U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/83-58

Docket No. 50-397 License No. CPPR-93 Safeguards Group ____

Licensee: Washington Public Power Supply System (WPPSS)

P. O. Box 968

Richland, Washington 99352

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

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

Inspection conducted: November 28 through December 20, 1983

Inspectors: for F. Wenslawski 1/25/84
G. P. Yuhas, Radiation Specialist — Date Signed

Approved by: F. A. Wenslawski 1/25/84
F. A. Wenslawski, Chief — Date Signed
Radiological Safety Branch

Summary:

Inspection on November 28 to December 2; December 8 to December 15,; and December 17 to December 20, 1983 (Inspection Report No. 50-397/83-58).

Areas Inspected: Routine, unannounced preoperational inspection of the licensee's radioactive waste management system and followup on actions taken in response to previous inspection findings. The inspection involved 140 hours on site by one regionally based inspector.

Results: Of the three areas inspected, two apparent items of noncompliance and one deviation were identified in one area (failure to include applicable acceptance criterion and failure to follow test procedures 10 CFR 50 Appendix B, XI, and failure to place radioactive piping in a shielded trunk as committed to in the FSAR, paragraph 3).

DETAILS

1. Persons Contacted

*G. Afflerbach, Assistant Plant Manager
*R. Barbee, Plant Engineering Supervisor
G. Blackburn, Test Group Manager
J. Bufis, Test Group Manager
*G. Bouchey, Director, Support Services
D. Cavanaugh, Startup Test Engineer
P. Chenell, Startup Test Engineer
A. Davis, Radiochemist
*L. Garvin, Manager, Construction, Quality Assurance
*R. Graybeal, Health Physics/Chemistry Manager
M. Grindel, Startup Test Engineer
L. Kassakatis, Test Group Manager
R. Koenings, Test Group Supervisor
W. Krueger, Startup Test Engineer
D. Larson, Manager Radiological Programs
*J. Martin, Plant Manager
*M. Monopli, Manager, Operations Assurance Programs
N. Pike, Startup Test Engineer
*P. Powell, Manager, WNP-2 Licensing
J. Shannon, Director, Power Generation
*V. Shockley, Health Physics/Chemistry Support Supervisor
*G. Sorensen, Manager Regulatory Programs
J. Thomas, Startup Test Engineer
*D. Walker, Plant Quality Assurance Manager

*Indicates those individuals attending the exit interview on December 20, 1983.

In addition to the individuals noted above, the inspector met with and held discussions with other members of the licensee's staff.

2. Licensee Action on Previous Inspection Findings

(Closed) (50-397/83-GY-03) Inspector identified item regarding control of radioactive material transported from Unit 2 to the Plant Support Facility. The licensee has committed to revise Section 12.5 of the Final Safety Analysis Report (FSAR) to include a description of their program in this area.

(Open) (50-397/83-16-01) The licensee has stated in their draft revision of FSAR Section 12.5 that procedures will be implemented to assure appropriate control is maintained with regard to the transport of radioactive material between Unit 2 and the Plant Support Facility. As of December 20, 1983 these procedures had not been finalized.

(Closed) (50-397/83-16-02) Inspection identified item concerning incorporation of adequate acceptance criteria in System Lineup Tests (SLTs). As described in paragraph 3 of this report, several examples were identified that demonstrated a failure to assure acceptance criteria

necessary to demonstrate compliance with FSAR commitments and Proposed Technical Specifications (T.S.) had been included in both SLTs and Preoperational Tests (PTs). The licensee took corrective action.

(Closed) (50-397/83-26-01) Permanent personnel access has not been provided to the Reactor Building elevated release air particulate and iodine samples. Plant Modification Record (PMR) No. 02-83-0102-0 was issued on December 19, 1983 to install a ladder.

(Open) (50-397/83-26-02) Several radioactive waste tanks (MWR-23A, 23B; MWR-31A, 3B; EDR-1) have dead legs in the bottom which may became radiation hot spots. As of December 18, 1983 no PMR had been issued to mitigate this condition.

(Open) (50-397/83-26-03) Accordion gates installed at many potential high radiation areas through the plant could prevent a worker from leaving the area. As of December 18, 1983 the licensee had not yet issued a PRM to correct this condition.

(Open) (50-397/83-32-03) As of December 18, 1983 the licensee had not established a formal retraining program for Health Physics and Chemistry Technicians.

(Closed) (50-397/83-32-06) Based on discussions between NRR, Radiological Assessment Branch, the licensee and the inspector, the licensee committed to revise section 12.5 of the FSAR to include a description of how and where radioactive materials will be used at the Plant Support Facility (PSF), and statements that clearly indicate the licensee's intent to perform their own personnel dosimetry. This revision is to be submitted to NRR by January 6, 1983.

(Closed) (50-397/83-32-07) By memoranda data October 19 and November 14, 1983 and proposed PMR dated November 28, 1983 the licensee has established a program to assure that only Schrader couplings are used in breathing air systems.

(Open) (50-397/83-23-14) The Post Accident Sampling System was not complete nor fully operational as of December 20, 1983. The system is not required until the Unit exceeds 5% power.

(Open) (50-397/83-23-18) Preoperational tests of the Area Radiation Monitoring system, PT 37A, were completed on October 22, 1983. The system was released for operation on December 19, 1983. As a result of physical inspection of the system two observations were brought to the licensee's attention. ARM-6 located on the 572' elevation of the Reactor Building has been placed in a manner such that a large concrete column shields the detector from the normally occupied area. The power cable for ARM-17, (AARM-9115-Div A) located near column F-10 was damaged. Review of the PT 37 Release For Operation (ROF) documentation resulted in two observations. PT 37D should have been identified as deferred and a Startup Work Request (SWR) or Maintenance Work Request (MWR) should have been initiated to repair ARM-RR-600, the system multipoint recorder.

The licensee was receptive to these observations.

This item (50-397/83-23-18) will remain open since it also involved the Process Radiation Monitoring System.

The Process Radiation Monitoring preoperational testing has been deferred by license condition and therefore will be reviewed in a subsequent inspection.

(Open) (50-397/83-23-38) As of December 20, 1983. The licensee had not developed specific procedures for collecting and analyzing very high level samples. The inspector reviewed the open item with licensee representatives and stated that action must be complete prior to exceeding 5% power.

(Closed) (50-397/83-23-54) Since the Emergency Plan Exercise the licensee has retrained those individuals expected to wear self contained breathing apparatus during emergency conditions.

(Open) (50-397/83-23-56) Post Accident Sampling System training was in progress. This matter will be reviewed in a subsequent inspection.

(Open) (50-397/83-23-58) On Sunday, December 11, 1983 the inspector interviewed several Health Physics/Chemistry Technicians during a tour of the plant to ascertain their systems knowledge and ability to operate equipment like the process and efflument monitoring sample skids. Based on these discussions the inspector informed licensee management representatives that the technicians did not demonstrate an adequate understanding of the radiological significance of systems operation nor did they demonstrate confidence in their readiness to operate process and effluent monitoring equipment. Licensee management responded by implementing a two phase program. Phase 1, to be complete prior to fuel load will assure that at least one Health Physics/Chemistry Technician per shift will be fully trained to operate equipment they are responsible for. Phase 2, to be completed prior to 5% power will assure each technician will be provided a descriptive walkdown of the entire plant. The inspector accompanied the initial systems walk down training of the 437' elevation of the Radwaste Building on December 14, 1983. The training was provided by the Manager, Radiological Programs and a Certified Health Physicist. Both individuals are experienced in boiling water reactor operation. The information being provided was appropriate and relevant to the technicians needs.

The inspector will verify that the training program has been completed in a subsequent inspection.

3. Radioactive Waste Treatment Systems

Five systems were reviewed by the inspector after completion of the preoperational test program and released for operation in accordance with the "WPPSS Test and Startup Administration Responsibilities, Controls and Procedures, Program Manual". The review consisted of a comparison of the as-built system with the Final Safety Analysis Report (FSAR) description, verification that selected design and performance criteria expressed in the FSAR, Technicial Specifications, and industry standards had been demonstrated by the preoperational test program, and that structures,

systems and components will perform satisfactorily in service. Based on this review the following observations were brought to the licensee's attention.

a. Standby Gas Treatment System, (SGTS), PT-39 Release for Operation, dated December 2, 1983.

- FSAR 6.5.1.2 System Design, Amendment No. 33, page 6.5-5 describes the fan start sequence and states: "Both SGTS units are fully operational within 34 seconds after an emergency signal." PT-39 did not verify this design criteria had been demonstrated. PT 202 verified the ability of SGT to decrease reactor building pressure to -0.25 inches water within two minutes but did not verify the 34 second criteria. These criteria were incorporated into the system design drawings.

  Failure to include the 34 seconds as an acceptance criteria in PT-39 represents apparent noncompliance with 10 CFR 50, Appendix B, Criterion XI "Test Control."

  In response to this observation the licensee retested the system on December 14, 1983 using SLT-S39.0-6 and found the actual time to be 29.4 seconds.

- Proposed Technical Specification 4.6.5.3 d.4. dated October 26, 1983 states: "Verifying that the heaters dissipate 20.7 ± 2.1 Kw when tested in accordance with ANSI N510-1980".

  Generic System Lineup Tests (SLT) SLT-E1, "Circuit Test Record-Non-Rotating Equipment" were performed for SGTS heaters EPN-SGT-EHC-1A1, 1A2, 1B1, and 1B2, however, the specific acceptance criteria were not entered in the test record. The inspector and responsible Test Engineer reviewed the test data and concluded the 20.7±2.1 Kw criteria had been met.

- The SGTS high efficiency filter (HEPA) and charcoal filters were tested by a contractor using specific SLT-S39.02-05 which references ANSI N510-1980 as committed by the licensee. With one exception the tests were successfully conducted consistent with the industry standard. The exception involved failure to perform SLT-S39.01, "Duct and Housing Leak Test" at 1.25 times the system design pressure as specified by ANSI N510-1980, paragraph 6.4.2.3.

  In response to this observation the licensee generated a Startup Problem Report SPR-M-3908. The resolution of this SPR was to limit the acceptable differential pressure across each filter to 2" water rather than retest the system to 1.25 times the design pressure.

- Test and Startup Instruction TSI Section 9.0, Revision 4, "Release for Operation" states in part that: "Documented deficiencies may exist at the time of release, but none of the remaining items can preclude or compromise the ability of the

system to perform it's design function." FSAR Amendment No. 33 page 6.5-5 states in part that:

"When started automatically by one of the above three isolation signals, the fans inlet vane position are automatically controlled by the secondary containment pressure control system. There are two, emergency powered, Siesmic Category I, control systems. Each is composed of four differential pressure controllers which transmit a control signal to the fan inlet vanes to maintain the lowest of the above differential pressures at a minimum of 0.25 inches of water, negative."

In reviewing the Release for Operations several open SPR's were acknowledged. One open SPR (SPR-I-3653) stated in Part 1 that: "Reactor Building DP input signal to SGT flow control circuit is from REA-DPIC-1A, 1B. This causes erratic operation of SGT flow controllers, they will not control SGT flow". The Test Engineer stated to the inspector that the statement was correct. He added the system would pull the Reactor Building down to a -0.25" water pressure automatically but would not control the pressure consistently. SPR-I-3653 appeared on the Master Completion List (MCL) but only addressed Part 2 involving a nameplate change. The Test Working Group approval dated November 29, 1983 recognized the flow control problem and noted it as an action item, however, the system was Released for Operations on December 2, 1983 with this deficiency outstanding.

Failure to follow procedure TSI 9.0 represents apparent noncompliance with 10 CFR 50, Appendix B, Criterion XI, "Test Control."

In response to this observation the licensee took action to assure that all SPR's appear on the MCL, that TWG action items are resolved prior to Release for Operations and that a statement addressing any issues is included by the test engineer in the Release for Operations Package. Regarding SPR-I-3653, Project Engineering Directive PED S220-I-1310 was implemented on December 14, 1983 to resolve the issue. The SGT was successfully retested pursuant to SLT-S39.0-6 on December 14, 1983.

- The inspector noted that the licensee used activated charcoal supplied by North American rather than Barneby Cheney 727 as described in FSAR 6.5.1.2., and had deleted the humidstat control system. SPR-M-3765 was issued regarding these deviations from the FSAR. The SPR was closed with the issuance of a SAR Change Notice (SCN) SCN-83-494 on December 16, 1983. Deletion of the humidstat control circuit was reviewed with the Test Engineer in terms of IE Information Notice No. 83-25, "Standby Gas Treatment System Heater High Temperature Trip Set Point Adjustment", and found to not present a safety hazard.

Based on the inspector's review of PT 39 a retest (SLT-S39.0-6) was performed and the SGT package was resubmitted, reviewed and approved by the TWG on December 15, 1983.

Final inspection was completed on December 18, 1983. This inspection concluded that the SGT can perform it's intended function.

b. Reactor Building Ventillation, PT-80 Released for Operations, dated December 12, 1983

- FSAR 9.4.2.1 Design Bases states in h. that the reactor building ventilation system is designed to provide for purging of the primary containment. PT 80.0-A reviewed and approved April 4, 1983 did not address this aspect of the design. SDR-17118 allowed 47 individual components not to be tested as a prerequisite for release for operations. The primary containment purge equipment and control circuits were among the deferred equipment. Another item deferred was REA-DPIC-15. This differential pressure instrument controller is intended to maintain the correct direction of airflow into the containment monitoring system room by exhausting air through the liquid sample hood. This is done to minimize personnel exposure and to prevent recirculation of reactor building air as stated in subparagraph C of 9.4.2.1. Burns and Roe drawing M545, Revision 32 showed the damper controlled by REA-DPIC-15 failing in the closed position which is not consistent with the design basis. PT 80.0-A did not specifically address verification of air flow direction as an acceptance criteria.

  The licensee responded to these observations by development and implementation of special test SLT-S80.0-9, "Containment Supply and Purge Equipment Operability Test" on December 18, 1983. The TWG approved the results on the same date. The verification of airflow direction was addressed by SPR-M-3950. This SPR was closed on December 17, 1983 after Burns and Roe reviewed air balancing data against specification contained in drawing M545, Revision 32. SDR-I-17557 was issued to correct the containment monitoring room damper and control circuit problem on December 18, 1983. The circuit was modified to fail open.

- The reactor building ventilation outdoor air intake duct and the exhaust discharge duct isolation valves are designated as engineering safety features. FSAR 9.4.2.2 states: "Closure time for these valves after receipt of an isolation signal is three seconds, thus preventing release of radioactive contaminants, which exceed allowable limits, to the environment." In addition, proposed Technical Specification 4.6.5.2 stated the maximum isolation time for these valves to be four seconds.

PT 80.0 found the valves required from 5.95 to 9.24 seconds to isolate. This was documented in SPR-M-2899 dated July 23, 1983. An October 17, 1983 entry in block 20 of the SPR stated: "Accept 'As Is' Offsite dose calculation performed assuming 8.0 second closing time for REA-V-1 and 2 (Reference WPBR-RO-43-266, dated 10/14/83). Increase in offsite dose is negligible. FSAR change initiated per BRSCN-83-72 to revise FSAR pages 9.4-21, 9.4-22 and Section 15.7.4. Closing times for ROA-V-1 and 2 have no affect on offsite dose." The Startup Manager approved this resolution on November 9, 1983. Block numbers 24 and 25, titled Change Complete Date and Procedures Changed/Date were signed November 9, 1983. Action reviewed was signed by the Test Group Supervisor on November 10, 1983 and the final approval was signed by the Startup Manager on November 20, 1983.

On December 13, 1983, SPR-M-2899 did not appear on the MCL and had not been identified as a possible mode restraint to core alterations pursuant to Proposed Technical Specification 3.6.5.2. The Test Engineer, in the presence of the inspector confirmed by telephone that the supply system licensing group had not received BRSCN-83-72 for implementation.

Release for operations of the reactor building ventilation system with isolation valve stroking times outside the FSAR and Proposed Technical Specification limits represents apparent noncompliance with 10 CFR 50, Appendix B, Criterion XI, "Test Control."

In response to this observation the licensee proposed a change to the FSAR and Technical Specification. The licensee conducted an audit to determine if other outstanding SCNs exist which could impact the technical specifications and if other closed SPRs also might represent issues which need to be addressed. The licensee's audit as documented in a December 17, 1983 memorandum concluded that: "The problem identified was isolated to the specific item identified. No generic cause or breakdown in the Quality Assurance was evident."

Final inspection was complete on December 18, 1983. The inspection concluded that the reactor building ventilation system can perform it's intended function.

- Floor and Equipment Drain Processing, PT 31.0A, Released for Operations, December 12, 1983

Proposed Technical Specification 3.11.1.3 states: "The liquid radwaste treatment system, as described in the ODCM, shall be operable." The inspector informed the licensee and NRR that the liquid radwaste treatment system is not described in the ODCM. Based on review of this

system and the preoperational test documentation no issues were identified which would bring into question the ability of the system to perform it's intended function.

- Solid Waste Processing System, PT 34.0-A, Released for Operation, December 7, 1983

  The preoperational test procedure did not include a test of the hyraulic waste compactor as described in FSAR 11.4.2.8. The waste compactor as described, was never installed at the Unit. A larger compactor has been purchased and will be installed under a Maintenance Work Request MWR-5715. The inspector noted that neither a SDR or SPR was initiated to assure a SCN was processed to update the FSAR.

- Process Sampling, Turbine Building, PT 106C, Released for Operation, December 18, 1983

  In response to NRC question 281.011 the licensee stated in subpart b., "Sample lines are made of continuous seamless tubing with a minimum of joints and all joints are welded." Drawing M607, Sheet 1, Revision 15, shows all lines to the Turbine Building Sample Rack, SR-1, to be seamless tubing with all joints welded.

  The inspector noted that all incoming lines (reactor water, main steam, feedwater heaters, etc) have isolation valves located between the root and the sample rack which are not welded and which are not shown on the drawing.

  In response to this observation the test engineer issued SPR-M-3994 on December 19 1983.

- FSAR 9.3.2.2.4 states: "Continuous flow lines containing fluids over 150°F are insulated to protect personnel." Drawing M607, Sheet 1, Revision 15, shows several samples like reactor water and feedwater heaters to be insulated.

  The inspector noted that high temperature lines running to SR-1 from the reactor coolant recirculation system and high pressure feedwater heaters run through occupied areas and corridors and are not insulated.

  In response to this observation the test engineer initiated SPR-M-3986 with a projected fix date of January 15, 1984.

- FSAR 9.3.2.2.4 states in part that: "Sample lines containing highly radioactive fluids are routed away from corridors or occupied areas or are shielded when entering

occupied areas." FSAR 12.3.1.3.3 states: "Radioactive piping routed through lower radiation zones is enclosed within a shielded tunnel."

SPR-M-3897 describes a failure to comply with this criteria for the reactor water sample line SP-1. This line runs unshielded from the 501' elevation reactor building across the main passageway into the turbine building, down the personnel stairway then in the 441' elevation corridor until it enters the turbine building sample room. The licensee has been aware of this condition since 1975. On December 17, 1983 Burns and Roe, Inc. submitted an evaluation which concluded that the dose rate from this line would be 0.66 mr/hr at one foot.

Since the areas which the line traverses are designated less than 2.5 mr/hr Burns and Roe concluded no shielding is necessary. On December 19, 1983 the test engineer proposed an SCN to ammend the FSAR commitment in this area.

Since the reactor water sample line is subject to primary system, temperature, pressure, radioactivity and corrosion product plateout the inspector informed the license representative that failure to comply with the existing commitment represents a deviation (50-397/83-58-01).

- Another open item (SPR-M-720, dated April 29, 1980) involving the turbine building sample room needs the licensee's attention. This SPR states that the one inch off gas sample lines may cause up to 4 rem/year unnecessary exposure to workers. The licensee stated this issue has not been resolved. Resolution of this issue will be reviewed in a subsequent inspection (50-397/83-58-02).

Based on review of PT 106C it appears that the system was released for operation with significant undocumented deficiencies representating potential safety hazards which is not consistent with TSI Section 9.0.

The licensee's corrective action with exception of these items identified as 50-397/83-58-01, 02 seem adequate to prevent a safety hazard prior to plant heatup.

4. Process and Effluent Radiation Monitoring System

During an October 1983 visit (Inspection Report No. 50-397/83-52) the inspector expressed concern with a perceived lack of formality in calibration of process radiation monitors.

On December 2, 1983 the inspector advised the licensee representatives that calibration of the mid-range reactor building, turbine building and radwaste building gas monitors using unapproved handwritten procedures was not consistent with their response to NRC question 423.021. This response stated in part that: "The calibrations are performed as system lineup tests (SLT's) which are prerequisites to the Process Radiation Monitoring System Preoperational test described in 14.2.12.1.22 which is performed prior to fuel loading." SLTs are written, reviewed, and approved procedures developed pursuant to TSP-7.

In response to this observation the licensee developed SCN83-494 on December 3, 1983 which amended FSAR 14.2.12.1.22 and 23; 14.2.12.3.1 and their response to NRC question 423.021 to delete the commitment to calibrate using SLTs and that sensors be calibrated as a prerequisite of the preoperational test. The licensee implemented an SPR to allow calibration using draft procedures provided the results are acceptable when compared to the final reviewed and approved calibration procedure issued prior to release for operation.

Perusal of several draft procedures found the licensee had elected to use the concept of Equivalent Linear Full Scale (ELFS) for an accuracy acceptance criteria. A comparison of this and other calibration procedures with the guidance provided in ANSI N13.10, "Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents" found the licensee in substantial deviation.

Since the licensee had not committed to ANSI N13.10 they had not developed a program consistent with the guidance. ANSI N.13-10 is recognized by NRC, therefore a series of telephone calls and written correspondence developed between the licensee and NRR in early December which resulted in a license commitment to implement portions of section 5.4, "Standards of Performance" by July 1, 1984.

Due to a contractual dispute with Kaman Industries a major provider of effluent monitoring equipment, the licensee had minimal support during this phase. For example, ten of eleven of the NE102 beta scintillaters failed during initial testing. Signal interference and loop grounding developed on other equipment. Construction deficiencies like bad cable and water spillage damaged other equipment. Poor design, like inappropriate air movers and vulnerable hardware in the isokenetic flow controllers were also identified. The inspector cautioned the licensee regarding reporting potentially generic items pursuant to 10 CFR 50.55e.

Due in part to these problems the licensee was unable to complete the preoperational test program prior to the scheduled issuance of the operating license. A license condition was developed which would allow issuance of the license with the provision that each subsystem would be successfully tested prior to being required by Technical Specifications.

On December 11, 1983 the inspector observed calibration of the Reactor Building HVAC Exhaust Plenum Monitor pursuant to Plant Procedure Manual, PPM-12.13.7.

During tours of the drywell the inspector observed that the drywell spray header was located within about 15 inches of the Containment High Range Monitor (NUREG 0737-II.F.1.3). From review of calibration calculations it did not appear that the effects of this geometry had been considered. This matter was brought to the licensee's attention (50-397/83-58-03).

As a result of problems with the process and effluent radiation monitoring system and due to findings associated with other preoperational tests reviewed the licensee presented a plan to perform a detailed technical review of PT 36 and PT 37 to assure that all licensing commitments have been met.

The inspector stated that PT 36 will be reviewed during a subsequent inspection (50-397/83-23-18).

6. Exit Interview

The inspector met with the licensee representatives several times during this inspection. These meetings were held to surface concerns which needed resolution prior to issuance of an operating license. The actions and/or commitments are described in the body of this report. The final exit interview was held on December 20, 1983 with the individuals denoted in paragraph 1. The inspector summarized the scope and findings of the inspection.

Recognizing that eight radicactive waste management system preoperational tests have been deferred, the inspector concluded that the inspected systems have been constructed and tested substantially in accordance with the FSAR.