No.

D.E.P.R. No. Contractor Name S.P. MPSCo Order No.

S.P.P.R. No. Duke Drawing No. Manufacturer's Equipment Model No.

Base Delivery Date: Contractor Dwg. No. (1)

Alternate Date:

Spare Part Name & No. (2)	Recommended QTY/UNIT (3)	Expected Service Life of Recommended Spares (4)	Basis For Recommendation (5)	Manufacturing Lead Time (6)	Price (Base) Price (Alt) (7)	Comments (8)

SPARE PARTS PROCUREMENT PROCEDURE
FORM SP-1 INSTRUCTIONS

Spare Parts Form SP-1 serves as a single point source document within Duke Power Company for the procurement of spare parts for all equipment. It is used by the Design Engineering Department, Steam Production Department, Construction Department, and Mill Power Supply Company to coordinate interface responsibilities throughout the spare parts procurement phase. A comprehensive evaluation of spare parts requirements and required delivery dates will be performed based on the information provided on Form SP-1. It is essential that all information requested be provided.

Bidder's instructions for providing Form SP-1 information are as follows:

1) Manufacturer's Equipment Model Number - Provide equipment model number.

2) Spare Part Name and Number - Supply the specific spare part name and number.

3) Recommended Quantity Per Unit - Designate the recommended number of specific spare parts required for each component, for example: each motor, pump, valve, or other piece of equipment.

4) Expected Service Life of Recommended Spare - Designate the service life of each spare part.

5) Basis of Recommendation - Define reasons for service life recommendations, for example: design life for the part, life expectancy based on operating experience, or other considerations.

6) Manufacturing Lead Time - Provide information on normal lead time for spare parts procurement. This information will aid in establishing spare parts procurement schedule.

7) Price (Base) / Price (Alt) - Provide spare parts prices for delivery on base and alternate delivery dates. Actual delivery dates for each spare part will be evaluated based on operating requirements and will be specified at the time of the spare parts order.

8) Comments - Provide specific comments concerning additional information considered to be helpful or necessary in the evaluation of component spare parts requirements. This information should include data such as limiting shelf life, specific supporting drawing numbers, unusual procurement, manufacturing, quality assurance, and storage requirements, and any other relevant information.

Revision 1, 1-25-1978

Specification No. CNS-1205.04-1
Attachment Date: February 4, 1975
Attachment No: 5.6

DUKE POWER COMPANY
SEISMIC DESIGN REQUIREMENTS
VALVES
CATAWBA 1 & 2
CLASS 2/3
DIAPHRAGM AND PLUG TYPE VALVES

1.0 Seismic Design Manual

The valve and appurtenances shall be qualified to meet the seismic design requirements of this specification in accordance with the procedures and guidelines of the Duke Power Company Seismic Design Manual. The Manual is intended to be utilized only as a reference to this section and not to be used alone. The sections of the Manual pertaining to particular portions of this specification are noted below. However, those sections should not be used directly without the background information provided in the remainder of the Manual.

2.0 Operating Conditions

2.1 Modes of Operation

Two modes of operation shall be considered (Manual Section 4.1.3). The upset mode includes the effects of the Operational Basis Earthquake (OBE), and the faulted mode includes the effects of the Safe Shutdown Earthquake (SSE). The seismic loads shall be considered in combination with all other concurrent loadings on the valve (Manual Section 4.1.3). The criteria for these loads are specified below.

2.2 Seismic Input Criteria

For the SSE, a Seismic Load Factor (SLF) of 3.0 g shall be applied in each of two orthogonal horizontal directions in combination with an SLF of 2.0 g in the vertical direction, all acting simultaneously (Manual Section 4.1.1.1). The SLF values for the OBE shall be taken as 8/15 of the respective values for the SSE.

2.3 Concurrent Loading Conditions

Other concurrent loadings to be considered are described in Manual Section 4.1.3. Any additional considerations are specified below.

3.0 Seismic Qualification

3.1 Procedure

One of the following procedures may be utilized for the seismic qualification:

3.1.1 Equivalent Static Analysis

An analysis shall be performed in accordance with Manual Section 4.2. The results shall be demonstrated to fulfill the acceptance criteria of Manual Section 6.0 for active valves.

3.1.2 Testing

A testing program shall be performed in accordance with Manual Section 5.0. Test procedures 5.2.1 to 5.2.8 shall be performed. It is to be noted that a preliminary report shall be submitted prior to any tests (Manual Section 7.1).

3.1.3 Combined Testing and Analysis

A testing program may be selected to satisfy only a portion of the seismic requirements. The remainder of the equipment shall be qualified by analysis. Complete documentation shall be presented demonstrating the correlation between the analysis and the test results (Manual Section 5.0).

3.2 Orientation

The valve shall be considered in the worst possible orientation (highest stress/deformation level in each valve component) with respect to the total combined loading conditions.

3.3 Support Conditions

The valve shall be considered to be supported only at the inlet and outlet ends.

3.4 Active Valves

For safety, relief, isolation, and all other active valves having extended operator structures:

3.4.1 Rigid Structure

The valves shall be designed such that there are no natural frequencies less than 33 Hz. This shall be demonstrated either via testing (Manual Section 5.2.4, Exploratory Scanning Test) or by analysis (Manual Section 4.2.1.2).

3.4.2 Static Deflection Test

A static deflection test shall be performed in accordance with Manual Section 5.2.9 to verify operability under the specified static loading conditions.

3.5 Piping Loads

The following two criteria shall be met to verify the capability of the valve with respect to piping loads.

3.5.1 To ensure that the torsional and bending moment capability of the valve body is greater than that of the adjacent piping, the ratio of the minimum section modulus of the valve body perpendicular to the run of the valve to the yield strength of the valve body material shall be at least 1.2 times the same ratio for the adjacent piping. Required data for the piping is as follows:

Pipe Size: _____
Yield Strength: Sy = _____ psi
Section Modulus: Z = _____ in^3

3.5.2 To ensure operability of the valve while subjected to maximum piping loads, valve operation shall not be impaired due to a bending moment, M = Z x Sy, or a torsional moment, T = 1.2 Z x Sy, each applied singly at the ends of the valve.

4.0 General Considerations

4.1 In addition to these seismic criteria, the requirements of ASME Section III shall be met.

5.0 Reporting Requirements

A fully documented report on the seismic qualification shall be submitted in accordance with Sections 7.0 and 8.0 of the Seismic Design Manual. This report must be approved by Duke Power Company prior to shipment of any items of equipment.

SPECIFICATION: CNS-1205.04-1

ATTACHMENT: 5.7

DUKE POWER COMPANY
MECHANICAL EQUIPMENT
STATUS REPORT

Equipment _____ Quantity _____

Manufacturer _____ Representative _____

Mill Power Order _____

	Unit		Unit	
	Promise Date	Actual Date	Promise Date	Actual Date
1. Spec Issue Date				
2. Quality Control Survey				
3. Mill Power Order Date				
4. Engineering Meeting				
5. Motor Data Sheet to Duke				
6. Motor Information Sheet to Duke				
7. Initial Outline Drawing to Duke				
8. Motor Pring to Mfgr				
9. Assembly Dwg to Duke				
10. Assembly Dwg Approved				
11. Mfgr Start Engineering				
12. Mfgr Complete Engring				
13. Mfgr Order Materials				
14. Quality Assurance Visit				
15. Mfgr Start Production				
16. Quality Assurance Visit				
17. Mfgr Complete Production				
18. Quality Assurance Visit				
19. Mfgr Start Testing				
20. Mfgr Submit Instr Book				
21. Mfgr Submit Sepia				
22. Mfgr Submit Complete Records				
23. Owner Submit QA Release				
24. Mfgr Ship Equipment				

EQUIPMENT STATUS REPORT
EXPLANATION & INSTRUCTIONS

The manufacturer is to complete, to the best of his knowledge at the time of proposition, those items checked or applying to said manufacturer by noting the date required in the column marked "promise".

1) Spec Issue Date - Date noted on specification - usually in upper right hand column.

2) QC Survey - Will be completed by Owner (not applicable in all cases).

3) Mill Power Order Date - Date of purchase order or letter of intent from Mill Power to manufacturer.

4) Engineering Meeting - Date of meeting shortly after order date to settle contractual items and discuss with the manufacturer problems or equipment in detail. This date usually set by Owner - Not applicable in many cases.

5) Motor Data Sheet- Date M-1, M-2, M-3, etc Duke Power motor data forms (if included in specification or later) are submitted (or will be submitted) to Duke Power. If motors are to be supplied by manufacturer, data sheets will be necessary - and completed as soon after order date as possible.

6) Motor Info Sheet - Date Mechanical Motor Data Form is or will be sent to Duke Power. Similar to above but Duke Power will supply motor for equipment based on information returned on this sheet.

7) Initial Outline - Date formal print submittal will be sent to Duke Power. (Proposal drawing not included). Drawing usually means first submittal and may or may not be certified depending on equipment. Manufacturer may desire to give two dates - one for preliminary drawing and one for certified drawings.

8) Motor Print to Mfr - Date (latest) that manufacturer needs outline of motor and pertinent information to meet scheduled (his or ours) dates. There is no need for mfr to enter "with order" as motor information will generally not be available until at least 10 to 12 weeks after order.

9) Assembly Dwg to Duke - Date all (or most) drawings, including assembly, if applicable will be submitted for approval commensurate with Owner's and Manufacturer's schedule.

10) Assy Dwg Approved - Date that Duke Power must return approval of above (No 9) prints to manufacturer. This does not mean Duke will hold prints until this date. Duke will use this date to estimate that point in time when changes or requests cannot be made without affecting equipment manufacturer or engineering. Manufacturer to use discretion when selecting this date as this may be part of the evaluation.

11) Mfgr Start Engineering - Date when manufacturer intends to start engineering of purchased equipment.

12) Mfgr to complete engr - Date when manufacturer must have completed all engineering in order to release to manufacturing or production.

13) Mfgr Order Material - Date when manufacturer will start ordering materials to proceed with production of equipment in order to meet scheduled delivery.

14) QA Visit - May not be applicable - Owner will select.

15) Mfg Start Production - Date when manufacturer makes initial commitment to shops or production floor in order to have equipment delivered per schedule.

16) QA Visit - Same as Item 14.

17) Mfr Complete Production - Date when manufacturer will have components assembled and completed.

18) QA Visit - Same as Item 14.

19) Mfr Start Testing - Date when manufacturer will start check out of panels, witness testing, performance testing, etc of assembled components (in part or in total) of purchased equipment per contractual agreements.

20) Mfr Submit Instruction Book - Date when mfgr will submit instructions on operating and maintenance to Owner per specification

21) Mfr to Submit Sepia - Date permanent sepia sent to Owner - may not be applicable.

22) Mfr to submit Records - Date permanent records sent to Owner for QA on performance testing records - may not be applicable.

23) QA Release - Date of notification to Owner that all QA records are in order and have been completed. See specifications for details - may not apply.

24)	Date equipment to be shipped to jobsite	- As shown on purchase order or agreement with Hill Power.

Notes:

(1) Mfr should check specifications for applicable items and further details.

(2) Owner to use sheet for evaluation purposes, measure performance of manufacturer for future reference.

(3) Report will not negate any contract agreements or specification requirements. No dates given or expressed shall be taken by the manufacturer as being approved by Owner necessarily because of acceptance of report by Owner.

(4) Column marked "actual" will be completed by Owner.

(5) Mfr to dist dates; ie, 1-2-71 in lieu of terms such as "after approval", "10 weeks after drawing approval", "after order".

TLO/cf
2-1-71

Form No. C1126-1 Rev. 12-01-77

GENERAL CONDITIONS OF CONTRACT

EQUIPMENT AND SYSTEMS

1. GENERAL CONDITIONS

a) These General Conditions of Contract of the Owner shall prevail in the event conditions offered by the Contractor add to or are in conflict with these General Conditions.

b) Where these General Conditions of Contract are in conflict with the Owner's specification, including revisions and addenda thereto, the specification shall prevail.

2. GUARANTEE

For a period of one calendar year after initial operation, the Contractor guarantees that the equipment covered by the specifications shall be free from defects in workmanship and materials, and shall operate satisfactorily under all conditions described by the specifications. Any equipment or components thereof which fail to meet the above guarantee shall be repaired, replaced, or upgraded by the Contractor to the full satisfaction of the Owner and at no cost to the Owner. The initial operation of this equipment is scheduled on or about 7/1/80.

3. FAILURE TO MEET GUARANTEE

a) Any defects in material or workmanship or other failure to meet requirements of the specifications, including errors or omissions, which are disclosed prior to final payment, or prior to acceptance by the Owner, whichever occurs at the later date, shall, if so directed by the Owner, be corrected entirely at the expense of the Contractor.

b) Any latent defects not disclosed before date of final payment or date of acceptance, whichever is the later date, but disclosed within one year after the equipment and/or systems are placed in use, shall be corrected promptly by and at the expense of the Contractor.

c) Any variation from the materials or design agreed upon with the Contractor at the time of the award of the contract shall be approved by the Owner before any such changes are incorporated in the equipment or system to be furnished by Contractor. Approved variations must be fully documented and records thereof furnished to the Owner.

4. RIGHT TO OPERATE UNSATISFACTORY EQUIPMENT

The Owner shall have the right to operate any and all equipment as soon and as long as it is in operating condition whether or not such equipment has yet been accepted as complete and satisfactory. This shall not be construed, however, to require continued operation of equipment which may be materially damaged by such operation before the required repair has been made.

If the operation or use of the equipment, after installation, proves to be unsatisfactory to the Owner, the Owner shall have the right to operate and use such equipment for such time as Owner deems necessary until it can be taken out of service for repairs or replacement in whole or part by the contractor. Use or operation of equipment, systems, or materials which do not meet the foregoing guarantee shall not waive Owner's right to require full compliance with the contract nor shall it waive the Owner's right to recover damages from Contractor.

5. PATENTS

The Contractor shall defend any suit or proceeding brought against the Owner so far as based on a claim that any equipment or any part thereof, furnished under this contract constitutes an infringement of any patent of the United States or any other country, and the Contractor shall indemnify and save the Owner harmless from all expenses, damages and costs awarded therein against the Owner or incurred by the Owner. In case said equipment, or any part thereof, is in such suit held to constitute infringement and the use of said equipment or part is enjoined, the Contractor shall, at its own expense and at its option, either procure for the Owner the right to continue using said equipment or part; or replace same with non-infringing equipment; or modify it so it becomes non-infringing; or remove said equipment and refund the purchase price and the transportation and installation costs thereof.

6. COMMENCEMENT, PROSECUTION AND DELIVERY

The Contractor agrees that he will commence performance of work under the contract within ten calendar days after receipt by him of notice of award of the contract unless the consent of the Owner in writing is given to begin at a different date, and that he will prosecute the same so that all work shall be entirely completed and performed in accordance with the specifications and the items delivered at destination on the dates established by the Owner.

7. SCHEDULE AND PROGRESS CHART

The Contractor shall submit to the Purchaser within fifteen days after award of contract for approval four copies of an outline of his proposed methods and manner of executing the work including sequences of operation and a brief time schedule of performing it. Within fifteen days after approval thereof, the Contractor shall submit to the Purchaser, for approval, a practicable schedule showing the order in which the Contractor proposes to carry on the work, the dates on which he will start the several salient features (including engineering, procurement of materials, fabrication, assembly, tests, shipments, etc.) and the contemplated dates for completing it. The schedule shall be in accordance with the outline and brief schedule previously approved and in the form of a bar graph of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time on the salient

features as well as the total contract. The Contractor shall enter on the graph the actual progress at the end of each month and shall immediately deliver to the Purchaser six copies thereof.

8. MATERIALS AND WORKMANSHIP

a) All materials used in the construction of the equipment shall be new and of highest standard commercial quality normally used for this type of equipment, considering strength, ductility, durability, best engineering practice, and the purpose for which the equipment is to be used (unless otherwise required by the specifications). Substantial design margins shall be used throughout the design and especially in the design of all parts subject to alternating stresses or shock.

b) All work shall be performed and completed in a thorough workmanlike manner and shall follow the best modern practice in the manufacture of high quality equipment, notwithstanding any omissions from the specifications or drawings. All work shall be performed by workmen skilled in their various trades. All parts shall be made accurately to standard gauge, where possible, to facilitate replacement and repairs. Like parts shall be interchangeable insofar as practicable. Incidental fittings, fixtures, accessories and supplies shall be new, of approved manufacture and of standard first-grade quality. The Contractor shall provide and maintain in storage for at least ten years, free of cost to the Owner, sufficient templates, gauges, patterns, or other records to enable the Contractor to make repair and replacement parts. Prior to the Contractor's going out of business or otherwise ceasing to offer for sale the goods, equipment or systems purchased by Owner pursuant to these terms and conditions, Contractor shall either arrange for said storage or offer to sell such templates, gauges, patterns and other records to Owner upon terms and conditions which are mutually agreeable. All special gauges and templates necessary for field erection and installation shall become the property of the Owner. The patterns shall remain the property of the Contractor.

9. INSPECTION AND TESTS

a) All materials furnished and all work performed will be subject to rigid inspection, and no materials shall be shipped until all required or specified tests, analyses, and inspections have been made, or certified copies of reports of tests and analyses or Contractor's guarantees shall have been accepted. The Contractor shall prepare specimens and perform tests and analyses in accordance with the specifications and as required to demonstrate conformance of the various materials with the applicable specifications. The Contractor shall furnish the Owner with copies of certified test reports for all tests and analyses and/or certifications required by the specifications.

b) The Contractor shall keep the Owner informed in advance, of the time of starting and of the progress of the work in its various stages so that arrangements can be made for inspection.

c) All items shipped to the Owner at any location will be subject to the Owner's receiving inspection upon arrival at the shipping destination and prior to unloading where possible.

d) Acceptance of the equipment or the waiving of the inspection thereof shall in no way relieve the Contractor of the responsibility for furnishing equipment meeting the requirements of the specifications.

10. ACCESS TO FACILITIES

a) The Owner and/or his agents shall at all times have access to all places where materials or equipment are being prepared or manufactured for use under the contract, and shall have full facilities for unrestricted inspection of such materials or equipment and their manufacture.

b) The Owner and/or his agents at all times have access to quality assurance records concerning equipment and systems being prepared or manufactured for use under the contract.

11. COOPERATION WITH OTHERS

The Contractor shall cooperate with other manufacturers or suppliers furnishing associated equipment or equipment connecting directly thereto. The Contractor shall exchange with other suppliers of goods and/or services all necessary drawings, dimensions, templates, gauges and other information required to insure a combined installation that is most suitable in every respect within the intent of the specification to eliminate delays in manufacture, fabrication or installation, and to enable Owner to most efficiently and expeditiously construct, install, erect, inspect, maintain and operate Owner's plant and equipment. The Contractor shall keep the Owner informed of all such coordination by copy of his letters to others.

12. MARKING

Each complete item, or component part of an item, if multiple units are being furnished, shall be given an identification number or letter, and each part of each item which is not permanently connected in shop assembly shall be legibly marked and match-marked. Except on bolts and other small parts, all such marks shall be made as required by the specifications or in a manner suitable for the expected service. Diagrams, detail drawings or erection drawings showing all such markings shall be supplied. Each piece or subassembly separately packaged for shipment shall be labeled or tagged with the specification number and the mark number of such piece or the numbers of the parts grouped in such subassembly or contained in the package.

13. PREPARATION FOR SHIPMENT

The Contractor shall prepare all equipment and materials for shipment in such manner to protect them from damage in transit. Any articles or material that might otherwise be lost shall be suitably packaged and protected and clearly marked for identification. All parts shall be prepared for shipment so that slings for handling may be attached readily while the parts are on the conveyance. Where it is unsafe to attach slings to a box, boxed parts shall be packed with

slings attached to the part, and the slings shall project through the box or crate so that attachment can be made readily. All finished surfaces shall be coated with rust-preventative compound, and all finished nonferrous metalwork and devices subject to damage shall be suitably wrapped or otherwise protected from damage during shipment unless otherwise specified in specification. All components requiring indoor storage prior to erection shall be shipped in closed, weather-right conveyances, and the package shall be clearly labeled in large letters with detailed instructions covering the proper protection of article or articles while in storage.

14. SHIPMENT

a) The Contractor shall notify the Purchaser at least fifteen days in advance of expected shipping dates. When a shipment is made, the Contractor shall notify the Purchaser giving the type of carrier and name of transporting agent and also a description of the article or articles shipped, the packing list, and any other information necessary for the identification, storage or assembly of the article or articles shipped. The shipping weight of such item shall also be given.

b) Title to, risk of loss of, and damage to equipment, materials and articles shipped shall be and remain with the Contractor until delivered to and accepted at the destination designated by the Owner.

15. ERECTION

a) Erection of the equipment will be performed by the Owner with the technical advice of the Contractor's erection engineers as required.

b) The Contractor shall furnish, if and when and to the extent required by the Owner, one or more erection engineers who shall give technical direction for the erecting, inspecting, initial operation and testing until completed to the satisfaction of the Owner, and to instruct the Owner (and/or his agent) in the operational and maintenance features of the equipment. The work and operations of the erection engineer (s) shall be coordinated with the construction program at the erection site as directed by the Owner.

c) In addition to other warranty requirements specified herein, if any portion of the equipment is damaged as a direct result of faulty or inadequate technical direction of installation, inspecting or instruction by the Contractor's erection engineer(s) within one year from the date of initial operation, the Contractor shall correct such damage at his own expense.

16. INDEMNITY

The Contractor will indemnify and save harmless the Owner against all damages, claims for damages, suits, demands, attorney fees and costs, in whole or in part, growing out of or in any way connected with the performance of this contract by the Contractor and its employees or its subcontractors, if any, and their employees. In connection with the foregoing indemnity, the Contractor, on demand by the Owner, shall take over and defend any suit against the Owner covered by the indemnity. The Contractor shall not, however, be liable in any event for any loss or injury to persons or property (including the apparatus installed) caused solely by:

a) The negligence or fault of the Owner, its employees, agents, and other contractors with Owner;

b) Failure to observe the erection engineer's instructions;

c) The failure or malfunctioning of tools, equipment, facilities, or devices not furnished by the Contractor, which is caused by defects therein not observable by the erection engineer's visual inspection.

17. SUBCONTRACTORS AND ASSIGNMENT

a) Prior to award of contract the Contractor shall submit to the Owner for his approval, a list of all portions of the contract in the engineering, material and fabrication areas that will be subcontracted to nondomestic suppliers. The following award of the contract, an up-to-date inventory shall be submitted by the Contract to the Owner on a monthly basis which provides information on the percentage of the total contract that will be provided by nondomestic subcontractors. Owner approval in writing is required prior to award by the Contractor of any subcontract to a nondomestic supplier.

b) The Contractor shall submit to the Owner within thirty days after the receipt of notice of award the name and address of all subcontractors, if any, of major parts, materials, and fabrications. Any portion of fabrication to be subcontracted must first be approved by the Owner prior to the award of the order to such subcontractor. No right or interest in the contract or obligation under the contract may be assigned by Contractor without written permission of the Owner.

18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

All work performed by the Contractor or any Subcontractor on the Owner's premises shall comply with the latest revision of Safety and Health Regulations for Construction (29 FR 1513). Designs of equipment or systems by the Contractor or subcontractor shall incorporate the features required to insure that such equipment or systems comply with latest revisions of Occupational Safety and Health Standards (29 FR 1910).

19. PRICE STABILIZATION

Contractor represents to the Owner that its prices and those of its subcontractors, if any, are in accord with the Economic Stabilization Act of 1970 and any Executive Orders and Rules and Regulations issued thereunder or any similar Act of Congress controlling prices or wages and any orders, rules, or regulations issued thereunder.

20. PAYMENT SCHEDULE

Unless specifically provided elsewhere in the contract to the contrary, all payments for work done or goods furnished hereunder shall be made as follows:

a) Invoices received by the Owner at any time between the 26th day of a month and 10th day of the next month shall be paid on the 25th day of said next month, provided the work has been satisfactorily completed or goods received and accepted.

b) Invoices received by the Owner at any time between the 11th and 25th days of any month shall be paid on the 10th day of the next ensuing month, provided the work has been satisfactorily completed or goods received and accepted.

c) Anything to the contrary in paragraphs a) and b) of this Article notwithstanding, Owner may elect to pay invoices within 30 days after receipt, provided the work has been satisfactorily completed or goods received and accepted.

d) Invoices on which payment is withheld due to an exception will be paid as provided above, such invoices to be considered received by the Owner on the date on which such exception is removed.

e) If any payment date as provided above shall fall on a Saturday, a Sunday or legal holiday, payment shall be deferred to the next ensuing business day of the Owner.

f) Terms of payment are to be as offered and accepted or as may be negotiated.

g) In addition to terms of payment, complete final payment will not be made until all documentation required for application, installation or other utilization is received by Owner from the Contractor. This includes, but is not limited to, test reports, handling and storage recommendations, quality assurance documentation, identification information, etc. A maximum of five percent of the contract amount will be withheld until such requirements are met.

21. TERMINATION

The Owner may terminate this Contract upon prior written notice. In the event of termination, the Owner shall pay reasonable termination charges to the Contractor which shall consist of all costs for labor and materials directly related to this Contract and expended by Contractor prior to such termination, plus a percentage of the profit Contractor would have realized under this Contract (had it not been terminated) equal to the percentage of the work performed by the date of termination, less the amount of any salvage which can be realized by the Contractor by the sale of any goods, materials or equipment purchased or manufactured prior to termination. The Contractor will take all reasonable steps to minimize termination charges and will provide the Owner with an accurate accounting of such termination charges. In the event that the Contractor is entitled to recover damages under this Contract, such damages shall not include any incidental damages. If the sum of all previous deposits and payments on account of the Contract price exceeds said termination charges, the excess will be refunded to the Owner.

22. SUSPENSION

Upon prior written notice the Owner may suspend Contractor's work or extend schedules for all or any portion of the goods and services to be furnished pursuant to this Contract. In the event of such suspension or extension, the Owner shall pay reasonable charges due the Contractor which shall consist of all costs for labor and materials directly related to this Contract and expended by Contractor prior to such suspension or extension, plus a percentage of the profit Contractor would have realized under this Contract (had it not been suspended or extended) equal to the percentage of the work performed by the date of such suspension or extension. The Contractor will take all reasonable steps to minimize such suspension or extension charges and will provide Owner with an accurate accounting of such charges. In the event that the Contractor is entitled to recover damages under this Contract, such damages shall not include any incidental damages. If the sum of all previous deposits and payments on account of the contract price exceeds said suspension and extension charges, the excess will be refunded to the Owner. All suspension or extension charges shall be applied toward and reduce the contract price.

Specification: CNS-1205.04-1

Date: 12/18/78

Attachment: 5.9

GENERAL REQUIREMENTS APPLICABLE TO SPECIFICATION

1. SPARE PARTS

Immediately after the award of the order the Contractor shall submit a recommended spare parts list for each piece of equipment. The list shall include firm pricing of each item for delivery with the first major piece of equipment. After award of the order a separate purchase order for spare parts will be issued by the Purchaser for those spare parts, if any, which he decides are necessary.

In shipping the parts the Contractor shall clearly identify spare parts as such. A tag shall be securely attached to each part and shall show the following information:

a. Equipment name (e.g. "Condensate Pump, Spare Parts").
b. Part name (e.g. "Main Bearing").
c. Applicable equipment outline drawing number(s).
d. Part item number (as shown on the equipment outline drawing) and/or part number.
e. Mill Power Supply Company purchase order and item numbers.

Complete QA documentation as required by paragraph 10 of the equipment specification is required for each spare part.

2. FOREIGN MANUFACTURE

No parts, materials, or equipment shall be of manufacture outside of the United States without prior approval of Owner. Bidder shall identify in his proposal any parts, materials, or equipment contemplated for manufacture outside of the United States.

3. TESTS, REPORTS, AND INSPECTION

The Owner shall have full access to the equipment during the process of its manufacture and shop testing. The Owner shall be notified when manufacturing schedule is arranged. Should any work, fabrication or materials be supplied by a subcontractor or outside vendor, the Owner shall be notified prior to release to the vendor. The Owner reserves the right of approval of any subcontractor and also the right to inspect work, fabrication or material being subcontracted at the subcontractor's location. The Owner shall be kept informed during manufacture of any major problems or rework of material and be informed of any major repair procedures. The Contractor shall obtain approval from Owner prior to proceeding with any major repair procedures or material rework.

Six copies of certified pump performance test curves for pumps covered by the specification are to be submitted to Mr. S. K. Blackley, Jr., Attention:
for approval prior to shipment of any pumps.

Six copies of hydrotest results, where applicable, are required for approval prior to shipment of equipment.

4. CARE DURING STORAGE

The Contractor must submit to Owner, within four to six months prior to the time at which equipment is shipped, instructions for care of equipment during the periods listed below. These instructions should include requirements, if any, for periodic operation, rotation, or engergizing, for application or removal of protective coatings or lubricants, for disassembly or assembly during storage, and other instructions as necessary.

a. On-site storage prior to installation.

b. After installation, prior to startup, during construction.

c. After startup, during a lay up due to extended unit outage (this information required only if such information is not included in the instruction manual).

This information should be mailed to Mr. S. K. Blackley, Jr., at the address given in the specification.

5. CONFORMANCE WITH SPECIFICATIONS

The Contractor must submit with his proposal a list of all major and minor exceptions to these specifications and obtain written approval from Owner prior to award of the order. If there are no exceptions, it must be so stated in writing. It is particularly emphasized that any unapproved non-conformity with the specification must be changed to complete conformity at the Contractor's expense and this expense will include the cost of all labor and materials and all other related expenses by the Owner or Contractor.

PACKAGING AND SHIPPING REQUIREMENTS

Specification No. CNS-1205.04-1 Date: 12/18/78

1. ITEM CLASSIFICATION (ANSI N45.2.2 - 1972)

   Level A B C D Special
   Special _____

2. PACKAGING (ANSI N45.2.2 - 1972, Section 3 and Appendix A3)

   Level A B C D Special
   Special Instructions _____

3. SHIPPING (ANSI N45.2.2 - 1972, Section 4.2)

   Carrier Open Closed Special
   Special Instructions _____

   Shipment via Train Truck Plane Barge Ship Other

   Description of other means _____

4. LOADING & TRANSIT (ANSI N45.2.2 - 1972, Section 4.3)

   Special Instructions for loading, rigging, handling, preservative coatings, seals, stacking and vandalism precautions _____

5. IDENTIFICATION AND MARKING (ANSI N45.2.2 - 1972, Appendix A3.9)

   Item Markings _____

   Container Markings _____

SPECIFICATION NO. 5005-I

DATE 5-1-76

DUKE POWER COMPANY

NUCLEAR STATIONS

CATAWBA 1-2 OCONEE 1-2-3

McGUIRE 1-2 P81 1-6

Title: Nuclear Coating Specification 5005-I

Class I Coatings

REVISION LOG

1	6
2	7
3	8
4	9
5	10

Form 301.1/Rev.2

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba 1-2, McGuire 1-2, Oconee 1-2-3, P-81-1-6

Title of Specification: Nuclear Coating Specification

Class I Coatings

Specification Number: 5005-I

Revision: 0

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Diggs Date: 5-11-76

Checked By: [signature] Date: 5-11-76

Approved By: [signature] Date: 5-11-76

Inspection Waived By: _____ Date: _____

Inspection Waived For: _____ ELECTRICAL _____ MECHANICAL _____ CIVIL

Inspected By: [signature] Date: 5-11-76

Inspected By: [signature] Date: 5/14/76

QUALITY ASSURANCE TC Roberts Date: 5-17-76

****

(FOR ASME CODE ITEMS)

_____ Division Date: _____
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with _____ Edition including the _____ Addendum of ASME Code, Section III, Paragraph _____.

(SEAL)

SIGNATURE: _____

NAME: _____
Registered Professional Engineer

No. _____

Form 301.2/Rev 2

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By: Design Engineering Date: 5-1-76 Revised: _____

1.0 SCOPE

This specification defines the method of surface preparation, materials application, inspection, certification, and record requirements for coating carbon steel rated as Coating Service Level I surfaces of a nuclear power plant.

This system may be used on surfaces where operating temperatures do not exceed 900°F.

Coating Service Level I surfaces are defined as any surfaces inside the primary containment, tank linings, or pipe interiors which are exposed to the flow of reactor coolant water during a DBA. These coating systems must perform in containment post accident environments without adverse interactions with engineered safety features.

2.0 COATING SYSTEM

Surface Preparation: DP-SP10-I Near White Metal blast cleaning

Prime Coat: DP#12-I Inorganic Ethyl Silicate Zinc rich primer @ 2.0 DFT

Minimum	2.0	DFT
Maximum	6.0	DFT

3.0 APPROVED MATERIALS

Coatings Manufactured by Mobil Chemical Company

DP#12-I 13-F-12 Mobil Zinc #7

Coatings manufactured by Carboline Company

DP#12-I Carbo Zinc #11

Coatings manufactured by Amercon Corrosion Control

DP#12-I Dimetcote #6

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By Design Engineering Date: 5-1-76 Revised:

4.0 SURFACE PREPARATION DP-SP10-I

a) Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP10-63 (Near White Metal Blast Cleaning).

b) Minimum cleaning is as defined in Section 2.2 of SSPC-SP10-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

c) No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to prime coat shall be reblasted.

d) Blasting shall not be performed in the same area where coating or curing of coated surfaces is in process.

e) The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

f) The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.0 to 3.0 mils average anchor pattern. No polished surfaces shall be allowed.

g) The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used.

h) Contaminated sand or grit shall not be used for finished work.

i) Remove weld splatter and visible welding contamination. Round sharp edges and grind welds.

j) All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

k) The prime coat should be applied within 8 hours after blasting and shall before any rust blooms begin to form. Reblast all surfaces that exceed conditions in section 4.0C.

l) Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By: Design Engineering Date: 5-1-76 Revised: _____

5.0 GENERAL APPLICATION REQUIREMENTS

a) No coatings shall be applied when the surface temperature is below 35°F or above 100°F, when the relative humidity is above 90% or when the surface or air temperature is within 5°F of the dew point.

b) Coatings that have been stored at low temperatures shall be brought up to a minimum temperature of 70°F before mixing and thinning and shall be kept at temperatures above 60°F until applied to the surface.

c) Prior to thinning and application all material shall be thoroughly mixed to insure breaking apart of lumps dispersion of settled pigments and provide a uniform composition.

d) Mixing, thinning, proper thinner and induction time prior to application shall be in strict accordance with the coating manufacturers written instructions for the Service Level I products selected.

e) Use of additional thinner to lower viscosity after the coating manufacturers recommended mixed pot life has expired shall not be allowed.

f) Mixed material should be strained through a 30-50 mesh strainer prior to application.

g) If application is stopped for short periods of time, material should be flushed from fluid lines and spray equipment cleaned.

h) A power mixer should be used for obtaining a uniform composition of pigment, vehicle, catalyst and thinners.

i) After each coat, all areas with DFT readings less than specified in section 2 shall receive an additional coat of paint prior to topcoating.

5.1 APPLICATION OF DP#12-I

a) Material shall be applied by spray application provided the minimum 2.0 DFT per coat and workmanship requirements of this specification are met.

b) Prior to topcoating, each coat shall be allowed to dry in strict accordance with the following minimum guidelines, based on temperature and relative humidity.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By: Design Engineering Date: 5-1-76 Revised: _____

	Temperature					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	72 Hr.					
50%		60 Hr.				
60%			48 Hr.			
70%				36 Hr.		
80%					24 Hr.	
90%						12 Hr.

c) Adequate cure can be checked by scratching primed surface with a coin. A cured zinc film will polish and an uncured zinc film will wrinkle.

d) Drying time for shipment or stacking together of finished coated work shall be in accordance with these minimum guidelines.

	Temperature					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	12 Hr.					
50%		8 Hr.				
60%			6 Hr.			
70%				4 Hr.		
80%					2 Hr.	
90%						1 Hr.

5.2 DP#12-I TOUCH-UP REQUIREMENTS

a) Touch-up procedures apply to those areas previously prepared in accordance with section 1.0 through section 5.1 which have been damaged due to handling, assembly, or other special procedures approved by Duke Power Company in writing.

b) Surface preparation of damaged bare areas shall be cleaned to a bright metal with power or hand tools followed by needle gunning to roughen the surface area and provide an anchor pattern for proper adhesion of the inorganic zinc.

c) All areas to be touched up shall be solvent cleaned in accordance with SSPC-PA1-64.

d) Overspray and powdery zinc shall be removed prior to touch-up using a soft bristle brush and clean water.

e) Material shall be applied by spray application except small areas not exceeding 1% of the total surface area may be touched up by brush.

f) Material used for touch-up over previously applied cured zinc shall be thinned 50% to prevent dusting and provide adhesion to the existing zinc film. Dry film thickness of overlaps adjacent to touched up areas shall not exceed 6.0 DFT.

g) Stacking and loading after touch-up should be in accordance with section 5.1d unless touched up areas are not subject to contact with other surfaces.

6.0 EQUIPMENT

a) Equipment shall be in accordance with the coating manufacturers written recommendations for Nuclear Service Level I Coatings for the product being applied.

7.0 GENERAL WORKMANSHIP REQUIREMENTS

a) All work shall meet the minimum requirements of this Coating Specification and referenced standards or previously agreed upon variations of these standards.

b) All work shall be supervised by qualified persons who have read and understood the Duke Power Company Nuclear Coating Specifications for the specific work he is responsible for supervising.

c) All work shall be done by persons experienced with the specific materials being applied or used, unless accompanied by some one who is experienced in the work being performed.

d) Any completed stage of work not meeting the minimum requirements of this specification shall be corrected prior to topcoating or completion of advanced stages of coating work.

e) Unless otherwise defined in this specification all standards of workmanship for the items listed below should meet the minimum requirements of SSPC-PA1-64 Paint Application Specification No. 1 Shop, Field, and Maintenance Painting.

Cleaning
Pretreatments
Storage of Paints and Thinners
Mixing and thinning
Application of Paint
Drying of Painted Steel
Handling of Painted Steel

7.1 COATING MATERIALS

a) All paint materials and accessories shall be delivered to the jobsite in original unopened containers with the manufacturers labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

b) All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at minimum maximum temperatures defined in writing by the Coating Manufacturer for Nuclear Service Level I Coatings.

c) Only paint materials approved in section 3.0 of this specification shall be used.

7.2 SURFACE PREPARATION

a) Cleaning and painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

b) Friction joints and weld seams shall be masked as defined in the coatings section of the component specification.

7.3 APPLICATION

a) Hardware, trim, underwriters labels, manufacturers serial numbers, dials, gauges, and other similar items shall be removed or masked to allow proper application of the coatings and prevent damage.

b) All applied coatings should be free of runs, sags, drops, ridges, waves, laps, bubbles, pin holes, embedded foreign matter, and other indications of improper application procedures.

7.3 EQUIPMENT

a) All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

b) Effective oil and water separators shall be used and serviced on all air lines.

8.0 INSPECTION

a) Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

b) The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

c) All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor.

d) Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

e) The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specificatic .

9.0 COATING CERTIFICATION REQUIREMENTS

9.1 QUALITY ASSURANCE REQUIREMENTS

a) This attachment establishes minimum record requirements for the certification of coating materials, surface preparation, application of materials and inspection. The record requirements of this attachment conforms to Section 1.2.4 of ANSI N 101.4-1972 (American National Standard Institute-Quality Assurance for Protective Coatings applied to Nuclear facilities).

b) The Supplier Quality Assurance Certification Form 930.1 (Page 12) shall be completed by the vendor for all Class I Coating work. One copy of this form shall be shipped with components or materials to the jobsite and when completed as required will be authorization for Duke Power Construction to accept delivery. Absense of a properly completed form will result in quarantine or return of the component or materials to the vendor.

c) The Coating Materials-Manufacturer's Product Identify Certification Record, DPNC Form 2 (Page 15) shall be obtained from the coating manufacturer for each batch of paint and thinner used by the vendor on Class I surfaces as listed on the DPNC Form 3.

d) The Supplier Quality Assurance Record, DPNC Form 3 (Page13, 14) shall be completed for all Class I Coating work. A separate form may be used to cover the following combinations of materials and components: (1) all work in each shipment (2) different types of components in each shipment (3) series of similar types of components in each shipment.

e) Failure of the vendor to meet all requirements of the bid specification or incomplete and inaccurate QA documentation shall result in rejection by the owner of any or all components covered by that DPNC Form 3.

9.2 RECORD REQUIREMENTS

a) The following records shall be sent to the QA Manager, Engineering and Services no later than the time materials and components are shipped.

One copy of Form 930.1 per shipment

DPNC Form 3 (s) to cover materials and components as listed on each Form 930.1.

A DPNC Form 2 to cover each batch of material used on any components or materials shipped as listed on the DPNC Form 3.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By: Design Engineering Date: 5-1-76 Revised: _____

9.3 INSTRUCTIONS FOR COMPLETING CLASS I COATING FORMS.

This section contains explanations and examples to aid the vendor in properly completing the forms listed in section 9.2, Record Requirements.

A) DPNC Form 3 (One form can cover a complete shipment, a size, a group, a type, a system, etc. of materials or components).

1 Identify components or equipment so that separate items are traceable, and can be matched up with a specific Report No.

2 Example: Carbon steel, cast iron, stainless, aluminum, etc.
3 This information is for items covered by each DPNC Form 3.
4 Information should be reported in even gallons for items covered by each DPNC Form 3.
5 List all information required for each batch of material used on components covered by this DPNC Form 3 and attach a DPNC Form 2 for each batch of material listed on this DPNC Form 3.
6 Duke Power Company surface preparation standard ex. DP-SP5.
7 Examples: Steel grit, silica sand, glass beads, garnet.
8 Examples: 8/20, 8/35, 16/35, 30/50, etc.
9 Example: Xylol, methyl ethyl ketone, etc.
10 Read pressure at nozzle (Do not use pressure at compressor.)
11 Was moisture trap used effectively (yes) (no) ?
12 Temperatures are to be taken in actual work areas and shall cover all conditions during surface preparation and exposure of components cleaned prior to priming.
13 Indoors - In a closed building kept at ambient temperatures.
14 Outdoors - Exposed to weather (even if under a roof).
15 Example - Brush, roller, spray, flow coated, etc.
16 Example - Graco airless, Devilbiss conventional.
17 Example - E Fluid Tip.
18 Example - #704 Air Cap.
19 Example - Yes (motor driven, yes (manual), (no).
20 Was oil separator used effectively? (yes) (no)
21 Report actual total dry film thickness after primer, intermediate and finish coat.
22 Report number to be same on both front and back page. Report numbers shall be logged and numbered in sequence from 1 to _____ to cover all reports of a given Duke Power Company Bid Specification.

B DPNC Form 2

23 The vendor shall fill out the General Data Section and attach a DPNC Form 2 to the purchase order sent to the coating manufacturer.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. 5005-I

By: Design Engineering Date: 5-1-76 Revised: _____

24 The coating manufacturer shall complete the Component Data Section, Mixed Component Data Section and Signature and Title section and return to the vendor.

C Form 930.1.

25 In space 1 write "Components inspected and are in compliance with Nuclear Coating Certification Specification, 5005-I , dated 5-1-76 ." Give Report Nos. of all DPNC Form #3 to cover materials or components listed on the Form 930.1.

26 If a form 930.1 is required for the Item by the Duke Power Design Specification, the same form may be used for coatings; otherwise a new 930.1 must be completed for the coatings only.

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY

QUALITY ASSURANCE DEPARTMENT

SUPPLIER QUALITY ASSURANCE CERTIFICATION

Name of Supplier _____ Date _____

Address of Supplier Plant _____ Mill Power Order No. _____

_____ Duke Item or Req. No. _____

_____ Spec. No. _____ Rev. ___

Supplier ID Nos. _____

Description of Component(s) or Material(s) _____

_____

_____

___ Attached Documentation covers all Components/Materials on Mill Power Order.
___ Attached Documentation covers partial shipment of Components/Materials on Mill Power Order.

The following listed tests, inspections and reports have been completed as required by the specification:

___ Physical & Chemical Analysis
___ Hydro (Test Pressure - PSIG _____)
___ Major Repair Records & Charts
___ Personnel Qualifications on Record

___ Design Report
___ Radiographic Test
___ Penetrant Test
___ Operating Test
___ Dimensional Check
___ Stress Report
___ Ultrasonic Test
___ Repair NDE
___ Performance Curve
___ Deviation Record # _____
___ Heat Treatment
___ Magnetic Particle
___ Cleanliness
___ ASME Data Report

1) _____

2) _____

3) _____

This certifies that the listed Component(s) or Material(s) conform to the requirements of the above referenced Duke Power documents including all codes, standards, test requirements and Quality Assurance requirements invoked therein.

_____

Supplier Representative Authorized Signature

Title _____ Date _____

(See Instructions)

Form 930.1A / Rev. 3

NUCLEAR SAFETY RELATED

DPNC FORM 3 (Page 1)
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No.(1) _____

_____

_____

GENERAL INFORMATION

Substrate Material: (2) _____

Estimated Surface Area Coated Sq. Ft./Item(3) _____ No. Items(3) _____ Total Sq. Ft.(3) _____

Estimated Coating Quantities — Primer (4) _____ Gal. (4) Intermediate _____ Gal. (4) Finish _____ Gal.

Date Work Began(3) Date Work Completed(3)

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED
(5)	(5)	(5)	(5)	(5)	(5)

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

( ) Number corresponds to a instruction number

Date 6-1-74; Revised 5-1-76

NUCLEAR SAFETY RELATED

DPNC FORM 3 (Page 2)

3. SURFACE PREPARATION

Surface Preparation No.(6) _____

Abrasive: Type(7) _____ Solvent: Type (9) _____

Size(8) _____ Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure(10) _____ Moisture Trap (11) _____

Temperature	Ambient	Surface	Dew Point
Max.:	(12) _____ °F	(12) _____ °F	(12) _____ °F
Min.:	(12) _____ °F	(12) _____ °F	(12) _____ °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors(13) _____ Outdoors(14) _____ Night _____ Day _____

Inspected By: _____ Approved By: _____

Date: _____ Date: _____

4. APPLICATION

Method of Application (15) _____

Spray:

Type Spray Gun (16) _____ Agitator Pot (19) _____

Fluid Tip (17) _____ Moisture Trap (11) _____

Air Cap (18) _____ Oil Separator (20) _____

Temperature:	Ambient	Surface	Dew Point
Max.:	(12) _____ °F	(12) _____ °F	(12) _____ °F
Min.:	(12) _____ °F	(12) _____ °F	(12) _____ °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	(21) _____ DFT	(21) _____ DFT	(21) _____ DFT
Intermediate	(21) _____ DFT	(21) _____ DFT	(21) _____ DFT
Finish:	(21) _____ DFT	(21) _____ DFT	(21) _____ DFT

Work Done: Indoors(13) _____ Outdoors(14) _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

Date: _____ Date: _____

Date 6-1-74; Revised 5-1-76 Report No.(22) _____

NUCLEAR SAFETY RELATED

DPNC FORM 2

COATING MATERIALS - MANUFACTURER'S PRODUCT IDENTITY CERTIFICATION RECORD
GENERAL DATA (23)

PURCHASER _____

BILLING ADDRESS _____

SHIPPING ADDRESS _____

PROJECT DESIGNATION _____

DATE _____ PURCHASE ORDER NO. _____ RELEASE NO. _____

COATING MANUFACTURER _____

PRODUCT DESIGNATION _____

GALLONS ORDERED _____ GALLONS SHIPPED _____ REFERENCE NO. _____

COMPONENT DATA (24)

	MIXED		INDIVIDUAL	
COMPONENT				
BATCH NO.				
GAL. ORDERED				
GAL. SHIPPED				
DATE MFG'D.				
SHELF LIFE				
SOLIDS BY VOLUME				
*WT./GAL.				
**VISCOSITY				
MIXING RATIO BY VOL.				

*(By Fed. Test Method Std. No. 141, Method 4814± or by ASTM D1475)
**(Method _____ @ _____ °F)

MIXED COMPONENT DATA (24)

GENERIC TYPE _____ POT LIFE _____ @ _____ °F

FLASH POINT (TOC) _____ DFT PER COAT _____ INDUCTION PERIOD _____ @ _____ °F

COLOR (VISUAL) _____

RECOAT TIME RANGE _____ @ _____ °F _____ %R.H.

DRY HARD _____ HRS. @ _____ °F _____ %R.H.

TACK FREE _____ HRS. @ _____ °F _____ %R.H.

COMMENTS:

Signature _____

Title _____

Date _____

Checked By _____

Revision 3 Dated 5-1-76

Revision 2 Dated 1-4-74

Distribution: 1 copy with shipment

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

SHOP COATING SPECIFICATION 4003-1
Replaces CCCC-1

BY: Design Engineering DATE 6-1-76 REVISED _____

1.0 SCOPE

This specification defines the method of surface preparation, materials application and inspection for coating carbon steel surfaces subject to interior and exterior exposures when maximum corrosion and abrasion resistance is required at service temperatures up to 900°F. High performance chemical resistant and high temperature coatings are normally used for finish coats.

Steel Structures Painting Council Specification SSPC-PA-1-64 "No. 1 Shop Field and Maintenance Painting" shall govern minimum standards not covered by this specification.

2.0 COATING SYSTEM

Surface Preparation:	DP-SP 10	Near White Metal Blast Cleaning	
Prime Coat:	DP# 12	Inorganic Ethyl Silicate Zinc Rich Primer	@ 2.0 DFT
		Minimum	2.0 DFT
		Maximum	6.0 DFT

	ATTACHMENTS	TITLE OF ATTACHMENT	*MANUAL SECTION
3.0	Approved Materials Attachment	4003-1	12
4.0	Surface Preparation Attachment	DP-SP 10	13
5.0	Application Attachment	DP# 12	14
6.0	Touch Up Attachment	DP# 12	14
7.0	Workmanship Attachment	WSE-1	16
8.0	Inspection Attachment	ISE-1	17
9.0	Records Requirements Attachment	VCI-1	18

*Manual Section Numbers for use by Design Engineering to assemble specifications.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

3.0 APPROVED MATERIALS ATTACHMENT
SYSTEM 4003-1

BY: Design Engineering DATE 6-1-76 REVISED _____

3.0 APPROVED MATERIALS

3.1 MATERIAL SELECTION

The selection of materials for use in this specification by the applicator or vendor shall be those products listed below, unless approved by Design Engineering.

3.2 MATERIALS

Coatings manufactured by Mobil Chemical Company

DP#12 13-F-12 Mobil Zinc #7
DP#
DP#
DP#

Coatings manufactured by Carboline

DP#12 Carbo Zinc II
DP#
DP#
DP#

Coatings manufactured by E I DuPont

DP#12 347-931 Zinc Rich Coating
DP#
DP#
DP#

Coatings manufactured by Ameron Corrosion Control

DP#12 Dimetcote #6 Zinc Rich Coating
DP#
DP#
DP#

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

4. SURFACE PREPARATION ATTACHMENT
DP-SP10

BY: Design Engineering DATE 6-1-76 REVISED

4.0 SURFACE PREPARATION

4.1 Metal surfaces shall be prepared by abrasive blast cleaning in strict accordance with Structural Steel Painting council SSPC-SP10-63 (near white metal blast cleaning).

4.2 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to priming shall be reblasted.

4.3 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

4.4 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.0 to 3.0 mils anchor pattern. No polished surfaces shall be allowed.

4.5 Contaminated sand or grit shall not be used for finished work.

4.6 Round sharp edges and smooth sharp welds.

4.7 All visible burrs, silvers, scabs, and weld splatter shall be removed after blast cleaning.

4.8 After blast cleaning the prime coat shall be applied within 8 hrs. and/or before the surface is exposed to dew point conditions or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

4.9 Remove all traces of grit, dust, grease and foreign matter after blast clenaing and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

4.10 Minimum cleaning is as defined in section 2 and section 3.2 of SSPC-SP10-63. S C 'S-1-[illegible] sh[illegible]e used to establish Visual Standards

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

5. APPLICATION ATTACHMENT
DP#12

BY: Design Engineering DATE 6-1-76 REVISED _____

5.0 APPLICATION

5.1 No material shall be applied when the surface or air temperature is below 35°F or above 100°F, when the relative humidity is above 90% or when the temperature is within 5°F of the dew point.

5.2 Material shall be applied by spray application provided the minimum DFT per coat and workmanship requirements of this specification are met.

5.3 Paint that has been stored at low temperatures shall be brought up to minimum of 70°F before mixing and thinning.

5.4 Prior to thinning or application, all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments, and a uniform composition.

5.5 Storage, mixing, thinning, and induction time shall be with a power mixer in accordance with the manufacturers recommendations for the product selected.

5.6 Mixed material shall be applied within the maximum pot life specified by the manufacturer for the product selected or prior to any significant change in viscosity, whichever comes first.

5.7 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

5.8 Minimum DFT shall be as specified in section 2 when inspected in accordance with SSPC-PA2-72.

5.9 All areas with DFT readings less than specified in section 2 shall receive an additional coat prior to topcoating.

5.10 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines based on temperature and relative humidity.

	Temperature					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	72 hr.					
50%		60 hr.				
60%			48 hr.	DO NOT RECOAT		
70%				36 hr.		
80%					24 hr.	
90%						12 hr.

* Adequate cure can be checked by scratching primed surface with a coin. A cured zinc film will polish and an uncured zinc film will wrinkle.

5.11 Drying time for shipment or stacking together of finish coated work shall be in accordance with the minimum guidelines.

	Temperature					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	12 hr.					
50%		8 hr.	DO NOT STACK			
60%			6 hr.			
70%				4 hr.		
80%					2 hr.	
90%						1 hr.

6.0 TOUCH-UP

6.1 Touch-up procedures apply to those areas previously prepared in accordance with section 1.0 through section 5.1 which have been damaged due to handling assembly or other special procedures approved by Duke Power Company in writing.

6.2 Surface preparation of damaged bare areas shall be cleaned to a bright metal with power or hand tools followed by needle gunning to roughen the surface for proper adhesion of the inorganic zinc.

6.3 All areas to be touched up shall be solvent cleaned in accordance with SSPC-PA1-64.

6.4 Overspray and powdery zinc shall be removed prior to touch-up using a soft bristle brush and clean water.

6.5 Material shall be applied by spray application except small areas not exceeding 1% of the total surface area may be touched up by brush.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

APPLICATION ATTACHMENT
DP#12

BY: Design Engineering DATE 6-1-76 REVISED _____

6.6 Material used for touch-up over previously applied cured zinc shall be thinned 50% to prevent dusting and provide adhesion to the existing zinc film. Dry film thickness of overlaps adjacent to touched-up areas shall not exceed 6.0 DFT.

6.7 Stacking and loading after touch-up should be in accordance with section 5.11 unless touched up areas are not subject to contact with other surfaces.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

7.0 WORKMANSHIP ATTACHMENT
WSE-1

BY: Design Engineering DATE 6-1-76 REVISED _____

7.0 WORKMANSHIP

7.1 GENERAL

All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to the topcoating or completion of advanced stages of the operation.

7.2 EQUIPMENT

Equipment shall be as recommended by the coating manufacturers.

All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray heads, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

Effective oil and water separators shall be used on all air lines.

7.3 SURFACE PREPARATION

Cleaning and painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

Where trim, underwriters labels, manufacturers serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and to prevent damage.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

7.0 WORKMANSHIP ATTACHMENT
WSE-1

BY: Design Engineering DATE 6-1-76 REVISED _____

7.4 COATING MATERIALS

All paint materials should be stored under cover and off the ground at temperatures not exceeding manufacturers minimum and maximum storage temperatures for lengths of time not exceeding the manufacturers recommended shelf life.

7.5 MIXING & THINNING

Mixing prior to application should be done with a power mixer. Mixed materials should be strained through a 30-50 mesh strainer prior to application.

Thinner should be as recommended by the coating manufacturer or equal.

7.6 APPLICATION

Applied coatings should be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application techniques.

7.7 MASKING OF FRICTION JOINTS

When component specification require masking of friction joints or weld seams, these surfaces should be taped or blocked to allow proper application of coatings to adjacent areas.

7.8 TOUCH-UP

Edges of damaged areas should be feathered by sanding after cleaning and prior to the application of the initial touch-up coat.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

8. INSPECTION ATTACHMENT
ISE-1

BY: Design Engineering DATE 6-1-76 REVISED _____

8.0 INSPECTION

Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor unless otherwise agreed to in writing by Duke Power Company.

Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Project:_____ Date:_____

D.P. Co. Spec. No.:_____ Paint Category:_____

Vendor:_____ Equip.:_____

Duke Power Coating System:_____

Primer: DP#_____ Product #_____ _____

Intermediate: DP#_____ Product #_____

Finish: DP#_____ Product #_____

Coating Manufacturer:_____

Complete only if vendor cannot meet Duke Power Specification:

GENERAL INFORMATION

Substrate Material:_____

Estimated Surface Area
By Sq. Ft._____ Per Item_____ Total

Estimated Coating Quantities Primer _____Gal. Intermediate _____Gal. Finish _____Gal.

COATING INFORMATION

Vendors Coating System No:_____

	DFT	Product No. and Name	Product Manufacturer
Primer			
Intermediate			
Finish			
Finish Color No.		Color Name	
Color Source			

Surface Preparation:_____

Attach surface preparation & application procedures.

NUCLEAR SAFETY RELATED

SPECIFICATION NO. CN-000-I-1

DATE 11-1-75

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

UNIT 1-2

Title: Nuclear Coating

Specification No. CN-000-I-1 Class I Coatings

REVISION LOG

1	6
2	7
3	8
4	9
5	10

Form 301.1/Rev.2

NUCLEAR SAFETY RELATED

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba 1-2

Title of Specification: Nuclear Coating Specification No. CN-000-T-1

Class I Coatings

File Number: CN-1167.02

Revision:

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Biggers Date: 11-11-75

Checked By: [signature] Date: 11-11-75

Approved By: [signature] Date: 11-11-75

Inspection Waived By: [signature] Date: 11-11-75

Inspection Waived For: X ELECTRICAL MECHANICAL CIVIL

Inspected By: [signature] Date: 11-11-75

Inspected By: Date:

QUALITY ASSURANCE T C Lobst Date: 11-11-75

****

(FOR ASME CODE ITEMS)

Division Date:

Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SIGNATURE:

NAME:

Registered Professional Engineer

No.

Form 301.2/Rev 1

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. CN-000-I-1

By: Design Engineering Date: 11-1-75 Revised:

1. SCOPE

1.1 This specification defines the method of surface preparation, materials, application, and inspection and record requirements for coating carbon steel surfaces cleaned to meet a minimum DP-SP 10 - Immersion (near white metal blast cleaning) rated as class I surface areas of a nuclear power plant.

1.2 Class I surfaces are exposed areas in the Containment and Reactor Buildings and the interior of tank linings of the reactor coolant system, that must withstand a DBA and LOCA.

1.3 Examples: As a shop or pre-installation system for equipment and misc. componenets that cannot be blast cleaned and coated in place and where normal operating surface temperatures do not exceed 200°F. Normally only touch up of damaged areas is required after installation.

2. ATTACHMENTS

2.1 The following Duke Power Company attachments are attached to and made a part of this specification:

2.1.1 Approved Materials
2.1.2 Surface Preparations
2.1.3 Application Procedures
2.1.4 Workmanship Standards
2.1.5 Inspection Standards
2.1.6 Record Requirements
2.1.7 Duke Power Company Field Data Sheet VIIA

3. COATING MATERIALS

3.1 Coating materials shall be in strict accordance with Duke Power Company Standard Approved Materials for System CN-000-I-1.

4. COATING SYSTEM

4.1	Surface Preparation	DP-SP10-Immersion (near white metal blast cleaning).		
4.2	Prime Coat	DP#12	Inorganic Ethyl Silicate Zinc Rich Primer	@ 2.0 DFT
4.3	Finish Coat	DP#67	Catalyzed Phenolic Epoxy	@ 4.0 DFT
			Minimum	6.0 DFT

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. CN-000-I-1

By: Design Engineering Date: 11-1-75 Revised:

5. SURFACE PREPARATION

5.1 Surface Preparation shall be in strict accordance with Duke Power Company Standard Surface Preparation DP-SP10-Immersion.

6. APPLICATION

6.1 Application shall be in strict accordance with Duke Power Company Application Procedures for, DP#12 and DP#67.

7. MIXING AND THINNING

7.1 Mixing and thinning shall be in strict accordance with Duke Power Company Data Sheets VII A, manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

8. EQUIPMENT

8.1 Equipment shall be in strict accordance with manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

9. WORKMANSHIP

9.1 Workmanship shall be in strict accordance with Duke Power Company Workmanship Standards for Nuclear Exposures,

10. INSPECTION

10.1 Inspection shall be in strict accordance with Duke Power Company Inspection Standards for Nuclear Exposures,

11. RECORD REQUIREMENTS

11.1 Records for all Class I Level Vendor coating work shall be in strict accordance with Duke Power Company Nuclear Coating Certification CN-MMM-I.

11.2 Records for all Class I Level Field applied coating work shall be in strict accordance with Duke Power Company Construction Procedure M-20.

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

STANDARD APPROVED MATERIALS

BY: Design Engineering DATE 11-1-75 REVISED

SYSTEM CN-000-I-1

3. MATERIALS

3.1 The selection of materials for use in this specification by the applicator or vendor shall be those products listed in Section 3.3 unless specifically defined in Section 3.2. All materials selected shall be from one coating manufacturer.

3.2

3.3 Approved Materials

3.3.1 Coatings manufactured by Carboline Company

DP# 12 Carbozinc 11
DP# 67 Phenoline 305 Finish
DP#
DP#

3.3.2 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.3 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.4 Coatings manufactured by

DP#
DP#
DP#
DP#

3.4 Products are as shown on Duke Power Company Field Coatings Data Sheet VIIA and Manufacturers Product Technical Bulletins.

APPROVED BY QA

I.C. Riddle 11.11.75
APPROVED BY DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP10 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP10-63 (Near White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP10-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

APPROVED BY QA

W. S. Lee 6-11-74
APPROVED BY DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP10 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP10-63 (Near White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP10-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

APPROVED BY QA

W.S. Bamberg 6-11-74
APPROVED BY DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6. APPLICATION FOR DP# 12

6.1 No material shall be applied when the surface or air temperature is below 35°F or above 110°F, when the relative humidity is above 90%, or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Minimum DFT shall be as specified in section 4 when inspected in accordance with SSPC-PA2-72.

6.4 All areas with DFT readings less than specified in section 4 shall be corrected as specified in section 6.7.

6.5 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines based on temperature and relative humidity unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	72 hr.					
50%		60 hr.				
60%			48 hr.			
70%				36 hr.		
80%					24 hr.	
90%						12 hr.

6.6* Drying time for shipment or stacking together of finish coated work shall be in accordance with the following minimum guidelines unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	12 hr.					
50%		8 hr.				
60%			6 hr.			
70%				4 hr.		
80%					2 hr.	
90%						1 hr.

*Adequate cure can be checked by scratching primed surface with a coin. A cured zinc film will polish and an uncured zinc film will wrinkle.

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APPROVED BY DATE

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6.7 Touch Up Procedures with DP# 12

6.7.1 Surface preparation of damaged or bare areas shall be in accordance with DPSP#6, except for areas previously blast cleaned to a DPSP#6 that have no signs of rust blooms which shall be cleared to a minimum DP-SP3.

6.7.2 Application shall be in accordance with section 6.1 through section 6.7 for all previously primed steel not exceeding the drying times specified in section 6.5.

6.7.3 Application for previously primed surfaces which have exceeded drying times specified in section 6.5 shall be the same as 6.7 .2 except material shall be thinned 25% to 50%.

6.7.4 Stacking and loading after touch up shall be in accordance with section 6.6 unless areas touched up do not make contact with other surfaces during stacking and loading.

7. MIXING AND THINNING

7.1 Prior to thinning or application, all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments, and a uniform composition.

7.2 Mixing and thinning shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP# 12 for the product selected.

7.3 Mixed material shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP# 12 for the product selected or prior to any significant change in viscosity, whichever comes first.

7.4 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

7.5 If work is stopped for short periods of time, material will be flushed from the fluid lines and equipment cleaned.

7.6 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

APPROVED BY QA

APPROVED BY DATE 2-11-74

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

BY: Design Engineering DATE 11-1-75 REVISED

6. APPLICATION FOR DP#67

6.1 No material shall be applied when the surface or air temperature is below 50°F or above 120°F, when the relative humidity is above 90%, or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by brush, roller or spray application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Paint that has been stored at low temperatures shall be brought up to a minimum of 70°F before mixing and thinning.

6.4 Prior to thinning or application all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments, and a uniform composition.

6.5 Storage, mixing, thinning, and induction time shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP#67 for the product selected.

6.6 Mixed material shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP#67 for the product selected or prior to any significant change in viscosity, whichever comes first.

6.7 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

6.8 The following procedures are considered good paint practices and shall be followed to insure maximum performance of the product.

6.8.1 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

6.8.2 If application is stopped for short periods of time, material will be flushed from the fluid lines and spray equipment cleaned.

6.8.3 Hot spray application may be used to control fluid temperature and viscosity, but normally should not exceed 90°F fluid temperature.

6.9 Minimum DFT shall be as specified in section 4 when inspected in accordance with SSPC-PA2-72 or based on solids by volume and coverage per gallon for non-metal surfaces.

APPROVED BY QA

T C Roberts 11-11-75
APPROVED BY DATE

NUCLEAR SAFETY RELATED

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

BY: Design Engineering DATE 11-1-75 REVISED

6.10 All areas with DFT readings less than specified in section 6.9 shall receive an additional coat of DP#67.

6.11 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines unless covered by a written project variation procedure.

		Brush	Spray
6.11.1	Below 50°F	Until dry	Until dry
6.11.2	50°F - 70°F	72 hr. - 48 hr.	36 hr. - 24 hr.
6.11.3	70°F - 90°F	48 hr. - 36 hr.	24 hr. - 12 hr.
6.11.4	90°F - 120°F	36 hr. - 24 hr.	12 hr. - overnight

6.12 Drying time for shipment or stacking together of finish coated work shall be in accordance with the minimum guidelines unless covered by a written project variation procedure.

6.12.1	Below 50°F	Do not handle
6.12.2	50°F - 70°F	24 hr.
6.12.3	70°F - 90°F	12 hr.
6.12.4	90°F - 120°F	8 hr.

6.13 Touch Up Procedures

6.13.1 Touch up for damaged areas or bare areas shall be in strict accordance with section 5 of this specification.

6.13.2 Application shall be in strict accordance with section 6.1 through section 6.7.

6.13.3 Touch up for holidays or damage to small areas does not require minimum drying time for previous coats.

6.14 Finished work shall not be subjected to immersion is less than 5 days at temperatures 70°F or higher or in less than 7 days at temperatures below 70°F.

5-10-67-2

APPROVED BY QA
T.C. Tuttle 11-11-75
APPROVED BY DATE

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9. WORKMANSHIP

9.1 All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

9.2 All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

9.3 All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

9.4 Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to topcoating or completion of advanced stages of the operation.

9.5 The following standards of workmanship are considered necessary to accomplish good workmanship and shall be adhered to unless covered by a written project variation procedure.

9.5.1 Coating Materials

9.5.1.1 All paint materials and accessories shall be delivered to the jobsite in original, unopened containers with the manufacturer's labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

9.5 1.2 All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at the minimum-maximum temperatures specified on Duke Power Company Field Coatings Product Data Sheet VII A.

9.5.2 Coating System

9.5.2.1 Only paint materials approved in section 3 of this specification shall be allowed.

9.5.2.2 The DFT of each coat and of the entire system shall meet the requirements of section 4 of this specification for both number of coats and minimum DFT.

APPROVED BY QA

9.5.3 Surface Preparation

9.5.3.1 Cleaning and Painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

9.5.3.2 Where required, imperfections, holes, stictwelds in the surface shall be filled with approved fillers or caulking.

9.5.3.3 Hardware, trim, underwriters labels, manufacturer's serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and prevent damage.

9.5.3.4 All concrete hardners, curing agents and form release agents shall be compatible with the recommended coating system or be removed prior to any coating work.

9.5.4 Masking of Friction Joints and Weld Joints

9.5.4.1 Steel surfaces which are primed with an inorganic zinc primer shall not be masked if the following conditions are specified:

a. Areas to be welded shall be primed with a fully weldable inorganic zinc primer.

b. Areas to be joined with High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be primed with an inorganic zinc primer - either weldable or non-weldable.

Steel surfaces which are primed with an inorganic zinc primer shall be masked back two inches from edges to be welded if they are to become part of a vessel which must conform to the ASME Pressure Vessel Code.

9.5.4.2 Steel surfaces which are primed in the shop shall be masked as noted below if an inorganic primer is used.

a. Areas to be welded shall be masked so that no organic coating is within six (6) inches of the weld prior to the welding operation.

b. Areas to be joined with the High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be masked so that no organic coating is beneath the bolts prior to joining.

c. These requirements shall also apply to organic topcoats when shop applied or when applied prior to assembly or erection.

9.5.5 Application

9.5.5.1 All applied coatings shall be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application procedures.

9.5.5.2 Drying time between coats shall be in accordance with section 6 of this specification, Duke Power Company Field Coatings Product Data Sheet VII A, and the Manufacturer's Product Data Sheets on the specific products in that order of priority.

9.5.6 Mixing and Thinning

9.5.6.1 Mixing and thinning shall be in accordance with section 6 of this specification and Duke Power Company Field Product Data Sheet VII A.

9.5.7 Equipment

9.5.7.1 All equipment shall meet the requirements of section 8 of this specification.

9.5.7.2 All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

9.5.7.3 Effective oil and water separators shall be used and serviced on all air lines.

APPROVED BY QA

A. B. Brumley 6-1-74
APPROVED BY DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

INSPECTION STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

10. INSPECTION

10.1 Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

10.2 The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

10.3 All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor, unless otherwise agreed to in writing by Duke Power Company.

10.4 Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

10.5 Duke Power Company Inspection Procedures for nuclear exposures will be made available to the applicator upon written request or presented in detail at the pre-start up meeting for each project.

APPROVED BY QA

6-13-74
APPROVED BY DATE

SPECIFICATION NO. CN-MMM-I

DATE 2-4-75

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

UNITS 1-2

Title: Nuclear Coating Certification

Specification No. CN-MMM-I

Class I Coatings

REVISION LOG

1 _____

2 _____

3 _____

4 _____

5 _____

Form 301.1/Rev.1

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba 1-2

Title of Specification: Nuclear Coating Certification
Specification No. CN-MMM-I Class I Coatings

File Number: CN-1167.02

Revision:

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Bigger Date: 2-7-75

Checked By: D W Peek Date: 2-7-75

Approved By: S B Hager Date: 2-7-75

Inspection Waived By: S B Hager Date: 2-7-75

Inspection Waived For: X ELECTRICAL ____ MECHANICAL ____ CIVIL

Inspected By: J. J. Wylie Date: 2-7-75

Inspected By: ____ Date: ____

QUALITY ASSURANCE T. C. Roberts Date: 2-10-75

****

(FOR ASME CODE ITEMS)

____ Division Date: ____
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SIGNATURE: ____

NAME: ____
Registered Professional Engineer

No. ____

Form 301.2/Rev 1

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. CN-MMM-I

By: Design Engineering Date: 2-4-75 Revised:

1. PURPOSE AND SCOPE

1.1 The purpose of this specification is to implement planned and systematic actions necessary to provide Duke Power Company with adequate confidence that a coating material has been properly manufactured and applied in a shop to Class I Servica level substrates of nuclear facilities.

1.2 This specification establishes minimum records required for coating materials, surface preparation, application of materials and inspection.

1.3 The procedure conforms to Section 1.2.4 ANSI N101.4-1972 (American National Standard Institute - Quality Assurance for Protective Coatings Applied to Nuclear Facilities).

2. ATTACHMENTS

2.1 The following Duke Power Co. attachments are attached to and made a part of this specification.

2.1.1 Duke Power Company Quality Assurance Department Supplier Quality Assurance Certification - Form 930.1.

2.1.2 Coating Materials - Manufacturer's Product Identity Certification Record - DPNC Form 2.

2.1.3 Duke Power Company Supplier Quality Assurance Record - DPNC Form 3.

3. GENERAL REQUIREMENT

3.1 The Duke Power Company QA Department Supplier Quality Assurance Certification Form 930.1 shall be completed by the supplier for all Class I coating work.

3.1.1 One copy of Form 930.1 shall accompany each shipment to the jobsite.

3.1.2 Two copies of Form 930.1 per shipment shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.1.3 Form 930.1, when completed as specified, shall be authorization for Duke Power Construction to accept delivery of components and materials. Absence of properly completed QA Certification form shall result in quarantine or return of the component or materials to the supplier.

3.2 A coating material - Manufacturer's Product Identity Certification Record (DPNC Form #2) shall be obtained from the coating manufacturer for each batch of paint and thinner used by the vendor on Class I components.

3.2.1 Two copies of each DPNC Form #2 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.2.2 DPNC Form #2 shall be enclosed to cover each batch of material used on any or all components or materials shipped as listed on Duke Power Company QA Department Supplier Quality Assurance Certification.

3.3 A Duke Power Company Supplier Quality Assurance Record (DPNC Form 3) shall be filled out for all Class I coating work.

3.3.1 A separate form may be used to cover the following combinations of materials and components.

3.3.1.1 All work in each shipment.

3.3.1.2 Different types of components in each shipment.

3.3.1.3 Series of similar types of components in each shipment.

3.3.2 Two copies of DPNC Form 3 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.3.3 Failure of the vendor to meet all requirements of the bid specification or incomplete and inaccurate QA Documentation shall result in rejection by the owner of any or all components covered by that DPNC Form 3.

4. DOCUMENTATION

This section contains additional explanations and examples to aid the vendor in properly completing the forms listed in sections 2.1.1, 2.1.2, and 2.1.3.

4A. DPNC Form 3 (Sample Form attached).

4.1 Identify components or equipment so that separate items are traceable, and can be matched up with a specific Report No.

4.2 Example: Carbon steel, cast iron, stainless, aluminum, etc.

4.3 This information is for items covered by each DPNC Form 3.

4.4 Information should be reported in even gallons for items covered by each DPNC Form 3.

4.5 List all information required for each batch of material used on components covered by this DPNC Form 3 and attach a DPNC Form 2 for each batch of material listed on this DPNC Form 3.

4.6 Duke Power Company Design Specification used.

4.7 Examples: Steel grit, silica sand, glass beads, garnet.

4.8 Examples: 8/20, 8/35, 16/35, 30/50, etc.

4.9 Example: Xylol, methyl ethyl ketone, etc.

4.10 Read pressure at nozzle with ANG air needle gauge or equal. (Do not use pressure at compressor.)

4.11 Was moisture trap used effectively (yes) (no)?

4.12 Temperatures are to be taken in actual work areas and shall cover all conditions during surface preparation and exposure of components cleaned prior to priming.

4.13 Indoors - In a closed building kept at ambient temperatures.

4.14 Outdoors - Exposed to weather (even if under a roof).

4.15 Example - Brush, roller, spray, flow coated, etc.

4.16 Example - Graco airless, Devilbiss conventional.

4.17 Example - E Fluid Tip.

4.18 Example - #704 Air Cap.

4.19 Example - Yes (motor driven), yes (manual), (no).

4.20 Was oil separator used effectively? (yes) (no)

4.21 Report actual total dry film thickness after primer, intermediate and finish coat.

4.22 Report number to be same on both front and back page. Report numbers shall be logged and numbered in sequence from 1 to ____ to cover all reports of a given Duke Power Company Bid Specification.

48. DPNC Form 2

4.23 The vendor shall fill out the General Data Section and attach a DPNC Form 2 to the purchase order sent to the coating manufacture.

4.24 The coating manufacturer shall complete the Component Data Section, Mixed Component Data Section and Signature and Title section and return to the vendor.

4C. Form 930.1.

4.25 In space 1 write "Components inspected and are in compliance with Nuclear Coating Certification Specification CN-MMM-I, dated 2-4-75".

4.26 List Report Nos. for all DPNC Form #3, under QA Documentation Required on the Form 930.1 for each shipment.

SAMPLE

DPHC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. (4.1) _____

GENERAL INFORMATION

Substrate Material: (4.2) _____

Estimated Surface Area Coated
Sq. Ft./Item (4.3) No. Items (4.3) Total Sq. Ft. (4.3)

Estimated Coating Quantities Primer (4.4) Gal. Intermediate (4.4) Gal. Finish (4.4) Gal.

Date Work Began (4.3) Date Work Completed (4.3)

Duke Power Coating System	Dated	Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED
(4.5)	(4.5)	(4.5)	(4.5)	(4.5)	(4.5)

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

SAMPLE

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. (4.6)

Abrasive: Type (4.7) Solvent: Type (4.9)

Size (4.8) Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure (4.10) Moisture Trap (4.11)

Temperature	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors (4.13) Outdoors (4.14) Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application (4.15)

Spray:

Type Spray Gun (4.16) Agitator Pot (4.19)

Fluid Tip (4.17) Moisture Trap (4.11)

Air Cap (4.18) Oil Separator (4.20)

Temperature:	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	(4.21) DFT	(4.21) DFT	(4.21) DFT
Intermediate	(4.21) DFT	(4.21) DFT	(4.21) DFT
Finish:	(4.21) DFT	(4.21) DFT	(4.21) DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

DPNC FORM 2

COATING MATERIALS - MANUFACTURER'S PRODUCT IDENTITY CERTIFICATION RECORD
GENERAL DATA

PURCHASER _____

BILLING ADDRESS _____

SHIPPING ADDRESS _____

PROJECT DESIGNATION _____

DATE _____ PURCHASE ORDER NO. _____ RELEASE NO. _____

COATING MANUFACTURER _____

PRODUCT DESIGNATION _____

GALLONS ORDERED _____ GALLONS SHIPPED _____ REFERENCE NO. _____

COMPONENT DATA

	MIXED		INDIVIDUAL	
COMPONENT				
BATCH NO.				
GAL. ORDERED				
GAL. SHIPPED				
DATE MFG'D.				
SHELF LIFE				
SOLIDS BY VOLUME				
*WT./GAL.				
**VISCOSITY				
MIXING RATIO BY VOL.				

*(By Fed. Test Method Std. No. 141, Method 4814± or by ASTM D1475)
**(Method _____ @ _____ °F)

MIXED COMPONENT DATA

GENERIC TYPE _____ POT LIFE _____ @ _____ °F

FLASH POINT (TOC) _____ DFT PER COAT _____ INDUCTION PERIOD _____ @ _____ °F

COLOR (VISUAL) _____

RECOAT TIME RANGE _____ @ _____ °F _____ %R.H.

DRY HARD _____ HRS. @ _____ °F _____ %R.H.

TACK FREE _____ HRS. @ _____ °F _____ %R.H.

COMMENTS:

Signature _____

Title _____

Date _____

Checked By _____

Revision 1 Dated 12-4-73

Revision 2 Dated 1-4-74

Distribution: 1 copy with shipment
2 copies Duke Civil Design

CN-S-13-3-7

OPNC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project: _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. _____

_____

_____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area Coated
Sq. Ft./Item _____ No. Items _____ Total Sq. Ft. _____

Estimated Coating Quantities — Primer _____ Gal. Intermediate _____ Gal. Finish _____ Gal.

Date Work Began _____ Date Work Completed _____

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

Date 6-1-74; Revised

CN-5-1,-3-8

Report No. _____

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. _____

Abrasive: Type _____ Solvent: Type _____

Size _____ Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure _____ Moisture Trap _____

Temperature	Ambient	Surface	Dew Point
Max.:	_____ °F	_____ °F	_____ °F
Min.:	_____ °F	_____ °F	_____ °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application _____

Spray:

Type Spray Gun _____ Agitator Pot _____

Fluid Tip _____ Moisture Trap _____

Air Cap _____ Oil Separator _____

Temperature:	Ambient	Surface	Dew Point
Max.:	_____ °F	_____ °F	_____ °F
Min.:	_____ °F	_____ °F	_____ °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	_____ DFT	_____ DFT	_____ DFT
Intermediate	_____ DFT	_____ DFT	_____ DFT
Finish:	_____ DFT	_____ DFT	_____ DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

Name of Supplier _____ Item No. _____

Address of Supplier Plant _____ Spec. No. _____ Rev. ____

Component(s) or Material Date _____

_____ Shipping ID No. _____

_____ Release No. _____

Mill Power Order No. _____

Certification Included _____ Full _____ Partial _____

The following listed tests and inspections have been completed as required by specification: (If partial certification, list materials or components for which certification applies.)

1) _____

2) _____

3) _____

Physical and Chemical Analysis	____	Major Repair Records and Chart	____
Design Report	____	Repair NDT	____
Stress Report	____	Hydro (Test Press.-PSIG ____)	____
Heat Treatment	____	Cleanliness	____
Radiographic Test	____	Operating Test	____
Ultrasonic Test	____	Performance Curve	____
Magnetic Particle	____	ASME Data Report	____
Penetrant Tests	____	Personnel Qualifications on Record	____

Deviation Record _____

The following QA Documentation as required by the specification is attached to the original copy of this form: (If partial certification, include documentation applicable only to this specific shipment.)

DPNC Form #3 (List Report No.) _____

_____

_____

(continued)

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

The listed component(s) or material(s) conform to the requirements of Duke Power Company Specification _____ with the approved deviations noted above. The QA documentation has been completed and attached to this form. No later than component or material shipment, the compliance QA documentation packet is being transmitted to Duke Power Company

H. L. Huggett
Quality Assurance Manager, Engineering
Quality Assurance Department
P. O. Box 2178
Charlotte, N. C. 28242

A copy of this completed Supplier Quality Assurance Certification form will be included with shipping papers and shipped with the component to Duke Power Company, at the address designated in the specification. This is to certify that the item of equipment identified above fully meets the requirement of the above listed specification including all of the codes, standards, test requirements, and quality assurance requirements invoked therein.

_____
Supplier Representative Authorized Signature

Title _____ Date _____

Form 930.18/Rev. 2

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

Rev. 11-1-75

COMPANY: Carboline Company
PRODUCT NAME: Carbo Zinc #11

DP NO: 12 rev. 11-1-75
DATE: 1-1-74, rev.3-10-75
PRODUCT NO: Carbo Zinc #11

PRODUCT DESCRIPTION: An inorganic ethyl silicate zinc rich metal primer formulated for excellent weathering and abrasion resistance. Affords cathodic protection of the steel. Can be applied to load bearing surfaces.

USAGES: As a shop or field primer over blast cleaned steel surfaces exposed to long term weathering before being topcoated or severe moisture after being topcoated with an epoxy, vinyl, urethane, chlorinated rubber or latex finish.

PRODUCT INFORMATION

PIGMENT TYPE:	Metallic Zinc Inerts
VEHICLE TYPE:	Inorganic ethyl silicate
SOLVENTS & DILUENTS:	Glycol ether, Aromatic Solvents
COLOR:	Gray or Green
GLOSS:	Flat
SOLIDS BY VOLUME:	60%
SOLIDS BY WEIGHT:	80%±
WEIGHT PER GALLON:	21.2 lbs.
THEO. COVERAGE @ 1.0 DFT:	1,000 sq. ft.
THEO. COVERAGE @ 2.5 DFT:	400 sq. ft.
VISCOSITY:	NA
PIGMENT VOLUME CONCENTRATION:	
FLASH POINT:	86°F
TOXICITY:	Aromatic & Ketone solvents, zinc dust
SHELF LIFE:	9 Months +
STORAGE TEMPERATURE:	25°F - 125°F
PACKAGED:	2 Component

APPROVED BY QA
TC Lobitz 11-11-75
APPROVED BY DATE

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior and Exterior (topcoated)
FLEXIBILITY:	Poor
ABRASION:	Excellent
NORMAL DFT PER COAT:	2.0 - 3.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	750°F	750°F	120°F
INTERMITTENT:	850°F	850°F	120°F

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	LR	NR	NR
ALKALI	R	NR	NR
SOLVENT	R	R	R
SALT	R	R	R
WATER	R	R	R

NUCLEAR SAFETY-RELATED

MANUFACTURER PRODUCT NO: Carbo Zinc #11 DUKE POWER NO: 2

MIXING: Pour liquid resin (10 parts by weight) into a clean dry metal container, sift zinc (22 parts by weight) into the resin while stirring with power mixer until smooth and free from lumps. Box after thinning.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	Self	SP#6, 10	SP#5, 10
Galvanized	Self	SP#6, 10	SP#5, 10

FINISH COATS: DP#53, 62, 63, 64, 67, 68, 69, 70, 73, 74, 75

APPLICATION:	PREFERRED	Conventional Spray or Special airless
	LIMITED	Brush (touch up)
THINNER:	BRUSH/ROLL	High Temperature #33, Low Temperature #26
	SPRAY	High Temperature #33, Low Temperature #26
	CLEAN-UP	Ketones
THINNING %:	BRUSH/ROLL	0-20
	SPRAY	0-20
POT LIFE (+) @:	50°F	14 hr.
	70°F	10 hr.
	90°F	6 hr.

DRYING TIME (+):	TOUCH	HANDLE	HARD	RECOAT
50°F	1 hr.	4 hr.	3-48 hr.	
70°F	45 min.	3 hr.	Depending upon temperature and	
90°F	30 min.	2 hr.	relative humidity.	

EQUIPMENT:

COMMENTS:

1. Do not exceed 6.0 mils dft.
2. Do not topcoat with alkyds, or oil based coating.
3. Material must have rough surface profile for proper adhesion.
4. Apply wet--do not dry spray or allow excessive overspray.
5. Material is moisture cured.

APPROVED BY QA
IC Elliott 11-11-25
APPROVED BY DATE

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Carboline Company
DP NO: 67
DATE: 11-1-75
PRODUCT NAME: Phenoline 305 Finish
PRODUCT NO: 305 Finish

PRODUCT DESCRIPTION: A phenolic epoxy formulated for good abrasion, moisture and chemical resistance.

USAGES: As an intermediate or finish coat over numerous surfaces subject to intermittant moisture and chemical contamination where a high gloss finish is required or surfaces to be finish coated with epoxies or urethanes.

PRODUCT INFORMATION

PIGMENT TYPE:	Titanium Dioxide, Inert silicates
VEHICLE TYPE:	Modified Phenolic Resin
SOLVENTS & DILUENTS:	Phenoline Thinner
COLOR:	Various
GLOSS:	Medium
SOLIDS BY VOLUME:	72%
SOLIDS BY WEIGHT:	81%
WEIGHT PER GALLON:	11.1 lbs.
THEO. COVERAGE @ 1.0 DFT:	1280 Sq Ft.
THEO. COVERAGE @ 4.0 DFT:	320 Sq. Ft.
VISCOSITY:	80-100 Ku
PIGMENT VOLUME CONCENTRATION:	22%
FLASH POINT:	215°F Cleveland O C
TOXICITY:	Moderate Skin Sensitizer
SHELF LIFE:	2 yrs.
STORAGE TEMPERATURE:	25°F - 125°F
PACKAGED:	2 Component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior and Exterior
FLEXIBILITY:	Good
ABRASION:	Excellent
NORMAL DFT PER COAT:	3.0 - 4.0 DFT
RECOMMENDED DFT:	4.0 DFT

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	200°F	200°F	NR
INTERMITTENT:	250°F	250°F	NR

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	R	R	LR
ALKALI	R	R	LR
SOLVENT	R	R	LR
SALT	R	R	LR
WATER	R	R	LR

APPROVED BY QA
TC Roberts 11-11-75
APPROVED BY DATE

NUCLEAR SAFETY RELATED

MANUFACTURER PRODUCT NO: Phenoline 305 Finish DUKE POWER NO: 67

MIXING: Mix 4 parts by volume of base to 1 part by volume of catalyst. Stir thoroughly with power mixer and box after thinning.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	DP#12	SP6	SP5, SP10

FINISH COATS: DP#67, 34, 62, 69, 72

APPLICATION:	PREFERRED	Spray, Roller
	LIMITED	Brush
THINNER:	BRUSH/ROLL	0 - 15%
	SPRAY	0 - 15%
	CLEAN-UP	Phenoline Thinner
THINNING %:	BRUSH/ROLL	Phenoline Thinner
	SPRAY	Phenoline Thinner
POT LIFE (±) @:	50°F	3 hr.
	70°F	1½ hr.
	90°F	1 hr.

DRYING TIME (±):

	TOUCH	HANDLE	HARD	RECOAT
50°F	16 hr.	24 hr.	8 days	24 hr.
70°F	8 hr.	12 hr.	4 days	18 hr.
90°F	6 hr.	8 hr.	3 days	12 hr.

EQUIPMENT:

COMMENTS:

APPROVED BY QA

T.C. Robb 11-11-75

APPROVED BY DATE

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

Specification CNS-1205.04-1
Date 12/18/78
Revision 1
Attachment No. 5.15

WALL THICKNESS VERIFICATION

1.0 The valve manufacturer must document and provide a record of wall thickness measurements on all pressure boundary items showing actual measurements and corresponding wall thickness required by the applicable ASME Code and manufacturers design. All such documented records should state the measurement accuracy. Measurement error when subtracted from the measured wall shall result in wall thickness equal to or greater than the required minimum wall thickness. A written procedure for verifying specified minimum wall thickness shall be submitted for owners approval and must be approved before use. The procedure shall provide for the following information dependent upon which measurement method is utilized.

1.1. Direct Physical Measurement Method

1.1.1 Tools used for measurement including manufacturing tolerence of each.

1.1.2 Cross section sketch of valve identifying areas that will be verified.

1.1.3 identify methods of recording data.

1.2 Ultrasonic Measurement Method

1.2.1 Identify the equipment by manufacturer and model.

1.2.2 State how equipment will be calibrated and operated.

1.2.3 Cross section sketch of valve identifying areas that will be verified.

1.2.4 State how error repeatability and accuracy is applied to verification measurements.

1.2.5 Identify method of recording data.

2.0 Wall thickness measurements and inspection shall be accomplished after final machining.

3.0 The valve manufacturer shall notify owner's Quality Assurance Department at the start of wall thickness inspection and verification. Owner may elect to witness wall thickness verification; however, manufacturer may proceed with inspection without owner's representative's presence.

DUKE POWER COMPANY

ALL STATIONS

INSTRUCTION MANUAL REQUIREMENTS FOR MECHANICAL EQUIPMENT

1.0 GENERAL

This specification attachment details requirements for Instruction Manuals provided for power plant equipment supplied as required in the general Equipment Specification.

2.0 BINDERS

2.1 All Instruction Manuals shall be provided with quality binders suitable for extended inplant use. Literature provided without binders is not acceptable.

2.2 All binders shall clearly indicate on the front cover the following information:

2.2.1 Applicable Plant and Unit Number

2.2.2 Equipment or Component Title as specified in the Equipment Specification

2.2.3 Duke Power Company Specification Number

2.2.4 Manufacturer's Model Number and Serial Number

3.0 FORMAT AND ORGANIZATION

The following format and sequence of organization shall be used for all Instruction Books. Each specific sub-section shall carry the paragraph number indication. Further sub-division within a specific sub-section shall be sequentially decimally indicated (for example 3.0, 3.1, 3.1.1, etc).

1.0 Title Page - Give all information specified under Paragraph 2.2 as well as manufacturer's name, division, address, etc.

2.0 Certification Page - Appropriate Code and/or Supplier's normal Quality Assurance Certification with appropriate Professional Engineer Seal and signoff shall be furnished.

3.0 Table of Contents

4.0 Physical Description and Operation of Equipment - This section shall give appropriate physical data and operating information for the specified piece of equipment. See Paragraph 4.1 for specific requirements and content for this section.

5.0 Design Conditions - See Paragraph 4.2 below for specific requirements and content for this section.

6.0 Operating Conditions - See Paragraph 4.3 below for specific requirements and content for this section.

7.0 Test Conditions - See Paragraph 4.4 below for specific requirements and content for this section.

8.0 Operating Precautions and Limitations - See Paragraph 4.5 below for specific requirements and content for this section.

9.0 Installation Instructions - See Paragraph 4.6 below for specific requirements and content for this section.

10.0 Maintenance Requirements - See Paragraph 4.7 below for specific requirements and content for this section.

11.0 Periodic In-Service Testing Recommendations and Procedures - See Paragraph 4.8 below for specific requirements and content for this section.

12.0 Maintenance Instructions - See Paragraph 4.9 below for specific requirements and content for this section.

13.0 Storage Requirements - See Paragraph 4.10 below for specific requirements and content for this section.

14.0 Reference Drawings - See Paragraph 4.11 below for specific requirements and content for this section.

4.0 SPECIFIC CONTENT REQUIREMENTS

The following paragraphs give minimum requirements for each section defined under Paragraph 3.0. Certain specified requirements may only be applicable to generic equipment (e.g., pumps, filters, etc). Where package units are supplied the required information shall be organized such that the user can clearly understand to which sub-component the provided information applies. All information provided shall accurately reflect the as-built condition of the equipment.

4.1 Physical Description and Operation of Equipment

4.1.1 A general description of each piece of equipment shall be provided. For example, for a heat exchanger: total tube surface, number of tubes, total volume, etc. It will be acceptable to specifically reference equipment drawings if they are included in Section 12 of the Manual.

4.1.2 A description shall be provided as to the intended operation of the equipment. Sufficient detail shall be provided to allow the user to startup, operate, and shutdown the equipment.

4.1.3 Other general information shall be provided that the manufacturer feels would be beneficial for training operations and maintenance personnel in the use of their equipment.

4.2 Design Conditions

4.2.1 Applicable Code of Design and Construction

4.2.2 Design Temperature

4.2.3 Design Pressure

4.2.4 Design Flowrate

4.2.5 Design Pressure Drop at Design Flowrate

4.2.6 Performance Data and/or Curves (where applicable)

4.3 Operating Conditions

4.3.1 Operating Temperature

4.3.2 Operating Pressure

4.3.3 Operating Flowrate

4.3.4 Operating Pressure Drop at Operating Flowrate

4.4 Test Conditions

4.4.1 Hydrostatic or Pneumatic Leak Test Pressure

4.4.2 Operating Time Test - For components requiring such test provide real time limits used (e.g., valve operators, etc).

4.5 Operating Precautions and Limitations - This section shall provide the following information as listed for each generic item provided.

4.5.1 Pumps, Compressors, Vacuum Pumps

4.5.1.1 Maximum Allowable Hydrostatic Test Pressure

4.5.1.2 Maximum Allowable Flowrate - Specific time limitations shall be specified at this flowrate if applicable.

4.5.1.3 Minimum Allowable Flowrate - Specific time limitations shall be specified at this flowrate if applicable.

4.5.1.4 Maximum Allowable Bearing Temperature

4.5.1.5 Maximum Allowable Bearing Oil Pressure

4.5.1.6 Maximum and Minimum Cooling Flowrates for Bearings, Oil Coolers, etc.

4.5.2 Heat Exchangers, Coolers, and After Coolers

4.5.2.1 Maximum Allowable Hydrostatic or Pneumatic Test Pressure - Specify for both tube and shell sides.

4.5.2.2 Maximum Allowable Flowrate - Specify for both tube and shell sides.

4.5.2.3 Maximum Allowable Differential Temperature - Specify for both tube and shell sides.

4.5.2.4 Maximum Allowable Heat-up Rates - Specify for both tube and shell sides.

4.5.3 Fluid Filters, Strainers, and Dryers

4.5.3.1 Maximum Allowable Hydrostatic or Pneumatic Test Pressure

4.5.3.2 Maximum Allowable Flowrate and Pressure Drop

4.5.4 Miscellaneous Equipment (such as Valve, Sight Glasses, etc)

4.5.4.1 Maximum Allowable Hydrostatic or Pneumatic Test Pressure

4.5.4.2 Maximum Allowable Flowrate

4.5.5 Air and Gas Filters

4.5.5.1 Testing and Operating Limitations as required by the Manufacturer with applicable Codes and Standards.

4.5.6 Associated Motors and Gear Trains (furnished with equipment)

4.5.6.1 Starting Duty - Specific number of starts allowable, required run time prior to restart.

4.5.6.2 Maximum Allowable Bearing Temperature

4.6 Installation Instruction

4.6.1 Lifting and Handling Requirements and Limitations

4.6.1.1 Any unacceptable mounting positions, installation restrictions, etc, shall be provided in this section.

4.6.2 Assembly Instruction

4.6.2.1 Detailed information shall be provided as to assembly sequence, assembly precautions, and recommended tooling and support. Assembly drawings as necessary shall be provided and included under Paragraph 14.0 of the Instruction Manual.

4.6.2.2 Initial alignment tolerances shall be specified as applicable.

4.6.2.3 Maximum and minimum torque values shall be provided for each mechanical fastener.

4.6.2.4 Detailed information shall be provided as to foundation or base requirements, grouting, doweling, etc.

4.6.3 Alignment Instructions

4.6.3.1 Detailed information shall be provided as required for shimming equipment, soleplates, etc, for initial alignment.

4.6.3.2 Any restrictions or tolerances as to thermal setting shall be provided.

4.6.4 Vibration

4.6.4.1 Detailed requirements as to allowable shaft and bearing housing vibration levels shall be provided

4.6.5 Pre-operational Checklist

4.6.5.1 For complex equipment requiring sophisticated start-up, a checklist shall be provided to aid in start-up. Items such as relief valve setpoint check, switch calibration, etc, shall be provided. If initial start-up is substantially different from normal start-up, two checklists shall be provided.

4.7 Maintenance Requirements

4.7.1 Recommended preventative maintenance details and frequencies shall be provided.

4.7.2 Recommended stock maintenance materials (including gaskets) shall be specified for both normal and severe service.

4.7.3 Complete lubrication instructions shall be specified including points of lubrication, capacity at each point, frequency at each point, and lubricant specification.

4.8 Periodic In-Service Testing Recommendations and Procedures

4.8.1 Detailed recommendations and procedures for all periodic testing required to demonstrate proper operation shall be provided.

4.9 Maintenance Instructions

4.9.1 Detailed information as to dis-assembly and re-assembly sequence, precautions, and tooling shall be provided. Supporting drawings as necessary shall be provided and included in Paragraph 12.0 of the Instruction Manual.

4.9.2 Re-alignment tolerances shall be provided as applicable.

4.9.3 Maximum and minimum torque values shall be provided for each applicable mechanical fastener.

4.9.4 A recommended "Trouble Shooting" chart shall be provided specifying types of trouble, probable causes, and resolutions.

4.10 Storage Requirements

4.10.1 Detailed information shall be provided as to long term storage requirements including any required long term storage maintenance.

4.10.2 Periodic recommended inspections during long term storage shall be provided.

4.11 Reference Drawings

4.11.1 All drawings referenced in any sections of the manual shall be included in this section. It will not be acceptable to merely reference fabrication drawings.

4.11.2 All drawings shall be of sufficient quality for reproduction by standard copy processes.

4.11.3 As a minimum, the following drawings shall be provided:

4.11.3.1 A complete outline drawing (or drawings) showing principal exterior dimensions, required maintenance areas, center of gravity, lifting points, and direction of shaft rotation where applicable.

4.11.3.2 A complete assembly drawing (or drawings) showing all parts in the properly assembled relationship to each other. Each part shall be numbered and identified as required in 4.10.3.3. These drawings may be sectional, exploded, or both.

4.11.3.3 A complete bill of materials for the equipment, listing each part by number as it appears on the assembly drawing, spare part numbers and material. Where certain parts or components are supplied by a sub-vendor, the sub-vendor's name, and his part number shall be specified.

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

Name of Supplier _____ Date _____

Address of Supplier Plant _____ Mill Power Order No. _____

_____ Duke Item or Req. No. _____

_____ Spec. No. _____ Rev. ___

Supplier ID Nos. _____

Description of Component(s) or Material(s) _____

_____

_____

___ Attached Documentation covers all Components/Materials on Mill Power Order.*
___ Attached Documentation covers partial shipment of Components/Materials on Mill Power Order.

The following listed tests, inspections and reports have been completed as required by the specification:

___ Physical & Chemical Analysis
___ Hydro (Test Pressure - PSIG _____)
___ Major Repair Records & Charts
___ Personnel Qualifications on Record

___ Design Report
___ Radiographic Test
___ Penetrant Test
___ Operating Test
___ Dimensional Check
___ Stress Report
___ Ultrasonic Test
___ Repair NDE
___ Performance Curve
___ Deviation Record # _____
___ Heat Treatment
___ Magnetic Particle
___ Cleanliness
___ ASME Data Report

1) _____

2) _____

3) _____

This certifies that the listed Component(s) or Material(s) conform to the requirements of the above referenced Duke Power documents including all codes, standards, test requirements and Quality Assurance requirements invoked therein.

_____
Supplier Representative Authorized Signature

Title _____ Date _____

(See Instructions)

Form 930.1A / Rev. 3

INSTRUCTIONS FOR COMPLETING DUKE FORM 930.1

This form should be completed as outlined for each shipment of components or materials. The original shall be sent, along with any required documentation, to Duke's QA Department no later than the shipment date. A copy shall accompany shipment to the site.

Address original to:

QA Manager, Engineering & Services
Quality Assurance Department
Duke Power Company
P O Box 2178 33189
Charlotte, North Carolina 28242

ALL INFORMATION TO BE TYPED OR CLEARLY PRINTED IN INK

NAME OF SUPPLIER: Name of company supplying equipment or materials to Mill Power Supply Company or Duke Power Company.

ADDRESS OF SUPPLIER PLANT: Address of plant where principal fabrication of work was performed on components or materials.

DATE: The date form is filled out.

MILL POWER ORDER NO: The printed number in the upper right-hand corner of the Mill Power Supply Company Purchase Order.

DUKE ITEM OR REQ. NO: The number near the top of the "Description" Section of the Mill Power Supply Company Purchase Order identified as "Item No ___" or "Requisition No _____".

SPEC NO _____ REV _____: The number and revision number of the Duke Power Company specification to which the component or material was fabricated or supplied. If the material or equipment was not supplied to a Duke Power Company specification write "N/A".

SUPPLIER ID NOS: Identification numbers of component(s) or material(s) shipped. (May be Bill of Laden numbers or other serialization provided by supplier.)

DESCRIPTION OF COMPONENT(S) OR MATERIAL(S): A brief description of the Component(s) or Material(s) shipped under this certification. These must be singularly identifie from all other certifications and shipments. (Include quantities as appropriate.)

ATTACHED DOCUMENTATION COVERS ALL COMPONENTS/MATERIALS ON MILL POWER ORDER: Check blank if (1) the entire order is being completed in one shipment, or (2) the final shipment of a multi-shipment order.

ATTACHED DOCUMENTATION COVERS PARTIAL SHIPMENT OF COMPONENTS/MATERIALS ON MILL POWER ORDER: Check blank if shipment does not constitute the complete order and is not the final shipment in a multi-shipment order.

THE FOLLOWING LISTED TESTS, INSPECTIONS AND REPORTS HAVE BEEN COMPLETED AS REQUIRED BY THE SPECIFICATION: Indicate all tests and inspections performed, and all documentation being transmitted as per specification and/or purchase order. Use blank lines as necessary for additional tests or record of deviations.

SUPPLIER REPRESENTATIVE AUTHORIZED SIGNATURE: The signature of the Corporate or Plant Quality Assurance or Quality Control Manager or his authorized representative.

TITLE _____ DATE _____: The title of the individual signing the certification and the date of signature.

DUKE POWER COMPANY

VALVE LIST DESCRIPTION

GENERAL:

This valve list description will supply the vendor with the necessary information required to interpret Duke Power Company Valve Lists. Each column of the valve list and the abbreviations used are defined. Information defined by the following notes is not directly referenced to by the valve list but is, in fact, an extension of each valve list.

All valves are to meet Duke Power Company Valve Specifications as presented to vendor on award of contract.

NOTES:

A) Valve List Numbering System

Code

CN-1500-16

(Body Material)

10	Stainless Steel 2 1/2" and larger (Nuclear)
11	Stainless Steel 2 1/2" and larger (Conventional)
12	Carbon Steel 2 1/2" and larger (Nuclear)
13	Carbon Steel 2 1/2" and larger (Conventional)
14	Stainless 2 1/2" and larger (Nuclear)
15	Cast Iron
16	Stainless Steel 2 1/2" and larger (Nuclear)
17	Stainless Steel 2 1/2" and larger (Conventional)
18	Carbon Steel 2 1/2" and larger (Nuclear)
19	Carbon Steel 2 1/2" and larger (Conventional)
20	Carbon Steel 2 1/2" and larger (Nuclear)
21	Carbon Steel 2" and smaller (Conventional)
22	Carbon Steel 2" and smaller (Nuclear)
23	Stainless Steel 2" and smaller (Conventional)
24	Stainless Steel 2" and smaller (Nuclear)
25	Stainless Steel - Plug Valves (Conventional)
26	Stainless Steel - Plug Valves (Nuclear)
27	Carbon Steel - Diaphragm Valves (Conventional)
28	Carbon Steel - Plug Valves (Nuclear)
29	Aluminum - Diaphragm Valves (Conventional)
30	Stainless Steel - Diaphragm Valves (Nuclear)
31	Bronze Diaphragm Valves (Conventional)
32	Carbon Steel - Diaphragm Valves (Nuclear)
33	Carbon Butterfly Valves (Conventional)
34	Carbon Steel Butterfly Valves (Nuclear)
35	Carbon Steel Butterfly Valves (Conventional)
36	Carbon Steel Butterfly Valves (Nuclear)
37	
38	Solenoid Valves (Nuclear)
39	Carbon Steel Butterfly Valves (Conventional)
76	Carbon Steel Wafer Check Valves (Nuclear)

(Pres. Class)

125#	400#	1500#	4500#
150#	600#	2500#	
300#	900#	3500#	

Station Symbol

Valve list number will appear at the top of each sheet of the applicable valve list; along with the latest revision number and date revised.

B) Item Number (First Column of Valve List)

Each valve shall have a metal tag, permanently secured to the valve yoke or as otherwise defined and as called for in the valve specification, which will show the item number of the valve.

Item Number Code — Definition

02 A - 199

- 199 — Identification Number
- A (Pres. Class)

A-125#	G-600#
B-150#	H-900#
C-Spare	J-1500#
D-300#	K-2500#
E-Spare	L-3500#
F-400#	M-4500#

- 02 (Body Material)

01. (Spare)	
02. Carbon Steel	
03. (Spare)	
04. Stainless Steel	
05. Stainless Steel	
06. Carbon Steel	
07. (Spare)	
08. (Spare)	
09. Stainless Steel	
10. Aluminum	
11. Bronze	

* All materials required for use in DPCo classification A, B, C, D, E, F, G, and H (see item "C" this description) will be procured in accordance with the applicable Specification.

Item numbers succeeded by an asterisk denote valves located within the reactor building. Please refer to the applicable Duke Power Company Specification regarding these valves.

C) Duke Valve Class (Second Column of Valve List)

This note described the different Duke Class and applicable Design Criteria for each class of valves.

DPCo Class	Design Criteria	Seismic Loading
A	ASME Section III, Class 1	Yes
B	ASME Section III, Class 2	Yes
C	ASME Section III, Class 3	Yes
D	ASME Section III, Class 2	No
E	ANSI B31.1.0	No
F	ANSI B31.1.0	Yes
G	ANSI B31.1.0	No
H	ANSI B31.1.0	No

D) Type (Third Column of Valve List)

This note describes the different types of valves and is used by Duke Power Company.

Code	Definition
SN	Solenoid Valve
GT	Gate Valve
GL	Globe Valve
CK	Check Valve
DP	Diaphragm Valve
BF	Butterfly Valve
PV	Plug Valve
NV	Needle Valve

E) Quantity (Fourth Column of Valve List)

Column 4 of the valve list gives the quantity required. Each valve should be tagged with an item number as outlined in B) of this description.

F) Size (Fifth Column of Valve List)

All sizes are nominal pipe size (NPS) and will be given in inches.

G) Manufacturers Figure Number (Sixth Column of Valve List)

Column 6 of the valve list will give the manufacturer's drawing or figure number. This column will be completed when Duke knows the appropriate number required. When this column is left blank, the valve manufacturer will supply the valve most suitable for Duke's requirements as spelled out on the valve list.

H) Operator (Seventh Column of Valve List)

Code	Definition
HW	Manufacturer's standard handwheel
CW	Chainwheel Operated (valve will be installed with stem in horizontal position and arranged for chain wheel operation). Chainwheel only shall be furnished with valve and shall be mounted by the manufacturer prior to shipment (Chain by Duke Power Company).
EMO	Electric Motor Operated - Unless otherwise stated, Electric Motor Operators will be supplied in accordance with the Specification. EMO succeeded by an asterisk (*) indicates that valve has a safety-related function and must meet the Electric Valve Operator Acceptance Criteria as defined in valve specification.

Code	Definition
SOL	Solenoid Operated
AIR	Air Operated
XO	Special Operator (See Remarks - Item "N" of this description)

I) Operator Speed (Eighth Column of Valve List)

This note indicates speed of operation required. If left blank or otherwise unspecified, standard speed (12 in./min.) is to be supplied.

J) Valve Ends (Ninth Column of Valve List)

This note describes the different end preparation required on valves.

For butt welding ends, the following code will apply:

Code	Definition
B-160	Pipe Schedule
	The particular Weld End Preparation Detail on Duke Drawing No. 1676-1

For socket weld, screwed, flanged and special ends, the following codes will apply:

Code	Definition
SW	Socket weld ends to be in accordance with ANSI B16.11.
SCR	Screwed ends to be in accordance with ANSI B16.11
F1	125# Cast Iron - Flat Face
F2	250# Cast Iron - 1/16" Raised Face
F3	150# Steel - Flat Face
F4	150# Steel - 1/16" Raised Face
F5	300# Steel - Flat Face
F6	300# Steel - 1/16" Raised Face
SE	Special Ends - See Remarks Item "N" this description
WAF	Wafer
FLN	Flanged ends - Diaphragm Valves

K) Seal Leak-Off (Tenth Column of Valve List)

This column will indicate when a valve requires a lantern gland leak-off connection.

Code	Definition
Yes	Valve shall have a lantern gland leak-off connection in accordance with the valve specification.
NA	Lantern gland leak-off not applicable.

L) Lock and Locking Device (Eleventh Column of Valve List)

This column will indicate when a valve requires a lock and locking device. (Mfg. standard)

Code	Definition
Yes	Valve to be equipped with lock and locking device. However, when valve has a chainwheel operator, lock and locking device will be supplied by Duke Power Construction Department.
NA	Lock and locking device not applicable.

M) Design Condition - PSIG and Temp (Twelth and Thirteenth Columns of Valve List)

The PSIG and Temperature (° F) column provides the vendor with the necessary information needed to supply the appropriate valve. Design temperature and pressure ratings will be furnished for the applicable pressure class regarding check and handwheel operated globe and gate valves. On air and motor operated valves the differential pressure across the valve will be the pressure given in the PSIG column.

N) Remarks

Any additional or special information required by the manufacturer to produce the quality valves as required by Duke will be spelled out in the remarks area. (See attached sample of valve list for remarks area).

O) Revisions

Revisions to any valve list will be indicated in a cover letter transmittal with each valve list.

P) Delivery Schedule

The total quantity ordered of any one item may be divided into groups with different required delivery dates. The following code will give the vendor the essential information for the applicable delivery schedule:

Code: DELIVERY REQD: (000) AA/AA/AA

Definition: (000) - Quantity Required
AA/AA/AA - Date Required

LIST NUMBER 3
PLANT CO[illegible] CAT
FILE ID [illegible] 4

DUKE POWER COMPANY
DESIGN ENGI[illegible]ING DATA BASE
CATAWBA NUCLEAR STATION
VALVE ITEM LIST

REV # 00 (Revision Number)

08/14/76 (Date)

VALVE LIST NUMBER CN-9999-99

ITEM NUMBER	CLASS	TYPE	QUANTITY	SIZE	MANUFACTURES DRAWING NUMBER	OPERATOR TYPE	OPERATOR SPEED	ENDS	SEAL LEAK-OFF	LOCK & LOCKING DEVICE	DESIGN PRESS PSIG	DESIGN TEMP. DEG.F
CD3-401	C	BF	50	4.00		HN		HAF	NR	YES	125	200
RMKS:MAX. OPERATING FLOW RATE - 450 GPM												
DELIVERY REQD: (025)03/01/77												
DELIVERY REQD: (025)03/01/78												
CD8-402	B	GT	24	3.00		EMO	10 SEC. MAX.	A-40	YES	NR	200	150
RMKS:ACTIVE VALVE												
DELIVERY REQD: (012)10/01/77												
DELIVERY REQD: (012)10/01/78												
CSD-403	A	SL	50	1.00		SO		SW	NR	NR	300	150
RMKS:CAPACITY - 1500 SCFM AT 300 PSIG, ENERGIZE OPEN. COIL 125V DC. REMOTE POSITION INDICATOR REQD. SERVICE - AIR												
DELIVERY REQD: (CSD)01/01/80												
CHJ-404	F	GL	1500	1.00		HN		SW	NR	NR	2465	650
DELIVERY REQD: (250)06/01/79												
DELIVERY REQD: (050)												

Delivery Schedule — See Note P

1st Column - See Note B
2nd Column - See Note C
3rd Column - See Note D
4th Column - See Note E
5th Column - See Note F
6th Column - See Note G
7th Column - See Note H
8th Column - See Note I
9th Column - See Note J
10th Column - See Note K
11th Column - See Note L
12th Column - See Note M
13th Column - See Note M

Remarks - See Note N

REVISION		INITIALS	DATE
A	Revised and re-issued	[illegible]	12/15/77
B	Added Nuclear Diaphragm and Wafer Check List to Note "A"		

SPECIFICATION NO. CNS-1205.04-1

DATE February 10, 1975

DUKE POWER COMPANY

Catawba Nuclear STATION

UNIT 1 & 2

Title: ASME Section III Diaphragm Type Valves

REVISION LOG

1 _____

2 _____

3 _____

4 _____

5 _____

VERIFICATION OF SPECIFICATION

Station and Unit Number: Catawba Nuclear Station Units 1 & 2

Title of Specification: ASME Section III Diaphragm Type Valves

File Number: CNS-1205.04-1

Revision:

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: Alan Harris Date: 2-21-75

Checked By: C.M. Myers Date: 2-21-75

Approved By: J.K. Berry Date: 3-14-75

Inspection Waived By: T.F. Wyke Date: 3-14-75

Inspection Waived For: ____ ELECTRICAL ____ MECHANICAL X CIVIL

Inspected By: D.J. Miller Date: 3/17/75

Inspected By: ____ Date: ____

DIVISION QUALITY ASSURANCE C.A. Bell Date: 3-13-75

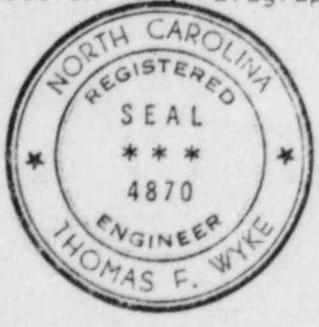
****

(FOR ASME CODE ITEMS)

Mechanical & Nuclear Division Date: 3-14-75
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1974 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)



SIGNATURE: Thomas F. Wyke

NAME: T. F. Wyke
Registered Professional Engineer

State & No. North Carolina #4870

Form 301.2 Rev. 1

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
UNITS 1 & 2

ASME SECTION III DIAPHRAGM TYPE VALVES

1. COVER SHEET

Attached.

2. VERIFICATION SHEET

Attached.

3. TABLE OF CONTENTS

Not applicable.

4. GENERAL

4.1 Scope:

This specification covers the design, fabrication, testing, quality assurance documentation and delivery of ASME Code Section III, Class 2 and 3 (Duke Classes B and C) diaphragm type valves important to nuclear safety with operators, as required, for Units 1 & 2 of Catawba Nuclear Station.

4.2 Installation Site:

All valves will be installed at the Catawba Nuclear Station located near Newport, South Carolina.

4.3 Definitions:

The following definitions shall apply to this specification:

Owner - Duke Power Company
Bidder - Person or Corporation who bids on the work.
Contractor - Person or Corporation to whom work is awarded.
Purchaser - Mill Power Supply Company

4.4 The attached "General Conditions of Contract", revised August 1, 1973, shall form a part of this specification.

4.5 Codes and Standards:

4.5.1 The valves shall be designed, fabricated, inspected and tested in accordance with the requirements of the following codes, as applicable, as well as any special requirements stated in succeeding sections of this specification:

4.5.1.1 ASME Boiler and Pressure Vessel Code Section III Nuclear Power Plant Components (dated July, 1974, with all addenda through Winter 1974). Code addenda that are mandatory on the purchase order date shall be used. The use of non-mandatory addenda may be negotiated at the Purchaser's option. Code case special rulings shall not be used except where written approval is granted by the Purchaser.

4.5.1.2 Manufacturers Standardization Society Standard Practice for Hydrostatic Testing of Steel Valves MSS-SP-61 (1961).

4.5.1.3 ASME Boiler & Pressure Vessel Code Section IX, Welder Qualification (1974 edition).

4.5.1.4 ANSI B16.11 (1966) American Standard for Steel Socket Weld Fittings.

4.5.1.5 American National Standard Code for Power Piping, ANSI B31.1 - 1973.

4.5.1.6 Steel Pipe Flanges and Flanged Fittings, ANSI B16.5 - 1973.

4.5.1.7 Pipe Threads, ANSI B2.1, 1968.

In all cases of conflict between codes and/or requirements, Section III of the ASME Boiler & Pressure Vessel Code shall always be the minimum requirement.

4.5.2 The electric motor operators, and all limit switches where required, shall be designed, fabricated, inspected and tested in accordance with the requirements of the following codes, as applicable:

4.5.2.1 IEEE 112A-1964 Test Procedure for Polyphase Induction Motors and Generators.

4.5.2.2 IEEE 117-1956, Test Procedure for Evaluation of Systems of Insulating Materials for Random-Wound Electric Machinery.

4.5.2.3 IEEE 344-1971, Seismic Qualification for Class 1 Electric Equipment for Nuclear Power Generating Stations.

4.5.2.4 IEEE 382-1972, Trial-Use Guide for Type Test of Class 1 Electric Valve Operators for Nuclear Power Generating Stations.

4.5.2.5 IEEE 323-1971, General Guide for Qualifying Class 1 Electric Equipment for Nuclear Power Generating Stations.

4.5.2.6 IEEE 334-1971, Trial Use Guide for Type Tests of Continuous-Duty Class 1 Motors Installed Inside the Containment of Nuclear Power Generating Stations.

4.5.3 The Contractor's Quality Assurance Program shall be in accordance with ANSI N45.2 (1971), "Quality Assurance Program Requirements for Nuclear Power Plants".

4.5.4 Packaging, shipping, receiving and storage shall be in accordance with ANSI N45.2.2 (1972), "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants".

4.5.5 Testing fluids and cleanliness levels shall be in accordance with ANSI N45.2.1 (1973), "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants."

5. ATTACHMENTS AND REFERENCE DRAWINGS

The following Duke Power Company drawings and attachments shall form a part of this specification:

5.1 "Drawing Requirements", revised December 13, 1974.

5.2 "Standard Identification Tag and EMO Orientation", dated January 24, 1974.

5.3 "Welding End Preparations", CN-1676-1 and CN-1676-1.1, Revision 1, June 20, 1974.

5.4 "Representative Valve List, Diaphragm Valves" Lists CN-150-26 and 28, dated November 8, 1974.

5.5 (Omit)

5.6 "Seismic Design Requirements, Class 2/3, Diaphragm and Plug Type Valves", dated February 4, 1975.

5.7 "Equipment Status Report" with "Explanation Sheets," dated February 1, 1971.

5.8 "General Conditions of Contract", revised August 1, 1973.

5.9 "General Requirements Applicable to Specification", dated February 3, 1975.

5.10 "Packaging and Shipping Requirements", form 301.4.

5.11 "Nuclear Coating Specification No. KKK-I, revised June 1, 1974.

5.12 "Nuclear Coating Specification No. KKK-II", revised October 21, 1974.

5.13 "Nuclear Coating Specification No. NNN-I", revised June 1, 1974.

5.14 "Nuclear Coating Specification No. NNN-II", revised October 21, 1974.

5.15 "Wall Thickness Verification", dated July 30, 1974.

6. OPERATING CONDITIONS

Operating Conditions will be shown on the complete itemized valve lists to be issued at a later date.

7. EQUIPMENT TO BE FURNISHED

7.1 For bidding purposes Attachment 5.4, "Representative Valve List, Diaphragm Valves" may be considered as an accurate estimate of the quantity of valves and operators required. It must be emphasized that this list is only an estimate and is subject to change.

7.2 A complete itemized valve list, with the specific design parameters for each valve, will be issued to the successful Bidder, after the award of the order, for manufacturing purposes. This complete, itemized valve list shall be considered a part of this specification and its receipt will signify the successful Bidder to finalize his engineering and to start manufacturing.

7.3 Any special tools required for proper installation of valve components, like packing, shall be provided.

8. GENERAL DESIGN

8.1 Valves:

8.1.1 Duke valve classes referenced in this specification and on the valve lists are defined as follows:

Duke Valve Class	Principal Design Criteria	Designed for Seismic Loading
B	ASME Section III, Class 2 (1974)	Yes
C	ASME Section III, Class 3 (1974)	Yes

8.1.2 The design of each valve shall satisfy the requirements of this specification and the associated valve lists (in addition to the principal design criteria).

8.1.3 Materials of construction shall be as outlined in paragraph 8.3 and as allowed by ASME Section III.

8.1.4 All valves located in the Reactor Building (noted on valve lists) shall be suitable for high temperature service. Normal ambient temperature in the Reactor Building will be 110 F and 100 percent relative humidity; however, all valves so designated on valve lists must be capable of operation for a period of at least 30 minutes during which the ambient temperature may reach 250 °F and 100 percent steam saturation.

8.1.5 Valves located within the Reactor Building will be subjected to and shall suffer no adverse effects from periodic application of external pressure during Reactor Building leakage rate tests. These tests will be conducted at pressures no greater than 19 psig and at a frequency of once per year.

8.1.6 Valves shall be designed for 500 open-shut cycles per year for a design life of forty years.

8.1.7 Stainless steel valves shall be suitable for service in fluids with chemical properties as follows:

pH, normal operation with LiOH, NH4OH, or KOH at 25 F	4.2 to 10.5
Hydrogen	25-35 CC/kg H_2O
Chlorides	0.15 PPM
Fluorides	0.15 PPM
Boric Acid	21,000 PPM Max.
Suspended solids	1.0 PPM Max.
Dissolved oxygen	5.0 PPM Max.

8.1.8 Carbon steel valves shall be suitable for service in fluids with chemical properties as follows:

pH at 25 C	6.0-9.0
Chloride	0.15 PPM Max.
Flouride	0.15 PPM Max.
Corrosion Inhibitor	K_2 Cr O_4

8.1.9 Valves shall be capable of being heated and cooled for 4,000 cycles at a rate of 300 F per hour between 40 F and the design temperature as given on the final valve lists.

8.1.10 Valves and operators shall be designed to withstand the seismic loadings outlined on Attachment 5.6, "Seismic Design Requirements". Seismic calculations shall be made for the valve and operator in the worst possible orientations. The Bidder shall certify in writing with the proposal that the valves and operator designs will consider and meet the seismic loading requirements set forth in this attachment (see paragraph 10.2.9).

8.1.11 For air operated valves the maximum operating air pressure will be 115 psig.

8.1.12 A stem seal shall be provided for the actuator stem permitting the bonnet to be a pressure boundary, should the diaphragm rupture, preventing leakage.

8.1.13 All valves located outside the containment shall be capable of withstanding an integrated radiation dose of 1×10^6 rads without leakage or loss of tight shut ability. All valves located inside the containment shall be capable of withstanding an integrated radiation dose of 2×10^8 rads without leakage or loss of tight shut ability. Valves located in the containment are indicated by an asterisk adjacent to the valve item number on the valve list.

8.1.14 All valves 2" and below shall have the ends prepared for socket welding per ANSI B16.11 (1966). All valves above 2" shall have the ends prepared for butt welding per attachment 5.3, "Welding

End Preparations", unless otherwise specified on the valve list. If other than weld end is required the following standards shall apply: flanged ends, ANSI B16.5; screwed ends, ANSI B2.1.

8.1.15 Construction and design of weld end valves shall be such as to preclude undue damage, warpage and subsequent leakage when properly welded into the pipeline. Any installation restrictions must be fully stated and attached to the valve prior to shipment.

8.1.16 The "O" ring seals of the spindle and bonnet shall be fully contained in the base metal.

8.2 Operators:

8.2.1 Valves shall have operators as specified on the valve list.

8.2.2 Manual actuators shall be capable of being positioned to meet all operating conditions.

8.2.3 Manual handwheel or lever actuators shall be provided with locking capability. This may be a 3/8" hole drilled through the lever or handwheel and a structural member of the valve so as to accommodate a conventional type lock.

8.2.4 Air operators shall be the diaphragm type with removable bolted top works. Operator shall have ample power capacity to position the valve under all operating conditions as specified on the valve lists. Dry compressed air at 70 to 80 psig will be available and air pressure reducing valves and filters shall be supplied by the Bidder where required.

8.2.5 Where specified on the valve lists, four limit switches shall be provided with manual or air operated valves for remote indication Two limit switches shall be mounted at the top and two at the bottom of the valve travel to indicate fully opened and fully closed positions. The limit switches shall be Namco, Cutler Hammer, or equal. The limit switch ontrols shall be single-pole, double-throw type with a rating no less than 0.5 A inductive 125 volts DC and 15 A, 120 volts AC, 60 Hz. Limit switches shall be mounted in NEMA Type 4 enclosures with 1 inch conduit openings. Mounting shall be of sufficient construction to prevent misalignment of the contacts and false indication of the valve position when conduit is later installed. Limit switches shall be adjustable for a range of up to 1/2 of the valve stroke.

8.2.6 Where specified on valve lists air operated valves shall be supplied with solenoid valves. Solenoid valves shall be ASCO model no. 8320 A11U.

8.2.7 Electric motor operators shall be Philadelphia Gear (Limitorque). All EMO's shall have sixteen travel limit switches and double torque control. The limit and torque switches shall have the following settings:

a. Four limit switches indicating fully open.

b. Four limit switches indicating fully closed.

c. One torque switch indicating fully open.

d. One torque switch indicating fully closed.

e. Four limit switches indicating open and intermediate.

f. Four limit switches indicating intermediate and closed.

All of the above limit and torque switches shall meet the following minimum requirements:

120 VAC - 15 amps
120 VDC - 0.5 amps

8.2.8 All EMO's and air operators located outside the containment must be capable of withstanding an integrated radiation dose of 1×10^6 rads without loss of function or integrity. All operators located inside the containment shall be capable of withstanding an integrated radiation dose of 2×10^8 rads without loss of function or integrity. Operators located in the containment are indicated by an asterisk adjacent to the valve item number on the valve list.

8.2.9 Electric valve operators applied inside the Containment (so identified on valve lists) must have successfully met and passed IEEE Standard 382-1972 (ANSI N41.6), IEEE Trial-Use Guide for Type Test of Class 1 Electric Valve Operators for Nuclear Power Generating Stations. The seismic qualification aspects required by section 4.3 of IEEE Standard 382 shall be those given in attachment 5.3.

The following IEEE standards are invoked by IEEE Standard 382, and are applicable for Containment operators:

a) IEEE 112A-1964, Test Procedure for Polyphase Induction Motors and Generators.

b) IEEE 117-1956, Test Procedure for Evaluation of Systems of Insulating Materials for Random-Wound Electric Machinery.

c) IEEE 323-1971, General Guide for Qualifying Class I Electric Equipment for Nuclear Power Generating Stations.

d) IEEE 334-1971, Trial Use Guide for Type Tests of Continuous-Duty Class I Motors Installed Inside the Containment of Nuclear Power Generating Stations.

e) IEEE 344-1971, Trial Use Guide for Seismic Qualification of Class 1 Electric Equipment for Nuclear Power Generating Stations.

8.2.10 Electric Valve operators applied outside the Containment must meet and pass the following standards referenced in 8.2.4:

a) IEEE 112A-1964
b) IEEE 117-1956
c) IEEE 344-1971

In addition, these motor operators must meet the seismic design requirements called out in attachment 5.3 for A, B, and C valves.

8.2.11 Documented results are required for the qualification test(s) necessary to meet the IEEE standards referenced in 8.2.9. The performance test documentation shall demonstrate that the equipment meets the specified performance requirements. (See paragraph 10.4)

8.2.12 All electric motor operators shall be rated 575 volt, three phase, 60 hertz.

8.2.13 All electric valve operators shall be tested against the valve design opening and closing load (the load may be simulated).

8.2.14 Operators and topworks within the Reactor Building shall be suitable for high temperature service. Normal ambient conditions in the Reactor Building will be 110 F and 100% relative humidity; however, all valves and valve operators designated on valve lists must be capable of operation for a period of at least 30 minutes during which the ambient conditions may reach 250 F and 100 percent steam saturation.

8.2.15 Operators located within the Reactor Building will be subjected to and shall suffer no adverse effects from periodic application of external pressure during Reactor Building leak rate testing. These tests will be conducted at pressures no greater than 19 psig and at a frequency of once per year.

8.3 Materials

8.3.1 Stainless Steel Valves

8.3.1.1 With the exception of the diaphragm all materials in contact with the working fluid shall be 304 or 316 stainless steel.

8.3.1.2 Pressure boundary materials of Duke Class B and C valves (body and bonnet) shall conform to materials allowed by ASME Boiler and pressure Vessel Code (as outlined in paragraph 4.5.1.1).

8.3.1.3 Body to bonnet studs and nuts shall conform to SA-193 and SA-194, respectively, or Owner approved equal.

8.3.2 Carbon Steel Valves

8.3.2.1 For Carbon Steel Valves the pressures boundary material shall conform to ASME Boiler and Pressure Vessel Code Section III (as outlined in paragraph 4.5.1.1).

8.3.2.2 Body to bonnet studs and nuts shall conform to SA-193 and SA-194, respectively, or Owner approved equal.

8.3.3 The "O" ring seals and diaphragms shall be EPT (nordel by du Pont).

8.3.4 Cast steel or ductile iron shall be used for the air operated diaphragm motor cases and frames.

8.3.5 Nitriding treatment or plating on any surface exposed to the working fluid is prohibited.

8.3.6 Low melting point materials (lead, zinc, cadmium, tin, antimony, mercury, bismuth, sulfur, etc.) their compounds or material containing low melting point materials as a basic constituent shall not be used in direct contact with these valves at any time. This shall include tooling fixtures, lubricants, masking materials, fluxes, paints, temperature crayons, etc., which might be used during the fabrication of these valves.

8.3.7 Contaminations of iron or copper on the surfaces of austenitic base material used in these valves is prohibited.

8.3.8 Any lubricants used for body-bonnet joints, etc., shall not contain any of the materials and contaminants described in paragraphs 8.3.6 and 8.3.7.

8.4 No parts, materials or equipment shall be of manufacture outside the United States without prior approval of the Owner.

9. SPECIAL REQUIREMENTS

9.1 All valves shall be tagged with metal tags showing Owner's valve item number. All tags shall be permanently secured to the valve bonnet as shown on attachment 5.2, "Standard Identification Tag and EMO Orientation."

9.2 All internal wetted surfaces shall be free of metal chips, weld spatter, slag, oil, grease, dirt, scale and other foreign material. Demineralized water as defined by paragraph 3.2 of ANSI N45.2.1 (1973) shall be used for final cleaning or rinsing.

9.3 Immediately after final cleaning, the end connections shall be sealed with plugs, caps or covers to prevent entry of contaminants and to prevent damage to facings or weld ends. These caps are to be secured so as not to become detached during shipment or handling.

9.4 All valves are to be suitable for inside storage of up to 24 months prior to startup of the plant. Bidder shall supply Owner information on care during storage in accordance with Attachment 5.10, "Packaging and Shipping Requirements".

9.5 The valves and accessories shall be packaged or crated to prevent deterioration, contamination and physical damage during transit or storage. All packaging material, especially the wooden crating for the larger components, must be flame treated or non-combustible wherever possible. Any articles or material that might otherwise be lost shall be boxed or wired in bundles and marked for identification with Owner's item number.

9.6 All valves shall be prepared for shipment so that handling and unloading may be facilitated. At no time are valves to be shipped in a disorderly arrangement or situation of disarray so as to promote damage or hamper inspection of the equipment when received on the jobsite.

9.7 Attachment 5.10, "Packaging and Shipping Requirements", shall be completed by the Bidder and submitted for approval with the Bidder's proposal.

9.8 All valves shall have a National Board Registration Number affixed to the valve.

9.9 One extra diaphragm and "O" ring for every ten valves of each size is required. A minimum of one diaphragm per size is required.

9.10 Each valve and operator shall be coated in accordance with one of the Duke Power Nuclear Coating Specifications, attachments 5.11 to 5.14. The following criteria shall be used to determine the appropriate coating spec:

9.10.1 For all valves with operating temperatures 200°F or below, use the following:

a) "Nuclear Coating Specification KKK-I", attachment 5.11, for valves in the containment.

b) "Nuclear Coating Specification KKK-II", attachment 5.12 for valves outside the containment.

9.10.2 For all valves with operating temperatures greater than 200°F use the following:

a) "Nuclear Coating Specification NNN-I", attachment 5.13, for valves in the containment.

b) "Nuclear Coating Specification NNN-II", attachment 5.19, for valves outside the containment.

10. QUALITY ASSURANCE

10.1 These specifications cover equipment, systems, structures and/or materials important to nuclear safety; and it is essential that they meet the quality standards of these specifications and referenced codes, standards and guides; that this quality be proven by full documentation. With the proposal, each Bidder shall submit a description of the quality assurance procedures he proposes to use; outline his quality assurance organization showing lines of authority; a description of the documentation that will be developed during manufacture and that will be shipped to the Owner for retention for the life of the item. Evaluation of proposals will include analysis of information submitted and rendering a judgment with respect to each Bidder's qualification to provide and document the quality required by these specifications. After award, the Contractor shall submit complete written quality assurance procedures for Owner's review and approval.

In lieu of the above, the Owner will accept a statement from the Bidder that his QA Program is in accordance with the latest copy of the Bidder's QA manual on file with the Owner. The Owner will then make a determination on the acceptability of the Bidder's QA Program based on the information contained therein.

10.2 The Contractor shall submit to the Owner no later than valve shipping date, a separate documentation package for <u>each</u> valve consisting of one reproducible copy of the following:

10.2.1 Original mill test reports from material supplier for all pressure boundary or pressure retaining material, including valve stem material.

10.2.2 Documentation of performance tests, seat leakage tests, and hydrostatic tests showing their results.

10.2.3 Heat treatment certification.

10.2.4 Certification of compliance that each non-evident form of NDT (UT, PT, MT) has been done by specified requirements and ASNT qualified operators. Include a list of the equipment used.

10.2.5 On radiography, a complete history; i.e., exposure diagram, reader sheet, record of defects, record of repairs, final cleared exposure diagram record. Final film to be sent to Duke Power Company. Film and reader sheets should note any conditions other than normal; i.e., surface conditions, indications within acceptance standards.

10.2.6 Completed Duke Power Company quality assurance certification (Form 930.1).

10.2.7 Required ASME Code data reports.

10.2.8 Records of all major repairs. The term "major repair" is to be defined by Section NB-2539.4 of the ASME Section III Code.

10.2.9 Certification of seismic design for valves and operators. A proposed certification form shall be submitted with the proposal which will be modified as required by Owner and agreed upon by Owner and Bidder prior to award of order.

10.2.10 Record of all deviations affecting the approved Contractor's drawings.

10.2.11 Record of wall thickness measurements in accordance with attachment 5.15, "Wall Thickness Verification".

10.3 The valve documentation package shall be sent to Q. A. Manager, Engineering and Services, Duke Power Company, P. O. Box 2178, Charlotte, North Carolina 28242, Attention: Q. A. Supervisor, Records. One copy of the Duke Power Company Quality Assurance certification (item 10.2.6) and a copy of form NPV-1 shall be shipped with each valve.

10.4 Documented results are required for the electric motor operator qualification test(s) necessary to meet the IEEE Standards referenced in paragraph 4.5.2. The test documentation shall demonstrate that the equipment has met all specified performance requirements pertinent to the application and shall be organized in an auditable form. The test data shall be submitted in a bound formal report for approval by the Owner before manufacture of the operators is started and shall include the following:

A. Identification of Equipment.

B. Equipment Specification.

C. Test Specifications.

D. Test Results.

E. Supporting data.

F. Certification.

The qualification test for motor operators and limit switches for safety related use (Duke Classes A, B and C) shall use the following values:

Location	Inside Containment	Outside Containment
Radiation, Rads	2×10^8	1×10^6
Pressure, psia	30	15
Temperature, F	250	110
Environment	Saturated steam with boric acid spray	100% relative humidity

The seismic loading values shall be as shown in attachment 5.6, "Seismic Design Requirements."

10.5 The Bidder's quality assurance program must be in accordance with ANSI N45.2 (1971) for his bid to be considered. Bidder shall state in his proposal whether or not his quality assurance program meets the requirement of this standard.

11. DELIVERY

Delivery of Unit 1 and Unit 2 valves is required to be completed on a system basis. Exact delivery dates are not available at this time, but will be supplied when the order is awarded. For bidding purposes, the valves will be required for delivery between July 1, 1976 and January 1, 1978.

12. DRAWINGS

Drawings shall be submitted in accordance with the attachment 5.1, "Drawing Requirements".

12.1 In addition to this attachment, the drawings shall include the following information:

12.1.1 Valve Item Number.

12.1.2 Valve List Number.

12.1.3 Valve size

12.1.4 Valve type, i.e., diaphragm.

12.1.5 Operator type, i.e., EMO, piston, solenoid, handwheel, chain-wheel, etc.

12.1.6 Contractor's standard operator orientation note; i.e., right-hand, lefthand, etc. Duke's normal acceptance orientation is as shown on attachment 5.2 "Standard Orientation EMO Valves".

12.1.7 Mounting position restrictions.

12.1.8 Necessary dimensions: end to end, centerline of valve to end of open stem, dismantling requirements for valve and operator, handwheel location, handwheel diameter, location of center of gravity, etc.

12.1.9 Ends to agree with valve list; i.e., socket weld, butt weld, flanged etc.

12.1.10 The words, "Nuclear Safety Related" shall be printed in a character size equal to or larger than the largest size used in the body of the document just above its title block.

12.1.11 Contractor's valve figure number.

12.1.12 Complete bill of materials for every valve part.

12.1.13 Weight of valve, weight of operator and combined weight of valve and operator.

12.1.14 Pressure rating of valve.

12.2 Each drawing submitted to Duke Power Company shall clearly show or state the valve item numbers as given on Duke Power valve list and the valve list number to which the drawing applies.

12.3 Only one valve list shall be assigned to one drawing; any number of valves may be shown on any one drawing as long as the list applies. Owner will outline in detail before first valve list is issued a "Procedure for Shop Acknowledgments and Drawings" to further define requirements of this section.

12.4 Contractor shall also submit (per attachment 5.1, "Drawing Requirements") motor operator outlines and wiring diagrams covering the motor operators. Each motor operator outline and wiring diagrams shall have a complete certification showing each applicable Duke Power valve list and valve tag number and giving all electric motor characteristics required for ordering motor starters by Duke Power, including motor horsepower, voltage, service factor, full load current and locked rotor current. Each operator wiring diagram shall show both opening and closing torque switches and indicate that these torque switches are supplied.

13. INSTRUCTION MANUALS

Fifteen copies of complete operating and maintenance instructions are to be submitted for approval to Mr S K Blackley, Jr, Chief Engineer, Mechanical & Nuclear Division, Duke Power Company, P O Box 2178, Charlotte, N C 28242, Attn: Mr C M Myers, before the equipment is shipped.

14. TEST AND INSPECTIONS

Tests, reports and inspections shall be in accordance with attachment 5.9, "General Requirements Applicable to Specification." In addition to this attachment, the following also shall be followed:

14.1 Nondestructive and destructive testing of pressure boundary materials of valves shall be in accordance with the procedures and acceptance standards set forth in reference code 4.5.1.1. Required examinations, procedures, and acceptance standards for each class of valves are spelled out in the following sections of the above code.

a) Class 1 components - Article NB-2000 for materials and parts; Article NB-5000 for welds.

b) Class 2 components - Article NC-2000 for materials and parts; Article NC-5000 for welds.

c) Class 3 components - Article ND-2000 for materials and parts; Article ND-5000 for welds.

14.2 Hydrostatic testing of valves shall be in accordance with reference code 4.5.1.1. Demineralized water as defined by paragraph 3.2 of ANSI N45.2.1 (1973) shall be used as the hydrostatic test media. The hydrostatic test shall be performed prior to the seat leakage test.

14.3 A seat leakage test shall be performed in accordance with MSS-SP-61 except the hold time shall be a minimum of 5 minutes. No seat leakage is permitted.

14.4 A bonnet hydrostatic test shall be performed at 1½ times the design pressure for a period of 10 minutes. No leakage is permitted through the "O" ring seal, the bonnet or the diaphragm gasket.

15. SPARE PARTS

15.1 See attachment 5.9, "General Requirements Applicable to Specification".

15.2 The Contractor shall be responsible for the maintaining of tracability of spare parts required for the specified equipment.

16. INFORMATION TO BE FURNISHED

Bidder shall submit with quotation complete and detailed specifications covering design, construction, materials and workmanship of equipment proposed. Information provided shall include but should not be limited to that outlined below. Bidder should understand that his cooperation in supplying the information requested will be considered in the evaluation of the proposals.

16.1 A valve outline and section drawing of each size and type of valve showing design features.

16.2 Weight of each valve.

16.3 Lists of installations for similar valves (size and pressure listings) for ASME Code applications of this type. Indicate those already in service and date they went into service.

16.4 Suggested materials and description of trim materials of valve if different from that specified.

16.5 Owner and Bidder will establish a reasonable schedule for the completion of drawings and analyses and manufacture of hardware. Schedule will recognize time required by Owner and Bidder for preparation and review/approval of drawings and analyses and for material procurement and manufacture. Bidder will take initial step toward establishment of schedule by returning a copy of attachment 5.7, "Equipment Status Report", with items 7, 9, 10, 11, 12, 13, 15, 17, 19, 20, 22 and 24 completed. Following notification of award of order, Contractor and Owner will meet to review and establish schedule.

16.6 Bidder shall submit with quotation a description of his testing facilities and procedures.

16.7 Bidder shall submit description of measures he will take to protect Owner's delivery schedule, for example, advance ordering of castings or establishment of an inventory of castings. Bidder shall also discuss additional flexibility in terms of his ability to respond to Owner's valve requirements on short notice.

16.8 Bidder shall submit unit prices for each valve by type, size and pressure rating assuming manual operators, Adders shall be quoted as follows:

16.8.1 "Mounting" charge for each type of electric motor operated valve. This price shall include all hardware required to mount the operator on each valve and perform the required testing but shall not include the operator itself.

16.8.2 Price addition, if any, for coating each valve, except materials such as stainless steel, aluminum, etc., in accordance with attachments 5.11 to 5.14. A unit price for each valve in accordance with each of the four coating specifications shall be included.

16.8.3 A complete price list for Limitorque operators.

16.8.4 Price addition for supplying valves with limit switches per paragraph 8.2.5.

16.8.5 Price addition for supplying air operated valves with solenoid valves per paragraph 8.2.6.

16.9 Completed copy of attachment 5.10, "Packaging and Shipping Requirements".

16.10 Proposed Seismic Design Certification form referred to in paragraph 10.2.9.

16.11 Bidder shall submit with his proposal, for Owner's approval, a description of the method and procedure he will employ to measure and assure adequate valve wall thickness.

16.12 Information as requested in paragraphs 10.1 and 10.4.

17. DISCREPANCIES AND INTERPRETATION

Should a Bidder find descrepancies in, or omission from drawings, attachments, or the specifications, or be in doubt as to their meaning, he shall notify the Owner who will issue a written interpretation.

18. CONFORMANCE WITH SPECIFICATIONS

See attachment 5.9, "General Requirements Applicable to Specification".

19. CONSTRUCTION SERVICES

Not required.

20. ERECTION ENGINEER

Not required.

21. SUBMISSION OF PRICES AND PROPOSALS

All proposals, complete with prices fob Newport, York County, South Carolina (Southern Railroad) and information requested shall be submitted to Mill Power Supply Company, P O Box 1339, Charlotte, North Carolina 28232, by_____. Any late or incomplete proposal without prior approval by the Owner may not be considered in the award of the order. Extension of the above date will be granted only for valid and sufficent reasons of the Bidder and provided such request does not delay or interfere with the work of the Owner. The Owner reserves the right to reject any or all bids. The Owner also reserves the right to split the order and purchase selected valves from different Bidders.

For any technical information required to prepare his proposal, the Bidder may contact by telephone A E Harms (704-373-8328) or C M Myers (704-373-8273).

AEH/dhc

DRAWING REQUIREMENTS

The Contractor shall prepare and submit five prints each of all drawings to Mr. S. K. Blackley, Jr., Duke Power Company, P. O. Box 2178, Charlotte, N. C. 28242, Attention: C. M. Myers . These prints are to be full size and legible with uniform background density suitable for microfilming and subsequent reproduction from microfilm. These prints will be reviewed by the Owner and, if satisfactory, will be approved and one so marked will be returned to the Contractor. If not satisfactory, the prints will be appropriately marked and one returned to Contractor for correction after which five (5) prints of the drawings as corrected shall again be submitted to the Owner for approval. Contractor shall make any corrections required by the Owner and appropriately note any changes by dated revisions on the drawing.

Drawings will be microfilmed by the Owner and should adhere to the following Drafting Lettering Standards:

Minimum character height (A, B, C size dwgs)	- 0.125 in (1/8)
Minimum character height (D & E size dwgs)	- 0.156 in (5/32)
Minimum spacing between lines of characters	- height of characters
Machine & guide generated characters	- 12 point size min
Density of characters and lines	- Dense, sharp, uniform
Background density of drawing	- uniform

If drawings are not acceptable to Owner for microfilming, Contractor shall furnish 15 copies of all drawings for Owner's records within 14 days of receipt of drawing approval. Bidder to state drafting lettering standards that will apply.

On all drawings and correspondence concerning this order, the Contractor shall show the following numbers: Mill Power Supply Company's Order Number and Duke Power Company's Item Number. Material is not to be fabricated until such drawings have been approved. All drawings will be due six weeks after award of order.

The following information shall be included on the certified prints of outline and cross-section drawings:

a) Support anchor bolt hole size ($\frac{1}{4}$" larger diameter than required bolt size) and location. Indicate anchored end and slotted end, if applicable.

b) Owner foundation requirements including bolt projection and grouting requirements. For safety related equipment, include:

   (1) Anchor bolt diameter and minimum yield stress requirement.
   (2) Operating moments and shears at the base of the equipment.
   (3) Seismic moments and shears at the base of the equipment.
   (4) Total dead load.

c) Overall dimensions and center-of-gravity of equipment, including equipment centerline to face of all piping connections requiring Owner connection and any disassembly clearances required, such as tube pulling clearances, etc.

d) All nozzle orientations with size and rating of all suction and discharge flanges, and ID/OD if not nominal for weld end nozzles. If more than one nozzle orientation is allowable, so indicate.

e) Nozzle list on drawing including all information on attached sheet tabulated in a similar format. List should include all connections including vents, drains, and instrument connections.

f) Each piece of equipment will be modeled by Owner; consequently, detailed dimensional information will be required, such as dimensional information on contractor supplied piping, location of manways, etc.

g) Equipment weight, empty and full of water, and baseplate weight, if applicable. For valves, weight of valve and weight of operator should be shown.

h) Lifting lugs shown for tanks as required by Duke Power specification and/or as normally furnished by the Contractor.

i) Information shown on equipment nameplate including design conditions.

j) Allowable nozzle loadings on equipment if applicable.

k) Electrical drawings to be furnished shall consist of complete elementary diagrams, wiring diagrams, interconnection wiring diagrams, outlines, bills of materials, full descriptions of operations and recommended trouble shooting procedures.

Contractor shall include in proposal or in supplemental data after order (not necessarily to be included on separate drawing):

a) Sketch of weld end detail for each nozzle connection per Owner's weld end standard.

b) List of all lifting lugs or eyes, with ASME or ASTM material specification, and sketch of handling method.

c) List of all miscellaneous valves, plugs, etc included as part of Contractor's scope of supply and sketch of diagram of any special piping, valves, controls, etc required and to be furnished by Owner. All diagrammatic connections must be identifiable by nomenclature or connection number to the connection as shown on the equipment drawing.

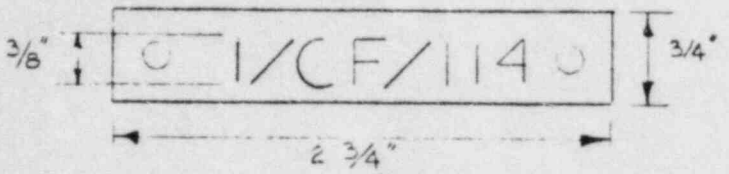
INFORMATION REQUIRED ON CONTRACTOR'S DRAWINGS

Listing of Nozzles for - (Name of Equipment)

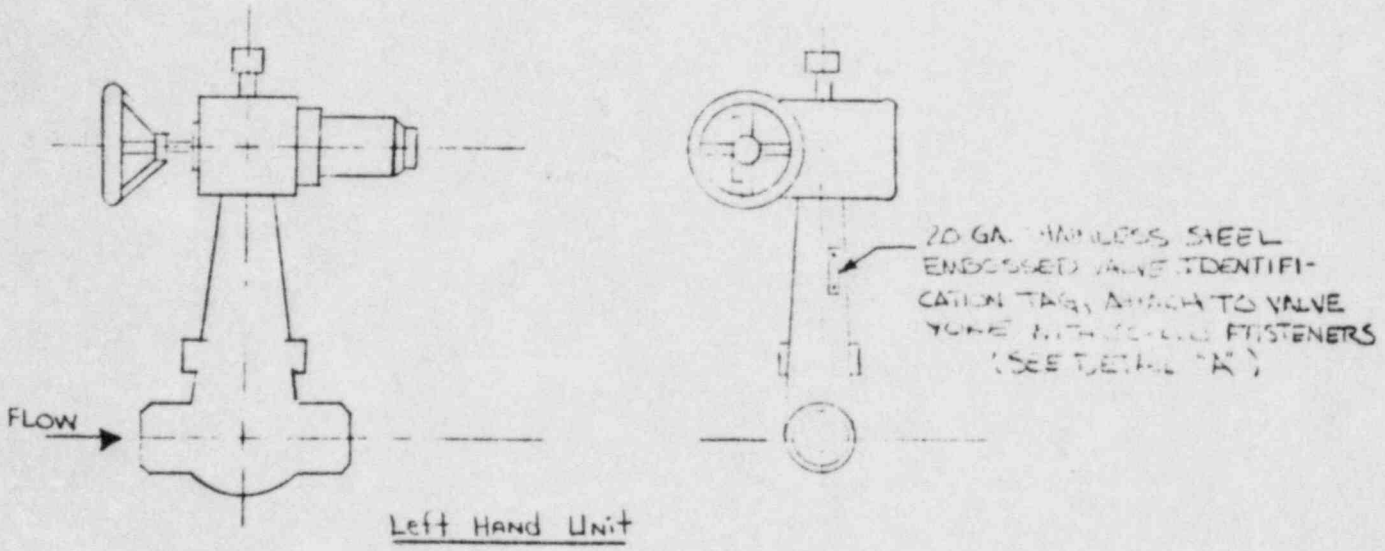
Nozzle Notation	Use (vent, drains, and spares, etc.)	Nominal size in inches	Type of Connection- Butt Weld, Socket Weld Flanged, or Threaded.	A.For butt welds list pipe sch. for which weld end preps are designed* B.Note type of thread for threaded connections C.For flanged connections note the pressure class and whether raised or flat face. Also note standard to which flange is layed out or note as special layout**	A. For butt and socket welds list ASME or ASTM specification and grade. of material. B. For flanged connections note whether flange is S.S., C.S., C.I., etc.

For butt welds made to Contractor standard, (as approved by Owner) note the standard (drawing) to which the weld prep will be made. For butt welds made per Duke drawings, a sketch will be required for each different weld end preparation.

For flanges made to a special layout, a sketch will be required for each different design noting the layout of the flange.



DETAIL "A" - SAMPLE VALVE TAG

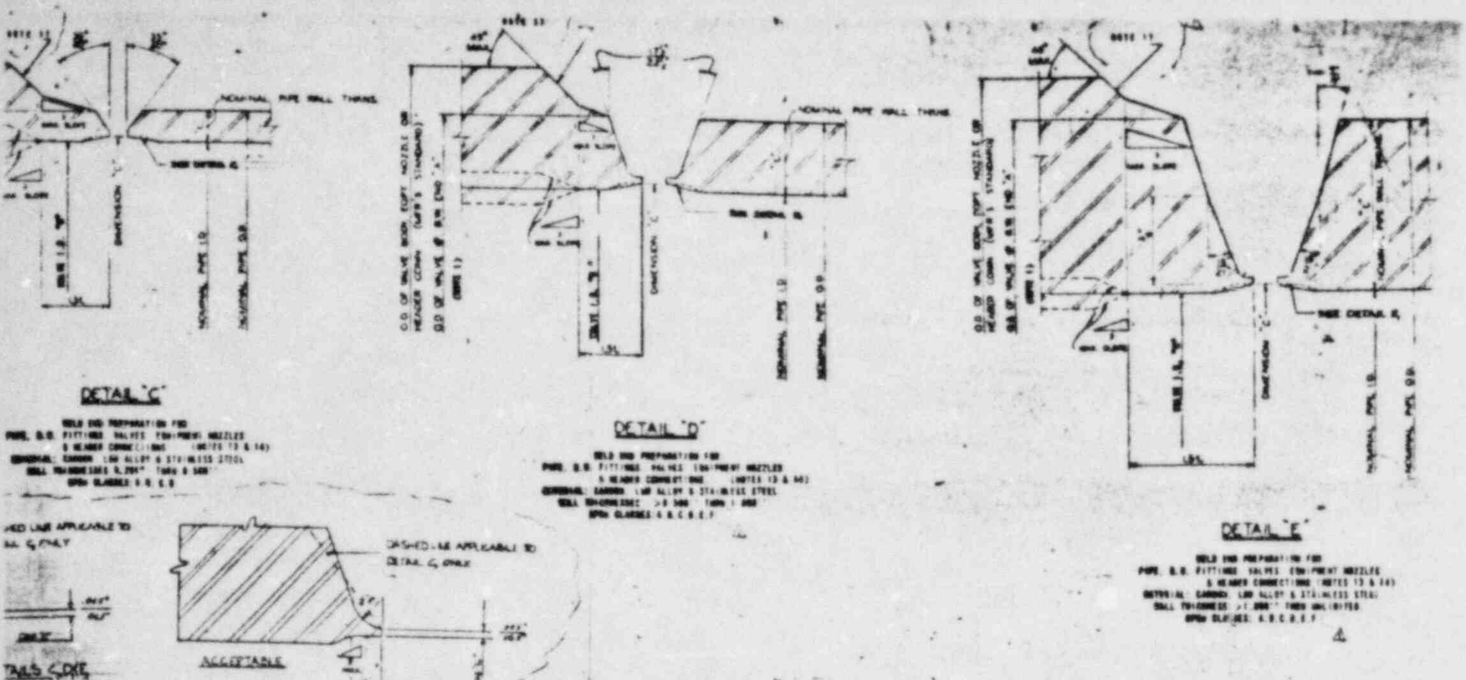


Left Hand Unit

DUKE POWER COMPANY STANDARD

IDENTIFICATION TAG AND END ORIENTATION

SMH
1/24/74



DETAIL "C"

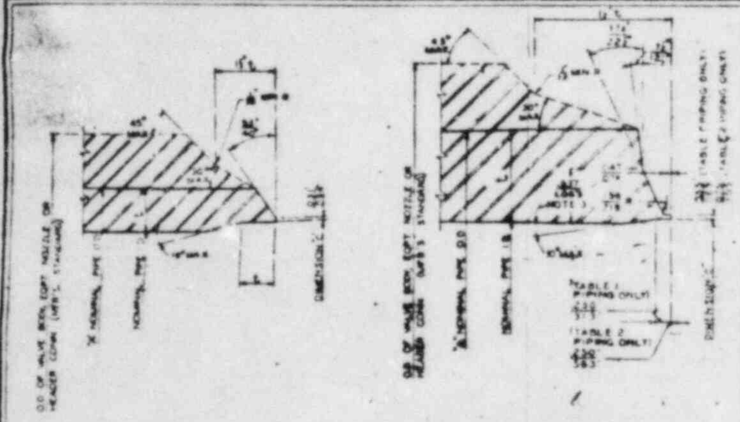
WELD END PREPARATION FOR PIPE, O.D. FITTINGS, VALVES, EQUIPMENT NOZZLES & HEADER CONNECTIONS (NOTES 13 & 14) [illegible]

DETAIL "D"

WELD END PREPARATION FOR PIPE, O.D. FITTINGS, VALVES, EQUIPMENT NOZZLES & HEADER CONNECTIONS (NOTES 13 & 14) MATERIAL: CARBON, LOW ALLOY & STAINLESS STEEL [illegible]

DETAIL "E"

WELD END PREPARATION FOR PIPE, O.D. FITTINGS, VALVES, EQUIPMENT NOZZLES & HEADER CONNECTIONS (NOTES 13 & 14) MATERIAL: CARBON, LOW ALLOY & STAINLESS STEEL WALL THICKNESS >1.000" THRU UNLIMITED DPCA CLASSES: A B C D E F



DETAIL "F"

WALL THICK.: [illegible]

DETAIL "G"

WALL THICK.: [illegible]

TABLE-1
AUXILIARY PIPING

NOM. PIPE SIZE	"A" NOM. O.D.	SCH. 40 NOM. I.D.	SCH. 40 C (±.010")	SCH. 40 T WALL T.	SCH. 80 NOM. I.D.	SCH. 80 C (±.010")	SCH. 80 T WALL T.	SCH. 120 NOM. I.D.	SCH. 120 C (±.010")	SCH. 120 T WALL T.	SCH. 140 NOM. I.D.	SCH. 140 C (±.010")	SCH. 140 T WALL T.	SCH. 160 NOM. I.D.	SCH. 160 C (±.010")	SCH. 160 T WALL T.
3	3.500	3.068	3.081	.216	2.900	2.924	.300							2.624	2.682	[illegible]
4	4.500	4.026	4.044	.237	3.826	3.858	.337	3.624	3.680	.438				3.438	3.509	[illegible]
5	5.563	5.047	5.075	.258	4.813	4.866	.375	4.563	4.647	.500				4.313	4.429	[illegible]
6	6.625	6.065	6.094	.280	5.761	5.808	.432	5.501	5.600	.562				5.189	5.327	[illegible]
8	8.625	7.981	8.019	.322	7.625	7.709	.500	7.189	7.327	.718	7.001	7.162	.812	6.813	6.995	[illegible]
10	10.750	10.020	10.079	.365	9.750	9.824	.500	9.064	9.234	.843	8.750	8.950	1.000	8.500	8.740	[illegible]
12	12.750	12.000	12.062	.375	11.750	11.824	.500	10.750	11.000	1.000	10.500	10.749	1.125	10.126	10.413	[illegible]
14	14	13.124	13.192	.438	12.500	12.940	.750	11.810	12.566	1.093	11.500	11.775	1.250	11.188	11.499	[illegible]
16	16	15.000	15.080	.500	14.314	14.464	.843	13.560	13.937	1.218	13.124	13.442	1.438	12.814	13.177	[illegible]
18	18	16.876	16.975	.562	16.126	16.219	.937	15.250	15.563	1.375	14.876	15.225	1.562	14.438	14.847	[illegible]
20	20	18.814	18.921	.593	17.938	18.155	1.031	17.000	17.324	1.500	16.500	16.850	1.750	16.064	16.515	[illegible]
24	24	22.626	22.757	.687	21.564	21.877	1.218	20.376	20.768	1.812	19.876	20.208	2.062	19.314	19.886	[illegible]

WESTINGHOUSE
WELD END PREPARATIONS

THESE DETAILS SHALL BE UTILIZED BY (W) FOR APPLICATION ON VALVES, EQUIPMENT NOZZLES, & HEADER CONNECTIONS BEING SUPPLIED BY (W). THESE DETAILS WILL NOT BE APPLIED TO ANY DUKE SUPPLIED COMPONENTS.
MATERIAL: STAINLESS STEEL, CARBON STEEL
DPCA CLASSES: A B C D E F G

NOTE: IN THE EVENT THAT (W) PROVIDES ANY OF THEIR COMPONENTS WITH DIFFERENT WALL THICKNESS THAN THAT SPECIFIED BY DPCA, THE LATTER'S LAYOUT DEPT. WILL INDICATE A TRANSITION SPOOL FOR ENCOMPASSING THE DIFFERENT INSIDE DIAMETERS.

REF: (W) DWG. [illegible]

TABLE-2
SEAMED
AUXILIARY PIPING

NOM. I.D.	"A" NOM. O.D.	C (±.010")	T WALL T.
27½"	30.50	27.75	1.50
29	32.87	29.29	1.62
31	34.17	31.35	1.61

GENERAL NOTES:

(1) MANUFACTURER'S STANDARD, BUT NOT LESS THAN NOMINAL PIPE OUTSIDE DIAMETER.
(2) [illegible] OF MACHINED SURFACE TO INSIDE DIAMETER OF VALVE TO HAVE NO ABRUPT CHANGE IN SECTION. INSIDE DIAMETER OF VALVE MAY BE EITHER LARGER OR SMALLER THAN PIPE INSIDE DIAMETER.
(3) THE OUTSIDE AND INSIDE OF VALVE ENDS SHALL BE EXTENDED BACK IN ANY MANNER WITHIN THE OUTSIDE AND MAXIMUM SLOPE LINES INDICATED. THE TRANSITION SHALL BE A SLOPE AVOIDING SHARP RE-ENTRANT ANGLES AND ABRUPT CHANGES IN SLOPE.
(4) THE COMBINED INTERNAL AND EXTERNAL TRANSITION OF THICKNESS SHALL NOT EXCEED AN INCLUDED ANGLE OF 30° AT ANY POINT WITHIN [illegible]
(5) ALL DIMENSIONS ARE IN INCHES.
(6) [illegible]
(7) DEFINITIONS OF ABBREVIATIONS: [illegible] STANDARD WEIGHT; XS: EXTRA STRONG; XXS: DOUBLE EXTRA STRONG
(8) [illegible]
(9) REFERENCE: ASME SECTION III [illegible]
(10) SOLID BACKING RINGS WILL NOT BE USED IN ANY DPCA CLASS OF PIPING.
(11) THE USE OR NON-USE OF CS CONSUMABLE INSERT RINGS IS OPTIONAL WITH THE DPCA CONSTRUCTION DEPT. WELDING ENGINEER.
(12) THE USE OR NON-USE OF COMMERCIAL SPLIT BACKING RINGS FOR CLASS [illegible] IS OPTIONAL WITH THE DPCA CONSTRUCTION DEPT. WELDING ENGINEER.
(13) PIPE DIMENSIONAL TOLERANCES SHALL CONFORM TO THE REQUIREMENTS OF THE APPLICABLE ASME/ASTM SPECIFICATION.
(14) FITTING DIMENSIONAL TOLERANCES SHALL CONFORM TO THE REQUIREMENTS OF ANSI B16.9.
(15) THE USE OF SOLID-BACKING OR COMMERCIAL SPLIT BACKING RINGS IN DPCA CLASSES A, B, & [illegible] IS PROHIBITED. [illegible]
(16) EXCEPTION FOR SYSTEM [illegible] [illegible]
(17) FOR ITEMS ORDERED AFTER [illegible], THE REQUIREMENTS OF DETAIL [illegible] [illegible]

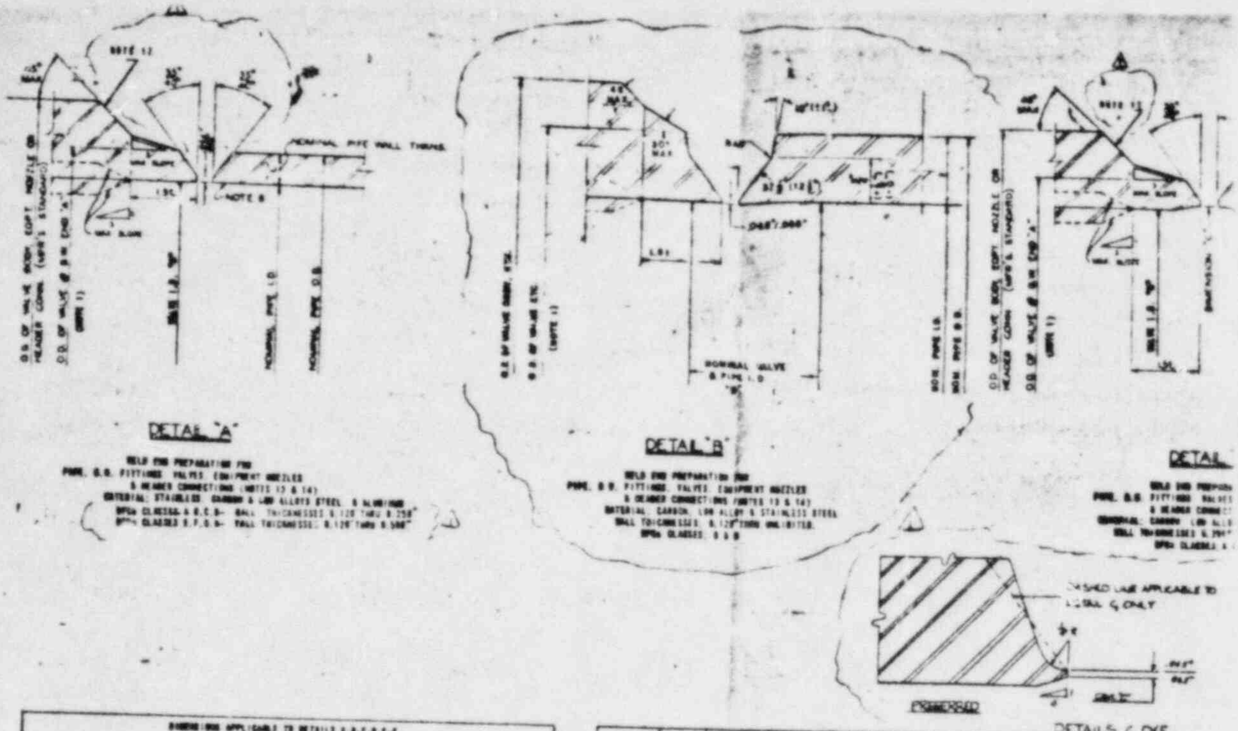
NOTES:

1. ALL WELD ENDS SHOWN ARE SUITABLE FOR USE WITH EITHER THE "GRINNELL" OR THE "EB" CONSUMABLE INSERT RING.
2. WELD END FIG. [illegible] IS ALSO SUITABLE FOR USE WITH THE WELDING "Y" CONSUMABLE INSERT RING.
3. APPLICABLE WHEN [illegible]
4. SCHEDULE 40S AND 80S APPLY TO PIPE UP TO AND INCLUDING 12" PIPE (ANSI B36.19). CARBON STEEL PIPE SCHEDULES APPLY FROM 14" TO 24" INCLUSIVE (ANSI B36.10). DIMENSIONS FOR THE NON-STANDARD SCHEDULE 27½", 29" AND 31" I.D. PIPE ARE LISTED IN TABLE 2 ABOVE.
5. [illegible]

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION

PIPING LAYOUT
WELDING END PREPARATIONS

DWG. [illegible]-1676-1



DETAIL "A"

WELD END PREPARATION FOR PIPE, B.O. FITTINGS, VALVES, EQUIPMENT NOZZLES & HEADER CONNECTIONS (NOTES 13 & 14)
MATERIAL: STAINLESS, CARBON & LOW ALLOY STEEL & ALUMINUM

DETAIL "B"

WELD END PREPARATION FOR PIPE, B.O. FITTINGS, VALVES, EQUIPMENT NOZZLES & HEADER CONNECTIONS (NOTES 13 & 14)
MATERIAL: CARBON, LOW ALLOY & STAINLESS STEEL
WALL THICKNESS: 0.120" THRU UNLIMITED

DETAIL

DIMENSIONS APPLICABLE TO DETAILS A-B-C-D-E-F
ALL MATERIALS - CLASSES

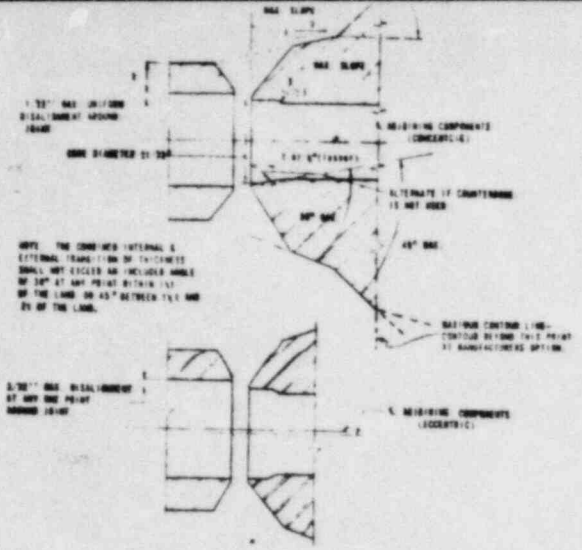
NOM. PIPE SIZE O.D.	SCH. NO.	PIPE "T"	PIPE	VALVE O.D. "A"	VALVE I.D. "B" NOMINAL	VALVE I.D. "B" TOLERANCE	I.D. WELD END "C"
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOM. PIPE SIZE O.D.	SCH. NO.	PIPE "T"	PIPE	VALVE O.D.	VALVE I.D. "B" NOMINAL	VALVE I.D. "B" TOLERANCE	I.D. WELD END "C"
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

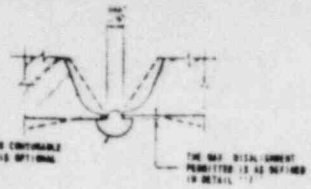
SPECIAL SIZES AND WALL THICKNESSES

SIZE O.D.	DETAIL	[illegible] WALL	[illegible] WALL	O.D. TOLERANCE	I.D. TOLERANCE	"C" DIMENSION
[illegible]	[illegible]	1.000"		± 1/32"	± 1/32"	[illegible]
54 54.000	D	.875"	.688"			54.695"
42 42.000	D	.750"	.875"			40.540"

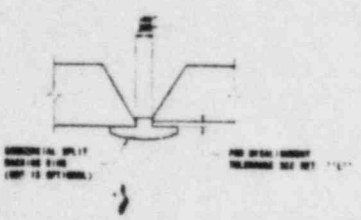
APPLICABLE TO PIPE 34" OD AND SMALLER. TOLERANCE SHALL BE (+ [illegible] - [illegible]) FOR PIPE 36" OD AND LARGER.



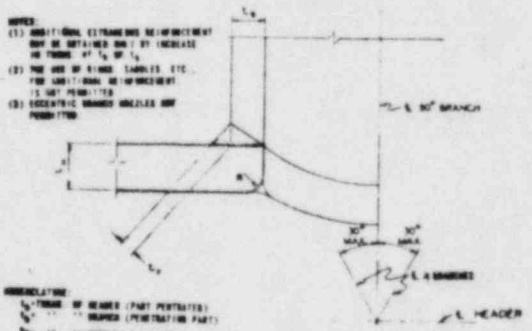
DETAIL "J"



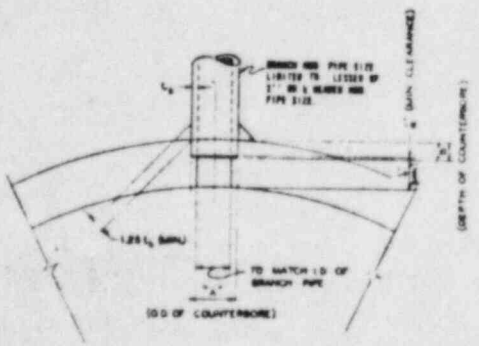
DETAIL "K"

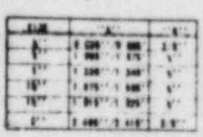


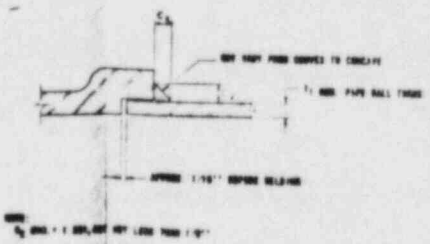
DETAIL "Q"



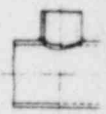
DETAIL "P"



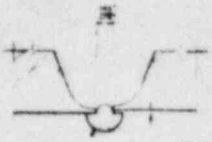




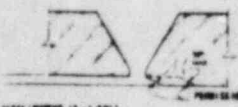
DETAIL "I"



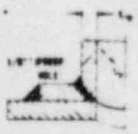
DETAIL "S"

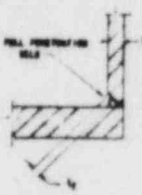


DETAIL "N"



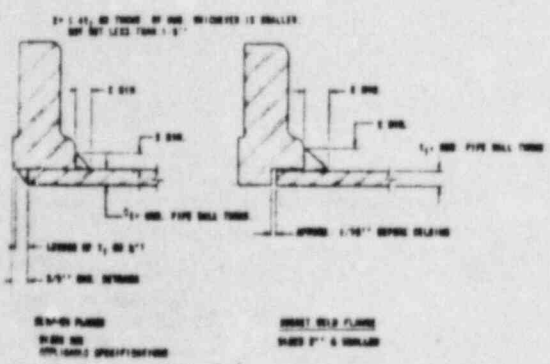
DETAIL "L"

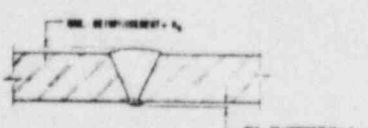


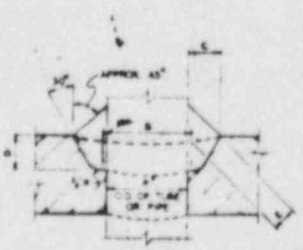


DETAIL "Q"

DETAIL "R"







DETAIL "W"

DETAIL "V"

DETAIL "W"

Specification CNS-1205.04-1 Attachment 5.3 Sheet 2 of 2

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION

PIPING LAYOUT
WELDING END PREPARATIONS

REPRESENTATIVE VALVE LIST, DIAPHRAGM VALVES
DUKE POWER COMPANY
DIAPHRAGM VALVES
VALVE LIST NO. CN-01,00-2a, REV. 0
DATE 11-05-74

SS/ DIAPHRAGM VALVES CODE

ITEM NO.	DUKE VALVE CLASS	TYPE	QTY	SIZE	MFG. FIGURE NUMBER	OPER	ENDS	LIMIT SWITCH	SEAL LEAK OFF	LOCK & LOCKING DEVICE	DESIGN COND PSIG	DESIGN COND TEMP	SERVICE
SR-601	B	DP	4	0.50		Pn	SW	NS	NR	NR	215	200	
SR-602	C	DP	26	0.50		Pn	SW	NS	NR	NR	215	200	
SR-603	B	DP	35	1.00		PN	SW	NS	NR	NR	215	200	
SR-604	B	DP	4	1.00		EMO*	SW	NS	NR	NR	215	200	
SR-604	REMARKS- EMC SPEED OF OPERATION 10 SECONDS MAX.												
SR-605	B	DP	2	1.00		AIR	SW	NS	NR	NR	215	200	
SR-605	REMARKS- FAIL CLOSED												
SR-606	C	DP	205	1.00		PN	SW	NS	NR	NR	215	200	
SR-607	C	DP	8	1.00		AIR	SW	NS	NR	NR	215	200	
SR-607	REMARKS- FAIL CLOSED												
SR-608	B	DP	7	2.00		PN	SW	NS	NR	NR	215	200	
SR-609	B	DP	8	2.00		EMO*	SW	NS	NR	NR	215	200	
SR-609	REMARKS- EMC SPEED OF OPERATION 10 SECONDS MAX.												
SR-610	B	DP	2	2.00		AIR	SW	NS	NR	NR	215	200	
SR-610	REMARKS- FAIL CLOSED												
SR-611	C	DP	56	2.00		PN	SW	NS	NR	NR	215	200	
SR-612	C	DP	23	2.00		AIR	SW	NS	NR	NR	215	200	
SR-612	REMARKS- FAIL CLOSED												
SR-613	C	DP	5	2.00		AIR	SW	NS	NR	NR	215	200	
SR-613	REMARKS- FAIL OPEN												
SR-614	B	DP	70	3.00		PN	SW	NS	NR	NR	215	200	
SR-615	B	DP	6	3.00		EMO*	SW	NS	NR	NR	215	200	
SR-615	REMARKS- EMC SPEED OF OPERATION 10 SECONDS MAX.												
SR-616	C	DP	35	3.00		PN	SW	NS	NR	NR	215	200	
SR-617	C	DP	12	3.00		AIR	SW	NS	NR	NR	215	200	
SR-617	REMARKS- FAIL CLOSED												

Specification CNS-1205.04-1
Attachment 5.4
PAGE NO. 1

CS/ DIAPHRAGM VALVES
CODE

REPRESENTATIVE VALVE LIST, DIAPHRAGM VALVES

DUKE POWER COMPANY
DIAPHRAGM VALVES
VALVE LIST NO. CN -[illegible] REV. 0
DATE 11-[illegible]-74

ITEM NO	CODE VALVE CLASS	TYPE	QTY	SIZE	MFG. FIGURE NUMBER	OPER	ENDS	LIMIT SWITCH	SEAL LEAK OFF	LOCK & LOCKING DEVICE	DESIGN COND PSIG	DESIGN COND TEMP	SERVICE
[illegible]	[illegible]	DP	2	0.50		PM	SW	NR	NR	NR	215	200	
[illegible]	[illegible]	DP	3	0.5[illegible]		PM	SW	NR	NR	NR	215	200	
[illegible]	B	DP	4	1.00		PM	SW	NR	NR	NR	215	200	
[illegible]	C	DP	56	1.[illegible]		PM	SW	NR	NR	NR	215	200	
[illegible]	[illegible]	DP	4	1.50		EMO*	SW	NR	NR	NR	215	200	
[illegible]	REMARKS- EMO SPEED OF OPERATION 10 SECONDS MAX.												
[illegible]	C	DP	20	1.00		AIR	SW	NR	NR	NR	215	200	
[illegible]	REMARKS- FAIL CLOSED												
[illegible]	C	DP	25	2.00		PM	SW	NR	NR	NR	215	200	
[illegible]	C	DP	25	2.00		AIR	SW	NR	NR	NR	215	200	
[illegible]	REMARKS- FAIL CLOSED												
[illegible]	C	DP	5	3.00		PM		NR	NR	NR	215	200	
[illegible]	B	DP	2	4.00		EMO*		NR	NR	NR	215	200	
[illegible]	REMARKS- EMO SPEED OF OPERATION 10 SECONDS MAX.												
[illegible]	B	DP	4	4.00		AIR		NR	NR	NR	215	200	
[illegible]	REMARKS- FAIL CLOSED												
[illegible]	C	DP	4	8.00		PM		NR	NR	NR	215	200	

REPRESENTATIVE VALVE LIST, DIAPHRAGM VALVES

CORE FUEL CLADDING
DIAPHRAGM VALVES
VALVE LIST NO. CA-0130-20, REV. 0
DATE 11-08-74

ITEM NO.	VALVE CLASS	TYPE	QTY	SIZE	PFG. FIGURE NUMBER	OPER	ENDS	LIMIT SWITCH	SEAL LEAK DET	LOCK & LOCKING DEVICE	DESIGN COND. PSIG	DESIGN COND. TEMP	SERVICE
SP-615	C	GP	6	3.00		AIR		NR	NR	NR	215	200	
REMARKS- FAIL OPEN													
SP-615	B	GP	17	4.00		HW		NR	NR	NR	215	200	
SP-620	B	GP	4	4.00		EMCP		NR	NR	NR	215	200	
REMARKS- EMF SPEED OF OPERATION 10 SECONDS MAX.													
SP-621	C	GP	24	4.00		HW		NR	NR	NR	215	200	
SP-622	B	GP	4	6.00		HW		NR	NR	NR	215	200	
SP-623	B	GP	4	6.00		EMCP		NR	NR	NR	215	200	
REMARKS- EMF SPEED OF OPERATION 10 SECONDS MAX.													
SP-624	C	GP	4	6.00		HW		NR	NR	NR	215	200	

Specification No. CNS-1205.04-1
Attachment Date: February 4, 1975
Attachment No: 5.6

DUKE POWER COMPANY
SEISMIC DESIGN REQUIREMENTS
VALVES
CATAWBA 1 & 2
CLASS 2/3
DIAPHRAGM AND PLUG TYPE VALVES

1.0 Seismic Design Manual

The valve and appurtenances shall be qualified to meet the seismic design requirements of this specification in accordance with the procedures and guidelines of the Duke Power Company Seismic Design Manual. The Manual is intended to be utilized only as a reference to this section and not to be used alone. The sections of the Manual pertaining to particular portions of this specification are noted below. However, those sections should not be used directly without the background information provided in the remainder of the Manual.

2.0 Operating Conditions

2.1 Modes of Operation

Two modes of operation shall be considered (Manual Section 4.1.3). The upset mode includes the effects of the Operational Basis Earthquake (OBE), and the faulted mode includes the effects of the Safe Shutdown Earthquake (SSE). The seismic loads shall be considered in combination with all other concurrent loadings on the valve (Manual Section 4.1.3). The criteria for these loads are specified below.

2.2 Seismic Input Criteria

For the SSE, a Seismic Load Factor (SLF) of 3.0 g shall be applied in each of two orthogonal horizontal directions in combination with an SLF of 2.0 g in the vertical direction, all acting simultaneously (Manual Section 4.1.1.1). The SLF values for the OBE shall be taken as 8/15 of the respective values for the SSE.

2.3 Concurrent Loading Conditions

Other concurrent loadings to be considered are described in Manual Section 4.1.3. Any additional considerations are specified below.

3.0 Seismic Qualification

3.1 Procedure

One of the following procedures may be utilized for the seismic qualification:

3.1.1 Equivalent Static Analysis

An analysis shall be performed in accordance with Manual Section 4.2. The results shall be demonstrated to fulfill the acceptance criteria of Manual Section 6.0 for active valves.

3.1.2 Testing

A testing program shall be performed in accordance with Manual Section 5.0. Test procedures 5.2.1 to 5.2.8 shall be performed. It is to be noted that a preliminary report shall be submitted prior to any tests (Manual Section 7.1).

3.1.3 Combined Testing and Analysis

A testing program may be selected to satisfy only a portion of the seismic requirements. The remainder of the equipment shall be qualified by analysis. Complete documentation shall be presented demonstrating the correlation between the analysis and the test results (Manual Section 5.0).

3.2 Orientation

The valve shall be considered in the worst possible orientation (highest stress/deformation level in each valve component) with respect to the total combined loading conditions.

3.3 Support Conditions

The valve shall be considered to be supported only at the inlet and outlet ends.

3.4 Active Valves

For safety, relief, isolation, and all other active valves having extended operator structures:

3.4.1 Rigid Structure

The valves shall be designed such that there are no natural frequencies less than 33 Hz. This shall be demonstrated either via testing (Manual Section 5.2.4, Exploratory Scanning Test) or by analysis (Manual Section 4.2.1.2).

3.4.2 Static Deflection Test

A static deflection test shall be performed in accordance with Manual Section 5.2.9 to verify operability under the specified static loading conditions.

3.5 Piping Loads

The following two criteria shall be met to verify the capability of the valve with respect to piping loads.

3.5.1 To ensure that the torsional and bending moment capability of the valve body is greater than that of the adjacent piping, the ratio of the minimum section modulus of the valve body perpendicular to the run of the valve to the yield strength of the valve body material shall be at least 1.2 times the same ratio for the adjacent piping. Required data for the piping is as follows:

Pipe Size: _____

Yield Strength: Sy = _____ psi

Section Modulus: Z = _____ in^3

3.5.2 To ensure operability of the valve while subjected to maximum piping loads, valve operation shall not be impaired due to a bending moment, M = Z x Sy, or a torsional moment, T = 1.2 Z x Sy, each applied singly at the ends of the valve.

4.0 General Considerations

4.1 In addition to these seismic criteria, the requirements of ASME Section III shall be met.

5.0 Reporting Requirements

A fully documented report on the seismic qualification shall be submitted in accordance with Sections 7.0 and 8.0 of the Seismic Design Manual. This report must be approved by Duke Power Company prior to shipment of any items of equipment.

SPECIFICATION: CNS-1205.04-1

ATTACHMENT: 5.7

DUKE POWER COMPANY
MECHANICAL EQUIPMENT
STATUS REPORT

Equipment _____ Quantity _____

Manufacturer _____ Representative _____

Mill Power Order _____

		Unit		Unit	
		Promise Date	Actual Date	Promise Date	Actual Date
1.	Spec Issue Date				
2.	Quality Control Survey				
3.	Mill Power Order Date				
4.	Engineering Meeting				
5.	Motor Data Sheet to Duke				
6.	Motor Information Sheet to Duke				
7.	Initial Outline Drawing to Duke				
8.	Motor Pring to Mfgr				
9.	Assembly Dwg to Duke				
10.	Assembly Dwg Approved				
11.	Mfgr Start Engineering				
12.	Mfgr Complete Engring				
13.	Mfgr Order Materials				
14.	Quality Assurance Visit				
15.	Mfgr Start Production				
16.	Quality Assurance Visit				
17.	Mfgr Complete Production				
18.	Quality Assurance Visit				
19.	Mfgr Start Testing				
20.	Mfgr Submit Instr Book				
21.	Mfgr Submit Sepia				
22.	Mfgr Submit Complete Records				
23.	Owner Submit QA Release				
24.	Mfgr Ship Equipment				

EQUIPMENT STATUS REPORT
EXPLANATION & INSTRUCTIONS

The manufacturer is to complete, to the best of his knowledge at the time of proposition, those items checked or applying to said manufacturer by noting the date required in the column marked "promise".

1) Spec Issue Date - Date noted on specification - usually in upper right hand column.

2) QC Survey - Will be completed by Owner (not applicable in all cases).

3) Mill Power Order Date - Date of purchase order or letter of intent from Mill Power to manufacturer.

4) Engineering Meeting - Date of meeting shortly after order date to settle contractual items and discuss with the manufacturer problems or equipment in detail. This date usually set by Owner - Not applicable in many cases.

5) Motor Data Sheet- Date M-1, M-2, M-3, etc Duke Power motor data forms (if included in specification or later) are submitted (or will be submitted) to Duke Power. If motors are to be supplied by manufacturer, data sheets will be necessary - and completed as soon after order date as possible.

6) Motor Info Sheet - Date Mechanical Motor Data Form is or will be sent to Duke Power. Similar to above but Duke Power will supply motor for equipment based on information returned on this sheet.

7) Initial Outline - Date formal print submittal will be sent to Duke Power. (Proposal drawing <u>not</u> included). Drawing usually means first submittal and may or may not be certified depending on equipment. Manufacturer may desire to give two dates - one for preliminary drawing and one for certified drawings.

8) Motor Print to Mfr - Date (latest) that manufacturer needs outline of motor and pertinent information to meet scheduled (his or ours) dates. There is no need for mfr to enter "with order" as motor information will generally not be available until at least 10 to 12 weeks after order.

9) Assembly Dwg to Duke - Date all (or most) drawings, including assembly, if applicable will be submitted for approval commensurate with Owner's and Manufacturer's schedule.

10) Assy Dwg Approved - Date that Duke Power must return approval of above (No 9) prints to manufacturer. This does not mean Duke will hold prints until this date. Duke will use this date to estimate that point in time when changes or requests cannot be made without affecting equipment manufacturer or engineering. Manufacturer to use discretion when selecting this date as this may be part of the evaluation.

11) Mfgr Start Engineering - Date when manufacturer intends to start engineering of purchased equipment.

12) Mfgr to complete engr - Date when manufacturer must have completed all engineering in order to release to manufacturing or production.

13) Mfgr Order Material - Date when manufacturer will start ordering materials to proceed with production of equipment in order to meet scheduled delivery.

14) QA Visit - May not be applicable - Owner will select.

15) Mfg Start Production - Date when manufacturer makes initial commitment to shops or production floor in order to have equipment delivered per schedule.

16) QA Visit - Same as Item 14.

17) Mfr Complete Production - Date when manufacturer will have components assembled and completed.

18) QA Visit - Same as Item 14.

19) Mfr Start Testing - Date when manufacturer will start check out of panels, witness testing, performance testing, etc of assembled components (in part or in total) of purchased equipment per contractual agreements.

20) Mfr Submit Instruction Book - Date when mfgr will submit instructions on operating and maintenance to Owner per specification

21) Mfr to Submit Sepia - Date permanent sepia sent to Owner - may not be applicable.

22) Mfr to submit Records - Date permanent records sent to Owner for QA on performance testing records - may not be applicable.

23) QA Release - Date of notification to Owner that all QA records are in order and have been completed. See specifications for details - may not apply.

24) Date equipment to be shipped to jobsite - As shown on purchase order or agreement with Mill Power.

Notes:

(1) Mfr should check specifications for applicable items and further details.

(2) Owner to use sheet for evaluation purposes, measure performance of manufacturer for future reference.

(3) Report will not negate any contract agreements or specification requirements. No dates given or expressed shall be taken by the manufacturer as being approved by Owner necessarily because of acceptance of report by Owner.

(4) Column marked "actual" will be completed by Owner.

(5) Mfr to dist dates; ie, 1-2-71 in lieu of terms such as "after approval", "10 weeks after drawing approval", "after order".

TLO/cf
2-1-71

GENERAL CONDITIONS OF CONTRACT

EQUIPMENT AND SYSTEMS

Effective August 1, 1973

1. GENERAL CONDITIONS

a) These General Conditions of Contract of the Owner shall prevail in the event conditions offered by the Contractor add to or are in conflict with these General Conditions.

b) Where these General Conditions of Contract are in conflict with the Owner's specification, including revisions and addenda thereto, the specification shall prevail.

2. GUARANTEE

For a period of one calendar year after initial operation, the Contractor guarantees that the equipment covered by the specifications shall be free from defects in workmanship and materials, and shall operate satisfactorily under all conditions described by the specifications. Any equipment or components thereof which fail to meet the above guarantee shall be repaired, replaced or upgraded by the Contractor to the full satisfaction of the Owner and at no cost to the Owner. The initial operation of this equipment is scheduled on or about January 1981.

3. FAILURE TO MEET GUARANTEE

a) Any defects in material or workmanship or other failure to meet requirements of the specifications, including errors or omissions, which are disclosed prior to final payment, or prior to acceptance by the Owner, whichever occurs at the later date, shall, if so directed by the Owner, be corrected entirely at the expense of the Contractor.

b) Any latent defects not disclosed before date of final payment or date of acceptance, whichever is the later date, but disclosed within one year after the equipment and/or systems are placed in use, shall be corrected promptly by and at the expense of the Contractor.

c) Any variation from the materia s or design agreed upon with the Contractor at the time of the award of the contract shall be approved by the Owner before any such changes are incorporated in the equipment or system to be furnished by Contractor. Approved variations must be fully documented and records thereof furnished to the Owner.

4. RIGHT TO OPERATE UNSATISFACTORY EQUIPMENT

The Owner shall have the right to operate any and all equipment as soon and as long as it is in operating condition whether or not such equipment has yet been accepted as complete and satisfactory. This shall not be construed, however, to require continued operation of equipment which may be materially damaged by such operation before the required repair has been made.

If the operation or use of the equipment, after installation, proves to be unsatisfactory to the Owner, the Owner shall have the right to operate and use such equipment for such time as Owner deems necessary until it can be taken out of service for repairs or replacement in whole or part by the Contractor. Use or operation of equipment, systems, or materials which do not meet the foregoing guarantee shall not waive Owner's right to require full compliance with the contract nor shall it waive the Owner's right to recover damages from Contractor.

5. PATENTS

The Contractor shall defend any suit or proceeding brought against the Owner so far as based on a claim that any equipment or any part thereof, furnished under this contract constitutes an infringement of any patent of the United States or any other country, and the Contractor shall indemnify and save the Owner harmless from all expenses, damages and costs awarded therein against the Owner or incurred by the Owner. In case said equipment, or any part thereof, is in such suit held to constitute infringement and the use of said equipment or part is enjoined, the Contractor shall, at its own expense and at its option, either procure for the Owner the right to continue using said equipment or part; or replace same with non-infringing equipment; or modify it so it becomes non-infringing; or remove said equipment and refund the purchase price and the transportation and installation costs thereof.

6. COMMENCEMENT, PROSECUTION AND DELIVERY

The Contractor agrees that he will commence performance of work under the contract within ten calendar days after receipt by him of notice of award of the contract unless the consent of the Owner in writing is given to begin at a different date, and that he will prosecute the same so that all work shall be entirely completed and performed in accordance with the specifications and the items delivered at destination on the dates established by the Owner.

7. SCHEDULE AND PROGRESS CHART

The Contractor shall submit to the Purchaser within fifteen days after award of contract for approval four copies of an outline of his proposed methods and manner of executing the work including sequences of operation and a brief time schedule of performing it. Within fifteen days after approval thereof, the Contractor shall submit to the Purchaser, for approval, a practicable schedule showing the order in which the Contractor proposes to carry on the work, the dates on which he will start the several salient features (including engineering, procurement of materials, fabrication, assembly, tests, shipments, etc.) and the contemplated dates for completing it. The schedule shall be in accordance with the outline and brief schedule previously approved and in the form of a bar graph of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time on the salient

features as well as the total contract. The Contractor shall enter on the graph the actual progress at the end of each month and shall immediately deliver to the Purchaser six copies thereof.

8. MATERIALS AND WORKMANSHIP

a) All materials used in the construction of the equipment shall be new and of highest standard commercial quality normally used for this type of equipment, considering strength, ductility, durability, best engineering practice, and the purpose for which the equipment is to be used (unless otherwise required by the specifications). Liberal factors of safety shall be used throughout the design and especially in the design of all parts subject to alternating stresses or shock.

b) All work shall be performed and completed in a thorough workmanlike manner and shall follow the best modern practice in the manufacture of high quality equipment, notwithsatnding any omissions from the specifications or drawings. All work shall be performed by workmen skilled in their various trades. All parts shall be made accurately to standard gauge, where possible, to facilitate replacement and repairs. Like parts shall be interchangeable insofar as practicable. Incidental fittings, fixtures, accessories and supplies shall be new, of approved manufacture and of standard first-grade quality. The Contractor shall provide and maintain in storage for at least ten years, free of cost to the Owner, sufficient templates, gauges, patterns, or other recores to enable the Contractor to make repair and replacement parts. All special gauges and templates necessary for field erection and installation shall become the property of the Owner. The patterns shall remain the property of the Contractor.

9. INSPECTION AND TESTS

a) All materials furnished and all work performed will be subject to rigid inspection, and no materials shall be shipped until all required or specified tests, analyses, and inspections have been made, or certified copies of reports of tests and analyses or Contractor's guarantees shall have been accepted. The Contractor shall prepare specimens and perform tests and analyses in accordance with the specifications and as required to demonstrate conformance of the various materials with the applicable specifications. The Contractor shall furnish the Owner with copies of certified test reports for all tests and analyses and/or certifications required by the specifications.

b) The Contractor shall keep the Owner informed in advance, of the time of starting and of the progress of the work in its various stages so that arrangements can be made for inspection.

c) All items shipped to the Owner at any location will be subject to the Owner's receiving inspection upon arrival at the shipping destination and prior to unloading where possible.

d) Acceptance of the equipment or the waiving of the inspection thereof shall in no way relieve the Contractor of the responsibility for furnishing equipment meeting the requirements of the specifications.

10. ACCESS TO FACILITIES

a) The Owner and/or his agents shall at all times have access to all places where materials or equipment are being prepared or manufactured for use under the contract, and shall have full facilities for unrestricted inspection of such materials or equipment and their manufacture.

b) The Owner and/or his agents at all times have access to quality assurance records concerning equipment and systems being prepared or manufactured for use under the contract.

11. COOPERATION WITH OTHER MANUFACTURERS

The Contractor shall cooperate with other manufacturers or suppliers furnishing associated equipment or equipment connecting directly thereto. The Contractor shall exchange with other suppliers all necessary drawings, dimensions, templates, gauges and other information required to insure a combined installation that is most suitable in every respect within the intent of the specification, and to eliminate delays in manufacture, fabrication or installation. The Contractor shall keep the Owner informed of all such coordination by copy of his letters to other manufacturers.

12. MARKING

Each complete item, or component part of an item, if multiple units are being furnished, shall be given an identification number or letter, and each part of each item which is not permanently connected in shop assembly shall be legibly marked and match-marked. Except on bolts and other small parts, all such marks shall be made as required by the specifications or in a manner suitable for the expected service. Diagrams, detail drawings or erection drawings showing all such marking shall be supplied. Each piece or subassembly separately packaged for shipment shall be labeled or tagged with the specification number and the mark number of such piece or the numbers of the parts grouped in such subassembly or contained in the package.

13. PREPARATION FOR SHIPMENT

The Contractor shall prepare all equipment and materials for shipment in such manner to protect them from damage in transit. Any articles or material that might otherwise be lost shall be suitably packaged and protected and clearly marked for identification. All parts shall be prepared for shipment so that slings for handling may be attached readily while the parts are on the conveyance. Where it is unsafe to attach slings to a box, boxed parts shall be packed with

slings attached to the part, and the slings shall project through the box or crate so that attachment can be made readily. All finished surfaces shall be coated with rust-preventative compound, and all finished nonferrous metalwork and devices subject to damage shall be suitably wrapped or otherwise protected from damage during shipment unless otherwise specified in specification. All components requiring indoor storage prior to erection shall be shipped in closed, weather-tight conveyances, and the package shall be clearly labeled in large letters with detailed instructions covering the proper protection of article or articles while in storage.

14. SHIPMENT

a) The Contractor shall notify the Purchaser at least fifteen days in advance of expected shipping dates. When a shipment is made, the Contractor shall notify the Purchaser giving the type of carrier and name of transporting agent and also a description of the article or articles shipped, the packing list, and any other information necessary for the identification, storage or assembly of the article or articles shipped. The shipping weight of such item shall also be given.

b) Title to, risk of loss of, and damage to equipment, materials and articles shipped shall be and remain with the Contractor until delivered to and accepted at the destination designated by the Owner.

15. ERECTION

a) Erection of the equipment will be performed by the Owner with the technical advice of the Contractor's erection engineers as required.

b) The Contractor shall furnish, if and when and to the extent required by the Owner, one or more erection engineers who shall give technical direction for the erecting, inspecting, initial operation and testing until completed to the satisfaction of the Owner, and to instruct the Owner (and/or his agent) in the operational and maintenance features of the equipment. The work and operations of the erection engineer(s) shall be coordinated with the construction program at the erection site as directed by the Owner.

c) In addition to other warranty requirements specified herein, if any portion of the equipment is damaged as a direct result of faulty or inadequate technical direction of installation, inspecting or instruction by the Contractor's erection engineer(s) within one year from the date of initial operation, the Contractor shall correct such damage at his own expense.

16. INDEMNITY

The Contractor will indemnify and save harmless the Owner against all damages, claims for damages, suits, demands, attorney fees and costs, in whole or in part, growing out of or in any way connected with the performance of this contract by the Contractor and its employess or its subcontractors, if any, and their employees. In connection with the foregoing indemnity, the Contractor, on demand by the Owner, shall take over and defend any suit against the Owner covered by the indemnity. The Contractor shall not, however, be liable in any event for any loss or injury to persons or property (including the apparatus installed) caused solely by:

a) The negligence or fault of the Owner, its employees, agents, and other contractors with Owner;

b) Failure to observe the erection engineer's instructions;

c) The failure or malfunctioning of tools, equipment, facilities, or devices not furnished by the Contractor, which is caused by defects therein not observable by the erection engineer's visual inspection.

17. SUBCONTRACTORS AND ASSIGNMENT

a) Prior to award of contract the Contractor shall submit to the Owner for his approval, a list of all portions of the contract in the engineering, material and fabrication areas that will be subcontracted to nondomestic suppliers. The following award of the contract, an up-to-date inventory shall be submitted by the Contractor to the Owner on a monthly basis which provides information on the percentage of the total contract that will be provided by nondomestic subcontractors. Owner approval in writing is required prior to award by the Contractor of any subcontract to a nondomestic supplier.

b) The Contractor shall submit to the Owner within thirty days after receipt of notice of award the name and address of all subcontractors, if any, of major parts, materials and fabrications. Any portion of fabrication to be subcontracted must first be approved by the Owner prior to the award of the order tosuch subcontractor. No right or interest in the contract or obligation under the contract may be assigned by Contractor without written permission of the Owner.

18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

All work performed by the Contractor or any Subcontractor on the Owner's premises shall comply with the latest revision of Safety and Health Regulations for Construction (29 FR 1518). Designs of equipment or systems by the Contractor or subcontractor shall incorporate the features required to insure that such equipment or systems comply with latest revisions of Occupational Safety and Health Standards (29 FR 1910).

19. PRICE STABILIZATION

Contractor represents to the Owner that its prices and those of its subcontractors, if any, are in accord with the Economic Stabilization Act of 1970 and any Executive Orders and Rules and Regulations issued thereunder or any similar Act of Congress controlling prices or wages and any orders, rules, or regulations issued thereunder.

20. PAYMENT SCHEDULE

Unless specifically provided elsewhere in the contract to the contrary, all payments for work done or materials furnished hereunder shall be made as follows:

a) Invoices received by the Owner at any time between the 26th day of a month and 10th day of the next month shall be paid on the 25th day of said next month, provided the work has been satisfactorily completed or materials received and accepted.

b) Invoices received by the Owner at any time between the 11th and 25th days of any month shall be paid on the 10th day of the next ensuing month, provided the work has been satisfactorily completed or materials received and accepted.

c) Invoices on which payment is withheld due to an exception will be paid as provided above, such invoices to be considered received by the Owner on the date on which such exception is removed.

d) If any payment date as provided above shall fall on a Saturday, a Sunday or legal holiday, payment shall be deferred to the next ensuing business day of the Owner.

e) Terms of payment are to be as offered and accepted or as may be negotiated.

f) In addition to terms of payment, complete final payment will not be made until all documentation required for application, installation or other utilization is received by the Owner from the Contractor. This includes, but is not limited to, test reports, handling and storage recommendations, quality assurance documentation, identification information, etc. A maximum of five percent of the contract amount will be withheld until such requirements are met.

Specification: CNS-1205.04-1

Date: February 10, 1975

Attachment: 5.9

GENERAL REQUIREMENTS APPLICABLE TO SPECIFICATION

1. SPARE PARTS

Immediately after the award of the order the Contractor shall submit a recommended spare parts list for each piece of equipment. The list shall include firm pricing of each item for delivery with the first major piece of equipment. After award of the order a separate purchase order for spare parts will be issued by the Purchaser for those spare parts, if any, which he decides are necessary.

In shipping the parts the Contractor shall clearly identify spare parts as such. A tag shall be securely attached to each part and shall show the following information:

a. Equipment name (e.g. "Condensate Pump, Spare Parts").
b. Part name (e.g. "Main Bearing").
c. Applicable equipment outline drawing number(s).
d. Part item number (as shown on the equipment outline drawing) and/or part number.
e. Mill Power Supply Company purchase order and item numbers.

Complete QA documentation as required by paragraph 10 of the equipment specification is required for each spare part.

2. FOREIGN MANUFACTURE

No parts, materials, or equipment shall be of manufacture outside of the United States without prior approval of Owner. Bidder shall identify in his proposal any parts, materials, or equipment contemplated for manufacture outside of the United States.

3. TESTS, REPORTS, AND INSPECTION

The Owner shall have full access to the equipment during the process of its manufacture and shop testing. The Owner shall be notified when manufacturing schedule is arranged. Should any work, fabrication or materials be supplied by a subcontractor or outside vendor, the Owner shall be notified prior to release to the vendor. The Owner reserves the right of approval of any subcontractor and also the right to inspect work, fabrication or material being subcontracted at the subcontractor's location. The Owner shall be kept informed during manufacture of any major problems or rework of material and be informed of any major repair procedures. The Contractor shall obtain approval from Owner prior to proceeding with any major repair procedures or material rework.

Six copies of certified pump performance test curves for pumps covered by the specification are to be submitted to Mr. S. K. Blackley, Jr., Attention:
for approval prior to shipment of any pumps.

Six copies of hydrotest results, where applicable, are required for approval prior to shipment of equipment.

4. CARE DURING STORAGE

The Contractor must submit to Owner, within four to six months prior to the time at which equipment is shipped, instructions for care of equipment during the periods listed below. These instructions should include requirements, if any, for periodic operation, rotation, or engergizing, for application or removal of protective coatings or lubricants, for disassembly or assembly during storage, and other instructions as necessary.

a. On-site storage prior to installation.

b. After installation, prior to startup, during construction.

c. After startup, during a lay up due to extended unit outage (this information required only if such information is not included in the instruction manual).

This information should be mailed to Mr. S. K. Blackley, Jr., at the address given in the specification.

5. CONFORMANCE WITH SPECIFICATIONS

The Contractor must submit with his proposal a list of all major and minor exceptions to these specifications and obtain written approval from Owner prior to award of the order. If there are no exceptions, it must be so stated in writing. It is particularly emphasized that any unapproved non-conformity with the specification must be changed to complete conformity at the Contractor's expense and this expense will include the cost of all labor and materials and all other related expenses by the Owner or Contractor.

PACKAGING AND SHIPPING REQUIREMENTS

Specification No. Date

1. ITEM CLASSIFICATION (ANSI N45.2.2 - 1972)

   Level A B C D Special
   Special _____

2. PACKAGING (ANSI N45.2.2 - 1972, Section 3 and Appendix A3)

   Level A B C D Special
   Special Instructions _____

3. SHIPPING (ANSI N45.2.2 - 1972, Section 4.2)

   Carrier Open Closed Special
   Special Instructions _____

   Shipment via Train Truck Plane Barge Ship Other

   Description of other means _____

4. LOADING & TRANSIT (ANSI N45.2.2 - 1972, Section 4.3)

   Special Instructions for loading, rigging, handling, preservative coatings, seals, stacking and vandalism precautions _____

5. IDENTIFICATION AND MARKING (ANSI N45.2.2 - 1972, Appendix A3.9)

   Item Markings _____

   Container Markings _____

SPECIFICATION: CNS-1205.04-1

SPECIFICATION NO. KKK-I

DATE 5-26-72

DUKE POWER COMPANY

McGuire Nuclear STATION

UNIT 1-2

Title: Nuclear Coating Specification No. KKK-I

Class I Coatings

REVISION LOG

1 9-14-72

2 2-7-74

3 6-1-74

4 11-18-74

5

Station and Unit Number: McGuire 1-2

Title of Specification: Nuclear Coating Specification No. KKK-I

Class I Coatings

File Number: MC-1167.02

Revision: 4

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Bryan Date: 6 Dec. 74

Checked By: [signature] Date: 12-6-74

Approved By: [signature] Date: 12-6-74

Inspection Waived By: [signature] Date: 12-6-74

Inspection Waived For: X ELECTRICAL MECHANICAL CIVIL

Inspected By: [signature] Date: 12-6-74

Inspected By: Date:

DIVISION QUALITY ASSURANCE [signature] Date: 12-11-74

****

(FOR ASME CODE ITEMS)

Division Date:
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL) SIGNATURE:

NAME:
Registered Professional Engineer

State & No.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. KKK-I

By: Design Engineering Date: 5-26-72 Revised: 11-18-74

1. SCOPE

1.1 This specification defines the method of surface preparation, materials, application, inspection, and record requirements for coating carbon steel surfaces cleaned to meet a minimum DP-SP10-Immersion (Near White Metal Blast Cleaning) rated as Class I Surface Areas of a nuclear power plant.

1.2 Class I surfaces are exposed areas in the Containment and Reactor Buildings and the interior of tank linings of the reactor coolant system, that must withstand a DBA and LOCA.

1.3 Examples: As a shop or pre-installation field prime coat for pumps, motors, equipment, structural steel, stairways, tank exteriors, etc. where normal operating surface temperatures do not exceed 200°F.

2. ATTACHMENTS

2.1 The following Duke Power Company attachments are attached to and made a part of this specification:

2.1.1 Approved Materials
2.1.2 Surface Preparations
2.1.3 Application Procedures
2.1.4 Workmanship Standards
2.1.5 Inspection Standards
2.1.6 Record Requirements
2.1.7 Duke Power Company Field Data Sheets VII A

3. COATING MATERIALS

3.1 Coating materials shall be in strict accordance with Duke Power Company Standard Approved Materials for System KKK, dated 1-1-74 as specified in Section 3.3.1.

4. COATING SYSTEM

4.1 Surface Preparation DP-SP10-Immersion Near White Metal Blast Cleaning

4.2 Prime Coat DP#17 Catalyzed Polyamide Epoxy Primer @ 2.5 DFT

Minimum 2.5 DFT

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. KKK-I

By: Design Engineering Date: 5-26-72 Revised: 11-18-74

5. SURFACE PREPARATION

5.1 Surface preparation shall be in strict accordance with Duke Power Company Standard Surface Preparation DP-SP10-Immersion, dated 1-1-74.

6. APPLICATION

6.1 Application shall be in strict accordance with Duke Power Company Application Procedures for DP#17, dated 1-1-74.

7. MIXING AND THINNING

7.1 Mixing and thinning shall be in strict accordance with Duke Power Company Data Sheets VII A, manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

8. EQUIPMENT

8.1 Equipment shall be in strict accordance with manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

9. WORKMANSHIP

9.1 Workmanship shall be in strict accordance with Duke Power Company Workmanship Standards for Nuclear Exposures, dated 6-1-74.

10. INSPECTION

10.1 Inspection shall be in strict accordance with Duke Power Company Inspection Standards for Nuclear Exposures, dated 6-1-74.

11. RECORD REQUIREMENTS

11.1 Records for all Class I Level Vendor coating work shall be in strict accordance with Duke Power Company Nuclear Coating Certification Specification MMM-1, dated 6-1-74.

11.2 The vendor is to complete the Duke Power Company Design Engineering Department Vendor Coating Information Form #1 and return it with his bid proposal to Duke Power Company.

11.3 Records for all Class I Level Field Applied coating work shall be in strict accordance with Duke Power Company Construction Procedure M-20.

STANDARD APPROVED MATERIALS

By: Durwood Peach DATE 1-1-74 REVISED

SYSTEM KKK

3. MATERIALS

3.1 The selection of materials for use in this specification by the applicator or vendor shall be those products listed in Section 3.3 unless specifically defined in Section 3.2. All materials selected shall be from one coating manufacturer.

3.2

3.3 Approved Materials

3.3.1 Coatings manufactured by Mobil Chemical Company

*DP#17 89-R-10 Val-Chem Hi-Build Epoxy Base
*DP#10 13-R-56 Zinc Chromate Epoxy Primer (Class II only)
*DP#16 13-R-60 Red Lead Epoxy Metal Primer (Class II only)
DP#

3.3.2 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.3 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.4 Coatings manufactured by

DP#
DP#
DP#
DP#

3.4 Products are as shown on Duke Power Company Field Coatings Data Sheet VIIA and Manufacturer's Product Technical Bulletins.

*May be substituted for DP#17 in Class II areas.

APPROVED BY QA

APPROVED BY DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP10 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP10-63 (Near White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP10-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

[illegible] QA

[illegible] 6-11-74
DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED _____

6. APPLICATION FOR DP#17

6.1 No material shall be applied when the surface or air temperature is below 50°F or above 110°F, when the relative humidity is above 90% or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray or brush application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Paint that has been stored at low temperatures shall be brought up to a minimum of 70°F before mixing and thinning.

6.4 Prior to thinning or application all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments and a uniform composition.

6.5 Storage, mixing, thinning, and induction time shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP#17 for the product selected.

6.6 Mixed materials shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP#17 for the product selected or prior to any significant change in viscosity, whichever comes first.

6.7 Use of additional thinner to lower the viscosity after the mixed pot life has been exceed shall not be allowed.

6.8 The following procedures are considered good paint practices and shall be adhered to if they affect the mixing, thinning, and application of the product.

6.8.1 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

6.8.2 If application is stopped for short periods of time, material will be flushed from the fluid lines and spray equipment cleaned.

6.8.3 Hot spray application may be used to control fluid temperature and viscosity but normally should not exceed 80°F fluid temperature.

6.9 Minimum DFT shall be as specified in section 4 when inspected in accordance with section 10 of this specification.

APPROVED BY QA

APPROVED BY _____ DATE 6-11-74

By: Durwood Peach DATE 1-1-74 REVISED

6.10 All areas with DFT readings less than specified in section 6.9 shall receive an additional coat of DP#17 prior to topcoating.

6.11 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines unless covered by a written project variation procedure.

		Spray	Brush
		Until dry	Until dry
6.11.1	Below 60°F		
6.11.2	60°F - 70°F	10 hr. - 8 hr.	48 hr. - 16 hr.
6.11.3	70°F - 80°F	8 hr. - 4 hr.	16 hr. - 12 hr.
6.11.4	80°F - 90°F	4 hr. - 3 hr.	12 hr. - 8 hr.
6.11.5	90°F - 100°F	2 hr.	8 hr.

6.12 Drying time for shipment or stacking together of finish coated work shall be in accordance with the minimum guidelines unless covered by a written project variation procedure.

6.12.1	Below 60°F	Until dry
6.12.2	60°F - 70°F	12 hr.
6.12.3	70°F - 80°F	8 hr.
6.12.4	80°F - 90°F	4 hr.
6.12.5	Above 90°F	3 hr.

6.13 Touch up procedures

6.13.1 Surface preparation of damaged or bare areas shall be in accordance with section 5 of this specification.

6.13.2 Application shall be in accordance with section 6.1 through 6.10.

6.13.3 Touch up for holidays and damage to small areas does not require minimum drying time for previous coat.

6.13.4 Stacking and loading after touch up shall be in accordance with section 6.12 unless areas touched up do not make contact with other surfaces during stacking and loading.

APPROVED by QA

[signature] 6-11-74
APPROVED BY DATE

5-10-17-2

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9. WORKMANSHIP

9.1 All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

9.2 All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

9.3 All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

9.4 Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to topcoating or completion of advanced stages of the operation.

9.5 The following standards of workmanship are considered necessary to accomplish good workmanship and shall be adhered to unless covered by a written project variation procedure.

9.5.1 Coating Materials

9.5.1.1 All paint materials and accessories shall be delivered to the jobsite in original, unopened containers with the manufacturer's labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

9.5.1.2 All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at the minimum-maximum temperatures specified on Duke Power Company Field Coatings Product Data Sheet VII A.

9.5.2 Coating System

9.5.2.1 Only paint materials approved in section 3 of this specification shall be allowed.

9.5.2.2 The DFT of each coat and of the entire system shall meet the requirements of section 4 of this specification for both number of coats and minimum DFT.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9.5.3 Surface Preparation

9.5.3.1 Cleaning and Painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

9.5.3.2 Where required, imperfections, holes, stictwelds in the surface shall be filled with approved fillers or caulking.

9.5.3.3 Hardware, trim, underwriters labels, manufacturer's serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and prevent damage.

9.5.3.4 All concrete hardners, curing agents and form release agents shall be compatible with the recommended coating system or be removed prior to any coating work.

9.5.4 Masking of Friction Joints and Weld Joints

9.5.4.1 Steel surfaces which are primed with an inorganic zinc primer shall not be masked if the following conditions are specified:

a. Areas to be welded shall be primed with a fully weldable inorganic zinc primer.

b. Areas to be joined with High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be primed with an inorganic zinc primer - either weldable or non-weldable.

Steel surfaces which are primed with an inorganic zinc primer shall be masked back two inches from edges to be welded if they are to become part of a vessel which must conform to the ASME Pressure Vessel Code.

9.5.4.2 Steel surfaces which are primed in the shop shall be masked as noted below if an inorganic primer is used.

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

a. Areas to be welded shall be masked so that no organic coating is within six (6) inches of the weld prior to the welding operation.

b. Areas to be joined with the High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be masked so that no organic coating is beneath the bolts prior to joining.

c. These requirements shall also apply to organic topcoats when shop applied or when applied prior to assembly or erection.

9.5.5 Application

9.5.5.1 All applied coatings shall be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application procedures.

9.5.5.2 Drying time between coats shall be in accordance with section 6 of this specification, Duke Power Company Field Coatings Product Data Sheet VII A, and the Manufacturer's Product Data Sheets on the specific products in that order of priority.

9.5.6 Mixing and Thinning

9.5.6.1 Mixing and thinning shall be in accordance with section 6 of this specification and Duke Power Company Field Product Data Sheet VII A.

9.5.7 Equipment

9.5.7.1 All equipment shall meet the requirements of section 8 of this specification.

9.5.7.2 All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

9.5.7.3 Effective oil and water separators shall be used and serviced on all air lines.

APPROVED BY QA

A. Brooks, 6-11-74

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

INSPECTION STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

10. INSPECTION

10.1 Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

10.2 The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

10.3 All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor, unless otherwise agreed to in writing by Duke Power Company.

10.4 Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

10.5 Duke Power Company Inspection Procedures for nuclear exposures will be made available to the applicator upon written request or presented in detail at the pre-start up meeting for each project.

[illegible] BY QA

[illegible] 6-18-74

SPECIFICATION NO. MMM-I

DATE 6-8-72

DUKE POWER COMPANY

McGuire Nuclear STATION

UNIT 1-2

Title: Nuclear Coating Certification

Specification No. MMM-I

Class I Coatings

REVISION LOG

1 6-1-74

2

3

4

5

VERIFICATION OF SPECIFICATION

Station and Unit Number: McGuire 1-2

Title of Specification: Nuclear Coating Certification

Specification No. MMM-I Class I Coatings

File Number: MC-1167.02

Revision: 1

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Bigger Date: 6 Dec 74

Checked By: [signature] Date: 12-6-74

Approved By: S B Hager Date: 12-6-74

Inspection Waived By: S B Hager Date: 12-6-74

Inspection Waived for: X ELECTRICAL _____ MECHANICAL _____ CIVIL

Inspected By: J. F. Wyle Date: 12-6-74

Inspected By: _____ Date: _____

DIVISION QUALITY ASSURANCE T.C. Roberts Date: 12-11-74

****

(FOR ASME CODE ITEMS)

_____ Division Date: _____

Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SIGNATURE: _____

NAME: _____

Registered Professional Engineer

State & No. _____

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION MMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

1. PURPOSE AND SCOPE

1.1 The purpose of this specification is to implement planned and systematic actions necessary to provide Duke Power Company with adequate confidence that a coating material has been properly manufactured and applied in a shop to Class I Service level substrates of nuclear facilities.

1.2 This specification establishes minimum records required for coating materials, surface preparation, application of materials and inspection.

1.3 The procedure conforms to Section 1.2.4 ANSI N101.4-1972 (American National Standard Institute - Quality Assurance for Protective Coatings Applied to Nuclear Facilities).

2. ATTACHMENTS

2.1 The following Duke Power Co. attachments are attached to and made a part of this specification.

2.1.1 Duke Power Company Quality Assurance Department Supplier Quality Assurance Certification - Form 930.1.

2.1.2 Coating Materials - Manufacturer's Product Identity Certification Record - DPNC Form 2.

2.1.3 Duke Power Company Supplier Quality Assurance Record - DPNC Form 3.

3. GENERAL REQUIREMENT

3.1 The Duke Power Company QA Department Supplier Quality Assurance Certification Form 930.1 shall be completed by the supplier for all Class I coating work.

3.1.1 One copy of Form 930.1 shall accompany each shipment to the jobsite.

3.1.2 Two copies of Form 930.1 per shipment shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.1.3 Form 930.1, when completed as specified, shall be authorization for Duke Power Construction to accept delivery of components and materials. Absence of properly completed QA Certification form shall result in quarantine or return of the component or materials to the supplier.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION MMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

3.2 A coating Material - Manufacturer's Product Identity Certification Record (DPNC Form #2) shall be obtained from the coating manufacturer for each batch of paint and thinner used by the vendor on Class I components.

3.2.1 Two copies of each DPNC Form #2 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.2.2 DPNC Form #2 shall be enclosed to cover each batch of material used on any or all components or materials shipped as listed on Duke Power Company QA Department Supplier Quality Assurance Certification.

3.3 A Duke Power Company Supplier Quality Assurance Record (DPNC Form 3) shall be filled out for all Class I coating work.

3.3.1 A separate form may be used to cover the following combinations of materials and components.

3.3.1.1 All work in each shipment.

3.3.1.2 Different types of components in each shipment.

3.3.1.3 Series of similar types of components in each shipment.

3.3.2 Two copies of DPNC Form 3 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.3.3 Failure of the vendor to meet all requirements of the bid specification or incomplete and inaccurate QA Documentation shall result in rejection by the owner of any or all components covered by that DPNC Form 3.

4. DOCUMENTATION

This section contains additional explanations and examples to aid the vendor in properly completing the forms listed in sections 2.1.1, 2.1.2, and 2.1.3.

4A. DPNC Form 3 (Sample Form attached).

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION MMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

4.1 Identify components or equipment so that separate items are traceable, and can be matched up with a specific Report No.

4.2 Example: Carbon steel, cast iron, stainless, aluminum, etc.

4.3 This information is for items covered by each DPNC Form 3.

4.4 Information should be reported in even gallons for items covered by each DPNC Form 3.

4.5 List all information required for each batch of material used on components covered by this DPNC Form 3 and attach a DPNC Form 2 for each batch of material listed on this DPNC Form 3.

4.6 Duke Power Company Design Specification used.

4.7 Examples: Steel grit, silica sand, glass beads, garnet.

4.8 Examples: 8/20, 8/35, 16/35, 30/50, etc.

4.9 Example: Xylol, methyl ethyl ketone, etc.

4.10 Read pressure at nozzle with ANG air needle gauge or equal. (Do not use pressure at compressor.)

4.11 Was moisture trap used effectively (yes) (no)?

4.12 Temperatures are to be taken in actual work areas and shall cover all conditions during surface preparation and exposure of components cleaned prior to priming.

4.13 Indoors - In a closed building kept at ambient temperatures.

4.14 Outdoors - Exposed to weather (even if under a roof).

4.15 Example - Brush, roller, spray, flow coated, etc.

4.16 Example - Graco airless, Devilbiss conventional

4.17 Example - E Fluid Tip

4.18 Example - #704 Air Cap

4.19 Example - Yes (motor driven), yes (manual), (no)

4.20 Was oil separator used effectively? (yes) (no)

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION MMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

4.21 Report actual total dry film thickness after primer, intermediate and finish coat.

4.22 Report number to be same on both front and back page. Report numbers shall be logged and numbered in sequence from 1 to ___ to cover all reports of a given Duke Power Company Bid Specification.

4B. DPNC Form 2

4.23 The vendor shall fill out the General Data Section and attach a DPNC Form 2 to the purchase order sent to the coating manufacture.

4.24 The coating manufacturer shall complete the Component Data Section, Mixed Component Data Section and Signature and Title section and return to the vendor.

4C. Form 930.1

4.25 In space 1 write "Components inspected and are in compliance with Nuclear Coating Certification Specification MMM-I, dated 6-1-74".

4.26 List Report Nos. for all DPNC Form #3, under QA Documentation Required, on the Form 930.1 for each shipment.

DPNC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. (4.1) _____

GENERAL INFORMATION

Substrate Material: (4.2) _____

Estimated Surface Area Coated
Sq. Ft./Item (4.3) No. Items (4.3) Total Sq. Ft. (4.3)

Estimated Coating Quantities Primer (4.4) Gal. Intermediate (4.4) Gal. Finish (4.4) Gal.

Date Work Began (4.3) Date Work Completed (4.3)

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED
(4.5)	(4.5)	(4.5)	(4.5)	(4.5)	(4.5)

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. (4.6)

Abrasive: Type (4.7) Solvent: Type (4.9)

Size (4.8) Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure (4.10) Moisture Trap (4.11)

Temperature	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors (4.13) Outdoors (4.14) Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application (4.15)

Spray:

Type Spray Gun (4.16) Agitator Pot (4.19)

Fluid Tip (4.17) Moisture Trap (4.11)

Air Cap (4.18) Oil Separator (4.20)

Temperature:	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	(4.21) DFT	(4.21) DFT	(4.21) DFT
Intermediate	(4.21) DFT	(4.21) DFT	(4.21) DFT
Finish:	(4.21) DFT	(4.21) DFT	(4.21) DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

COATING MATERIALS - MANUFACTURER'S PRODUCT IDENTITY CERTIFICATION RECORD
GENERAL DATA

PURCHASER _____

BILLING ADDRESS _____

SHIPPING ADDRESS _____

PROJECT DESIGNATION _____

DATE _____ PURCHASE ORDER NO. _____ RELEASE NO. _____

COATING MANUFACTURER _____

PRODUCT DESIGNATION _____

GALLONS ORDERED _____ GALLONS SHIPPED _____ REFERENCE NO. _____

COMPONENT DATA

	MIXED		INDIVIDUAL	
COMPONENT				
BATCH NO.				
GAL. ORDERED				
GAL. SHIPPED				
DATE MFG'D.				
SHELF LIFE				
SOLIDS BY VOLUME				
*WT./GAL.				
**VISCOSITY				
MIXING RATIO BY VOL.				

*(By Fed. Test Method Std. No. 141, Method 4814± or by ASTM D1475)
**(Method _____ @ _____ °F)

MIXED COMPONENT DATA

GENERIC TYPE _____ POT LIFE _____ @ _____ °F

FLASH POINT (TOC) _____ DFT PER COAT _____ INDUCTION PERIOD _____ @ _____ °F

COLOR (VISUAL) _____

RECOAT TIME RANGE _____ @ _____ °F _____ %R.H

DRY HARD _____ HRS. @ _____ °F _____ %R.H

TACK FREE _____ HRS. @ _____ °F _____ %R.H

COMMENTS:

Signature _____

Title _____

Date _____

Checked By _____

Revision 1 Dated 12-4-73

Revision 2 Dated 1-4-74

Distribution: 1 copy with shipment
2 copies Duke Civil Design

S-13-3-7

DPNC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. _____

_____

_____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area Coated
Sq. Ft./Item _____ No. Items _____ Total Sq. Ft. _____

Estimated Coating Quantities — Primer _____ Gal. Intermediate _____ Gal. Finish _____ Gal.

Date Work Began _____ Date Work Completed _____

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. _____

Abrasive: Type _____ Solvent: Type _____

Size _____ Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure _____ Moisture Trap _____

Temperature	Ambient	Surface	Dew Point
Max.:	_____ °F	_____ °F	_____ °F
Min.:	_____ °F	_____ °F	_____ °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application _____

Spray:

Type Spray Gun _____ Agitator Pot _____

Fluid Tip _____ Moisture Trap _____

Air Cap _____ Oil Separator _____

Temperature:	Ambient	Surface	Dew Point
Max.:	_____ °F	_____ °F	_____ °F
Min.:	_____ °F	_____ °F	_____ °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	_____ DFT	_____ DFT	_____ DFT
Intermediate	_____ DFT	_____ DFT	_____ DFT
Finish:	_____ DFT	_____ DFT	_____ DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

Name of Supplier _____ Item No. _____

Address of Supplier Plant _____ Spec. No. _____ Rev. ____

Component(s) or Material Date _____

_____ Shipping ID No. _____

_____ Release No. _____

Mill Power Order No. _____

Certification Included _____ Full _____ Partial _____

The following listed tests and inspections have been completed as required by specification: (If partial certification, list materials or components for which certification applies.)

1) _____

2) _____

3) _____

Physical and Chemical Analysis	____	Major Repair Records and Chart	____
Design Report	____	Repair NDT	____
Stress Report	____	Hydro (Test Press.-PSIG ____)	____
Heat Treatment	____	Cleanliness	____
Radiographic Test	____	Operating Test	____
Ultrasonic Test	____	Performance Curve	____
Magnetic Particle	____	ASME Data Report	____
Penetrant Tests	____	Personnel Qualifications on Record	____

Deviation Record _____

The following QA Documentation as required by the specification is attached to the original copy of this form: (If partial certification, include documentation applicable only to this specific shipment.)

DPNC Form #3 (List Report No.) _____

_____

_____

(continued)

Form 930.1A/Rev. 2

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

The listed component(s) or material(s) conform to the requirements of Duke Power Company Specification _____ with the approved deviations noted above. The QA documentation has been completed and attached to this form. No later than component or material shipment, the compliance QA documentation packet is being transmitted to Duke Power Company

H. L. Huggett
Quality Assurance Manager, Engineering
Quality Assurance Department
P. O. Box 2178
Charlotte, N. C. 28242

A copy of this completed Supplier Quality Assurance Certification form will be included with shipping papers and shipped with the component to Duke Power Company, at the address designated in the specification. This is to certify that the item of equipment identified above fully meets the requirement of the above listed specification including all of the codes, standards, test requirements, and quality assurance requirements invoked therein.

_____
Supplier Representative Authorized Signature

Title _____ Date _____

Form 930.1B/Rev. 2

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Mobil Chemical Co.
DP NO: 17
DATE: 1-1-74
PRODUCT NAME: Val Chem High Build Epoxy Base
PRODUCT NO: 89-R-10

PRODUCT DESCRIPTION: A catalyzed polyamide epoxy formulated for good abrasion, moisture, and chemical resistance as well as high film build properties.

USAGES: As a primer over blast cleaned metal surfaces in class I containment area where extended weathering without topcoating is required (material is leas free).

PRODUCT INFORMATION

PIGMENT TYPE:	Red Iron Oxide, Silicates, Barytes
VEHICLE TYPE:	Polyamide Epoxy
SOLVENTS & DILUENTS:	Ketones & aromatics
COLOR:	Red
GLOSS:	Low
SOLIDS BY VOLUME:	56%
SOLIDS BY WEIGHT:	74%
WEIGHT PER GALLON:	12.04 lbs:
THEO. COVERAGE @ 1.0 DFT:	900 sq. ft.
THEO. COVERAGE @ 2.0 DFT:	450 sq. ft.
VISCOSITY:	80 ± 5 Ku
PIGMENT VOLUME CONCENTRATION:	32
FLASH POINT:	80°F
TOXICITY:	Epoxy, Urea, Ketones, Alcohols, Aromatics
SHELF LIFE:	1 year
STORAGE TEMPERATURE:	25°F-125°F
PACKAGED:	2 component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior and Exterior (Chalks)
FLEXIBILITY:	Good
ABRASION:	Excellent
NORMAL DFT PER COAT:	2.0-3.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	250°F	200°F	NR
INTERMITTENT:	250°F	200°F	NR

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	R	R	NR
ALKALI	R	R	NR
SOLVENT	R	R	NR
SALT	R	R	NR
WATER	R	R	NR

APPROVED BY QA

MANUFACTURER PRODUCT NO: 89-R-10 DUKE POWER NO: 17

MIXING: Thoroughly mix 1 part base and 1 part 89-T-1 catalyst by volume with power mixer and box after thinning. Allow 30 min. Induction period.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SURFACE PREPARATIONS SEVERE
Steel	Self	SP#2,3,6	SP#5,5-Immersio , #10
Galvanized	Self	SP#11	SP#11
Stainless	Self	SP#12	SP#12
Aluminum	Self	SP#13	SP#13

FINISH COATS: DP#33, 34, 62, 67, 69, 72, 74, 75, 63.

APPLICATION: PREFERRED Spray
LIMITED Brush (small areas only)

THINNER: BRUSH/ROLL 7-T-25
SPRAY 7-T-25

CLEAN-UP MEK, Ketone Aromatic Blend, 7-T-25

THINNING %: BRUSH/ROLL 0-10
SPRAY 0-15

POT LIFE (±) @: 50°F 16 hr.
70°F 8 hr.
90°F 4 hr.

DRYING TIME (±):

	TOUCH	HANDLE	HARD	RECOAT SPRAY	RECOAT BRUSH
50°F	6 hr.	10 hr.	48 hr.	8 hr.	48 hr.
70°F	4 hr.	6 hr.	24 hr.	4 hr.	16 hr.
90°F	2 hr.	2 hr.	16 hr.	2 hr.	8 hr.

EQUIPMENT:

COMMENTS:
1. Chalks during exterior exposure.
2. Check for "lifting" when using over conventional coating.
3. Do Not apply when air or surface temperature is below 50°F.

APPROVED

J. B. Rosen
APPROVED BY

-4-74
DATE

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Project: _____ Date: _____

D.P. Co. Spec. No.: _____ Paint Category: _____

Vendor: _____ Equip: _____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area
By Sq. Ft. _____ Per Item _____ Total

Estimated Coating Quantities Primer _____Gal. Intermediate _____Gal. Finish _____ Gal.

Duke Power Standard Coating (Completed by vendor if DP Co. standard spec. is used)

Duke Power Coating System		Finish Color No. and Name	
	Primer	Intermediate	Topcoat
Duke Power Product No.	DP#	DP#	DP#
Manufacturer			

VENDOR'S STANDARD COATING

Surface Preparation (check one)

Steel Structures Painting Council SSPC-Standards-64								
SP1	SP2	SP3	SP5	SP6	SP7	SP8	SP10	Other (describe)

Generic Coating

	Alkyd	Lacquer	Phenolic	Epoxy	Urethane	Other (describe)
Primer						
Intermediate						
Finish						

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Specific Coating

	DFT	Product No. and Name	Product Manufacturer
Primer			
Intermediate			
Finish			
Finish Color No.		Color Name	
Color Source			

Drying Method

	Air	Baked	Catalyzed	Other
Primer				
Intermediate				
Finish				

Coating Specified by Duke Power Company
(To be completed by Design Engineering)

Field

Duke Power Coating System: _____

Surface Preparation: _____

Primer: _____

Intermediate: _____

Finish: _____

Finish Color No.: _____

Finish Color Name: _____

Comments:

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. KKK-II

10-21-74 (4)
6- 1-74 (3)
2- 7-74 (2)
9-14-72 (1)

By: Design Engineering Date: 5-26-74 Revised:

5. SURFACE PREPARATION

5.1 Surface Preparation shall be in strict accordance with Duke Power Company Standard Surface Preparation DP-SP10-Immersion.

6. APPLICATION

6.1 Application shall be in strict accordance with Duke Power Company Application Procedures for DP#10 and DP#16.

7. MIXING AND THINNING

7.1 Mixing and thinning shall be in strict accordance with Duke Power Company Data Sheets VII A, manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

8. EQUIPMENT

8.1 Equipment shall be in strict accordance with manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

9. WORKMANSHIP

9.1 Workmanship shall be in strict accordance with Duke Power Company Workmanship Standards for Nuclear Exposures.

10. INSPECTION

10.1 Inspection shall be in strict accordance with Duke Power Company Inspection Standards for Nuclear Exposures.

11. RECORDS

11.1 The vendor is to complete the Duke Power Company Design Engineering Department Vendor Coating Information Form #1 and return it with his bid proposal to Duke Power Company.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. KKK-II 10-21-74(4)
6-1-74 (3)
2-7-74 (2)

By: Design Engineering Date: 5-26-72 Revised: 9-14-72 (1)

1. SCOPE

1.1 This specification defines the method of surface preparation, materials, application, and inspection for coating carbon steel surfaces cleaned to meet a minimum DP-SP10-Immersion (Near White Metal Blast Cleaning) that are rated as Class II Surface Areas of a nuclear power plant.

1.2 Class II Service Level for coatings applies to those systems and components of nuclear facilities which are essential to the attainment of the intended normal operating performance.

1.3 Examples: As a shop or pre-installation field prime coat, pumps, motors, equipment, structural steel, stairways, tank exteriors, etc. where normal operating surface temperatures do not exceed 200°F.

2. ATTACHMENTS

2.1 The following Duke Power Company attachments are attached to and made a part of this specification:

2.1.1 Approved Materials
2.1.2 Surface Preparations
2.1.3 Application Procedures
2.1.4 Workmanship Standards
2.1.5 Inspection Standards
2.1.6 Duke Power Company Data Sheets VIIA
2.1.7 Vendor Coating Information Form #1

3. COATING MATERIALS

3.1 Coating materials shall be in strict accordance with Duke Power Company Standard Approved Materials for System KKK-II.

4. COATING SYSTEM

4.1	Surface Preparation	DP-SP10-Immersion Near White Metal Blast Cleaning		
4.2	Prime Coat	DP#10/DP#16	Catalyzed Polyamide Epoxy Primer	@ 2.5 DFT
			Minimum	2.5 DFT

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

STANDARD APPROVED MATERIALS

BY: Design Engineering DATE 10-21-74 REVISED

SYSTEM KKK-II

3. MATERIALS

3.1 The selection of materials for use in this specification by the applicator or vendor shall be those products listed in Section 3.3 unless specifically defined in Section 3.2. All materials selected shall be from one coating manufacturer.

3.2

3.3 Approved Materials

3.3.1 Coatings manufactured by Mobil Chemical Company

*DP# 10 13-R-56 Zinc Chromate Epoxy Primer
*DP# 16 13-R-60 Red Lead Epoxy Metal Primer
DP#
DP#

3.3.2 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.3 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.4 Coatings manufactured by

DP#
DP#
DP#
DP#

3.4 Products are as shown on Duke Power Company Field Coatings Data Sheet VIIA and Manufacturers Product Technical Bulletins.

*DP#16 may be substituted for DP#10.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP10 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP10-63 (Near White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP10-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

APPROVED BY QA

6-11-74
DATE

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6. APPLICATION FOR DP#10

6.1 No material shall be applied when the surface or air temperature is below 50°F or above 110°F, when the relative humidity is above 90% or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray, brush, or roller application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Paint that has been stored at low temperatures shall be brought up to a minimum of 70°F before mixing and thinning.

6.4 Prior to thinning or application all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments and a uniform composition.

6.5 Storage mixing, thinning, and induction time shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP#10 for the product selected.

6.6 Mixed materials shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP#10 for the product selected or prior to any significant change in viscosity, whichever comes first.

6.7 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

6.8 The following procedures are considered good paint practices and shall be adhered to if they affect the mixing, thinning, and application of the product.

6.8.1 Mixed material shall be strained through a 30 - 50 mesh strainer prior to application.

6.8.2 If application is stopped for short periods of time, material will be flushed from the fluid lines and spray equipment cleaned.

6.8.3 Hot spray application may be used to control fluid temperature and viscosity but normally should not exceed 80°F fluid temperature.

6.9 Minimum DFT shall be as specified in section 4 when inspected in accordance with section 10 of this specification.

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6.10 All areas with DFT readings less than specified in section 6.6 shall receive an additional coat of DP#10 prior to topcoating.

6.11 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines unless covered by a written project variation procedure.

		Spray Until dry	Brush Until dry
6.11.1	Below 60°F	10 hr. - 8 hr.	48 hr. - 16 hr.
6.11.2	60°F - 70°F	8 hr. - 4 hr.	16 hr. - 12 hr.
6.11.3	70°F - 80°F	4 hr. - 3 hr.	12 hr. - 8 hr.
6.11.4	80°F - 90°F	2 hr. -	8 hr.
6.11.5	90°F - 100°F		

6.12 Drying time for shipment or stacking together of finish coated work shall be in accordance with the minimum guidelines unless covered by a written project variation procedure.

		Until dry
6.12.1	Below 60°F	12 hr.
6.12.2	60°F - 70°F	8 hr.
6.12.3	70°F - 80°F	4 hr.
6.12.4	80°F - 90°F	3 hr.
6.12.5	Above 90°F	

6.13 Touch up procedures

6.13.1 Surface preparation of damaged or bare areas shall be in accordance with DP-SP6 or DP-SP3.

6.13.2 Application shall be in accordance with section 6.1 through 6.10.

6.13.3 Touch up for holidays and damage to small areas does not require minimum drying time for previous coat.

6.13.4 Stacking and loading after touch up shall be in accordance with section 6.12 unless areas touched up do not make contact with other surfaces during stacking and loading.

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6. APPLICATION FOR DP#16

6.1 No material shall be applied when the surface or air temperature is below 50°F or above 110°F, when the relative humidity is above 90% or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray or brush application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Paint that has been stored at low temperatures shall be brought up to a minimum of 70°F before mixing and thinning.

6.4 Prior to thinning or application all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments and a uniform composition.

6.5 Storage, mixing, thinning, and induction time shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP#16 for the product selected.

6.6 Mixed materials shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP#16 for the product selected or prior to any significant change in viscosity, whichever comes first.

6.7 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

6.8 The following procedures are considered good paint practices and shall be adhered to if they affect the mixing, thinning, and application of the product.

6.8.1 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

6.8.2 If application is stopped for short periods of time, material will be flushed from the fluid lines and spray equipment cleaned.

6.8.3 Hot spray application may be used to control fluid temperature and viscosity but normally should not exceed 80°F fluid temperature.

6.9 Minimum DFT shall be as specified in section 4 when inspected in accordance with section 10 of this specification.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6.10 All areas with DFT readings less than specified in section 6.9 shall receive an additional coat of DP#16 prior to topcoating.

6.11 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines unless covered by a written project variation procedure.

		Spray	Brush
6.11.1	Below 60°F	Until dry	Until dry
6.11.2	60°F - 70°F	10 hr. - 8 hr.	48 hr. - 16 hr.
6.11.3	70°F - 80°F	8 hr. - 4 hr.	16 hr. - 12 hr.
6.11.4	80°F - 90°F	4 hr. - 3 hr.	12 hr. - 8 hr.
6.11.5	90°F - 100°F	2 hr.	8 hr.

6.12 Drying time for shipment or stacking together of finish coated work shall be in accordance with the minimum guidelines unless covered by a written project variation procedure.

6.12.1	Below 60°F	Until dry
6.12.2	60°F - 70°F	12 hr.
6.12.3	70°F - 80°F	8 hr.
6.12.4	80°F - 90°F	4 hr.
6.12.5	Above 90°F	3 hr.

6.13 Touch up procedures

6.13.1 Surface preparation of damaged or bare areas shall be in accordance with DP-SP6 or DP-SP3.

6.13.2 Application shall be in accordance with section 6.1 through 6.10.

6.13.3 Touch up for holidays and damage to small areas does not require minimum drying time for previous coat.

6.13.4 Stacking and loading after touch up shall be in accordance with section 6.12 unless areas touched up do not make contact with other surfaces during stacking and loading.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9. WORKMANSHIP

9.1 All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

9.2 All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

9.3 All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

9.4 Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to topcoating or completion of advanced stages of the operation.

9.5 The following standards of workmanship are considered necessary to accomplish good workmanship and shall be adhered to unless covered by a written project variation procedure.

9.5.1 Coating Materials

9.5.1.1 All paint materials and accessories shall be delivered to the jobsite in original, unopened containers with the manufacturer's labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

9.5.1.2 All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at the minimum-maximum temperatures specified on Duke Power Company Field Coatings Product Data Sheet VII A.

9.5.2 Coating System

9.5.2.1 Only paint materials approved in section 3 of this specification shall be allowed.

9.5.2.2 The DFT of each coat and of the entire system shall meet the requirements of section 4 of this specification for both number of coats and minimum DFT.

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DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9.5.3 Surface Preparation

9.5.3.1 Cleaning and Painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

9.5.3.2 Where required, imperfections, holes, stictwelds in the surface shall be filled with approved fillers or caulking.

9.5.3.3 Hardware, trim, underwriters labels, manufacturer's serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and prevent damage.

9.5.3.4 All concrete hardners, curing agents and form release agents shall be compatible with the recommended coating system or be removed prior to any coating work.

9.5.4 Masking of Friction Joints and Weld Joints

9.5.4.1 Steel surfaces which are primed with an inorganic zinc primer shall not be masked if the following conditions are specified:

a. Areas to be welded shall be primed with a fully weldable inorganic zinc primer.

b. Areas to be joined with High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be primed with an inorganic zinc primer - either weldable or non-weldable.

Steel surfaces which are primed with an inorganic zinc primer shall be masked back two inches from edges to be welded if they are to become part of a vessel which must conform to the ASME Pressure Vessel Code.

9.5.4.2 Steel surfaces which are primed in the shop shall be masked as noted below if an inorganic primer is used.

B Bonney 6-11-74

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
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BY. Design Engineering DATE 6-1-74 REVISED

a. Areas to be welded shall be masked so that no organic coating is within six (6) inches of the weld prior to the welding operation.

b. Areas to be joined with the High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be masked so that no organic coating is beneath the bolts prior to joining.

c. These requirements shall also apply to organic topcoats when shop applied or when applied prior to assembly or erection.

9.5.5 Application

9.5.5.1 All applied coatings shall be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application procedures.

9.5.5.2 Drying time between coats shall be in accordance with section 6 of this specification, Duke Power Company Field Coatings Product Data Sheet VII A, and the Manufacturer's Product Data Sheets on the specific products in that order of priority.

9.5.6 Mixing and Thinning

9.5.6.1 Mixing and thinning shall be in accordance with section 6 of this specification and Duke Power Company Field Product Data Sheet VII A.

9.5.7 Equipment

9.5.7.1 All equipment shall meet the requirements of section 8 of this specification.

9.5.7.2 All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

9.5.7.3 Effective oil and water separators shall be used and serviced on all air lines.

APPROVED BY QA

G.B. Brenda 6-11-74

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

INSPECTION STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

10. INSPECTION

10.1 Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

10.2 The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

10.3 All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor, unless otherwise agreed to in writing by Duke Power Company.

10.4 Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

10.5 Duke Power Company Inspection Procedures for nuclear exposures will be made available to the applicator upon written request or presented in detail at the pre-start up meeting for each project.

BY SA

6-11-74

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Mobil Chemical Company
DP NO: 10
DATE: 1-1-74
PRODUCT NAME: Val-Chem Zinc Chromate Epoxy Primer
PRODUCT NO: 13-R-56

PRODUCT DESCRIPTION: A rust inhibitive catalyzed zinc chromate polyamide epoxy metal primer formulated for abrasion resistance and chemical resistance, with good adhesion properties.

USAGES: As a primer over blast cleaned metal surfaces subject to abrasion and chemical contamination (PH above 5) to be topcoated with vinyls, epoxies and urethanes.

PRODUCT INFORMATION

PIGMENT TYPE:	Iron Oxide, Zinc Chromate, Silicates
VEHICLE TYPE:	Phenolic Ether Resin, Polyamide Resin, Urea - Silicone Resin
SOLVENTS & DILUENTS:	Xylols, Ketones, Alcohols
COLOR:	Red
GLOSS:	Low
SOLIDS BY VOLUME:	48%
SOLIDS BY WEIGHT:	66%
WEIGHT PER GALLON.	11.3 lbs.
THEO. COVERAGE @ 1.0 DFT:	770 sq. ft.
THEO. COVERAGE @ 2.5 DFT:	312 sq. ft.
VISCOSITY:	70 - 75 ku's @ 75°F
PIGMENT VOLUME CONCENTRATION:	40
FLASH POINT:	74°F (TOC) Mixed Materials
TOXICITY:	Xylols, Ketones, Alcohols, Epoxy Resin
SHELF LIFE:	1 year +
STORAGE TEMPERATURE:	25°F - 125°F
PACKAGED:	2 Component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior (topcoated) and Exterior (topcoated)
FLEXIBILITY:	Good
ABRASION:	Good
NORMAL DFT PER COAT:	2.0 - 3.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	200°F	200°F	NR
INTERMITTENT.	200°F	200°F	NR

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	R	LR	NR
ALKALI	R	R	LR
SOLVENT	R	LR	NR
SALT	R	R	NR
WATER	R	R	NR

MANUFACTURER PRODUCT NO: 13-R-56 DUKE POWER NO: 10

ING: Thoroughly mix equal volumes of base component and curing agent with power mixer and allow to stand for 30 minutes. Box after thinning prior to use.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	Self	SP#2, 3, 6	SP#5, 10
Galvanized	Self	SP#11	SP#11
Stainless	Self	SP#12	SP#12
Aluminum	Self	SP#13	SP#13

FINISH COATS: DP# 33, 34, 62, 63, 67, 69, 72, 74, 75

APPLICATION:	PREFERRED	Brush, Roll, Spray
	LIMITED	
THINNER:	BRUSH/ROLL	7-T-25
	SPRAY	7-T-25
	CLEAN-UP	7-T-25, Xylol
THINNING %:	BRUSH/ROLL	0-10
	SPRAY	0-15
POT LIFE (+) @:	50°F	24 hr.
	70°F	16 hr.
	90°F	8 hr.

DRYING TIME (+):	TOUCH	HANDLE	HARD	RECOAT Spray	RECOAT Brush
50°F	3 hr.	12 hr.	36 hr.	8 hr.	48 hr.
70°F	1 hr.	6 hr.	20 hr.	4 hr.	16 hr.
90°F	30 min.	3 hr.	16 hr.	2 hr.	8 hr.

EQUIPMENT:

COMMENTS:
1. Do not use as a primer for constant immersion.
2. Do not apply when air or surface temperature is below 50°F.
3. Check for "lifting" prior to using over conventional coatings.

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Mobil Chemical Company
DP NO: 16
DATE: 1-1-74
PRODUCT NAME: Epoxy Metal Primer
PRODUCT NO: 13-R-60

PRODUCT DESCRIPTION: A rust inhibitive catalyzed red lead polyamide epoxy primer formulated for moisture resistance as well as abrasion and chemical resistance with good adhesion properties.

USAGES: As a primer over blast cleaned metal surfaces subject to abrasion, moisture, chemical contamination (PH above 5) to be topcoated with vinyls, epoxies and urethanes.

PRODUCT INFORMATION

PIGMENT TYPE:	Basic Silico Lead Chromate
VEHICLE TYPE:	Epoxy/Polyamide
SOLVENTS & DILUENTS:	Xylol, Ketones
COLOR:	Brown
GLOSS:	Flat
SOLIDS BY VOLUME:	51%
SOLIDS BY WEIGHT:	71%
WEIGHT PER GALLON:	12 lbs.
THEO. COVERAGE @ 1.0 DFT:	818 sq. ft.
THEO. COVERAGE @ 2.5 DFT:	326 sq. ft.
VISCOSITY:	65 - 75 ku (75°F)
PIGMENT VOLUME CONCENTRATION:	40
FLASH POINT:	73°F
TOXICITY:	Lead, Aromatic Solvents, Epoxy Resin
SHELF LIFE:	1 year +
STORAGE TEMPERATURE:	25°F - 125°F
PACKAGED:	2 Component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior (topcoated) and Exterior (topcoated)
FLEXIBILITY:	Good
ABRASION:	Good
NORMAL DFT PER COAT:	2.0 - 3.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	200°F	150°F	NR
INTERMITTENT:	200°F	200°F	NR

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	R	LR	NR
ALKALI	R	R	NR
SOLVENT	R	LR	NR
SALT	R	R	R
WATER	R	R	R

MANUFACTURER PRODUCT NO: 13-R-60 DUKE POWER NO: 16

MIXING: Thoroughly mix equal volumes of base component and curing agent with power mixer and box after thinning. Allow to stand for 30 minutes before using.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	Self	SP#2, 3, 6	SP#5, 5-Immersion, 10
Galvanized	Self	SP#11	SP#11
Stainless	Self	SP#12	SP#12
Aluminum	Self	SP#13	SP#13

FINISH COATS: DP# 33, 34, 62, 67, 69, 72, 74, 75, 63

APPLICATION:	PREFERRED	Brush, Spray
	LIMITED	Roll
THINNER:	BRUSH/ROLL	7-T-25
	SPRAY	7-T-25
	CLEAN-UP	7-T-25, Xylol
THINNING %:	BRUSH/ROLL	0-10
	SPRAY	0-15
POT LIFE (±) @:	50°F	24 hr.
	70°F	16 hr.
	90°F	8 hr.

DRYING TIME (±):	TOUCH	HANDLE	HARD	RECOAT Spray	RECOAT Brush
50°F	4 hr.	12 hr.	36 hr.	8 hr.	48 hr.
70°F	2 hr.	6 hr.	20 hr.	4 hr.	16 hr.
90°F	1 hr.	4 hr.	16 hr.	2 hr.	8 hr.

EQUIPMENT:

COMMENTS:

1. Can be used in constant immersion.
2. Do not apply when air or surface temperature is below 50°F.
3. Check for "lifting" prior to using over conventional coatings.

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Project: _____ Date: _____

D.P. Co. Spec. No.: _____ Paint Category: _____

Vendor: _____ Equip: _____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area
By Sq. Ft. _____ Per Item _____ Total

Estimated Coating Quantities Primer _____Gal. Intermediate _____Gal. Finish _____ Gal.

Duke Power Standard Coating (Completed by vendor if DP Co. standard spec. is used)

Duke Power Coating System		Finish Color No. and Name	
	Primer	Intermediate	Topcoat
Duke Power Product No.	DP#	DP#	DP#
Manufacturer			

VENDOR'S STANDARD COATING

Surface Preparation (check one)

Steel Structures Painting Council SSPC-Standards-64								
SP1	SP2	SP3	SP5	SP6	SP7	SP8	SP10	Other (describe)

Generic Coating

	Alkyd	Lacquer	Phenolic	Epoxy	Urethane	Other (describe)
Primer						
Intermediate						
Finish						

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Specific Coating

	DFT	Product No. and Name	Product Manufacturer
Primer			
Intermediate			
Finish			
Finish Color No.		Color Name	
Color Source			

Drying Method

	Air	Baked	Catalyzed	Other
Primer				
Intermediate				
Finish				

Coating Specified by Duke Power Company
(To be completed by Design Engineering)

Field

Duke Power Coating System: _____

Surface Preparation: _____

Primer: _____

Intermediate: _____

Finish: _____

Finish Color No.: _____

Finish Color Name: _____

Comments:

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. NNN-I

By: Design Engineering Date: 6-8-72 Revised: 11-18-74

1. SCOPE

1.1 This specification defines the method of surface preparation, materials, application, inspection and record requirements for coating carbon steel surfaces cleaned to meet a minimum DP-SP5-Immersion (White Metal Blast Cleaning) rated as Class I Surface Areas of a nuclear power plant.

1.2 Class I surfaces are exposed areas in the Containment and Reactor Buildings and the interior of tank linings of the reactor coolant system, that must withstand a DBA and LOCA.

1.3 Examples: As a shop or field primer for liner plate, polar cranes, structural steel tanks, steam generators to be stored outside for extended periods of time prior to installation. Also as a prime coat for operating temperatures up to 900°F.

2. ATTACHMENTS

2.1 The following Duke Power Company attachments are attached to and made a part of this specification:

2.1.1 Approved Materials
2.1.2 Surface Preparations
2.1.3 Application Procedures
2.1.4 Workmanship Standards
2.1.5 Inspection Standards
2.1.6 Record Requirements
2.1.7 Duke Power Company Field Data Sheet VII A

3. COATING MATERIALS

3.1 Coating materials shall be in strict accordance with Duke Power Company Standard Approved Materials for System NNN, dated 1-1-74, as specified in Section 3.3.1.

4. COATING SYSTEM

4.1	Surface Preparation	DP-SP5-Immersion White Metal Blast Cleaning		
4.2	Prime Coat	DP#12	Inorganic Ethyl Silicate Zinc Rich Primer	@ 2.0 DFT
			Minimum	2.0 DFT
			Maximum	6.0 DFT

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. NNN-I

By: Design Engineering Date: 6-8-72 Revised: 11-18-74

5. SURFACE PREPARATION

5.1 Surface preparation shall be in strict accordance with Duke Power Company Standard Surface Preparation DP-SP5-Immersion, dated 1-1-74.

6. APPLICATION

6.1 Application shall be in strict accordance with Duke Power Company Application Procedures for DP#12, dated 1-1-74.

7. MIXING AND THINNING

7.1 Mixing and thinning shall be in strict accordance with Duke Power Company Data Sheets VII A, manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

8. EQUIPMENT

8.1 Equipment shall be in strict accordance with manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

9. WORKMANSHIP

9.1 Workmanship shall be in strict accordance with Duke Power Company Workmanship Standards for Nuclear Exposures, dated 6-1-74.

10. INSPECTION

10.1 Inspection shall be in strict accordance with Duke Power Company Inspection Standards for Nuclear Exposures, dated 6-1-74.

11. RECORD REQUIREMENTS

11.1 Records for all Class I Level Vendor Coating work shall be in strict accordance with Duke Power Company Nuclear Coating Certification Specification MMM-I, dated 6-1-74.

11.2 The vendor is to complete the Duke Power Company Design Engineering Department Vendor Coating Information Form #1 and return it with his bid proposal to Duke Power Company.

11.3 Records for all Class I Level Field Applied Coating work shall be in strict accordance with Duke Power Company Construction Procedure M-20.

SPECIFICATION NO. NNN-I

DATE 6-8-72

DUKE POWER COMPANY

McGuire Nuclear STATION

UNIT 1-2

Title: Nuclear Coating Specification No. NNN-I

Class I Coatings

REVISION LOG

1 6-1-74

2 11-18-74

3

4

5

VERIFICATION OF SPECIFICATION

Station and Unit Number: McGuire 1-2

Title of Specification: Nuclear Coating Specification No. NNN-I
Class I Coatings

File Number: MC-1167.02

Revision: 2

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Briggs Date: 6 Dec. 74

Checked By: [signature] Date: 12-6-74

Approved By: [signature] Date: 12-6-74

Inspection Waived By: [signature] Date: 12-6-74

Inspection Waived For: X ELECTRICAL ____ MECHANICAL ____ CIVIL

Inspected By: A. F. Wyle Date: 12-6-74

Inspected By: ____ Date: ____

DIVISION QUALITY ASSURANCE T. C. Peluso Date: 12-11-74

****

(FOR ASME CODE ITEMS)

____ Division Date: ____
Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SIGNATURE: ____

NAME: ____
Registered Professional Engineer

State & No. ____

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

STANDARD APPROVED MATERIALS

By: Durwood Peach DATE 1-1-74 REVISED

SYSTEM NNN

3. MATERIALS

3.1 The selection of materials for use in this specification by the applicator or vendor shall be those products listed in Section 3.3 unless specifically defined in Section 3.2. All materials selected shall be from one coating manufacturer.

3.2

3.3 Approved Materials

3.3.1 Coatings manufactured by Mobil Chemical Company.

DP#12 13-F-12 Mobil Zinc #7
DP#
DP#
DP#

3.3.2 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.3 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.4 Coatings manufactured by

DP#
DP#
DP#
DP#

3.4 Products are as shown on Duke Power Company Field Coatings Data Sheet VIIA and Manufacturers Product Technical Bulletins.

APPROVED BY QA

[signature] 4-11-74
Approved by Date

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP5 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP5-63 (White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP5-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew point or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

REVIEWED BY QA

A.P. Thomas 1-6-11-74

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6. APPLICATION FOR DP# 12

6.1 No material shall be applied when the surface or air temperature is below 35°F or above 110°F, when the relative humidity is above 90%, or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Minimum DFT shall be as specified in section 4 when inspected in accordance with SSPC-PA2-72.

6.4 All areas with DFT readings less than specified in section 4 shall be corrected as specified in section 6.7.

6.5 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines based on temperature and relative humidity unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	72 hr.					
50%		60 hr.				
60%			48 hr.			
70%				36 hr.		
80%					24 hr.	
90%						12 hr.

6.6* Drying time for shipment or stacking together of finish coated work shall be in accordance with the following minimum guidelines unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	12 hr.					
50%		8 hr.				
60%			6 hr.			
70%				4 hr.		
80%					2 hr.	
90%						1 hr.

*Adequate cure can be checked by scratching primed surface with a coin. A cured zinc film will polish and an uncured zinc film will wrinkle.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6.7 Touch Up Procedures with DP# 12

6.7.1 Surface preparation of damaged or bare areas shall be in accordance with DPSP#6, except for areas previously blast cleaned to a DPSP#6 that have no signs of rust blooms which shall be cleaned to a minimum DP-SP3.

6.7.2 Application shall be in accordance with section 6.1 through section 6.7 for all previously primed steel not exceeding the drying times specified in section 6.5.

6.7.3 Application for previously primed surfaces which have exceeded drying times specified in section 6.5 shall be the same as 6.7 .2 except material shall be thinned 25% to 50%.

6.7.4 Stacking and loading after touch up shall be in accordance with section 6.6 unless areas touched up do not make contact with other surfaces during stacking and loading.

7. MIXING AND THINNING

7.1 Prior to thinning or application, all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments, and a uniform composition.

7.2 Mixing and thinning shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP# 12 for the product selected.

7.3 Mixed material shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP# 12 for the product selected or prior to any significant change in viscosity, whichever comes first.

7.4 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

7.5 If work is stopped for short periods of time, material will be flushed from the fluid lines ard equipment cleaned.

7.6 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

APPROVED BY QA

APPROVED BY 5-11-71 DATE

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9. WORKMANSHIP

9.1 All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

9.2 All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

9.3 All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

9.4 Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to topcoating or completion of advanced stages of the operation.

9.5 The following standards of workmanship are considered necessary to accomplish good workmanship and shall be adhered to unless covered by a written project variation procedure.

9.5.1 Coating Materials

9.5.1.1 All paint materials and accessories shall be delivered to the jobsite in original, unopened containers with the manufacturer's labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

9.5.1.2 All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at the minimum-maximum temperatures specified on Duke Power Company Field Coatings Product Data Sheet VII A.

9.5.2 Coating System

9.5.2.1 Only paint materials approved in section 3 of this specification shall be allowed.

9.5.2.2 The DFT of each coat and of the entire system shall meet the requirements of section 4 of this specification for both number of coats and minimum DFT.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9.5.3 Surface Preparation

9.5.3.1 Cleaning and Painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

9.5.3.2 Where required, imperfections, holes, stictwelds in the surface shall be filled with approved fillers or caulking.

9.5.3.3 Hardware, trim, underwriters labels, manufacturer's serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and prevent damage.

9.5.3.4 All concrete hardners, curing agents and form release agents shall be compatible with the recommended coating system or be removed prior to any coating work.

9.5.4 Masking of Friction Joints and Weld Joints

9.5.4.1 Steel surfaces which are primed with an inorganic zinc primer shall not be masked if the following conditions are specified:

a. Areas to be welded shall be primed with a fully weldable inorganic zinc primer.

b. Areas to be joined with High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be primed with an inorganic zinc primer - either weldable or non-weldable.

Steel surfaces which are primed with an inorganic zinc primer shall be masked back two inches from edges to be welded if they are to become part of a vessel which must conform to the ASME Pressure Vessel Code.

9.5.4.2 Steel surfaces which are primed in the shop shall be masked as noted below if an inorganic primer is used.

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

a. Areas to be welded shall be masked so that no organic coating is within six (6) inches of the weld prior to the welding operation.

b. Areas to be joined with the High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be masked so that no organic coating is beneath the bolts prior to joining.

c. These requirements shall also apply to organic topcoats when shop applied or when applied prior to assembly or erection.

9.5.5 Application

9.5.5.1 All applied coatings shall be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application procedures.

9.5.5.2 Drying time between coats shall be in accordance with section 6 of this specification, Duke Power Company Field Coatings Product Data Sheet VII A, and the Manufacturer's Product Data Sheets on the specific products in that order of priority.

9.5.6 Mixing and Thinning

9.5.6.1 Mixing and thinning shall be in accordance with section 6 of this specification and Duke Power Company Field Product Data Sheet VII A.

9.5.7 Equipment

9.5.7.1 All equipment shall meet the requirements of section 8 of this specification.

9.5.7.2 All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

9.5.7.3 Effective oil and water separators shall be used and serviced on all air lines.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

INSPECTION STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

10. INSPECTION

10.1 Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

10.2 The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

10.3 All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor, unless otherwise agreed to in writing by Duke Power Company.

10.4 Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

10.5 Duke Power Company Inspection Procedures for nuclear exposures will be made available to the applicator upon written request or presented in detail at the pre-start up meeting for each project.

REVIEWED BY QA

6-12-74

SPECIFICATION NO. MMM-I

DATE 6-8-72

DUKE POWER COMPANY

McGuire Nuclear STATION

UNIT 1-2

Title: Nuclear Coating Certification

Specification No. MMM-I

Class I Coatings

REVISION LOG

1 6-1-74

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VERIFICATION OF SPECIFICATION

Station and Unit Number: McGuire 1-2

Title of Specification: Nuclear Coating Certification

Specification No. MMM-I Class I Coatings

File Number: MC-1167.02

Revision: 1

This document specifies items related to nuclear safety. In accordance with established procedures, its quality has been assured. Signatures certify that the above specification was originated, checked, approved and inspected (or waived) as noted below:

Prepared By: C L Briggs Date: 6 Dec 74

Checked By: [signature] Date: 12-6-74

Approved By: S B Hager Date: 12-6-74

Inspection Waived By: S B Hager Date: 12-6-74

Inspection Waived For: X ELECTRICAL _____ MECHANICAL _____ CIVIL

Inspected By: J. J. Wyler Date: 12-6-74

Inspected By: _____ Date: _____

DIVISION QUALITY ASSURANCE T. C. Roberts Date: 12-11-74

****

(FOR ASME CODE ITEMS)

_____ Division Date: _____

Design Engineering Department

This is to certify that the above specification has been reviewed by me, the undersigned, and is correct, complete, and in compliance with 1971 Edition of ASME Code, Section III, Paragraph NA-3250.

(SEAL)

SIGNATURE: _____

NAME: _____

Registered Professional Engineer

State & No. _____

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION NMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

1. PURPOSE AND SCOPE

1.1 The purpose of this specification is to implement planned and systematic actions necessary to provide Duke Power Company with adequate confidence that a coating material has been properly manufactured and applied in a shop to Class I Service level substrates of nuclear facilities.

1.2 This specification establishes minimum records required for coating materials, surface preparation, application of materials and inspection.

1.3 The procedure conforms to Section 1.2.4 ANSI N101.4-1972 (American National Standard Institute - Quality Assurance for Protective Coatings Applied to Nuclear Facilities).

2. ATTACHMENTS

2.1 The following Duke Power Co. attachments are attached to and made a part of this specification.

2.1.1 Duke Power Company Quality Assurance Department Supplier Quality Assurance Certification - Form 930.1.

2.1.2 Coating Materials - Manufacturer's Product Identity Certification Record - DPNC Form 2.

2.1.3 Duke Power Company Supplier Quality Assurance Record - DPNC Form 3.

3. GENERAL REQUIREMENT

3.1 The Duke Power Company QA Department Supplier Quality Assurance Certification Form 930.1 shall be completed by the supplier for all Class I coating work.

3.1.1 One copy of Form 930.1 shall accompany each shipment to the jobsite.

3.1.2 Two copies of Form 930.1 per shipment shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.1.3 Form 930.1, when completed as specified, shall be authorization for Duke Power Construction to accept delivery of components and materials. Absence of properly completed QA Certification form shall result in quarantine or return of the component or materials to the supplier.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION NMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

3.2 A coating Material - Manufacturer's Product Identity Certification Record (DPNC Form #2) shall be obtained from the coating manufacturer for each batch of paint and thinner used by the vendor on Class I components.

3.2.1 Two copies of each DPNC Form #2 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.2.2 DPNC Form #2 shall be enclosed to cover each batch of material used on any or all components or materials shipped as listed on Duke Power Company QA Department Supplier Quality Assurance Certification.

3.3 A Duke Power Company Supplier Quality Assurance Record (DPNC Form 3) shall be filled out for all Class I coating work.

3.3.1 A separate form may be used to cover the following combinations of materials and components.

3.3.1.1 All work in each shipment.

3.3.1.2 Different types of components in each shipment.

3.3.1.3 Series of similar types of components in each shipment.

3.3.2 Two copies of DPNC Form 3 shall be sent to Duke Power Company Quality Assurance Manager, Engineering.

3.3.3 Failure of the vendor to meet all requirements of the bid specification or incomplete and inaccurate QA Documentation shall result in rejection by the owner of any or all components covered by that DPNC Form 3.

4. DOCUMENTATION

This section contains additional explanations and examples to aid the vendor in properly completing the forms listed in sections 2.1.1, 2.1.2, and 2.1.3.

4A. DPNC Form 3 (Sample Form attached).

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION NNM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

4.1 Identify components or equipment so that separate items are traceable, and can be matched up with a specific Report No.

4.2 Example: Carbon steel, cast iron, stainless, aluminum, etc.

4.3 This information is for items covered by each DPNC Form 3.

4.4 Information should be reported in even gallons for items covered by each DPNC Form 3.

4.5 List all information required for each batch of material used on components covered by this DPNC Form 3 and attach a DPNC Form 2 for each batch of material listed on this DPNC Form 3.

4.6 Duke Power Company Design Specification used.

4.7 Examples: Steel grit, silica sand, glass beads, garnet.

4.8 Examples: 8/20, 8/35, 16/35, 30/50, etc.

4.9 Example: Xylol, methyl ethyl ketone, etc.

4.10 Read pressure at nozzle with ANG air needle gauge or equal. (Do not use pressure at compressor.)

4.11 Was moisture trap used effectively (yes) (no)?

4.12 Temperatures are to be taken in actual work areas and shall cover all conditions during surface preparation and exposure of components cleaned prior to priming.

4.13 Indoors - In a closed building kept at ambient temperatures.

4.14 Outdoors - Exposed to weather (even if under a roof).

4.15 Example - Brush, roller, spray, flow coated, etc.

4.16 Example - Graco airless, Devilbiss conventional

4.17 Example - E Fluid Tip

4.18 Example - #704 Air Cap

4.19 Example - Yes (motor driven), yes (manual), (no)

4.20 Was oil separator used effectively? (yes) (no)

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING CERTIFICATION SPECIFICATION MMM-I

By: Design Engineering Date: 6-8-72 Revised: 6-1-74

4.21 Report actual total dry film thickness after primer, intermediate and finish coat.

4.22 Report number to be same on both front and back page. Report numbers shall be logged and numbered in sequence from 1 to ___ to cover all reports of a given Duke Power Company Bid Specification.

4B. DPNC Form 2

4.23 The vendor shall fill out the General Data Section and attach a DPNC Form 2 to the purchase order sent to the coating manufacture.

4.24 The coating manufacturer shall complete the Component Data Section, Mixed Component Data Section and Signature and Title section and return to the vendor.

4C. Form 930.1

4.25 In space 1 write "Components inspected and are in compliance with Nuclear Coating Certification Specification MMM-I, dated 6-1-74".

4.26 List Report Nos. for all DPNC Form #3, under QA Documentation Required, on the Form 930.1 for each shipment.

DPNC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. (4.1) _____

_____

_____

GENERAL INFORMATION

Substrate Material: (4.2) _____

Estimated Surface Area Coated
Sq. Ft./Item (4.3) No. Items (4.3) Total Sq. Ft. (4.3)

Estimated Coating Quantities — Primer (4.4) Gal. Intermediate (4.4) Gal. Finish (4.4) Gal.

Date Work Began (4.3) Date Work Completed (4.3)

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED
(4.5)	(4.5)	(4.5)	(4.5)	(4.5)	(4.5)

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. (4.6)

Abrasive: Type (4.7) Solvent: Type (4.9)

Size (4.8) Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure (4.10) Moisture Trap (4.11)

Temperature	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Maximum Time Between Cleaning and Coating _____ Hrs.

Work Done: Indoors (4.13) Outdoors (4.14) Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application (4.15)

Spray:

Type Spray Gun (4.16) Agitator Pot (4.19)

Fluid Tip (4.17) Moisture Trap (4.11)

Air Cap (4.18) Oil Separator (4.20)

Temperature:	Ambient	Surface	Dew Point
Max.:	(4.12) °F	(4.12) °F	(4.12) °F
Min.:	(4.12) °F	(4.12) °F	(4.12) °F

Recoat Time	Minimum	Maximum	Average
Primer:	_____ Hr.	_____ Hr.	_____ Hr.
Intermediate:	_____ Hr.	_____ Hr.	_____ Hr.
Finish:	_____ Hr.	_____ Hr.	_____ Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	(4.21) DFT	(4.21) DFT	(4.21) DFT
Intermediate	(4.21) DFT	(4.21) DFT	(4.21) DFT
Finish:	(4.21) DFT	(4.21) DFT	(4.21) DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

Date 6-1-74; Revised

COATING MATERIALS - MANUFACTURER'S PRODUCT IDENTITY CERTIFICATION RECORD

GENERAL DATA

PURCHASER _____

BILLING ADDRESS _____

SHIPPING ADDRESS _____

PROJECT DESIGNATION _____

DATE _____ PURCHASE ORDER NO. _____ RELEASE NO. _____

COATING MANUFACTURER _____

PRODUCT DESIGNATION _____

GALLONS ORDERED _____ GALLONS SHIPPED _____ REFERENCE NO. _____

COMPONENT DATA

	MIXED		INDIVIDUAL	
COMPONENT				
BATCH NO.				
GAL. ORDERED				
GAL. SHIPPED				
DATE MFG'D.				
SHELF LIFE				
SOLIDS BY VOLUME				
*WT./GAL.				
**VISCOSITY				
MIXING RATIO BY VOL.				

*(By Fed. Test Method Std. No. 141, Method 4814± or by ASTM D1475)

**(Method _____ @ _____ °F)

MIXED COMPONENT DATA

GENERIC TYPE _____ POT LIFE _____ @ _____ °F

FLASH POINT (TOC) _____ DFT PER COAT _____ INDUCTION PERIOD _____ @ _____ °F

COLOR (VISUAL) _____

RECOAT TIME RANGE _____ @ _____ °F _____ %R.H

DRY HARD _____ HRS. @ _____ °F _____ %R.H

TACK FREE _____ HRS. @ _____ °F _____ %R.H

COMMENTS:

Signature _____

Title _____

Date _____

Checked By _____

Revision 1 Dated 12-4-73

Revision 2 Dated 1-4-74

Distribution: 1 copy with shipment
2 copies Duke Civil Design

DPNC FORM 3
DUKE POWER COMPANY
SUPPLIER COATINGS QUALITY ASSURANCE RECORDS
CLASS I

Project : _____ Date: _____

D.P. Co. Spec. No. _____ Shipping I.D. No. _____

Mill Power Order No. _____ Release No. _____

Vendor: _____

Equipment Name and No. _____

_____

_____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area Coated
Sq. Ft./Item _____ No. Items _____ Total Sq. Ft. _____

Estimated Coating Quantities Primer _____Gal. Intermediate _____Gal. Finish _____Gal.

Date Work Began Date Work Completed

Duke Power Coating System Dated		Finish Color No. and Name	
Duke Power Product No.	Primer DP#	Intermediate DP#	Topcoat DP#
Manufacturer			

1. MATERIALS IDENTIFICATION

DP NO.	PRODUCT No.	PRODUCT NAME	BATCH NO.	EXPIRATION DATE	GALLONS USED

2. MATERIAL WAREHOUSING

Storage Temperature		Material Stored		
Maximum	Minimum	Indoors	Outdoors	Other
°F	°F			

DPNC FORM 3

3. SURFACE PREPARATION

Surface Preparation No. _____

Abrasive: Type _____ Solvent: Type _____

Size _____ Product No. _____

Mfg. _____ Mfg. _____

Nozzle Pressure _____ Moisture Trap _____

Temperature	Ambient	Surface	Dew Point
Max.:	_____°F	_____°F	_____°F
Min.:	_____°F	_____°F	_____°F

Maximum Time Between Cleaning and Coating _____Hrs.

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected By: _____ Approved By: _____

4. APPLICATION

Method of Application _____

Spray:

Type Spray Gun _____ Agitator Pot _____

Fluid Tip _____ Moisture Trap _____

Air Cap _____ Oil Separator _____

Temperature:	Ambient	Surface	Dew Point
Max.:	_____°F	_____°F	_____°F
Min.:	_____°F	_____°F	_____°F

Recoat Time	Minimum	Maximum	Average
Primer:	_____Hr.	_____Hr.	_____Hr.
Intermediate:	_____Hr.	_____Hr.	_____Hr.
Finish:	_____Hr.	_____Hr.	_____Hr.

Measured DFT (mils)	Minimum	Maximum	Average
Primer:	_____DFT	_____DFT	_____DFT
Intermediate	_____DFT	_____DFT	_____DFT
Finish:	_____DFT	_____DFT	_____DFT

Work Done: Indoors _____ Outdoors _____ Night _____ Day _____

Inspected by: _____ Approved by: _____

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

Name of Supplier _____ Item No. _____

Address of Supplier Plant _____ Spec. No. _____ Rev. ____

Component(s) or Material Date _____

_____ Shipping ID No. _____

_____ Release No. _____

Mill Power Order No. _____

Certification Included _____ Full _____ Partial _____

The following listed tests and inspections have been completed as required by specification: (If partial certification, list materials or components for which certification applies.)

1) _____

2) _____

3) _____

Physical and Chemical Analysis	____	Major Repair Records and Chart	____
Design Report	____	Repair NDT	____
Stress Report	____	Hydro (Test Press.-PSIG ____)	____
Heat Treatment	____	Cleanliness	____
Radiographic Test	____	Operating Test	____
Ultrasonic Test	____	Performance Curve	____
Magnetic Particle	____	ASME Data Report	____
Penetrant Tests	____	Personnel Qualifications on Record	____

Deviation Record _____

The following QA Documentation as required by the specification is attached to the original copy of this form: (If partial certification, include documentation applicable only to this specific shipment.)

DPNC Form #3 (List Report No.) _____

_____

_____

(continued)

DUKE POWER COMPANY
QUALITY ASSURANCE DEPARTMENT
SUPPLIER QUALITY ASSURANCE CERTIFICATION

The listed component(s) or material(s) conform to the requirements of Duke Power Company Specification _____ with the approved deviations noted above. The QA documentation has been completed and attached to this form. No later than component or material shipment, the compliance QA documentation packet is being transmitted to Duke Power Company

H. L. Huggett
Quality Assurance Manager, Engineering
Quality Assurance Department
P. O. Box 2178
Charlotte, N. C. 28242

A copy of this completed Supplier Quality Assurance Certification form will be included with shipping papers and shipped with the component to Duke Power Company, at the address designated in the specification. This is to certify that the item of equipment identified above fully meets the requirement of the above listed specification including all of the codes, standards, test requirements, and quality assurance requirements invoked therein.

_____
Supplier Representative Authorized Signature

Title _____ Date _____

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Mobil Chemical Company

PRODUCT NAME: Mobilzinc 7

DP NO: 12
DATE: 1-1-74 , rev.6-1-74
PRODUCT NO: 13-F-12

PRODUCT DESCRIPTION: An inorganic ethyl silicate zinc rich metal primer formulated for excellent weathering and abrasion resistance. Affords cathodic protection of the steel. Can be applied to load bearing surfaces.

USAGES: As a shop or field primer over blast cleaned steel surfaces exposed to long term weathering before being topcoated or severe moisture after being topcoated with an epoxy, vinyl, urethane, chlorinated rubber or latex finish.

PRODUCT INFORMATION

PIGMENT TYPE:	Zinc dust, Inerts and Colorents
VEHICLE TYPE:	Ethyl Silicate
SOLVENTS & DILUENTS:	Alcohols, Glycol Ether
COLOR:	Gray Green
GLOSS:	Low
SOLIDS BY VOLUME:	63%
SOLIDS BY WEIGHT:	80.5%
WEIGHT PER GALLON:	21.3 lbs ± .3
THEO. COVERAGE @ 1.0 DFT:	800 sq. ft.
THEO. COVERAGE @ 2.5 DFT:	320 sq. ft.
VISCOSITY:	70 ± ku
PIGMENT VOLUME CONCENTRATION:	85.5
FLASH POINT:	76°F
TOXICITY:	Zinc dust
SHELF LIFE:	6 months on vehicle
STORAGE TEMPERATURE:	25°F - 100°F
PACKAGED:	2 component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior and exterior (topcoated)
FLEXIBILITY:	Poor
ABRASION:	Excellent
NORMAL DFT PER COAT:	2.0 - 5.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	750°F	750°F	120°F
INTERMITTENT:	850°F	850°F	120°F

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	NR	NR	NR
ALKALI	R	NR	NR
SOLVENT	R	R	R
SALT	R	R	R
WATER	R	R	R

APPROVED BY QA

APPROVED BY DATE

MANUFACTURER PRODUCT NO: 13-F-12 DUKE POWER NO: 12

MIXING: Pour liquid component "A" (6.6 lbs. liquid) into a clean dry, metal container, sift component "B" (14.6 lbs. dust) slowly into the liquid while stirring constantly with power mixer until smooth and free from lumps. Strain through a 30-50 mesh screen.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	Self	SP#6, 10	SP#5, 10
Galvanized	Self	SP#6, 10	SP#5, 10

FINISH COATS: DP#53, 62, 63, 64, 67, 68, 69, 70, 73, 74, 75

APPLICATION:	PREFERRED	Conventional Spray or special Airless Spray
	LIMITED	Brush (small touch up)
THINNER:	BRUSH/ROLL	7-T-3
	SPRAY	7-T-16, 7-T-3
	CLEAN-UP	Alcohol, 7-T-16, 7-T-3
THINNING %:	BRUSH/ROLL	0-20
	SPRAY	0-20
POT LIFE (±) @:	50°F	10 hr.
	70°F	8 hr.
	90°F	4 hr.

DRYING TIME (±):	TOUCH	HANDLE	HARD	RECOAT
50°F	1 hr.	4 hr.		3-48 hrs.
70°F	45 min.	3 hr.		Depending upon temperatures
90°F	30 min.	2 hr.		and relative humidity.

EQUIPMENT:

COMMENTS:
1. Do not exceed 6.0 mils dft.
2. Do not topcoat with alkyds on oil based coatings.
3. Material must have rough surface profile for proper adhesion.
4. Apply wet--do not dry spray or allow excessive overspray.
5. Material is moisture cured.

APPROVED BY QA

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Project: _____ Date: _____

D.P. Co. Spec. No.: _____ Paint Category: _____

Vendor: _____ Equip: _____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area
By Sq. Ft. _____ Per Item _____ Total

Estimated Coating Quantities Primer _____ Gal. Intermediate _____ Gal. Finish _____ Gal.

Duke Power Standard Coating (Completed by vendor if DP Co. standard spec. is used)

Duke Power Coating System		Finish Color No. and Name	
	Primer	Intermediate	Topcoat
Duke Power Product No.	DP#	DP#	DP#
Manufacturer			

VENDOR'S STANDARD COATING

Surface Preparation (check one)

Steel Structures Painting Council SSPC-Standards-64								
SP1	SP2	SP3	SP5	SP6	SP7	SP8	SP10	Other (describe)

Generic Coating

	Alkyd	Lacquer	Phenolic	Epoxy	Urethane	Other (describe)
Primer						
Intermediate						
Finish						

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. NNN-II

By: Design Engineering Date: 6-8-72 Revised: 10-21-74 (2) 6- 1-74 (1)

1. SCOPE

1.1 This specification defines the method of surface preparation, materials, application, and inspection for coating carbon steel surfaces cleaned to meet a minimum DP-SP5-Immersion (White Metal Blast Cleaning) that are rated as Class II Surface Areas of a nuclear power plant.

1.2 Class II Service Level for coatings applies to those systems and components of nuclear facilities which are essential to the attainment of the intended normal operating performance.

1.3 Examples: As a shop or field primer for liner plate, polar cranes, structural steel, tanks, steam generators to be stored outside for extended periods of time prior to installation. Also a primecoat for operating temperatures up to 900°F.

2. ATTACHMENTS

2.1 The following Duke Power Company attachments are attached to and made a part of this specification:

2.1.1 Approved Materials
2.1.2 Surface Preparations
2.1.3 Application Procedures
2.1.4 Workmanship Standards
2.1.5 Inspection Standards
2.1.6 Duke Power Company Data Sheets VII A
2.1.7 Vendor Coating Information Form #1

3. COATING MATERIALS

3.1 Coating materials shall be in strict accordance with Duke Power Company Standard Approved Materials for System NNN.

4. COATING SYSTEM

4.1 Surface Preparation — DP-SP5-Immersion White Metal Blast Cleaning

4.2 Prime Coat — DP#12 Inorganiz Ethyl Silicate Zinc Rich Primer @ 2.0 DFT

Minimum	2.0 DFT
Maximum	6.0 DFT

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

NUCLEAR COATING SPECIFICATION NO. NNN-II

By: Design Engineering Date: 6-8-72 Revised: 10-21-74 (2) 6- 1-74 (1)

5. SURFACE PREPARATION

5.1 Surface preparation shall be in strict accordance with Duke Power Company Standard Surface Preparation DP-SP5-Immersion.

6. APPLICATION

6.1 Application shall be in strict accordance with Duke Power Company Application Procedures for DP#12.

7. MIXING AND THINNING

7.1 Mixing and thinning shall be in strict accordance with Duke Power Company Data Sheets VII A, manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

8. EQUIPMENT

8.1 Equipment shall be in strict accordance with manufacturer's recommendations and SSPC-PA-1-64 Paint Application Specifications No. 1, Shop, Field, and Maintenance Painting.

9. WORKMANSHIP

9.1 Workmanship shall be in strict accordance with Duke Power Company Workmanship Standards for Nuclear Exposures.

10. INSPECTION

10.1 Inspection shall be in strict accordance with Duke Power Company Inspection Standards for Nuclear Exposures.

11. RECORDS

11.1 The vendor is to complete the Duke Power Company Design Engineering Department Vendor Coating Information Form #1 and return it with his bid proposal to Duke Power Company.

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

STANDARD APPROVED MATERIALS

By: Durwood Peach DATE 1-1-74 REVISED

SYSTEM NNN

3. MATERIALS

3.1 The selection of materials for use in this specification by the applicator or vendor shall be those products listed in Section 3.3 unless specifically defined in Section 3.2. All materials selected shall be from one coating manufacturer.

3.2

3.3 Approved Materials

3.3.1 Coatings manufactured by Mobil Chemical Company.

DP#12 13-F-12 Mobil Zinc #7
DP#
DP#
DP#

3.3.2 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.3 Coatings manufactured by

DP#
DP#
DP#
DP#

3.3.4 Coatings manufactured by

DP#
DP#
DP#
DP#

3.4 Products are as shown on Duke Power Company Field Coatings Data Sheet VIIA and Manufacturers Product Technical Bulletins.

APPROVED BY QA

[signature] 6-11-74
APPROVED DATE

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

5. SURFACE PREPARATION DP-SP5 - IMMERSION

5.1 Metal surfaces shall be prepared by dry hand sandblasting or automatic blast cleaning in strict accordance with Structural Steel Painting Council SSPC-SP5-63 (White Metal Blast Cleaning).

5.2 Minimum cleaning is as defined in Section 2.2 of SSPC-SP5-63. If Visual Standards are necessary, they shall be established by preparing actual panels for approval by Duke Power Company or from control panels designated by Duke Power Company. SSPC-VIS-1-63T Visual Standards shall not be used to establish minimum standards.

5.3 No surface preparation shall be allowed when the temperature is within 5°F of the dew poin. or above 90% relative humidity. Surface areas exposed to condensation or moisture prior to topcoating shall be reblasted.

5.4 Blasting shall not be performed in the same area where coating or curing of coated surfaces are in process.

5.5 The surface shall be free of excessive grease or oil prior to blast cleaning. Organic solvents, alkaline solutions, steam, hot water with detergents, or other systems that completely remove dirt, oil, grease, etc., may be used.

5.6 Blasting equipment shall be in good operating conditions as required by the manufacturer. Traps and filters in air lines shall be frequently cleaned and checked.

5.7 The grit shall be sharp silica sand, steel slag grit, similar or equal to 16-35 mesh flint silica to give a 1.2 to 2.5 mils anchor pattern. No polished surfaces shall be allowed.

5.8 The compressed air used for nozzle blasting shall be free of detrimental amounts of condensed water and oil. Adequate separators and traps shall be used. Nozzle pressure shall not be less than 80 psi.

5.9 Contaminated sand or grit shall not be used for finished work.

5.10 Remove weld splatter and visible welding contamination. Grind sharp edges to 1/8" radius and grind welds. Skip welds should be welded solid or caulked.

5.11 All visible burrs, slivers, scabs, and weld splatter shall be removed after blast cleaning.

5.12 The prime coat shall be applied within 8 hours after blasting and/or before any rust blooms begin to form. Reblast all surfaces that exceed these conditions before applying prime coat.

5.13 Remove all traces of grit, dust, grease, and foreign matter after blast cleaning and prior to application of each coat of material by solvent cleaning, high pressure air or brush.

REVIEWED BY QA

11-11-74

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6. APPLICATION FOR DP# 12

6.1 No material shall be applied when the surface or air temperature is below 35°F or above 110°F, when the relative humidity is above 90%, or when the temperature is within 5°F of the dew point.

6.2 Material shall be applied by spray application provided the minimum DFT per coat and workmanship requirements of this specification are met.

6.3 Minimum DFT shall be as specified in section 4 when inspected in accordance with SSPC-PA2-72.

6.4 All areas with DFT readings less than specified in section 4 shall be corrected as specified in section 6.7.

6.5 Prior to topcoating each coat shall be allowed to dry in strict accordance with the following minimum guidelines based on temperature and relative humidity unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	72 hr.					
50%		60 hr.				
60%			48 hr.			
70%				36 hr.		
80%					24 hr.	
90%						12 hr.

6.6* Drying time for shipment or stacking together of finish coated work shall be in accordance with the following minimum guidelines unless covered by a written project variation procedure.

	TEMPERATURE					
	40°F	50°F	60°F	70°F	80°F	90°F
40%	12 hr.					
50%		8 hr.				
60%			6 hr.			
70%				4 hr.		
80%					2 hr.	
90%						1 hr.

*Adequate cure can be checked by scratching primed surface with a coin. A cured zinc film will polish and an uncured zinc film will wrinkle.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

By: Durwood Peach DATE 1-1-74 REVISED

6.7 Touch Up Procedures with DP# 12

6.7.1 Surface preparation of damaged or bare areas shall be in accordance with DPSP#6, except for areas previously blast cleaned to a DPSP#6 that have no signs of rust blooms which shall be cleaned to a minimum DP-SP3.

6.7.2 Application shall be in accordance with section 6.1 through section 6.7 for all previously primed steel not exceeding the drying times specified in section 6.5.

6.7.3 Application for previously primed surfaces which have exceeded drying times specified in section 6.5 shall be the same as 6.7 .2 except material shall be thinned 25% to 50%.

6.7.4 Stacking and loading after touch up shall be in accordance with section 6.6 unless areas touched up do not make contact with other surfaces during stacking and loading.

7. MIXING AND THINNING

7.1 Prior to thinning or application, all material shall be thoroughly mixed in such a manner as to insure the breaking apart of all lumps, complete dispersion of all settled pigments, and a uniform composition.

7.2 Mixing and thinning shall be with a power mixer in accordance with DP Product Data Sheet VII A for DP# 12 for the product selected.

7.3 Mixed material shall be applied within the maximum pot life specified on DP Product Data Sheet VII A for DP# 12 for the product selected or prior to any significant change in viscosity, whichever comes first.

7.4 Use of additional thinner to lower the viscosity after the mixed pot life has been exceeded shall not be allowed.

7.5 If work is stopped for short periods of time, material will be flushed from the fluid lines and equipment cleaned.

7.6 Mixed material shall be strained through a 30-50 mesh strainer prior to application.

APPROVED BY QA

APPROVED BY 5-11-74 DATE

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9. WORKMANSHIP

9.1 All work shall meet the minimum requirements of the Duke Power Company Coating Specifications and referenced standards or previously agreed upon variations of these standards.

9.2 All work shall be supervised by qualified persons who have read and understand the Duke Power Company Standard Coating Specifications for the specific work he is responsible for supervising.

9.3 All work will be done by persons experienced with the specific materials being applied or used unless accompanied by someone who is experienced in the work being performed.

9.4 Any completed work not meeting the minimum requirements of the Duke Power Company Coating Specification shall be corrected prior to topcoating or completion of advanced stages of the operation.

9.5 The following standards of workmanship are considered necessary to accomplish good workmanship and shall be adhered to unless covered by a written project variation procedure.

9.5.1 Coating Materials

9.5.1.1 All paint materials and accessories shall be delivered to the jobsite in original, unopened containers with the manufacturer's labels and tags intact. Containers shall remain unopened until required for mixing and thinning.

9.5.1.2 All paint shall be stored under cover and off the ground for no longer than the shelf life specified, and at the minimum-maximum temperatures specified on Duke Power Company Field Coatings Product Data Sheet VII A.

9.5.2 Coating System

9.5.2.1 Only paint materials approved in section 3 of this specification shall be allowed.

9.5.2.2 The DFT of each coat and of the entire system shall meet the requirements of section 4 of this specification for both number of coats and minimum DFT.

APPROVED BY QA

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

9.5.3 Surface Preparation

9.5.3.1 Cleaning and Painting shall be scheduled so that the dust and other contaminants from the cleaning process will not fall on newly painted surfaces.

9.5.3.2 Where required, imperfections, holes, stictwelds in the surface shall be filled with approved fillers or caulking.

9.5.3.3 Hardware, trim, underwriters labels, manufacturer's serial numbers, dials, gauges, and other items shall be removed or masked to allow proper application of the coatings and prevent damage.

9.5.3.4 All concrete hardners, curing agents and form release agents shall be compatible with the recommended coating system or be removed prior to any coating work.

9.5.4 Masking of Friction Joints and Weld Joints

9.5.4.1 Steel surfaces which are primed with an inorganic zinc primer shall not be masked if the following conditions are specified:

a. Areas to be welded shall be primed with a fully weldable inorganic zinc primer.

b. Areas to be joined with High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be primed with an inorganic zinc primer - either weldable or non-weldable.

Steel surfaces which are primed with an inorganic zinc primer shall be masked back two inches from edges to be welded if they are to become part of a vessel which must conform to the ASME Pressure Vessel Code.

9.5.4.2 Steel surfaces which are primed in the shop shall be masked as noted below if an inorganic primer is used.

APPROVED

6-11-74

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT

WORKMANSHIP STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

a. Areas to be welded shall be masked so that no organic coating is within six (6) inches of the weld prior to the welding operation.

b. Areas to be joined with the High Tension (Friction Type) bolts such as ASTM Type A325 or A490 shall be masked so that no organic coating is beneath the bolts prior to joining.

c. These requirements shall also apply to organic topcoats when shop applied or when applied prior to assembly or erection.

9.5.5 Application

9.5.5.1 All applied coatings shall be free of runs, sags, drops, ridges, waves, laps, bubbles, embedded foreign matter, and other indications of improper application procedures.

9.5.5.2 Drying time between coats shall be in accordance with section 6 of this specification, Duke Power Company Field Coatings Product Data Sheet VII A, and the Manufacturer's Product Data Sheets on the specific products in that order of priority.

9.5.6 Mixing and Thinning

9.5.6.1 Mixing and thinning shall be in accordance with section 6 of this specification and Duke Power Company Field Product Data Sheet VII A.

9.5.7 Equipment

9.5.7.1 All equipment shall meet the requirements of section 8 of this specification.

9.5.7.2 All equipment shall be maintained in good working order. It shall be thoroughly cleaned and inspected daily. Worn tips, spray nozzles, hoses, blast nozzles, and other parts necessary to meet good work standards shall be replaced regularly.

9.5.7.3 Effective oil and water separators shall be used and serviced on all air lines.

APPROVED BY QA

G.B. Brandt 6-11-74

DUKE POWER COMPANY

DESIGN ENGINEERING DEPARTMENT

INSPECTION STANDARDS
NUCLEAR EXPOSURES

BY: Design Engineering DATE 6-1-74 REVISED

10. INSPECTION

10.1 Duke Power Company, the coating manufacturer and their responsible representatives shall have access to shop or field at all times during the surface preparation, and application of coating work or to inspect work previously finished.

10.2 The Owner reserves the right to reject all work that does not meet the Duke Power Company Coating Specification. This may be done either at the vendor's shop or at the jobsite.

10.3 All or any portion of finished work not meeting the minimum standards of this specification and referenced standards shall be corrected by the applicator or vendor, unless otherwise agreed to in writing by Duke Power Company.

10.4 Inspection by Duke Power Company or their responsible representatives, or failure to provide inspection shall not relieve the applicator of his responsibilities to provide materials and perform the work in accordance with the Duke Power Company coating specifications.

The applicator shall be required to furnish proper inspection equipment as necessary to check the minimum or maximum conditions of this specification.

10.5 Duke Power Company inspection Procedures for nuclear exposures will be made available to the applicator upon written request or presented in detail at the pre-start up meeting for each project.

REVIEWED BY QA

6-13-74

DUKE POWER COMPANY
FIELD COATINGS PRODUCT DATA SHEET VIIA

COMPANY: Mobil Chemical Company

PRODUCT NAME: Mobilzinc 7

DP NO: 12
DATE: 1-1-74 , rev.6-1-74
PRODUCT NO: 13-F-12

PRODUCT DESCRIPTION: An inorganic ethyl silicate zinc rich metal primer formulated for excellent weathering and abrasion resistance. Affords cathodic protection of the steel. Can be applied to load bearing surfaces.

USAGES: As a shop or field primer over blast cleaned steel surfaces exposed to long term weathering before being topcoated or severe moisture after being topcoated with an epoxy, vinyl, urethane, chlorinated rubber or latex finish.

PRODUCT INFORMATION

PIGMENT TYPE:	Zinc dust, Inerts and Colorents
VEHICLE TYPE:	Ethyl Silicate
SOLVENTS & DILUENTS:	Alcohols, Glycol Ether
COLOR:	Gray Green
GLOSS:	Low
SOLIDS BY VOLUME:	63%
SOLIDS BY WEIGHT:	80.5%
WEIGHT PER GALLON:	21.3 lbs $\pm$ .3
THEO. COVERAGE @ 1.0 DFT:	800 sq. ft.
THEO. COVERAGE @ 2.5 DFT:	320 sq. ft.
VISCOSITY:	70 $\pm$ ku
PIGMENT VOLUME CONCENTRATION:	85.5
FLASH POINT:	76°F
TOXICITY:	Zinc dust
SHELF LIFE:	6 months on vehicle
STORAGE TEMPERATURE:	25°F - 100°F
PACKAGED:	2 component

PHYSICAL PROPERTY INFORMATION

NORMAL EXPOSURE:	Interior and exterior (topcoated)
FLEXIBILITY:	Poor
ABRASION:	Excellent
NORMAL DFT PER COAT:	2.0 - 5.0 mils
RECOMMENDED DFT:	2.5 mils

TEMPERATURE LIMITS	INTERIOR	EXTERIOR	IMMERSION
CONSTANT:	750°F	750°F	120°F
INTERMITTENT:	850°F	850°F	120°F

CHEMICAL RESISTANCE	FUME	SPLASH/SPILLAGE	IMMERSION
ACID	NR	NR	NR
ALKALI	R	NR	NR
SOLVENT	R	R	R
SALT	R	R	R
WATER	R	R	R

APPROVED BY QA

APPROVED BY 6-11-74 DATE

MANUFACTURER PRODUCT NO: 13-F-12 DUKE POWER NO: 12

MIXING: Pour liquid component "A" (6.6 lbs. liquid) into a clean dry, metal container, sift component "B" (14.6 lbs. dust) slowly into the liquid while stirring constantly with power mixer until smooth and free from lumps. Strain through a 30-50 mesh screen.

SUBSTRATES	PRIMERS	SURFACE PREPARATIONS NORMAL	SEVERE
Steel	Self	SP#6, 10	SP#5, 10
Galvanized	Self	SP#6, 10	SP#5, 10

FINISH COATS: DP#53, 62, 63, 64, 67, 68, 69, 70, 73, 74, 75

APPLICATION:	PREFERRED	Conventional Spray or special Airless Spray
	LIMITED	Brush (small touch up)
THINNER:	BRUSH/ROLL	7-T-3
	SPRAY	7-T-16, 7-T-3
	CLEAN-UP	Alcohol, 7-T-16, 7-T-3
THINNING %:	BRUSH/ROLL	0-20
	SPRAY	0-20
POT LIFE (±) @:	50°F	10 hr.
	70°F	8 hr.
	90°F	4 hr.

DRYING TIME (±):	TOUCH	HANDLE	HARD	RECOAT
50°F	1 hr.	4 hr.		3-48 hrs.
70°F	45 min.	3 hr.		Depending upon temperatures
90°F	30 min.	2 hr.		and relative humidity.

EQUIPMENT:

COMMENTS:
1. Do not exceed 6.0 mils dft.
2. Do not topcoat with alkyds on oil based coatings.
3. Material must have rough surface profile for proper adhesion.
4. Apply wet--do not dry spray or allow excessive overspray.
5. Material is moisture cured.

APPROVED BY QA

R-Recommended LR-Limited Recommendations NR-Not Recommended NA-Not Applicable

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Project: _____ Date: _____

D.P. Co. Spec. No.: _____ Paint Category: _____

Vendor: _____ Equip: _____

GENERAL INFORMATION

Substrate Material: _____

Estimated Surface Area
By Sq. Ft. _____ Per Item _____ Total

Estimated Coating Quantities Primer _____ Gal. Intermediate _____ Gal. Finish _____ Gal.

Duke Power Standard Coating (Completed by vendor if DP Co. standard spec. is used)

Duke Power Coating System		Finish Color No. and Name	
	Primer	Intermediate	Topcoat
Duke Power Product No.	DP#	DP#	DP#
Manufacturer			

VENDOR'S STANDARD COATING

Surface Preparation (check one)

Steel Structures Painting Council SSPC-Standards-64								
SP1	SP2	SP3	SP5	SP6	SP7	SP8	SP10	Other (describe)

Generic Coating

	Alkyd	Lacquer	Phenolic	Epoxy	Urethane	Other (describe)
Primer						
Intermediate						
Finish						

DUKE POWER COMPANY
DESIGN ENGINEERING DEPARTMENT
VENDOR COATING INFORMATION #1

Specific Coating

	DFT	Product No. and Name	Product Manufacturer
Primer			
Intermediate			
Finish			
Finish Color No.		Color Name	
Color Source			

Drying Method

	Air	Baked	Catalyzed	Other
Primer				
Intermediate				
Finish				

Coating Specified by Duke Power Company
(To be completed by Design Engineering)

Field

Duke Power Coating System: _____

Surface Preparation: _____

Primer: _____

Intermediate: _____

Finish: _____

Finish Color No.: _____

Finish Color Name: _____

Comments:

WALL THICKNESS VERIFICATION

1.0 The valve manufacturer must document and provide a record of wall thickness measurements on all pressure boundary items showing actual measurements and corresponding wall thickness required by the applicable ASME Code and manufacturers design. All such documented records should state the measurement accuracy. Measurement error when subtracted from the measured wall shall result in wall thickness equal to or greater than the required minimum wall thickness. A written procedure for verifying specified minimum wall thickness shall be submitted for owners approval and must be approved before use. The procedure shall provide for the following information dependent upon which measurement method is utilized.

1.1. Direct Physical Measurement Method

1.1.1 Tools used for measurement including manufacturing tolerence of each.

1.1.2 Cross section sketch of valve identifying areas that will be verified.

1.1.3 identify methods of recording data.

1.2 Ultrasonic Measurement Method

1.2.1 Identify the equipment by manufacturer and model.

1.2.2 State how equipment will be calibrated and operated.

1.2.3 Cross section sketch of valve identifying areas that will be verified.

1.2.4 State how error repeatability and accuracy is applied to verification measurements.

1.2.5 Identify method of recording data.

2.0 Wall thickness measurements and inspection shall be accomplished after final machining.

3.0 The valve manufacturer shall notify owner's Quality Assurance Department at the start of wall thickness inspection and verification. Owner may elect to witness wall thickness verification; however, manufacturer may proceed with inspection without owner's representative's presence.

Attachment 2

Seismic Report
for
Valves VQ2A and VQ16A