U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report: 50-397

EA No.: 92-254

License: NPF-21

Licensee: Washington Public Power Supply System (WPPSS)
P.O. Box 968
3000 George Washington Way
Richland, WA 99352

Facility: Washington Nuclear Project 2 (WNP-2)

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

Inspection duration: November 30 - December 21, 1992

Inspected by: L. L. Coblentz, Senior Radiation Specialist — 12/28/92 Date Signed

M. Cillis, Senior Radiation Specialist — 12/28/92 Date Signed

L. C. Carson II, Reactor Radiation Specialist — 12-28-92 Date Signed

Approved by: James H. Reese, Chief
Facilities Radiological Protection Branch — 12/28/92 Date Signed

Summary:

Areas Inspected: This routine unannounced inspection covered followup items and the licensee's radiation protection and chemistry programs. The inspection included evaluating management's effectiveness in taking prompt corrective actions on radiological matters identified by workers, quality assurance, and inspectors. Inspection procedures 83722, 83724, 83725, 83727, 92701, and 92702 were used.

Results: The licensee's programs exhibited a weakness in achieving timely, effective corrective action for previously identified HP issues. Seven apparent violations were identified, as follows:

(1) For exceeding Department of Transportation radiation limits, as given in 49 CFR 173.441(a), for packages shipped by open vehicle (Section 4.a(1))

(2) For failure to perform an adequate survey, as required by 10 CFR 20.201(b), in order to classify a liner of spent resin (Section 4.a(2))

(3) For failure to dispose of radioactive cooling tower sludge in a manner approved by 10 CFR 20.301 (Section 4.a(3))

(4) For failure to perform a written safety evaluation, in accordance with 10 CFR 50.59, for operating the service air system as radioactively contaminated (Section 4.b)

(5) For failure to follow procedures, as required by Technical Specification 6.8.1, when performing temporary modifications to the service air system (Section 4.b)

(6) For failure to follow procedures for personnel radiation protection, as required by TS 6.11.1, with three examples (Section 4.c):

   (a) Deliberate violation of posted health physics requirements when a plant engineer exited the radiologically controlled area via an unapproved pathway

   (b) Deliberate violation of posted health physics requirements when an operator entered the 487' Radwaste Building men's washroom without performing a whole-body frisk

   (c) Repeated failures to adhere to radiation protection procedures for recording dose on radiation exposure cards

(7) For failure to follow procedures for process control program implementation as required by TS 6.8 (Section 4.a(2)).

In addition, two items were opened, regarding (1) the presence of radioactivity in the auxiliary condensate system, and (2) the presence of radioactivity in the sanitation ponds (Section 4.b).

LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
AO	Auxiliary Operator
BTP	Branch Technical Position
CAS	Control Air System
cc	Cubic Centimeter
Ce-144	Cerium-144
CFR	Code of Federal Regulations
Ci/m3	Curies per Cubic Meter
Co-60	Cobalt-60
Cs-137	Cesium-137
DOE	Department of Energy
DOT	Department of Transportation
EDR/FDR	Equipment Drain System/Floor Drain System
FFTF	Fast Flux Test Facility
gpm	Gallons per Minute
HP	Health Physics (used interchangeably with Radiation Protection)
I&C	Instrumentation and Controls
IEB	NRC Inspection and Enforcement Bulletin
IN	NRC Information Notice
INPO	Institute of Nuclear Power Operations
IOM	Inter-Office Memorandum
IR	Inspection Report
IRB	Incident Review Board
LLD	Lower Limit of Detection
LSA	Low Specific Activity
m3	Cubic Meter
mCi	Millicurie(s)
MDA	Minimum Detectable Activity
ml	Milliliter(s)
mrem/hr	Millirem per hour
nCi/gm	Nanocuries per gram
NOS	Nuclear Operating Standard
NOV	Notice of Violation
ODCM	Offsite Dose Calculation Manual
OER	Operational Evaluation Report
pCi	Picocurie(s)
pCi/l	Picocuries per liter
PER	Problem Evaluation Request
PM	Plant Manager
POC	Plant Oversight Committee
PPM	Plant Procedures Manual
QA	Quality Assurance
QASR	Quality Assurance Surveillance Report
QFR	Quality Finding Report
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
REC	Radiation Exposure Card
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
ROR	Radiological Occurrence Report
RP	Radiation Protection
RPM	Manager, Radiation Protection

RW	Radioactive Waste
RWCU	Reactor Water Cleanup System
RWP	Radiation Work Permit
TER	Technical Evaluation Request
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications
uCi/ml	Microcuries per milliliter
UFSAR	Updated Final Safety Analysis Report
WNP-2	Washington Nuclear Project 2

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DETAILS

1. Persons Contacted

Licensee

J. Baker, Plant Manager
R. Barbee, Technical Supervisor, I&C
*J. Britton, Public Affairs Officer
*C. Card, Supervisor, REMP
*J. Chasse, Environmental Engineer, Regulatory Programs
J. Dabney, Manager, Work Control
A. Davis, Principal Health Physicist and Radiochemist
W. Davison, Manager, Plant Quality Assurance
*C. Fies, Engineer, Licensing
*L. Garvin, Manager, Programs and Audits
C. Halbfoster, Manager, Chemistry (INPO)
D. Feldman, Assistant Manager, Maintenance
*J. Gearhart, Director, Quality Assurance
S. Grundhauser, Supervisor, I&C
*J. Harmon, Manager, Maintenance
L. Harrold, Assistant Plant Manager, WNP-2
*C. Hemphill, Engineer, HP Planning Group
*A. Hosler, Manager, Licensing
*J. Hunter, Supervisor, Health Physics Operations
*D. Kerlee, Principal Engineer, Quality Assurance
*W. Kiel, State Liaison
*S. Kim, Engineer, ALARA
*P. Macbeth, Supervisor, Radwaste
*C. McGilton, Manager, Operational Assurance Programs
*C. Madden, Engineer, Quality Assurance
*V. Parrish, Assistant Managing Director of Operations
*R. Patch, Supervisor, Health Physics Craft Technicians
*J. Peters, Manager, Plant Administration
*D. Pisarcik, Manager, Radiation Protection
*M. Reis, Supervisor, Compliance
*J. Rhoads, Manager, Operations Event Assessment
W. Shaeffer, Manager, Operations
*V. Shockley, Manager, Health Physics
*L. Schleder, Environmental Scientist, REMP
*G. Smith, Division Manager, Operations
*G. Sorensen, Manager, Regulatory Programs
*D. Truman, Supervisor, Health Physics Craft Technicians
R. Webring, Manager, Plant Technical

(*) Denotes those individuals who attended the exit meeting on December 10, 1992. The inspectors met and held discussions with additional members of the licensee's staff during the inspection.

2. Followup (92701)

a. Item 50-397/91-40-04 (Closed): This item involved the Chemistry Department's LLD for routine tritium analyses. The licensee had written a deviation to PPM 12.4.21, "The Sampling and Determination of Tritium,"

on August 24, 1992. This deviation instructed the chemist to contact supervision if a tritium sample measured <1.2 E-5 uci/ml. In such a case, the chemistry supervisor would have the tritium sample recounted for at least 50 minutes to ensure an LLD sensitivity of 3.0 E-6 uci/ml.

Because of additional concerns regarding tritium and contaminated systems, the licensee was in the process of making a permanent revision to PPM 12.4.21. The inspectors had no further concerns in this matter.

b. Item 50-397/92-13-01 (Closed): This item involved the licensee's use of RWPs and RECs in controlling worker radiation exposure. The inspectors examined the licensee's efforts in this area, as discussed in Section 4.c, below. Any additional followup of this item will be conducted pursuant to the potential violation discussed in Section 4.c. This item is considered closed.

c. Item 50-397/92-35-04 (Closed): This item involved the timeliness and effectiveness of the licensee's corrective actions for problems identified related to plant health physics. Followup of this item became integral to the overall focus of this inspection, as discussed in the introductory remarks to Section 4, below. Any additional followup of this item will be conducted pursuant to the potential violations discussed in Section 4. This item is considered closed.

3. Followup of Items of Noncompliance (92702)

a. Item 50-397/91-26-03 (Closed): This violation involved the failure to label containers of assorted radioactive material containing a total of approximately 73 mCi of mixed radionuclides.

The inspectors verified that the corrective actions listed in the licensee's October 18, 1991, "Response to Notice of Violation," had been implemented. The verification was performed by personal observations, reviews of training lesson plans and attendance records, and discussions with various members of the licensee's staff. Based on the inspectors' review, there is no further concern in this matter.

b. Item 50-397/91-31-02 (Closed): This violation involved the failure to perform adequate surveys for three administrative overexposures that occurred in April 1991.

The inspectors verified that the corrective actions listed in the licensee's November 15, 1991, "Response to Notice of Violation" (and supplemental response of February 7, 1992), had been implemented. The verification was performed by personal observations, reviews of training lesson plans and attendance records, and discussions with various members of the licensee's staff. The licensee's root cause analysis was also reviewed and found to be adequate. Based on the inspectors' review, there is no further concern in this matter.

4. <u>Licensee Corrective Actions for Health Physics Problems</u>

During a previous NRC inspection at WNP-2, the inspectors had noted a lack of timeliness and effectiveness in the licensee's resolution of HP issues related to the onsite storm drain evaporation pond (see IR 50-397/92-35). This concern was addressed as an inspector followup item (see Section 2.c, above).

In addition, during this inspection, the inspectors examined specific areas related to HP, to determine whether the observed lack of timely and effective corrective action had been an isolated case or represented a pattern in the licensee's resolution of HP issues. The areas examined were:

* Disposal of Solid Radioactive Waste
* System Contamination Control
* Adherence to HP Programs for Control of Personnel Radiation Exposure
* Quality Controls for Radiation Monitoring Instruments
* Control of HP Organizational Changes
* Use of WNP-2 Corrective Action Programs (RORs, PERs, QFRs, etc.)

a. <u>Disposal of Solid Radioactive Waste</u>

The inspectors reviewed a history of licensee activities related to disposal of solid radioactive waste. Where problems had previously been identified, the inspectors reviewed the licensee's corrective actions for timeliness and effectiveness. Ineffective and untimely corrective actions were noted in several areas, related to RW transportation activities, classification of RW for disposal, and disposition of radioactive cooling tower sludge.

(1) <u>RW Transportation Activities</u>

(a) <u>Background</u>

During 1990 and 1991, the licensee's burial site license had been suspended by the State of Washington on three occasions, due to less than adequate control of RW packaging, transport, and disposal. The inspectors examined records of recent activities in this area for comparison with past performance, to determine whether previously identified problems had been corrected.

(b) <u>Timeline</u>

September 1990: The licensee made a shipment of low-level RW to the nearby commercial low-level RW disposal site. Inaccuracies in the shipping papers, identified by State of Washington inspectors, resulted in suspension of the licensee's authorization to use the burial site.

October - November 1990: The licensee hired an external consulting firm to perform an audit of RW processing activities. The audit identified approximately 90 adverse findings in this area, including problems with training, RW transportation, and waste classification.

January 30, 1991: The licensee shipped a container to the nearby commercial low-level RW disposal site. State of Washington inspectors identified the container as non-conservatively misclassified. The licensee determined that a lack of understanding of RW classification and inadequate review of classification calculations were responsible for the error.

February 4, 1991: Based on the RW misclassification, the State of Washington again suspended the licensee's authorization to use the disposal site.

April 15, 1991: NRC IR 50-397/91-07 was issued, accompanied by an NOV for the misclassification described above. In addition, the NRC report notes (1) an "adverse trend" developing in this area, and (2) a deviation from the licensee's commitment to IEB 79-19, due to a failure to train a supervisor and a contract employee involved in RW processing, packaging, and transportation.

October 9, 1991: The State of Washington again suspended the licensee's burial site authorization. The licensee's shipment survey had failed to detect a 140 mrem/hr radiation "hot spot" on the side of a shipping container. As a result, the licensee's shipping papers had been inaccurate.

December 17, 1991: NRC IR 50-397/91-36 was issued, accompanied by an NOV for the failure to perform an adequate survey as described above. The report notes a "continuing programmatic weakness" in this area.

December 20, 1991: The licensee completed an internal audit of the "Radwaste Process Control Program." Several problems were identified related to corrective action for the 1990 audit. As one example, an HP technician involved in RW activities was not properly trained or qualified.

September 30, 1992: The licensee sent RW Shipment 92-61-02, comprised of a single container of spent resin, to the nearby commercial burial site. Subsequent review of the waste classification calculations demonstrated continuing inadequate classification practices and poor management review (see discussion in Section 4.a(2), below).

October 8, 1992: The licensee sent RW Shipment 92-84-02, comprised of six LSA boxes of dry active waste on an open

vehicle, to the nearby commercial burial site. The external surface of one of the boxes had radiation levels of 260 mrem/hr, in excess of DOT-prescribed radiation limits (see ensuing discussion).

(c) Applicable Requirements

49 CFR 173.441(a) requires that each package of radioactive materials offered for transportation be designed and prepared for shipment so that under conditions normally incident to transportation, the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package. For an exclusive use shipment, this radiation level may be exceeded if:

(i) the shipment is made by closed vehicle;

(ii) the package is secured to prevent shifting during transport; and

(iii) no unloading and loading of the shipment occurs between departure and arrival.

Several DOT and NRC discussions (including IN 80-32) have clarified the "open or closed vehicle" distinction. As a minimum, a personnel barrier must be erected around the shipment to prevent access to the excessive radiation levels.

(d) NRC Inspectors' Evaluation

The inspectors reviewed the circumstances related to RW Shipment 92-84-02. Several items were noted:

(i) The unacceptable radiation level (260 mrem/hr) had been noted on the pre-shipment survey. In addition, the HP technician performing the survey had notified the RW Supervisor of the radiation levels, and documented the notification in the RP work log.

(ii) Two HP supervisors (and the RW Supervisor) had reviewed the pre-shipment survey results. One of the HP supervisors had not received training in accordance with IEB 79-19.

(iii) The RW Supervisor had given approval for sending the shipment by open vehicle, asking only that the box in question be turned so that the excessive radiation level faced inward (toward another box). No personnel barrier was erected to prevent access to the excessive radiation level.

(iv) In response to the inspectors' questions, the RW Supervisor stated that he had understood the DOT regulation, but believed that this practice had been acceptable in the past.

(v) The licensee had designated an Incident Review Board to investigate the incident. The RW Supervisor who had authorized the shipment had been included as a member of the IRB.

The IRB had completed their investigation on October 9, 1992, one day after the shipment. The IRB had concluded that inadequate procedures and an error by the RW Supervisor had caused the incident. Corrective actions included (1) a revision to the procedure and (2) a discussion between the RW Supervisor and the RPM. The IRB did not identify inadequate training as a factor contributing to the incident.

Although the IRB acknowledged that an error had occurred, conclusions regarding compliance were not definitive (e.g., "It was determined by the Supply System that <u>full literal</u> compliance with regulations <u>may</u> not have been achieved" -- emphasis added).

(vi) The Plant QA group had recently completed Surveillance 292-0011, "Radioactive Materials Management." Although the surveillance report had not yet been issued, the draft report discussed this incident as a clear non-compliance with DOT regulations. In addition, the draft report noted continuing problems with pre-shipment surveys and waste classification (discussed in Section 4.a(2), below).

In discussions with Plant QA personnel, the inspectors also noted that the NUPAC operator had not received training in accordance with IEB 79-19. This problem had been identified (in relation to a previous NUPAC operator) in the 1990 consultant audit, and in NRC IR 50-397/91-07.

(e) <u>NRC Inspectors' Conclusion</u>

The inspectors concluded that the excessive radiation levels associated with RW Shipment 92-84-02 constituted an apparent violation of 49 CFR 173.441(a) (50-397/92-41-01). The inspectors concluded, further, that the licensee's corrective actions for previously identified problems in this area were ineffective in ensuring adequate controls.

(2) Classification of RW for Disposal

For additional background and timeline related to this area, refer to Section 4.a(1), above.

The inspectors reviewed the licensee's classification of several recent RW shipments, to determine whether the corrective actions associated with previously identified waste classification discrepancies had been effective in preventing recurrence. Several problems were noted related to Shipment 92-61-02, sent for near-surface disposal on September 30, 1992:

(a) Applicable Requirements

10 CFR 20.201(b) requires that each licensee shall make or cause to be made such surveys as (1) may be necessary to comply with the regulations of 10 CFR 20, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

10 CFR 20.311(d) states in part that any licensee who transfers radioactive waste to a land disposal facility shall prepare all waste so that the waste is classified according to 10 CFR 61.55.

10 CFR 61.55 provides the classification system for low-level radioactive waste, and establishes activity and concentration limits for waste to be acceptable for near-surface disposal. This regulation acknowledges that various methods may be used to determine the concentrations of radionuclides in the waste.

In May 1983, the NRC Low-Level Waste Licensing Branch issued a Branch Technical Position on waste classification. The BTP outlined acceptable methods for approximating, for the purposes of waste classification, the concentrations of those radionuclides that are difficult to measure with conventional laboratory equipment. Several points from the BTP apply:

(i) Licensees may establish an inferential program whereby concentrations of radioisotopes that cannot be readily measured are projected through ratioing to concentrations of radioisotopes which can be readily measured.

(ii) The LLD of a measurement technique for direct measurement of a particular radionuclide should be no more than 0.01 times the smallest concentration for that radionuclide as listed in Table 1 or Table 2 of 10 CFR 61.55.

The smallest concentration given for Cs-137 in Table 2 is 1 Ci/m3. An acceptable LLD for Cs-137, therefore, should be no more than 0.01 Ci/m3.

Licensee Procedure PPM 11.2.23.2, "Radioactive Waste Classification," Revision 10, dated September 2, 1992, establishes the licensee's "inferential program" correlating certain readily measurable radionuclides to "hard-to-measure" radionuclides. The licensee uses ratios of Co-60 for "hard-to-measure" activation products, Cs-137 for "hard-to-measure" fission products, and Ce-144 for "hard-to-measure" transuranics. These ratios are established based on yearly samples of each waste stream, sent to an independent offsite laboratory for more detailed analysis.

(b) <u>NRC Evaluation of Liner 338 Classification</u>

RW Shipment 92-61-02 consisted of a single liner, Model EL-142, Serial #338. Spent Powdex resin had been placed in the liner in three increments. The first increment had been EDR/FDR resin (chemistry sample 5749); the second and third increments had been RWCU resin (chemistry samples 5750 and 5751, respectively).

Results of the chemistry samples had been sent to RW personnel, who had performed a waste classification calculation for the liner using a vendor-provided waste classification computer program. The inspectors reviewed the licensee's calculation with RW personnel, plant QA personnel, and a vendor representative. Several points were of interest:

(i) The chemistry sample results had been <MDA for Ce-144 for all three samples. Cs-137 had been detectable for Sample 5749, but had been <MDA for Samples 5750 and 5751.

(ii) In sending RW the results of the samples, Chemistry had included only the results for radionuclides detected. The full gamma spectral analysis had not been given to RW for review; no information had been provided regarding the MDA levels for Cs-137, Ce-144, or any other radionuclides.

In review of other sample results, the inspectors noted that this practice was characteristic of the licensee's waste classifications. RW personnel did not review MDA results, nor did anyone assess whether the LLD achieved for directly measured radionuclides was reasonable pursuant to the BTP.

(iii) For Sample 5749, RW personnel had entered the measured concentration for Cs-137 into the waste classification computer code. To achieve a value for Ce-144, the computer code had applied a secondary factor (using a pre-established ratio of Cs-137 to Ce-144, based on the last independent laboratory sample). Since the EDR/FDR resin comprised 31.4% of the liner volume, the measured Cs-137 concentration and derived Ce-144 concentration had been multiplied by 0.314 to estimate the concentrations of these radionuclides through the liner volume.

For Samples 5750 and 5751, RW personnel had entered "0" as the concentration of both Cs-137 and Ce-144. The inspectors noted that this computer entry had resulted in a false assumption: in essence, by entering "0" for these "readily measurable" radionuclides, the computer code automatically assumed "0" values for all "hard-to-measure" fission products and transuranics, as well. The inspectors noted that this error indicated either carelessness or a basic lack of understanding of the premises of 10 CFR 61 and the BTP.

(iv) In discussions with the inspectors, both Plant QA and the vendor representative stated that the licensee's RW personnel, during initial discussions of this problem, had insisted that WNP-2, as a matter of policy, did not use secondary ratios for waste classification.

(v) The inspectors reviewed the actual gamma spectral analysis for Samples 5749, 5750, and 5751. The following results were noted (in uCi/gm):

Isotope	Sample 5749	Sample 5750	Sample 5751
Co-60	3.90 E+0	7.46 E+1	3.80 E+1
Cs-137	2.39 E-1	<2.1 E-1	<9.6 E-2
Ce-144	<4.9 E-2	<9.3 E-1	<1.6 E-1

Based on a total weight of 2.31 E+6 grams, and a volume of 2.97 m3, the inspectors determined that, for Samples 5750 and 5751, the Cs-137 LLD had been approximately 0.16 Ci/m3 and 0.075 Ci/m3, respectively. The inspectors noted that these LLDs had been unacceptably high in relation to the BTP-referenced values (see Section 4.a(2)(a)(ii), above).

(vi) The inspectors noted that a conservative approach to classifying Liner 338 would have been to assume that Cs-137 and Ce-144 were present at the MDA values. Use of these values, however, would have resulted in classifying the liner as "greater than Class C" (i.e., unacceptable for near-surface burial).

The licensee stated that use of the MDA values was unreasonable, because it inferred concentrations of transuranics that could only be present due to severe fuel leakage. This leakage would have also shown up in daily RCS samples and other fuel leakage monitoring. Since fuel leakage had not been detected, the licensee concluded that using the MDA input values must be considered unreasonable.

After discussions with the vendor representative, the licensee stated that an acceptable method would have been to use secondary ratios (i.e., Co-60 to Cs-137 and Cs-137 to Ce-144), based on the latest waste characterization of the applicable waste stream as performed by an independent laboratory (see Item iv, above).

(vii) The inspectors reviewed results of the licensee's chemistry laboratory analyses for several waste streams that used Powdex resin. The inspectors noted that the only samples containing real values for all three "readily measurable" radionuclides (Co-60, Cs-137, and Ce-144) were October 1992 condensate resin samples.

These condensate resin samples showed Ce-144 concentrations slightly higher than Cs-137 concentrations. Ratios of the three "readily measurable" radionuclides showed a significant shift from the latest waste characterization of the condensate resin waste stream as performed by an independent laboratory. The inspectors noted that the secondary ratios found in the recent condensate samples were similar to the postulated ratios that would have resulted from using MDA values to classify Liner 338.

The inspectors asked members of the licensee's staff whether the shift in radionuclide ratios, as observed in the condensate samples, might indicate that use of the observed MDAs as input values for Liner 338 would have been reasonable. The licensee's staff stated that condensate resin ratios bore no relation to RWCU or EDR/FDR resin, and that the results of the October 1992 condensate samples had probably been inaccurate or anomalous.

(c) NRC Inspectors' Evaluation of Applicable Procedures

The inspectors reviewed selected licensee procedures used for obtaining RW samples and performing waste classification. Several items were noted:

(i) PPM 11.2.23.2, "Radioactive Waste Classification," was not prescriptive regarding the methods to be used for determining radionuclide concentrations. No action was described for samples in which the scaling radionuclides (Co-60, Cs-137, and Ce-144) were <MDA.

(ii) PPM 11.2.23.21, "Use of the Nupac Services Transport Cask Model 10/142," in Prerequisite 4.2, requires that the waste classification will be determined prior to using the shipping cask for RW shipments. When filling Liner 338, the licensee had been unable to comply with this prerequisite, because the normal resin sample lines were plugged, and samples could only be drawn while filling the liner. As a result, the waste classification had to be performed after the cask was closed.

The inspectors noted that the inability to sample the resin prior to transfer had also been identified in the 1990 consultant audit. The licensee stated that efforts were underway to resolve this deficiency.

(d) NRC Inspectors' Conclusions

The inspectors reviewed the draft report for Plant QA Surveillance 292-0011, as stated earlier. The inspectors noted that Plant QA had identified (and was pursuing) many of the deficient practices described above. The inspectors observed, however, that similar issues related to RW processing, packaging, and transport had repeatedly been identified in previous internal audits and NRC inspections. The licensee's corrective actions related to previously identified problems did not appear to have been effective in establishing a sound RW program.

The inspectors concluded that the licensee's practices in classifying Liner 338 demonstrated several basic deficiencies:

(i) The chemistry laboratory analyses of Samples 5750 and 5751 had not achieved an acceptable LLD as described in the BTP.

(ii) The practice of entering "0" for scaling radionuclides with no accompanying evaluation of MDA indicated either carelessness or a lack of understanding of the BTP and 10 CFR 61.55.

(iii) The RW supervisor had not been thorough in verifying the waste classification calculation.

(iv) The presence of Cs-137 and Ce-144 in unusually high concentrations in October 1992 condensate resin samples indicated the possibility that similar shifts could have occurred in RWCU or EDR/FDR resin. This, in turn, indicated that the use of scaling ratios based on March 1992 waste characterization samples might be both non-conservative and inaccurate. The licensee had not analyzed the reason for the abnormal levels of Cs-137 and Ce-144 in the condensate resin.

The inspectors concluded, further, that the licensee's survey of Liner 338 had not been sufficient to ensure compliance with 10 CFR 20.311(d), and had not been reasonable under the circumstances in evaluating the extent of radiation hazards that may be present. As such, this matter constitutes an apparent violation of 10 CFR 20.201(b) (50-397/92-41-02). Additionally, the inspectors concluded that failure to classify the waste for shipment 92-61-02 prior to using the shipping cask for RW shipments in accordance with PPM 11.2.23.21 constituted an apparent violation of TS 6.8 (50-397/92-41-10).

The inspectors concluded, finally, that the licensee's continued problems in RW packaging, classification, and transport indicated that corrective actions associated with previous internal audits and NRC inspections had not been fully effective in achieving a sound RW program.

(3) Disposition of Radioactive Cooling Tower Sludge

The inspectors conducted a review to determine whether the licensee was controlling cooling tower sludge in accordance with the recommendations provided in IN 88-22, "Disposal of Sludge From Onsite Sewage Treatment Facilities at Nuclear Power Stations." The IN alerted licensees of recent events at other facilities, and emphasized the potential for contamination of sludge and the relevant regulatory requirements. The IN recommended that licensees review the information for applicability to their facility and consider actions, as appropriate, to avoid similar problems.

Review of licensee records showed that radioactivity had been present for several years in the cooling tower sludge. The licensee had repeatedly speculated as to whether the source of radioactivity was the Columbia River (from an upstream reactor plant) or WNP-2. At the time of the inspection, the licensee had not resolved the issue, nor taken action to properly dispose of the sludge.

(a) Timeline

August 28, 1985: Licensee IOM reported that an evaluation of

cooling tower basin samples indicated that some of the activity may have originated from WNP-2. The report concluded that both WNP-2 and river water concentration effects must be assumed to be contributors.

July 15, 1986: Licensee IOM reported that the latest sludge samples contained Cs-134 and Ru-103, possibly indicating a recent primary leak.

October 2, 1986: Licensee IOM reported the continued presence of Ru-103 and Ru-106 in the cooling tower sediment.

February 2, 1987: Licensee Test Plan 15, "Cooling Tower Sediment Contamination," stated that the plan was being implemented to monitor the deposition of radionuclides in the cooling tower sediment. The plan added that these contaminants may be the result of (1) the cooling towers concentrating radionuclides found in the river, (2) a gaseous release, or (3) a primary leak at WNP-2.

August 26, 1987: Licensee IOM, "Cooling Tower Radioisotope Activity," included the following statement: "The presence of Zn-65 in the discharge water and the flocculator sediment as well as the cooling tower sediment (periodically) may suggest Rx building effluent impact on cooling tower water and sludge concentrations. The fact that river sediment does not appear to contain detectable levels of Zn-65 and the rather short half life of Zn-65 indicates that it is of WNP-2 origin."

The memo also reported that the concentrations found in the cooling tower sludge were very low, and less than any levels that would be construed as a danger to the health and safety of the plant, plant personnel, or general public.

September 29, 1988: Licensee IOM, "10 CFR 20.302 Exemption For Tower Sludge," cautioned that a 20.302 application could put the licensee's total free release program in jeopardy, and that the disposal budget for the plant would need to be increased substantially to cover the added disposal costs.

August 28, 1989: An NRC Region V memorandum described a telephone conversation held between a Region V inspector and the licensee's HP/Chemistry Manager. The memorandum stated that the licensee sampled their cooling tower sludge when the material was removed (2-3 times per year). The memo added that radioactivity had been detected, with both natural and fission product isotopes. The licensee had concluded that the source of the radioactivity was not plant-related, as quantities were consistent with upstream environmental activities.

The licensee reported that the sludge was dumped in a fenced, unlined pit within the licensee's restricted area. The licensee

reported that they were submitting a request for on site burial in accordance with 10 CFR 20.302.

September 29, 1989: Licensee IOM, "OER 83022F Status," reported that the subject OER involved monitoring and possible disposal requirements for sludge contaminated to very low levels from three sources: the sewage treatment plant, cooling towers, and roof drains. The report added that a draft cooling tower sludge disposal evaluation had been performed and was included as an attachment. The report also stated: "In the evaluation, the low levels of activity were possibly determined to be of DOE and WNP-2 origin and therefore no 10 CFR 20.302(a) application would be necessary." The report concluded by stating that information to support this position was still being accumulated and that a final cooling tower sludge disposal evaluation was expected by February 1, 1990.

The attached draft cooling tower sludge evaluation stated: "The low levels of radionuclides in the sludge from routine plant airborne effluents result from air drawn into the cooling towers to aid in the water cooling process. This is due primarily to the close proximity of the cooling towers to the Reactor Building release point. Particulate emissions in the effluent are effectively washed out and trapped in the cooling tower sludge. Since the radioactive material in the sludge originates partly from the Reactor Building release point, it has already been accounted for in terms of license requirements and therefore represents environmental radioactivity. The accumulation of airborne effluents in the cooling tower sludge, however, represents an alternative pathway for the radionuclides released from the stack."

The closeout statement in the OER, dated October 13, 1989, stated: "NSAG concurs with the fact that a waste sludge disposal program per 10 CFR 20.302 is not needed at WNP-2 at this time. The radioactivity found is believed to have come from the Rx Bldg Stack release (already monitored) or natural Hanford background."

Discussions held with the licensee's staff disclosed that the final sludge disposal evaluation, as proposed in the September 29, 1989, memorandum, was never performed.

The inspector concluded that the licensee's evaluation regarding the cooling tower sludge was not consistent with the recommendations provided in IN 88-22 (which was also included as an attachment with the OER 83022F package).

November 9, 1989: Licensee IOM, "Tower Sludge Contamination Pathways from the Plant," reported that cooling tower sludge has had detectable trace radioisotopic activity noted for a period of time. The report included an evaluation of three possible pathways and the results of radioactivity that had been detected in the cooling tower sludge between the period of March 22, 1986 and August 3, 1987.

(b) Applicable Requirements

10 CFR Part 20.301 requires that no licensee dispose of licensed radioactive material except by certain specific methods. 10 CFR Part 20.302 allows licensee's to apply for approval of procedures or alternate methods of disposal not otherwise authorized.

(c) NRC Inspectors' Evaluation

Results of cooling tower sludge that had been sampled between 1985 and 1992 were reviewed. The results listed below represent the highest values that have been detected during this period (in uCi/ml).

Mn-54 1.188E-7	Co-58 2.411E-8	Co-60 7.91E-7	Cs-134 2.847E-7
Cs-137 1.377E-6	Zn-65 1.016E-7	Cd-109 8.283E-6	Be-7 1.58E-5

Results of Columbia River sediment and environmental sediment samples indicated that the upstream reactor plant had been a contributing source of radioactivity in the cooling tower sludge. However, comparison of the radionuclides present, their concentrations, and their relative ratios indicated clearly that WNP-2 had also been a source of the cooling tower sludge radioactivity.

Discussions with the licensee's staff disclosed that cooling tower sludge was still routinely sampled for radioactivity. Recent samples continued to show the low levels of radioactivity that were previously reported. Several members of the licensee's staff were uncertain as to whether the activity was or was not plant-related. Each agreed that licensee evaluations to date have not adequately assessed the sources and disposition of the radioactivity found in the cooling tower sludge.

(d) NRC Inspectors' Conclusions

At the exit interview held December 10, 1992, the inspectors informed the licensee that they had been in error by believing that radioactivity, once monitored (i.e., after having left the plant stack), should no longer be considered licensed material requiring controls. The inspectors noted that if effluents from the plant stack became re-entrained in the cooling tower system and subsequently appeared in the sludge, the licensee would be

responsible for controlled disposal of that sludge.

The inspectors determined:

(i) that the licensee's evaluation regarding this matter had not been timely.

(ii) that the licensee's performance had not been consistent with the recommendations of IN 88-22 or the requirements prescribed in 10 CFR 20.301.

(iii) that information provided to the NRC Region V staff on August 28, 1989, had not been totally consistent with the information present at that time in licensee records. As indicated above, several licensee reports prior to that time had indicated that the cooling tower sludge radioactivity originated, in part, from WNP-2.

The inspectors concluded that the licensee's failure to control and dispose of the cooling tower sludge in accordance with the recommendations provided in IN 88-22 was an apparent violation of 10 CFR 20.301 (50-397/92-41-03).

b. <u>System Contamination Controls</u>

The inspectors reviewed the licensee's monitoring and control of several plant systems that were non-radioactive by design but had potential for becoming radioactive. Systems reviewed included the control and service air system, the auxiliary condensate system, and the sanitation ponds.

(1) <u>Control and Service Air System</u>

The control and service air system is described in UFSAR Section 9.3.1. Section 9.3.1.1.1 gives the design bases, Section 9.3.1.2.1 gives a system description, Section 9.3.1.3.1 gives the safety evaluation, Section 9.3.1.4.1 gives testing and inspection requirements, and Section 9.3.1.5.1 gives instrumentation requirements. No provisions are described or analyzed for the system to be operated as radioactively contaminated.

(a) <u>Timeline</u>

July 26, 1989: PER 289-0627 stated that contamination had been discovered in the service air system. Dessicant from the CAS dryers showed Co-60 contamination. The PER noted that the service air system was used for respiratory breathing air, and recommended periodic samples of the system.

May 27, 1990: PER 290-0408 found that SA-V-102/93, a permanently installed service air check valve, was missing. The PER recommended that these check valves be tagged to remind plant personnel not to remove them.

June 19, 1991: PER 291-539 found that water drained from the service air system was contaminated.

September 20, 1991: NRC IR 50-397/91-26 discussed the licensee's actions related to discovery of contamination in the service air system. The IR stated that the licensee intended to implement periodic radiological surveys of the service air system. The IR identified as a weakness the lack of timely resolution of service air system contamination.

January 6, 1992: The licensee issued PPM 12.5.36 for sampling the service air system. Four points in the system were identified for sampling. The licensee determined that each point should be sampled once annually. These locations and periodicities were not included in the procedure.

May 28, 1992: PER 292-563 reported five service air hose stations that were found to be missing their respective permanently installed check valves. The valves were removed "by persons unknown." The PER noted that these check valves are specifically designed to prevent back-contamination of the service air system when connected to a higher pressure system.

December 1, 1992: PER 292-1353 reported another service air hose station from which the permanently installed check valve had been removed.

(b) Applicable Requirements for Performing a Safety Evaluation

10 CFR 50.59 requires, in part, that the licensee shall maintain records of changes to the facility or procedures described in the Updated Final Safety Analysis Report (UFSAR), including a written safety evaluation that provides the basis for determining that the change does not involve an unreviewed safety question.

NRC IEB 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment," requests operating licensees to take several actions. Specific action is designated for situations in which nonradioactive systems become radioactively contaminated:

(i) Use of the system must be restricted until the cause of contamination is identified and corrected, and the system decontaminated.

(ii) If continued operation is necessary with the system contaminated, a safety evaluation must be performed per 10 CFR 50.59 (as given above).

(iii) If the evaluation concludes that the system may be operated as a radioactive system, any potential releases must be controlled and maintained to the levels addressed in 10 CFR 50, Appendix I.

(c) <u>Applicable requirements for Temporary System Modifications</u>

TS 6.8.1 requires that written procedures shall be established, implemented, and maintained covering the activities referenced in RG 1.33, Appendix A.

RG 1.33, Appendix A, Section 1, "Administrative Procedures," references procedures as follows:

9. Procedures for Performing Maintenance

   e. General procedures for the control of maintenance, repair, replacement, and modification of work should be prepared before reactor operation is begun. These procedures should include information on areas such as the following:

      (1) Method for obtaining permission and clearance for operation personnel to work and for logging such work ...

PPM 1.3.9, "Temporary Modifications," defines a temporary modification as "any alteration to the Plant which will cause a piece of equipment, a component, or a system to be physically or functionally different from approved design documents." PPM 1.3.9 outlines the requirements for performing such temporary modifications, including applicable approvals, engineering evaluations, and documentation.

(d) <u>NRC Inspectors' Evaluation</u>

The inspectors discussed the service air system contamination with various members of the plant RP and engineering staff. Several items were noted:

(i) The licensee was unable to produce any record of having performed an evaluation, per 10 CFR 50.59, when the service air system was found to be contaminated.

(ii) Plant HP management agreed that monitoring of the system should be more frequent, and should be performed in more locations. During the December 21, 1992, telephone conference, the RPM stated that action had been taken to increase system monitoring.

(iii) PER 290-0408 had resulted in labelling all check valves so that plant personnel would know not to remove the valves.

The licensee's corrective actions for both PER 290-0408 and PER 292-0563, however, had failed to prevent check valve removal.

(e) NRC Inspectors' Conclusion

The inspectors concluded that the licensee's failure to perform a written safety evaluation for operating as radioactive a system designed to be non-radioactive constituted an apparent violation of 10 CFR 50.59 (50-397/92-41-04). The inspectors noted that the licensee's performance in this area was similar, in some respects, to the lack of effective resolution observed when radioactivity had been detected in samples of the onsite storm drain pond (see NRC IR 50-397/92-35).

The inspectors concluded, further, that on May 28, 1992, and December 1, 1992, PPM 1.3.9 had not been implemented as required, in that check valves designed for permanent installation had been removed from the service air system, and the required approvals, engineering evaluations, and documentation had not been performed. As such, the removal of these check valves constituted an apparent violation of TS 6.8.1 (50-397/92-41-05).

Regarding the removal of the check valves, the inspectors concluded that the continued recurrence of this problem indicated a careless disregard, on the part of plant workers, for adhering to controls established for the service air system. The licensee's corrective actions, in this area, appeared to have been ineffective in preventing problem recurrence.

(2) Auxiliary Condensate System

On November 25, 1992, the licensee informed the NRC Region V Office that the auxiliary boiler had been determined to have tritium contamination at an average concentration of 23,000 pCi/l. The licensee documented the problem on PER 292-1263 on November 9, 1992. The PER was dispositioned to perform a 10 CFR 50.59 review, identify the source of the contamination, establish a sampling and trending program, revise the FSAR, and revise the ODCM.

The licensee had performed a 10 CFR 50.59 review on November 24, 1992. The associated dose impact calculation assumed a worse case situation where the tritium concentration was 2.0E+6 pCi/l, which resulted in a dose of 8.7E-3 mrem/yr. The inspectors concluded that the licensee's dose assessment and 10 CFR 50.59 evaluation had been adequately performed in accordance with IEB 80-10. The inspectors determined, however, that additional time would be necessary to fully evaluate this issue. The issue will be further examined during a future inspection (50-397/92-41-06).

(3) Contamination in the Sanitary Waste Pond

On October 28, 1992, the licensee notified the State of Washington and the NRC that tritium concentrations in the sanitary waste ponds were approximately 1400 pCi/l, which exceeded the State reporting level of 1000 pCi/l. In addition, PER 292-1206, written on November 4, 1992, identified that Cs-137 and Co-60 levels were increasing in the pond. The licensee took action to identify the source of the radioactivity.

During later discussions, the licensee stated that a sewage line from the DOE FFTF had been installed in 1991. The FFTF sewage line was not supposed to be in service, but the license had found approximately 14 gpm flowing from the FFTF line. The licensee initially believed (and told the inspectors) that FFTF personnel had installed isolation valves and locks per the contractual agreement, but this was not the case. The licensee initiated a complete root cause evaluation.

One inspector attended a meeting of the root cause team. The root cause team had completed their investigation, and the inspectors reviewed a preliminary report. The preliminary report concluded:

* That all sanitary waste pond radioactivity had been caused by FFTF and not by WNP-2.
* That no evidence could be found that the Supply System had discharged radioactive water from the sanitary pond.
* That the radioactivity was 10 CFR 30 byproduct material in exempt quantities.
* That the root cause had been external influence.
* That corrective action would include plugging the line and periodic inspections.

The inspector noted the following:

* The root cause did not explain how WNP-2 had allowed such a sewage line to be installed from the FFTF without an evaluation to identify the potential impact on WNP-2 sewage and resources.
* The root cause did not explain how WNP-2 had allowed the sewage line to be installed without verifying that isolation valves were in place.

This item will be followed up during a future inspection (50-397/92-41-07).

c. Adherence to HP Programs for Control of Personnel Radiation Exposure

The inspectors periodically observed radiation protection practices to determine whether the licensee's program was being implemented in accordance with licensee procedures and NRC requirements. In addition, the inspectors performed extensive reviews of licensee documentation regarding adherence to HP procedures. Observations were made concerning deliberate violations of HP posted signs, use of radiation exposure cards, and use of radiation work permits.

(1) <u>Deliberate Violations of HP Posted Signs</u>

Review of licensee PERs, RORs, and QFRs from 1991 and 1992 revealed numerous examples of workers failing to adhere to proper HP controls. The inspectors noted that certain instances appeared to involve deliberate circumventing of HP controls.

(a) <u>Timeline</u>

February 28, 1991: The Plant Manager issued an IOM to all staff re-emphasizing the need for improved radiological performance and accountability. The IOM recognized an unacceptable level of personnel performance issues.

December 23, 1991: A plant engineer exited the RCA via an unapproved exit point, in violation of the posted sign. When questioned, the engineer stated that he had performed this action intentionally, because he had a plane to catch. PER 291-1033 was written to document this concern, and the engineer was temporarily denied RCA access.

January 16, 1992: A letter was placed in the engineer's personal file, and his RCA access was restored.

February 25, 1992: The same engineer escorted a visitor into the RCA without a TLD. Although the visitor had been issued a pocket dosimeter, PPM 1.11.3 requires a TLD in order to provide an official dose record. PER 292-0257 was written to document this concern, and the engineer's RCA access was again temporarily denied.

March 18, 1992: As corrective action, the engineer was sent to general employee training. On arrival, he told the instructor that he was there as a course evaluator. During the lectures, he became so disruptive that the instructor finally called his supervisor. In addition, the engineer missed approximately 6 hours of a 3-day course. No additional corrective action was taken for this behavior. The engineer's RCA access was restored.

November 30, 1992: Plant management called for an "HP TIMEOUT," during which all plant radiation workers were to be trained on the importance of adhering to HP procedures, and in particular to posted requirements.

December 3, 1992: An NRC inspector observed an auxiliary operator enter the men's washroom, located on the 487' level of the RW Building. The inspector noted that the AO failed to perform a whole-body frisk prior to entry, contrary to the radiological posting.

The inspector challenged the individual as he exited the washroom. The individual admitted that he had not performed the required whole body frisk. The observation was reported to the licensee's HP office.

(b) NRC Inspectors' Evaluation

The inspectors reviewed the circumstances related to these instances, and held interviews with available individuals and supervision. Several items were of interest:

(i) The inspectors discussed the December 23, 1991, incident with the plant engineer's supervisor. The supervisor stated that, at the time of the infraction, he had wanted to take more severe disciplinary action toward the engineer, but had been opposed by plant management and by the licensee's Human Resources group.

(ii) The licensee took immediate corrective action after the December 3, 1992, incident. The individual was asked to immediately leave the area. The HP staff initiated a Personally Preventable Radiological Event Notification and a PER. The HP staff also performed a contamination survey of the area to ensure the AO had not contaminated the area by his failure to perform a whole-body frisk. Additional actions were taken by the AO's shift manager. The corrective actions were scheduled to continue beyond the inspection period.

(c) Applicable Requirements

Technical Specification 6.11.1 states:

> Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

PPM 1.11.11, "Entry Into, Conduct In, and Exit from Radiologically Controlled Areas," Section 4.5 states: "Persons entering a radiologically controlled area shall adhere to all requirements specified by Health Physics personnel (i.e., RWP requirements, posted instructions, verbal instructions, etc.)."

(d) NRC Inspectors' Conclusions

The inspectors concluded that the failures of plant workers to adhere to posted HP instructions, on December 23, 1991, and December 3, 1992, constituted two instances of an apparent violation of TS 6.11.1, as quoted above (50-397/92-41-08).

In addition, the NRC Senior Resident Inspector discussed these observations with the plant manager. The senior resident inspector stated that the "HP TIMEOUT" held on November 30, 1992, did not appear to have been effective in clarifying management's expectations, or in preventing recurrence.

(2) Use of Radiation Exposure Cards

The licensee used a manual system for logging in and out of the RCA. Each individual was responsible for ensuring that his or her dose was properly recorded.

(a) Applicable Requirements

PPM 11.2.6.2, "Direct Reading Pocket Dosimeters and Alarming Dosimeters," Section 6.3.9.a-c requires each person exiting the radiologically controlled area to record the time, pocket dosimeter reading, and net dose received on his or her REC. In addition, if exposure was received, Section 6.3.9.e requires that the REC and pocket dosimeter shall be turned in to HP for recording the exposure.

(b) Timeline

September 10, 1991: The HP/Chemistry Manager issued an IOM describing management's expectations for using RECs.

January 27, 1992: PER 292-069 documented the concern of an HP technician that people were not adhering to REC usage requirements. Approximately 60 people were noted as not having turned in their TLD when measurable dose had been received, or not properly completing the REC when exiting the RCA.

April 29, 1992: PER 292-376 documented the concern of Plant QA that corrective actions for PER 292-069 had not corrected the problem. QA noted approximately 85 additional instances in which workers had not turned in their pocket dosimeter to HP, and dose had gone unrecorded.

May 5, 1992: In an IOM, the plant manager again communicated to all plant workers management expectations for use of RECs.

June 8, 1992: Plant management held an "HP TIMEOUT," during which all plant radiation workers were to be retrained on the importance of adhering to HP procedures. This "HP TIMEOUT" specifically addressed the need to adhere to REC procedural requirements.

December 6, 1992: The inspectors reviewed most of the RECs located at the primary RCA access area. Approximately 36 RECs were found with either (1) the time, pocket dosimeter reading, and net dose not recorded, or (2) some amount of exposure received, and the REC not turned in to HP for recording the exposure.

(c) NRC Inspectors' Evaluation

The inspectors noted that the licensee's program for recording dose depended on the individual worker in order to be effective and accurate. As reviewed, the licensee's corrective actions to identified problems in this area appeared to be ineffective. Several items were of note:

(i) The December 6, 1992, NRC observation was made during a non-outage period, when RCA traffic was minimal compared to outage periods. The number of discrepancies observed indicated that adherence to the REC program did not improve during non-outage periods.

(ii) Of the 36 discrepancies noted, 9 were errors by licensee management and supervision.

(d) NRC Inspectors' Conclusion

The inspectors concluded that the recurrence of this problem, and the number of discrepancies, indicated an overall careless disregard, by portions of the plant staff, for adhering to REC procedural requirements. In addition, the inspectors concluded that the failure to record radiation dose in accordance with PPM 11.2.6.2, on January 27, April 29, and December 6, 1992, constituted another instance of an apparent violation of TS 6.11.1 (50-397/92-41-09).

(3) Use of Radiation Work Permits

The licensee used RWPs to establish the specific radiological controls to be employed (e.g., protective clothing, dosimetry) when working in an area of radiological hazard. In review of past radiological performance issues, the inspectors noted several discrepancies related to RWP controls.

(a) Timeline

December 6, 1990: QFR 290-101-4 reported that operations and technical staff were not signing in on the correct RWPs, and were bypassing HP controls.

March 1, 1991: An IOM documented plant HP's response to the QFR, emphasizing efforts to improve RWP applicability, quality, and use.

April 22, 1992: Two workers were found working in a radiation area without being on an RWP and with TLDs laying on a nearby table.

April 29, 1992: PER 292-0381 identified problems with personnel working on the wrong RWP (and not filling out RECs properly).

May 19, 1992: An NRC inspector found several I&C technicians working on the wrong RWP. This became the subject of an open item (see Section 2.b, above).

June 6, 1992: The RPM issued an IOM to all plant radiation workers reiterating the requirements for signing in on a specific, group, or area RWP.

June 8, 1992: As noted earlier, plant management held an "HP TIMEOUT" to emphasize the need for adherence to HP procedures. One issue specifically addressed in the "HP TIMEOUT" was the need for signing in on, and adhering to, the proper RWP for a given task.

(b) NRC Inspectors' Evaluation and Conclusion

The inspectors discussed RWP controls with various plant personnel, including general laborers, HP technicians, and members of supervision. During the inspection period, no instances were noted of individuals not signed in on the appropriate RWP.

In discussions with several HP technicians, however, the inspectors were informed that many workers still preferred to sign in on their group RWP, even in situations where use of a task-specific RWP was required.

The inspectors concluded that plant HP management had taken steps to improve the overall level of control and applicability of RWPs. The inspectors noted, however, that the effectiveness of corrective actions in this area would be better evaluated during the next period of extended outage.

d. Quality Controls for Radiation Monitoring Instruments

The inspectors reviewed the licensee's programs for ensuring the accuracy of measurements made using radiation monitoring instruments. Review of licensee documents revealed a relatively high incidence of instrument quality control deficiencies, as identified both by NRC and internal audits.

(1) Timeline

February 24, 1989: Plant QA issued QASR 289-005, based on a surveillance of radiation survey instruments. Deficiencies

identified by this surveillance included inadequate procedures and a lack of check sources for several instruments (including teletectors).

August 8, 1990: The PSF sent an IOM to plant HP, indicating that the teletector jig (for performing adequate teletector source checks) was ready for delivery to the plant.

April 29, 1991: PER 291-0317 documented several deficiencies related to teletectors, including: (1) that, contrary to procedures, they were being used to set area dose rates; (2) that the check source had still not been placed in use; and (3) that they were frequently found to be substantially out of calibration.

May 3, 1991: Plant management issued an IOM to the HP/Chemistry Manager requesting "immediate discontinuance" of all work involving teletectors until problems with sources, training, and procedures were resolved.

August 23, 1991: QFR 291-027-2 identified seven radiation survey instruments that did not have sources or adequate procedures.

September 23, 1991: An IOM was sent to plant QA, in response to QFR 291-027-2, stating that improved procedures and check sources would be obtained to correct the identified deficiencies.

December 17, 1991: NRC IR 91-36 was issued, accompanied by an NOV for the licensee's failure to follow procedures for over a year for performing calibrations and high voltage plateaus on the Kaman beta scintillator intrument.

January 2, 1992: PER 292-014 documented that WCM-14, the bag monitor, had inadequate procedures and quality control documentation.

January 24, 1992: The licensee responded to the NRC NOV, stating that management had re-emphasized to plant personnel the importance of following approved procedures.

January 31, 1992: Plant QA issued a "Letter of Unacceptable Corrective Action" IOM for QFR 291-027-2, in that the Eberline ASP-1 instrument still did not have an adequate source check procedure.

May 12, 1992: PER 292-461 documented that TCM-2, the tool contamination monitor, had been placed in service without proper HP technician training or quality controls. Review of the control charts indicated a significant non-conservative skew.

June 25, 1992: NRC IR 92-13 was issued, accompanied by an NOV for personnel contamination monitors not having approved calibration procedures.

July 1, 1992: Plant QA issued a second "Letter of Unacceptable

Corrective Action" IOM for QFR 291-027-2, in that one of the instruments identified still did not have the required procedures.

(2) NRC Inspectors' Evaluation and Conclusion

The inspectors observed that deficiencies identified in 1992 were of the same type identified in the 1989 surveillance, regarding adequate sources, adequate procedures, and quality controls. In addition, the inspectors noted that actions to correct several of the findings had not been timely. The inspectors concluded that plant HP had not been aggressive in correcting the root causes of these deficiencies.

e. HP Organizational Changes

The inspectors reviewed HP personnel and organization changes that had occurred in 1992. The inspectors found that official changes in the HP/Chemistry Department had not been accompanied by timely changes to licensing documents and procedures.

(1) Background

On July 7, 1992, the Plant Manager implemented a change to the HP/Chemistry Department, which involved several aspects:

* The HP and Chemistry organizations, which had been under a joint manager, were separated into two departments. The HP group was renamed the Radiation Protection Department.

* The former HP/Chemistry Manager became the Radiation Protection Manager, with no oversight responsibilities for the chemistry group.

On September 11, 1992, an additional change was announced, making the Chemistry Department part of the Operations Division. Under this proposed organization, the HP group would remain at the "department" level, reporting directly to the PM.

The inspectors examined the licensee's TS, UFSAR, and procedures to determine whether proper controls had been applied to these organizational changes.

(2) Applicable Requirements

TS 6.5.1.2 details the composition of the POC, including requirements for achieving a quorum. The HP/Chemistry Manager is listed as one of the POC members.

UFSAR Chapter 13 details the composition of the HP/Chemistry organization. As one example, Chapter 13 describes the role of the Assistant HP/Chemistry Manager.

[illegible]

NOS-1, "Organization Responsibilities/Changes," requires an evaluation of TSs prior to making organizational changes. If the organizational change requires a TS amendment, the change shall not be announced or implemented without prior NRC approval and prior determination that the change does not involve an unreviewed safety question per 10 CFR 50.59.

PPM 1.2.3, "Use of Controlled Procedures," Section 5.5.7, requires in part that any person performing a task for which there is a procedure is responsible for doing the job as described by the procedure. When a procedure is unable to be performed as approved and the revision process is not appropriate, a procedure deviation shall be initiated.

(3) Timeline

December 1990: NRC IR 50-397/90-29 identified that UFSAR Chapter 13 organizational charts and descriptions did not agree with the actual organization.

May 1991: NRC IR 50-397/91-10 again identified that UFSAR Chapter 13 organizational charts and descriptions did not agree with the actual organization.

July 3, 1991: QASR 291-049 determined that organization and personnel changes made without meeting the requirements of NOS-1 represented a programmatic breakdown. Health Physics/Chemistry Management was identified in the QASR and QFR. QASR 291-049 also identified that UFSAR Chapter 13 was inaccurate with respect to the HP/Chemistry Department organization.

January 10, 1992: The licensee eliminated the Assistant Health Physics/Chemistry Manager position.

November 3, 1992: PER 292-1230 identified that HP and Chemistry organizational changes were not reflected in TS Section 6.0.

November 25, 1992:. The licensee applied for a TS amendment to remove the HP/Chemistry Manager from the POC, in order to be consistent with the actual organization.

(4) NRC Inspectors' Evaluation

The inspectors noted several discrepancies related to HP organizational changes:

(a) Confusion existed among licensee management regarding HP and Chemistry representation on the POC. Implementing the organizational change before making the TS amendment had resulted in several discrepancies in achieving a POC quorum. At the time of the inspection, the TS amendment had still not received NRC approval.

(b) UFSAR Chapter 13 was still inaccurate in several aspects related to the HP organization.

(c) Many plant procedures still referred to the "HP/Chemistry Department" or members of the "HP/Chemistry" organization. These procedures had not been deviated to reflect current management expectations for organizational responsibilities or reporting chains.

(5) NRC Inspectors' Conclusion

The inspectors concluded that the recent HP organizational changes had not been accompanied by proper control of licensing documents and procedures. No instances were identified in which this lack of control had directly impacted plant or personnel safety; however, the inspectors noted that the lack of clearly defined organizational responsibilities could lead to worker confusion, inadequate oversight, missed requirements, and overall organizational inefficiency.

In addition, the inspectors noted that concerns (related to controlling organizational changes and maintaining licensing documents current) had previously been identified by NRC and by WNP-2 QA. The inspectors concluded that the licensee's corrective actions in response to these concerns had been ineffective.

f. Use of WNP-2 Corrective Action Programs (RORs, PERs, QFRs)

The inspectors reviewed the licensee's various corrective action programs, in an effort to determine the overall timeliness and effectiveness of the different mechanisms. The inspectors reviewed Problem Evaluation Requests, Radiological Occurrence Reports, and Quality Finding Reports.

(1) Problem Evaluation Requests

PPM 1.3.12, "Plant Problems - Problem Evaluation Request [PER]," provides a method for licensee personnel to formally communicate problems to management for disposition and resolution. Resolution can lead to other processes, such as RORs, root cause/corrective action assessments, or memoranda.

The inspectors reviewed dispositioned PERs 292-001 to 292-810 for the first half of 1992. Eighty of those PERs reviewed were found to be radiologically related, of which 20 involved "Loss of Contamination Control."

The inspectors examined the licensee's treatment of recurring PERs. The PER Coordinator and the Radiation Protection Manager revealed that they did not specifically trend PERs based on recurrence. The inspector found that the Nuclear Safety Assurance Department was responsible for trending PERs. However, for the past six months no PER trending had occurred, because the licensee had been evaluating alternatives for improving their PER process. The licensee stated that trending of radiological issues would continue in January 1993. The licensee further explained that PER trending reports will be used by senior management. Line managers with adverse PER trends will be required to develop and implement action plans to correct problems.

(2) Radiological Occurrence Reports

The inspectors reviewed RORs for 1991 and 1992. The review disclosed that the majority of RORs were related to loss of contamination control and loss of contaminated tool control. Licensee studies indicated that loss of contamination control events have accounted for more than 40% of RORs for the last 3 years. In addition, the annual average of RORs written for failure to adhere to health physics program controls was 27.34%. This is indicative of poor personnel performance, and shows that corrective actions have not been effective in preventing a recurrence of identified problems.

The inspectors also noted, in reviewing the 1991 ROR log, that 12 out of a total of 39 RORs written in 1991 had not been resolved as of December 1, 1992, even though an expected completion date of one month after the ROR is issued is assigned. This is indicative that corrective actions have not been implemented in a timely manner.

(3) Quality Finding Reports

The inspectors reviewed 1991 and 1992 Quality Audits and QA Surveillances related to HP issues. The technical merit of the findings resulting from these audits and surveillances, in general, was consistent and technically sound. Several items were of note:

(a) The timeliness of response to QFRs related to HP issues was in some cases inadequate. Over the 2-year period reviewed, the inspectors noted four IOMs sent by plant QA for unacceptable responses, and six IOMs sent by plant QA for unacceptable corrective actions.

(b) While the QFRs clearly identified sound technical issues, the larger root cause was not always addressed. This had resulted, in some cases, in later deficiencies of a similar nature which might have never occurred had the root cause of the problem been eliminated. (For an example, refer to the timeline for quality controls of radiation monitoring instruments, as given in Section 4.d(1), above)

(c) The inspectors specifically noted the licensee's treatment of an issue raised in Quality Audit 92-594. The Phase 1 audit report, issued on May 28, 1992, discussed the results of interviews with plant HP technicians. The technicians had perceived several problems related to treatment of HP issues:

[illegible]

(i) According to the HP technicians, little management support existed to correct problems. The technicians felt that writing PERs could be a "career-limiting" action.

(ii) The technicians stated that workers were not in all cases held accountable for HP violations. According to the interviews, dual standards of HP performance were used for different plant organizations.

The Phase 1 audit report had included this information in the body of the narrative. As part of the audit, 19 QFRs had been written on a variety of technical issues; however, no means had been established to ensure corrective action for the worker perceptions, as discussed above.

At the exit interview held on December 10, 1992, the inspectors noted that the problems stated by the HP technicians, whether real or perceived, were still problems. Documenting the issues in the report narrative was helpful; however, allowing the perceptions to persist without a visible method of following them up did not appear to be an effective means of achieving resolution.

g. Summary: Licensee Corrective Actions for Health Physics Problems

The inspectors concluded that the licensee had several effective mechanisms in place for identifying health physics issues. However, the licensee's response and resolution to these issues appeared to be lacking in timeliness and effectiveness. The inspectors concluded, furthermore, that the ineffective corrective actions discussed in NRC IR 50-397/92-35 had not been an isolated instance.

5. Exit Interview

The inspectors met with members of licensee management at the conclusion of the onsite portion of the inspection on December 10, 1992. The scope and findings of the inspection were discussed. The inspectors emphasized the overall need for improved timeliness and effectiveness in the licensee's corrective action for HP issues. The licensee agreed to this need for improvement, and stated that several efforts were already underway to strengthen plant response to HP issues.

On December 21, 1992, a conference call was held between members of licensee management and members of NRC Region V. Several additional items were discussed, and have been included where appropriate in the report. The licensee stated that increased emphasis was being placed on management presence in the plant, with a particular focus on addressing HP program concerns.