

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/89-21

Docket No. 50-397

License No. NPF-21

Licensee: Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Facility Name: Washington Nuclear Project No. 2 (WNP-2)

Inspection at: WNP-2, Benton County, Washington

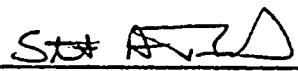
Inspection Conducted: March 27-April 7, and May 8-26, 1989

Inspectors: W. Wagner, Reactor Inspector
R. Wilson, Vendor Inspection Branch, NRR


S. Richards, Chief, Engineering Section

6-23-89
Date Signed

Consultant: B. Scanga

Approved by: 
S. Richards, Chief, Engineering Section

6-23-89
Date Signed

Summary:

Inspection During the Period of March 27 - April 7, and May 8-26, 1989 (Report No. 50-397/89-21).

Areas Inspected: This report provides the results of the SSOMI team inspection findings which relate to dedication of commercial grade material for use in safety related applications. The remaining SSOMI inspection areas are reported in inspection report 50-397/89-06. Inspection procedure 38703 was used as guidance for the inspection.

Results: One potential enforcement item was identified involving several examples wherein the licensee had not properly dedicated commercial grade items for safety related use, in that the critical characteristics of the items were not fully identified or verified by testing or inspections.

Details

1. Persons Contacted

*A. L. Oxsen, Assistant Managing Director
*J. W. Baker, Assistant Plant Manager
S. H. Peck, Material Support Engineering Supervisor
L. L. Dodson, Materials Engineer

*Denotes those attending the May 26, 1989 exit meeting. See inspection report 50-397/89-06 for a listing of additional attendees.

2. Background

10 CFR 50, Appendix B, Criteria III, IV, VII, and X require that licensees establish measures to ensure that suitable materials, parts, and equipment are selected for use in safety related systems during the design process, and require that licensees establish measures to ensure the proper procurement of materials, parts, and equipment. These measures include procurement document control, inspections and audits of manufacturers and suppliers, receipt inspections, and testing of procured items. In practice, licensees have two basic options for the procurement of material for use in safety related applications. Licensees can procure the material as safety related from a vendor whose quality assurance program has been reviewed and found to adequately address all regulatory requirements for manufacture and processing of safety related material, or licensees can procure material as commercial grade and then dedicate the material themselves for safety related use. The dedication process consists of those actions taken by the licensee to gain assurance that the component or part will fulfill its safety related function under any analyzed accident condition, including harsh environments and during seismic events, as appropriate. NRC Generic Letter 89-02, dated March 21, 1989, describes methods that the NRC finds acceptable for the dedication of commercial grade items. The methods include audits of manufacturers and suppliers to ensure the presence of quality assurance measures commensurate with the significance of the item being procured; or the performance of special tests and inspections by the licensee to verify the critical characteristics of the item.

3. Licensee Procurement of Commercial Grade Items For Safety Related Use

Within the Supply System's Plant Technical organization, the licensee has formed an engineering group whose function is to ensure that design requirements are met in the procurement of material. When the need for the procurement of material is identified, the Materials Requirements Group provides the request to the Plant Technical Staff for review. The Plant Technical staff then performs a procurement requirements evaluation. This evaluation identifies whether the item can be used in a safety related application, and if so, whether the item will be procured as commercial grade or as safety related from a source with an appropriate 10 CFR 50, Appendix B, Quality Assurance Program. If the item is safety related and procured commercial grade, a dedication evaluation is performed by the Plant Technical Staff, if an applicable evaluation is -

not already on file. The dedication evaluation justifies the use of commercial grade procurements and identifies what special requirements, inspections, or tests are imposed to support the dedication. All of the above activities are controlled by licensee procedure 1.3.39, "Plant Technical Procurement Review."

The licensee maintains a file of procurement requirement evaluations. Each evaluation may address numerous individual items to be procured and may address both safety related and non safety related items. At the time of the inspection, the licensee had approximately 2600 evaluation packages on file. The inspectors reviewed the evaluation index and a computer sort of component types to determine which evaluations to review in detail. The inspectors reached the following conclusions based on reviews of selected evaluations, based on reviews of work records which installed material into the plant, and based on discussions with the Plant Technical Staff.

- ° The majority of the procurement requirement evaluations address non safety related items.
- ° Items which are required to be environmentally qualified or which are considered ASME pressure boundary items receive a special review, which recognizes the more rigorous requirements placed on these items.
- ° The evaluations almost exclusively address replacement parts. The procurements are normally like-for-like, i.e. the manufacturer and part number of the item being procured are the same as for the item it is intended to replace. If the proposed procurement item differs in any known way from the installed part, including a change in part number, a substitution evaluation procedure is entered.
- ° The licensee has performed special tests in some cases to provide assurance that an item could perform its safety function. The majority of such testing consisted of testing samples of electrical components to verify their seismic capability. Examples of testing performed to support dedication of commercial grade items for use in safety related systems include:
 - Seismic testing of relays procured under evaluations 1276, 1297, and 1319.
 - Hardness testing of ASTM high strength structural bolts procured under dedication 073.
 - Verification of the electrical characteristics of a transformer for 250 VDC Battery Charger E-C2-2 under dedication 033. However, the specific testing requirements were not listed in the dedication.
- ° Although the licensee's procedure requires that the critical characteristics of components be specifically identified in their procurement requirement evaluations, this is typically not being done. Rather, most evaluations identify the manufacturer, the part

number, the drawing and item number, and the model number. Critical characteristics such as ratings for flow, speed, pressure, voltage, amperage, contact rating, hardness, tensile strength, heat treatment, response time, etc., are not being identified nor do the evaluations discuss whether such characteristics should be verified.

- o The following are examples of procured items that appear to have been inadequately dedicated and then installed in the plant:
 - Evaluation 668 dedicated Potter-Brumfield MDR type control circuit relays for use in the safety related portions of the emergency diesel generator (EDG) control circuitry, based primarily on the relays being advertised as meeting military specifications which exceed the postulated seismic loading at WNP-2, for shock and vibration. One such relay was installed in the "Loss of Power" section of the EDG control circuit by Maintenance Work Request (MWR) AV1684, dated May 17, 1988. No special testing, such as seismic testing of the relay, was performed. The EDG received a routine post-maintenance test after the work was complete.
 - Evaluation 1179 dedicated commercial grade Anchor Darling valve parts for use in repairing valve HPCS-V-4. This valve is a normally closed safety related valve in the high pressure core spray system, which must open under accident conditions. In dedicating the valve parts, the evaluation required no special testing or inspections to verify critical characteristics such as tensile strength or hardness. The parts, which included a yoke stem, wedges, and a wedge pin, were installed in the valve by MWR AT 3142 dated April 11, 1988.
 - The licensee has implemented Standard Procurement and Use Policies which constitute generic evaluations for certain types of items. Policy No. 6 addresses the procurement of fuses (600 volts and under). This Use Policy allows the procurement of a selected listing of fuses, as commercial grade, based on the licensee's judgement that standard manufacturing quality control is sufficient, fuses are not complex or unique, quality history supports this judgement, and functional compliance can be demonstrated by inspection and installation tests. The inspectors questioned whether routine installation tests verify fuse quality and function in that control system voltages can vary over a range of approximately 105 to 135 volts in the 125 VDC system for instance, therefore a single test may not verify that a fuse would not open early at a voltage different than the test voltage. Additionally, many equipment control circuits include several different electrical current paths, depending on the manner in which the equipment change in state is initiated. Routine post maintenance testing would not normally check a fuse for all possible electrical current conditions.
 - On July 20, 1987, the licensee installed a pressure switch, P/N 9012ACW-29 per Maintenance Work Request No. AT-0854. This item

was purchased commercial grade from Stoneway Electric on PO No. 89583 with no special testing or inspections performed for dedication. This pressure switch is part of the control circuitry for the air compressor that maintains starting air pressure necessary for operation of the emergency diesel generators.

- During the 1988 outage the licensee installed metallic O-rings in the discharge flange assembly of RHR relief valve RHR-RV-1B. The O-rings were purchased commercial grade from American Seal and Engineering Company on PO No. 090163 with a CMTR from Superior Tube Company on the Inconel "X" 750 alloy tubing. The licensee accepted the Certified Materials Test Report (CMTR) from the supplier (who was not on the Evaluated Supplier List (ESL)) without verifying the validity of the CMTR or evaluating the effectiveness of the certification system through source surveillance or audits.
- o Additional examples of items which appear to have been inadequately dedicated for safety related use, which were available for issue to the field from the warehouse include:
 - PO 93056 - General Motors Electro-Motive Division (GM/EMD); gear assembly for left hand rotating engines; shaft governor drive gear; these are spare parts for the emergency diesel generators.
 - PO 70808 - Baxter Air Engineering; a pump shaft as a spare part for applicable emergency core cooling pumps.
 - PO 94920 - North Coast Electronic; various General Electric relays, e.g. undervoltage, time over-current, instantaneous, voltage time delay, and power directional time relays.
 - PO 201734 - York, Division of Borg-Warner; chiller shaft.
 - PO 83283 - Paramount Supply; pressure gages for various applications.

Discussions with licensee personnel indicated that the licensee had previously recognized the need to upgrade their procurement program. The licensee initiated an internal study of procurement practices in July, 1988, however the results of that review were not yet available at the time of the inspection.

4. Conclusions

Although the licensee's procurement of commercial grade items for use in safety related applications includes a significant involvement by engineers of the Plant Technical Staff, and in several examples reviewed by the inspectors, special testing was required by engineering to support the dedication of items, the licensee has not consistently identified all the critical characteristics of items and then documented their evaluation of what measures should be taken to verify those characteristics. In several examples reviewed, it appears that



significant safety related items, such as relays, pump shafts, and valve parts, were procured commercial grade and placed in service in the plant or in the warehouse available for issue, with no special inspections, tests, or audits of the manufacturer performed to provide assurance that the parts were suitable for their application.

The failure to procure and install commercial grade components without adequately assuring their suitability for use in safety-related applications, and the failure to perform audits, testing or inspection activities to adequately verify the acceptability of these items is an apparent violation of 10 CFR 50, Appendix B, Criteria III, IV, VII, and X (50-397/89-21-01).

5. Exit Meeting

The scope and findings of the inspection were discussed with the licensee's management at the SSOMI exit meeting on May 26, 1989.

