U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/84-38

Docket No. 50-397

License No. NPF-21

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

Facility Name: WNP-2

Inspection at: WNP-2 Site, Benton County, Washington

Inspection conducted: December 10-13, 17-20, 1984 and January 7-11, 1985

Inspectors: for P H Johnson 1/30/85
D. J. Willett, Reactor Inspector Date Signed

A. D. Johnson 1/30/85
A. D. Johnson, Enforcement Officer Date Signed

L. R. Kanow 1/30/85
L. R. Kanow, Reactor Specialist Date Signed

Approved by: P H Johnson 1/30/8
P. H. Johnson, Chief Date Signed
Reactor Projects Section 3

Summary:

Inspection on December 10-13, 17-20, 1984 and January 7-11, 1985 (Report No. 50-397/84-38

Areas Inspected: Routine, unannounced safety inspection of receipt, storage and materials handling, procurement control, 50.55(e) follow-up, part 21 follow-up, TMI (NUREG-0737) issues, IE Bulletin follow-up, power ascension test results review, and test program summary. The inspection involved a total of 99 onsite hours by three NRC inspectors.

Results: Of the eight areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

*+J. W. Shannon, Director, Power Generation
#*+J. D. Martin, WNP-2 Plant Manager
*+C. M. Powers, Assistant Plant Manager
*+D. H. Walker, Plant Quality Assurance Manager
#*+J. F. Peters, Plant Administrative Manager
+P. L. Powell, Plant Licensing Manager
*+C. VanHoff, WPPSS Representing EFSEC
R. Mertins, Compliance Engineer
* W. L. Fitch, State of Washington, EFSEC
* G. D. Bouchey, Director of Support Services
* R. G. Graybeal, Health Physics/Chemistry Manager
D. Gano, Shift Technical Advisor
J. Fu, E.G. - STA Supervisor
+J. Massey, Supervisor I&C
H. McGilton, Manager, Safety Engineering Group
R. Mineke, Warehouse Supervisor
D. F. Miller, Senior QC Engineer
J. F. Beaunuax, Manager Procurement
D. Fisher, Buyer
M. Hatrick, Supervisor, Materials
L. Dodson, Engineer Materials
D. S. Feldman, Plant QA Supervisor
M. Etchamendy, Operations Contract and Materials Management Manager
M. R. Wuestefeld, Senior Engineer

The inspectors also held discussions with other licensee and contract personnel during these inspections. These included licensed and non-licensed operators, plant staff engineers, technicians, administrative assistants and quality assurance personnel.

+Denotes those present during the exit interview on December 20, 1984.
#Denotes those present during the exit interview on December 13, 1984.
*Denotes those present during the exit interview on January 11, 1985.

2. QA Program - Receipt, Storage and Handling of Equipment and Materials

The inspector examined and discussed with licensee representatives the licensee's administrative procedures for receipt, storage and handling of equipment and materials, procurement documents, records of receipt inspections, storage records, and items in storage to ascertain whether the licensee had developed and implemented a QA program for the control of receipt, storage and handling of equipment and materials that is in conformance with regulatory requirements, commitments in the application and industry guides and standards. The inspector examined and discussed the following listed procedures with licensee personnel:

POC-09, Receiving Inspection

PPM 10.1.16, Warehousing
CMI-4.5.2, In Storage Maintenance
PPM-1.3.12, Plant Problems
CMI-4.5.18, Control of Warehouse Access
CMI 4.5.8, Material Storage
PQA 13, Handling, Storage and Shipping
PQA 15, Nonconforming Materials, Parts, or Components
PQA 16, Corrective Action
PQA 8, Identification and Control of Materials, Parts, and Components

Storage and the procurement documents, records of receipt, and other documents related to the following listed items were examined by the inspector.

1. Low pressure core spray pump collar, sleeve and stuffing box
2. Instrument rack couplings and quick disconnects
3. Air filters
4. Thermocouples
5. RHR pump impeller, shaft and O-rings
6. Limitorque motors
7. Flow transmitter, sensor and amplifier board

No violations or deviations were identified.

3. QA Program - Procurement Control

The inspector examined and discussed with licensee representatives the licensee's organization, administrative controls, and procurement records of the items listed in paragraph 2 above. The inspector included in the examination the following listed documents to ascertain that the licensee had developed and implemented a QA program relating to the control of procurement activities that was in conformance with regulatory requirements, commitments in the application, and industry guides and standards.

1. Master Equipment List
2. Authorized Vendor List
3. Vendor Audit Records including Schedules
4. Vendor Audit Procedures
5. Administrative Procedure PPM 1.3.13, Material, Equipment, Parts and Supplies Procurement
6. QA/QC Instruction PQA-06, Procurement Document Review
7. QAP-7, - Control of Purchased Material, Equipment and Services
8. QAP-4, Procurement Document Control
9. Procurement and Buyer Instruction Manual
10. Purchase orders for the items listed in Paragraph 1 of this report

No violations or deviations were identified.

4. TMI (NUREG 0737) Items

Item II.F.2 (Closed) - "Inadequate Core Cooling" and Generic Letter 84-23 - "Reactor Vessel Level Instrumentation for BWRS"

Water level instrumentation in boiling water reactors (BWRS) is relied upon for information which is used as a basis for actions to assure adequate core cooling. Certain inherent problems can plague BWR level instrumentation. These include inaccuracies generated by temperature effects on the reference caused by drywell heating, flashing in the reference leg, and vulnerability of failure of mechanical level indicators.

The BWR owners' group (BWROG) commissioned an evaluation of BWR water level instrumentation adequacy, which also provided several improvements that can be made to accuracy and reliability (S. Leavy Report #SLI-8211). The BWR owners' group reviewed the Oak Ridge National Laboratory "Evaluation of instrumentation for detection of inadequate core cooling in BWRS" (NUREG/CR-3652, December 1983) and agreed specifically with the executive summary, that:

...the BWR practice of multiple, redundant level instruments with overlapping ranges, can be a reliable basis for indication of approach to an inadequate core cooling condition (letter #8438, BWROG to W. Hooges, NRC, November 1, 1984).

The BWR owners' group also completed a probabilistic evaluation of accident models considering analog and mechanical water level trip systems (letter #8447, BWROG to W. Hooges, NRC, November 2, 1984).

The Supply System has concluded that the present design satisfies Item II.F.2. because:

- The vertical drop for the reference leg in the drywell is adequate to minimize drywell heating effects.
- Operating experience confirms the high reliability of present mechanical level instrumentation.
- WNP2 presently satisfies the requirements for detection of inadequate core cooling that have resulted from the NRC staff's review of the BWR owners group reports - SLI-8211 and SLI-8218.

The inspector's review determined that two of the mechanical water level instruments have been replaced with analog instruments (because they are easier to environmentally qualify) which gives added reliability. The licensee also pointed out that mechanical instruments give added reliability during loss of power scenarios.

Item II.K.1.23 (Closed) "Reactor Pressure Vessel (RPV) Level Indication"

The licensee had modified procedure PPM 5.1.1 - "RPV Level Control" to identify the water level instruments by number and their associated range of operation.

Item II.K.3.34 (Closed) "Adequacy of Space Cooling for High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) Systems"

This item states that the RCIC and HPCI systems should be designed to withstand a complete loss of offsite AC power to their support systems, including coolers, for at least two hours. The cooling water system is supplied by the standby service water system. Loss of offsite power will not affect the operability of the space coolers, which are powered from a class 1E bus. The licensee has completed design calculation which support the adequacy of the heat removal capability. These design calculations will be verified during a future scheduled shutdown when a representative 100% power decay heat source is available (by or before July 1985).

5. IE Bulletin Followup

IEB 80-03 (Closed), "Containment Flooding"

This 1980 bulletin required plants with closed cooling water systems inside containment to... "provide a summary of experiences with cooling water system leakage into containment". WNP-2 loaded fuel in December 1983 and could not provide a summary of experiences within 45 days.

The licensee has reviewed the facility's design and can account for both identified and unidentified leakage in the containment to prevent flooding. The leak detection system alarms in the control room when unidentified leakage in the Floor Drain and Equipment Drain Sumps in the containment exceed 25 GPM. In the event that leakage was not detected by these sumps, this water would seep through the downcommers into the suppression pool which is monitored and has a high/low alarm.

IEB 84-03 Closed, "Refueling Cavity Water Seal"

This bulletin describes a rapid loss of refueling cavity water at a nuclear plant and requested an evaluation of applicability to all licensee facilities.

The WNP-2 design consists of two permanently installed bellows welded in place and encased in a ¼ inch thick plate. The primary bellows is backed up by a secondary self-energized spring seal which seals tighter, in the event of a bellows rupture, due to water pressure. The licensee concluded that large unrestricted openings and excessive leak rates are not credible failures. Seven methods of make up water to the fuel pool and reactor are available without exposing personnel on the refueling floor. The licensee performed two analyses assuming maximum decay heat load for a suspended fuel bundle and boil-off of spent fuel water. Emergency operating procedures, although in draft form, have been reviewed with respect to the bulletins concerns and changes will be made to support the first refueling (Spring 1986).

6. 10 CFR 50.55(e) Follow-Up

50.55(e) No. 84-04 (Open) "Protection of Control and Instrument Cables, in the Dedicated Shutdown System, from the Effects of Fire"

Nine of the ten cables discussed in the report were added to the design after the base line appendix R evaluations. Plant Engineering Directives

S218-E-D071 and S215-E-7343 and their respective Plant Modification Requests 84910 Rev. 0 and 84909 were issued to correct the deficiencies. This issue will be followed up in a future inspection.

7. Power Ascension Testing Results

The inspectors reviewed the test record copies, apparent test result determinations, vendor generated startup test reports and associated documents/records for the following power ascention tests, selected on a sampling basis:

PPM 8.2.26 - Relief Valves
PPM 8.2.25 - Main Steam Isolation Valves
PPM 8.2.19 - Core Performance

This review concentrated on Test Condition No. 6 (100% Reactor Power) test results. These results were evaluated using the criteria, guidance, requirements and commitments contained in:

Administrative Procedure PPM 8.2.0, Power Ascension Test Program Administration

WNP-2 FSAR, Section 14

WNP-2 FSAR, Appendices C.2 and C.3

Regulatory Guide 1.68, Initial Test Programs for Water-Cooled Nuclear Power Plants

This evaluation verified that:

a. Results were within previously established acceptance criteria.

b. Testing, test changes and recordkeeping were in accordance with administrative practices and regulations.

c. Results, deficiencies and changes were reviewed, dispositioned, and annotated respectively. Approved procedure deviations did not change the basic objectives.

d. The results were extrapolated and compared satisfactorily with predicted performance allowing testing to proceed to the next test condition/power plateau.

e. Personnel and organizations responsible for reviews had documented these reviews.

No violations or deviations were identified.

8. Summary of Testing, Initial Operation and Inspection Activities

The initial test program consisted of a series of tests categorized as system lineup testing, preoperational, and initial startup tests. These respective tests determine correct installation and functional

operability of equipment; the capability of plant systems to meet performance requirements; and beginning with fuel loading, demonstrate the capability of the integrated plant to meet performance requirements.

The objectives of the initial test program were:

a. to ensure that the construction was complete and acceptable;

b. to demonstrate the capability of structures, components, and systems to meet their performance requirements;

c. to demonstrate, where practical, that the plant is capable of withstanding anticipated transients and postulated accidents;

d. to bring the plant to rated capacity and sustained power operation;

e. to establish and evaluate surveillance testing procedures;

f. to achieve an orderly and safe initial core loading;

g. to conduct initial heatup and hot functional testing so that hot integrated operation of all systems is verified acceptable;

h. to provide documentation of the performance and safety of equipment and systems;

i. to provide baseline test and operating data on equipment and systems for future reference;

j. to run-in a system for a sufficient period so that any design, manufacturing, or installation defects can be detected and corrected;

k. to ensure that plant systems operate together on an integrated basis to the extent possible;

l. to give maximum opportunity to the permanent plant operating staff to obtain practical experience in the operation and maintenance of equipment and systems; and

m. to establish safe and efficient normal, abnormal and emergency operating procedures to the extent possible.

Throughout this test program the regional and resident inspectors have reviewed, witnessed and evaluated the test program objectives, performance and results to determine the capability and adequacy of the plant procedures, staff, and systems, and to verify that appropriate considerations and criteria simulate and demonstrate actual operations within the extremes of possible operation.

This report concludes inspection activities of the initial operations and test program except for follow-up of previously identified concerns and review of the startup and power escalation summary report required by technical specifications.

9. 10 CFR Part 21 Followup

Agastat brand model 7000 timing relays can exhibit as much as 32% error if they are bench calibrated in the horizontal position and then mounted in the vertical position.

The inspectors reviewed this issue with personnel responsible for calibration of these relays to determine if the licensee utilized this brand and model, if they were aware of the potential problem and, whether the issue represented a potential problem at the facility.

The licensee stated that there were approximately 270 Agastat brand timing relays in service, that these relays were not currently part of the schedule for periodic calibration but would be added as part of an ongoing program to identify and evaluate equipment which, while not subject to change, may be worthy of periodic attention.

The licensee further stated that the relays currently in use were calibrated in position and verified acceptable by functional tests in system and integrated operation during the preoperational and power ascension test programs.

No violations or deviations were identified.

10. Exit Interview

The inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection visits on December 13 and 20, 1984 and January 11, 1985. The scope and findings of the inspections were discussed during the exit interviews as set forth in paragraphs 1 through 9 of this report.