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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 99900702/80-01

Program No. 51300 &
51400

Company: Morrison-Knudsen Company, Incorporated
Power Systems Division
101 Gelo Road
Rocky Mount, North Carolina 27801

Inspection at: 101 Gelo Road and 1400 Vance Street

Inspection Conducted: February 4-8, 1980.

Inspector: W. E. Foster 2/29/80
W. E. Foster, Contractor Inspector Date
Components Section II
Vendor Inspection Branch

Approved by: D. M. Hunnicutt 2/29/80
D. M. Hunnicutt, Chief Date
Components Section II
Vendor Inspection Branch

Summary:

Inspection on February 4-8, 1980 (99900702/80-01).

Areas Inspected: Implementation of 10 CFR 50, Appendix B criteria, and applicable codes and standards, including quality assurance program; change control; and manufacturing process control. Implementation of 10 CFR 21 and follow-up of Regional Office requests were also areas of inspection. The inspection involved twenty-seven (27) inspector-hours on site and six (6) inspector-hours at the motel.

Results: In the five (5) areas inspected, the following seven (7) deviations; two (2) unresolved items; and two (2) follow-up items were identified:

Deviations: Quality Assurance Program - practices were not consistent with Criterion V of Appendix B to 10 CFR 50; paragraph 3.4.3 of Quality Control Procedure No. N-7, Revision 3, dated November 28, 1979 (See Notice of Deviation, Item A); and paragraph 5.2 of Quality Control Procedure No. N-18, Revision 3, dated November 28, 1979 (See Notice of Deviation, Item B).

Change Control - practices were not consistent with Criterion V of Appendix B to 10 CFR 50; paragraph 3.6 of Engineering Procedure No. 501, Revision 1, dated November 18, 1979 (See Notice of Deviation, Item C); paragraph 3.1.B, subparagraphs (7) and (11), and paragraph 3.2.C of Engineering Procedure No. 502, Revision 0, dated November 18, 1979 (See Notice of Deviation, Item D); paragraph 3.7 of Engineering Procedure No. 201, Revision 2, dated November 21, 1979 (See Notice of Deviation, Item E); and paragraph 3.1 of Shop Control Procedure No. 103, Revision 1, dated November 26, 1979 (See Notice of Deviation, Item F).

Manufacturing Process Control - practices were not consistent with Criterion V of Appendix B to 10 CFR 50; and paragraph 3.2.3 of Shop Control Procedure No. 603, Revision 0, dated November 21, 1979 (See Notice of Deviation, Item G).

Unresolved Items: Follow-up of Region II Daily Report Items - there were no records to substantiate that returned switchgear had been reworked and reinspected (Details Section, paragraph C.3.b). Quality Assurance Program - the Quality Control Manager is required to review completed receiving inspection report forms; however, such reviews had not been documented (Details Section, paragraph E.3.b).

Follow-up Items: Follow-up of Region II Daily Report Items - receipt of information, corrective actions, and preventive measures regarding exhaust temperature elements; rework, reinspect, corrective actions and preventive measures regarding switchgear for Phipps Bend, Unit 2.

DETAILS SECTIONA. Persons Contacted

- R. E. Baker, Inspector - Receiving
- *J. A. Barnes, Chief Clerk - Document Control
- D. H. Eilers, Inspector
- **H. W. Falter, Division Engineer
- T. Fryar, Manager - Technical Services
- J. Gregg, Senior Warehouseman
- **N. D. Henry, Manager - Division Quality Assurance
- *V. R. Kattoju, Manager - Engineering
- **R. D. Kulchak, Manager - Corporate Quality Assurance
- *H. E. Loewe, Manager - Quality Control
- *L. C. Madison, Manager - Business Development
- A. R. Manning, Superintendent - Inventory Control, Shipping and Receiving
- M. C. Morley, Manager - Operations
- **J. G. Rutherford, Manager - Division Business
- J. Schultz, Manager - Personnel
- J. W. Winstead, Purchasing Agent

*Attended Exit Interview.

**Attended Initial Management Meeting and Exit Interview.

B. Initial Management Meeting1. Objectives

An initial management meeting was conducted to acquaint the vendor's management with the NRC responsibility to protect the health and safety of the public and to inform them of certain responsibilities imposed on vendors by the "Energy Reorganization Act of 1974" (Public Law 93-438). Those in attendance are denoted in paragraph A.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

- a. Describing the historical events that indicated the need for the Vendor Inspection Program.

Explaining the inspection base and how the inspections are conducted.

- c. Describing how inspection results are documented and how proprietary items are handled, including the vendor's opportunity to review the report for the purpose of identifying items considered to be proprietary.
- d. Describing the vendor's responsibility in responding to identified enforcement items relating to:
 - (1) Correction of the identified deviation.
 - (2) Action to be implemented to prevent recurrence.
 - (3) The dates when (1) and (2) above will be implemented or completed.
- e. Explaining that all reports and communications are placed in the Public Document Room.
- f. Explaining the publication and function of the Licensee Contractor and Vendor Inspection Status Report, NUREG-0040.

3. Findings

The contractor fabricates diesel generators as opposed to manufacturing them. Currently, there are three (3) orders for domestic nuclear stations; however, none are currently in work. All functional activities are identical for domestic and foreign orders.

C. Follow-up of 10 CFR 50.55 (e) Reports

1. Objectives

The objectives of this area of the inspection were to verify that adequate corrective actions and preventive measures had been taken regarding diesel generator switchgear wiring discrepancies and exhaust temperature element problems.

2. Methods of Accomplishment

- a. Discussions with cognizant personnel to determine if a 10 CFR Part 21 report had been submitted for:
 - (1) Terminations in wiring for diesel generator exhaust temperature elements and the mounting of the thermocouple junction boxes for Watts Bar Nuclear Plant, Units 1 and 2,

- (2) Wiring discrepancies in the High Pressure Core Spray diesel generator switchgear for Phipps Bend Nuclear Plant, Units 1 and 2; and Hartsville Nuclear Plant, Units A1 and A2.
- b. Reviewing first interim 10 CFR 50.55(e) report regarding switchgear wiring discrepancies at Phipps Bend Nuclear Plant.
 - c. Reviewing final 10 CFR 50.55(e) report regarding switchgear wiring discrepancies at Hartsville Nuclear Plant.
 - d. Reviewing General Electric's Nonconformance Disposition Request No. LG6-500, dated May 10, 1979, regarding wiring discrepancies in the diesel generator control panel at Phipps Bend Nuclear Plant, Unit 2.
 - e. Reviewing Morrison-Knudsen Memo, dated June 14, 1979, To: M. Morley, H. Loewe, and T. Fryar, From: P. Spence, Subject: GETVA - Field Deviation Report IWO 6005-Phipps Bend Units X22.
 - f. Reviewing Quality Control Procedure No. 102, Revision 0, dated October 26, 1979 - Electrical Component Workmanship and Acceptance Standards; and attendant Training Records.
 - g. Reviewing the following drawings which had been revised to reflect the as-built condition: WD-100-6005, sheet 2, Revision F, dated February 7, 1979; 6005F11003, Revision C, dated March 10, 1979.
 - h. Reviewing Morrison-Knudsen Memo, dated October 26, 1979, To: N. Henry, From: H. Loewe, Subject: QA/AC Survey at IC&S, Rocky Mount, North Carolina, Date: October 25, 1979. Note: This company supplies the switchgear under discussion.

3. Findings

Unresolved Item

The final 10 CFR 50.55(e) report regarding switchgear wiring discrepancies at Hartsville Nuclear Plant, Units A1 and A2 states in part, "GE decided to ship the Hartsville A1, A2, B1,

and B2 and the Phipps Bend unit 1 and unit 2 switchgear back to Morrison-Knudson (sic) to be reworked to match the wiring and connection diagrams." Personnel at Morrison-Knudsen, Power Systems Division, acknowledge receipt, rework, reinspect, and reshipment of the switchgear. The report indicates the hardware varied from the wiring diagram in areas of identification and connection in numerous instances. The contractor considered the discrepancies to be workmanship problems not conducive to a substantial safety hazard; therefore, a 10 CFR Part 21 report was not filed. The inspector was informed that the problem is limited to the Hartsville and Phipps Bend Nuclear Plants.

There were no records to indicate the discrepancies had been evaluated or that the switchgear had been reworked and reinspected. Consequently, the NRC inspector was unable to make a determination regarding the safety significance of the discrepancies or to verify that rework and inspection had occurred.

The contractor indicated that procedures for documenting evaluations, rework and reinspection of hardware returned as a result of customer complaints would be implemented as applicable.

4. Follow-up Items

During a follow-up inspection, the NRC inspector will verify that:

- (1) The contractor has received information, taken adequate corrective actions and preventive measures regarding wiring terminations and mounting of junction boxes for exhaust temperature elements on the diesel generators at Watts Bar Nuclear Plant, Units 1 and 2.
- (2) The contractor has evaluated the discrepancies, reworked and reinspected the diesel generator switchgear and has documents supporting the evaluation, corrective actions and preventive measures.

D. Implementation of 10 CFR Part 21

1. Objectives

The objectives of this area of the inspection were to verify that suppliers of safety related equipment had established and implemented procedures in accordance with 10 CFR 21.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

- a. Reviewing the following customer orders to verify the equipment was safety related and 10 CFR 21 had been invoked:
 - (1) Mill-Power Supply Company, Purchase Order No. E50338-74, dated December 15, 1978, attendant changes, and specifications,
 - (2) General Electric Company - San Jose, Purchase Order No. 205-AG894, Revision 0, dated November 4, 1977, attendant changes, and specifications, and
 - (3) General Electric Company - San Jose, Purchase Order No. 205-AG898, Revision 0, dated November 4, 1977, attendant changes, and specifications.
- b. Reviewing paragraph 3.2 of Quality Control Procedure No. N-16, Revision 2, dated September 28, 1979, - Corrective Action.
- c. Reviewing Power Systems Division's cover letter and attached Section E, Revision 0, dated April 5, 1978 of the Corporate Quality Control Manual.
- d. Reviewing posting in the Administration and Manufacturing areas.

3. Findings

The purchase orders identified above (paragraph D.2.a.) invoked 10 CFR Part 21. Within this area of the inspection, no deviations or unresolved items were identified.

E. Quality Assurance Program

1. Objectives

The objectives of this area of the inspection were to verify that the program had been documented, controls had been established and the program had been implemented.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

- a. Reviewing the following customer orders to verify that 10 CFR 50, Appendix B; ANSI N45.2 -1971; or adequate interpretation had been invoked:
- (1) Mill-Power Supply Company, Purchase Order No. E50338-74, dated December 15, 1978, attendant changes, and specifications,
 - (2) General Electric Company - San Jose, Purchase Order No. 205-AG894, Revision 0, dated November 4, 1977, attendant changes, and specifications, and
 - (3) General Electric Company - San Jose, Purchase Order No. 205-AG898, Revision 0, dated November 4, 1977, attendant changes, and specifications.
- b. Review of the following documents to verify the program had been documented by written policies, procedures, or instructions:
- (1) Training Procedure No. 401, Revision 0, dated November 26, 1979 - Operations Indoctrination and Training Requirements,
 - (2) Procurement Procedure No. 201, Revision 1, dated November 21, 1979 - Purchase Requisition Preparation and Processing,
 - (3) Quality Control Procedures, Nos. -
 - (a) N-2, Revision 3, dated November 28, 1979 - Quality Assurance Program,
 - (b) N-4, Revision 2, dated September 28, 1979 - Procurement Document Control,
 - (c) N-7, Revision 3, dated November 28, 1979 - Control of Purchased Material, Items, and Services,
 - (d) N-8, Revision 2, dated September 28, 1979 - Identification and Control of Material, Parts, and Components,
 - (e) N-12, Revision 2, dated September 28, 1979 - Control of Measuring and Test Equipment,

- (f) N-13, Revision 2, dated September 28, 1979 - Handling, Storage, Shipping and Preservation,
 - (g) N-16, Revision 2, dated September 28, 1979 - Corrective Action, and
 - (h) N-18, Revision 3, dated November 28, 1979 - Audits and Surveys.
- c. Review of the following activities to verify the program had been implemented: Training; Procurement Document Control; Control of Purchased Material, Equipment, and Services; Control of Measuring and Test Equipment; Corrective Action; and Audits.

3. Findings

The purchase orders identified above (paragraph E.2.a.) invoked 10 CFR 50, Appendix B; ANSI N45.2 -1971; or an adequate interpretation.

a. Deviations From Commitment

- (1) See Notice of Deviation, Item A.
- (2) See Notice of Deviation, Item B.

b. Unresolved Item

Paragraph 3.4.3 of Quality Control Procedure No. N-7, Revision 3, dated November 28, 1979, requires the QC Manager review completed receiving inspection report forms. However, there is no requirement the review be documented. As a result, the NRC inspector was unable to determine that completed receiving inspection report forms had been reviewed by the QC Manager.

The contractor should reevaluate the requirement for QC Manager review of completed receiving inspection report forms for the purpose of verifying accomplishment if it is indeed necessary to review the completed forms.

F. Change Control1. Objectives

The objectives of this area of the inspection were to verify that measures had been established to control changes to software and hardware. Also, to verify the measures for software changes included provisions for review, approval, and distribution to and usage at the location where the prescribed activity is performed. An additional phase was to verify the measures had been implemented.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

- a. Reviewing the following customer orders to verify that 10 CFR 50, Appendix B; ANSI N45.2 -1971; or adequate interpretation had been invoked:
 - (1) Mill - Power Supply Company, Purchase Order No. E50338-74, dated December 15, 1978, attendant changes, and specifications,
 - (2) General Electric Company - San Jose, Purchase Order No. 205-AG894, Revision 0, dated November 4, 1977, attendant changes, and specifications, and
 - (3) General Electric Company - San Jose, Purchase Order No. 205-AG898, Revision 0, dated November 4, 1977, attendant changes, and specifications.
- b. Reviewing the following documents to verify measures had been established to control changes to software and hardware:
 - (1) Quality Control Procedures, Nos. -
 - (a) N-3, Revision 2, dated September 28, 1979 - Order Entry and Design Control,
 - (b) N-4, Revision 2, dated September 28, 1979 - Procurement Document Control,

- (c) N-6, Revision 3, dated November 28, 1979 - Document Control, and
 - (d) N-15, Revision 2, dated September 18, 1979 - Non-conformance control.
- (2) Engineering Procedures, Nos. -
- (a) 201, Revision 2, dated November 21, 1979 - Component Certified Design Specification Control,
 - (b) 202, Revision 2, dated November 18, 1979 - Design Review,
 - (c) 301, Revision 0, dated November 18, 1979 - Procedure for the Preparation of Factory Test Procedures,
 - (d) 501, Revision 1, dated November 18, 1979 - Engineering Change Notice,
 - (e) 502, Revision 0, dated November 18, 1979 - Engineering Change Proposal,
 - (f) 503, Revision 0, dated November 18, 1979 - Production Change Proposal,
 - (g) 801, Revision 0, dated November 18, 1979 - Internal Drawings/Document Control Procedure, and
 - (h) Quality Control Procedure No. 301, Revision 0, dated November 28, 1979 - Nonconformance Control.
- c. Reviewing the following documents to verify the established measures had been implemented:
- (1) Engineering Change Notices, Nos. - 5839, dated October 10, 1979; 5842, dated October 11, 1979; 5789, dated October 8, 1979; 6161, dated January 7, 1980; 6236, dated January 17, 1980; 6235, dated January 17, 1980; 6203, dated January 17,

- 1980; 6162, dated January 7, 1980; 6204, dated January 17, 1980; 6242, dated January 17, 1980; 6071, dated December 18, 1979; 6072, dated December 18, 1979; and 6243, dated January 17, 1980.
- (2) Engineering Change Proposals, Nos. - 2910, dated January 17, 1980; 2893, dated January 17, 1980; 2890, dated January 17, 1980; 2889, dated January 17, 1980; 2888, dated January 17, 1980; 2773, dated January 2, 1980; 2769, dated January 3, 1980; 2373, dated November 19, 1979; 2426, dated December 4, 1979; and 2430, dated December 4, 1979.
- (3) Production Change Proposals, Nos. - 1730, dated November 28, 1979; 1697, dated December 8, 1979; 1696, dated December 8, 1979; and 1695, dated December 8, 1979.
- (4) Component . . . Design Specifications . . . , Nos. - 6022-301A/301B, Amendment I, dated February 8, 1979, Amendment II, dated December 17, 1979; 6022-303/304, Revision 1, dated December 17, 1979; 6022-304-1, Addendum No. 1, dated December 17, 1979; 6022-312-2, Addendum No. 4, dated December 17, 1979; and R6022-711, dated December 18, 1979.
- (5) Nonconformance Reports, Nos. - 46, dated November 11, 1979; 48, dated December 13, 1979; 49, dated December 13, 1979; 50, dated December 13, 1979; 51, dated December 13, 1979; and 52, dated December 11, 1979.

3. Findings

The purchase orders identified above (paragraph F.2.a.) invoked 10 CFR 50, Appendix B; ANSI N45.2-1971; or an adequate interpretation.

a. Deviations From Commitment

- (1) See Notice of Deviation, Item C.

(2) See Notice of Deviation, Item D.

(3) See Notice of Deviation, Item E.

(4) See Notice of Deviation, Item F.

b. Unresolved Items

None.

G. Manufacturing Process Control

1. Objectives

The objectives of this area of the inspection were to verify that measures had been established and documented to control manufacturing, inspection and test activities. Also, to verify these activities had been accomplished in accordance with the established and documented measures. Additionally, verification of indication of mandatory hold points in appropriate documents.

2. Methods of Accomplishment

The preceding objectives were accomplished by:

a. Reviewing the following customers orders to verify that 10 CFR 50, Appendix B; ANSI N45.2-1971; or adequate interpretation had been invoked:

(1) Mill-Power Supply Company Purchase Order No. E50338-74, dated December 15, 1978, attendant changes, and specifications,

(2) General Electric Company - San Jose, Purchase Order No. 205-AG894, Revision 0, dated November 4, 1977, attendant changes, and specifications and

(3) General Electric Company - San Jose, Purchase Order No. 205-AG898, Revision 0, dated November 4, 1977, attendant changes, and specifications.

b. Reviewing the following documents to verify measures had been established and documented to control manufacturing, inspection and test activities:

- (1) Quality Control Procedures, Nos. -
 - (a) N-5, Revision 2, dated September 28, 1979 - Instructions, Procedures, and Drawings,
 - (b) N-9, Revision 2, dated September 28, 1979 - Production Processes,
 - (c) N-10, Revision 2, dated September 28, 1979 - Examinations, Tests, and Inspections,
 - (d) N-11, Revision 2, dated September 28, 1979 - Test Control,
 - (e) N-14, Revision 2, dated September 28, 1979 - Examination or Test Status,
 - (f) N-20, Revision 2, dated September 28, 1979 - Data Reports and Symbol Stamping,
 - (g) 201, Revision 0, dated November 16, 1979 - Visual Inspection Procedure for Welded Joints . . . ,
and
 - (h) 501, Revision 0, dated November 19, 1979 - Final Inspection Procedure.
- (2) Shop Control Procedures, Nos. -
 - (a) 101, Revision 0, dated October 22, 1979 - Cleaning and Painting of Diesel Generator Units,
 - (b) 102, Revision 0, dated November 19, 1979 - Traveler Preparation Usage,
 - (c) 301, Revision 0, dated October 22, 1979 - Hydrostatic Test Procedure for Piping Sub-Assemblies,
 - (d) 302, Revision 0, dated November 10, 1979 - Hydrostatic Test Procedure for Pump Assemblies,
 - (e) 401, Revision 0, dated November 18, 1979 - Certification Procedure for Manual Application of Metal Arc Welding Process to Position 6-G and 2-F,
and
 - (f) 603, Revision 0, dated November 21, 1979 - Weld Rod Storage and Issuance.

- c. Reviewing completed Data Package for Engine Serial No. 79E1-1015 (Black Fox) to verify established measures had been implemented.
- d. Reviewing weld rod storage and issuance to verify implementation of Shop Control Procedure No. 603.
- e. Cursory review of shop operations to verify usage of documented instructions, procedures, and drawings.

3. Findings

The purchase orders identified above (paragraph G.2.a.) invoked 10 CFR 50, Appendix B; ANSI N45.2-1971; or an adequate interpretation.

a. Deviation From Commitment

See Notice of Deviation, Item G.

b. Unresolved Items

None.

H. Exit Interview

1. The inspector met with management representatives denoted in paragraph A. at the conclusion of the inspection on February 8, 1980.
2. The following subjects were discussed:
 - a. Areas inspected.
 - b. Deviations identified.
 - c. Unresolved Items identified.
 - d. Contractor response to the report.

The contractor was requested to structure his response under headings of corrective action, preventive measures, and dates for each deviation.

Additionally, management representatives were requested to notify the Commission in writing if dates require adjustment, commitments require modification, etc.

3. Management representatives acknowledged the comments made by the inspector.