

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-397  
License No.: NPF-21  
Report No.: 50-397/98-07  
Licensee: Washington Public Power Supply System  
Facility: Washington Nuclear Project-2  
Location: Richland, Washington  
Dates: May 4-8, 1998  
Inspector(s): Michael C. Hay, Radiation Specialist  
Plant Support Branch  
Approved By: Blaine Murray, Chief  
Plant Support Branch  
Division of Reactor Safety  
Attachment: Supplemental Information

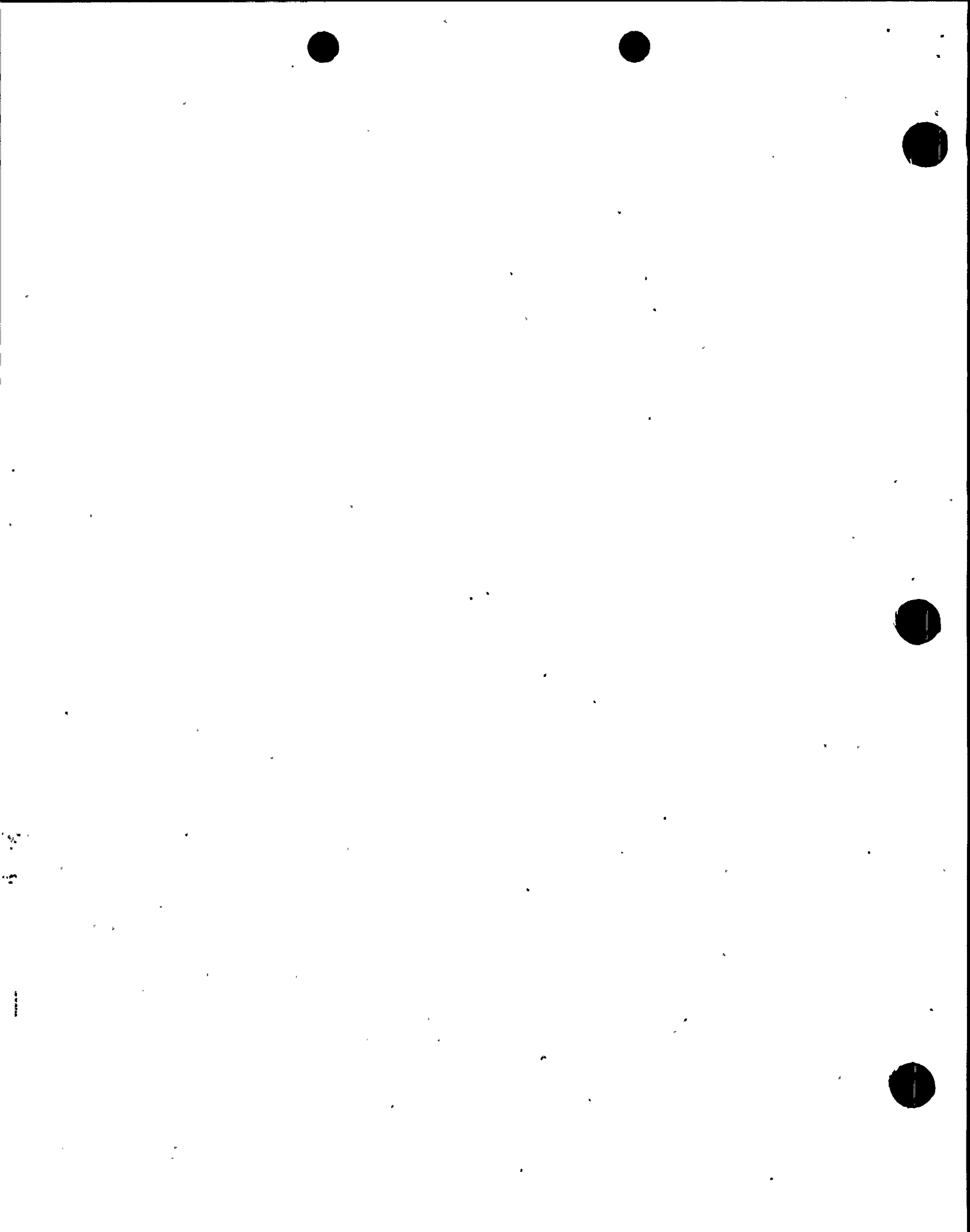
EXECUTIVE SUMMARY

Washington Nuclear Project-2  
NRC Inspection Report 50-397/98-07

This announced, routine inspection reviewed external exposure controls, internal exposure controls, dose assessment and dose records, controls of radioactive materials and contamination, and surveying and monitoring activities associated with refueling outage R13.

Plant Support

- Overall, good external exposure control and dosimetry programs were implemented. All Technical Specification high, and high-high radiation areas observed were properly controlled and posted. Dosimeter placement was proper to monitor exposure from both uniform and non-uniform photon radiation fields. All personnel observed wore their dosimetry properly (Section R1.1).
- A noncited violation of Technical Specification 5.4.1.a was identified involving the failure to barricade and conspicuously post a high-high radiation area (Section R1.1).
- Housekeeping within the radiological controlled area was good. Materials and equipment used for outage activities were properly stored and controlled (Section R1.1).
- A good program was in place for the proper calibration and response checking of radiation survey meters. Radioactive material was properly labeled and posted (Section R1.3).
- A violation of Technical Specification 5.4.1.a, with three examples, was identified involving the failure to perform proper radiological surveys. A similar violation was also identified in NRC Inspection Report 50-397/97-16 (Section R1.3).
- An effective ALARA program had been implemented. Significant improvement had been made to reduce person-rem for the period 1994-1997. The 1998 person-rem projected dose was 255. Outage and nonoutage ALARA person-rem goals were challenging and in close agreement with actual results. (Section R1.4).
- An effective training program for contract radiation protection technicians had been implemented (Section R5.1).



## Report Details

### Summary of Plant Status

During the inspection period, the station was conducting refueling outage R13.

## IV. Plant Support

### **R1 Radiological Protection and Chemistry Controls**

#### **R1.1 External Exposure Controls**

##### **a. Inspection Scope (83750)**

The inspector interviewed radiation protection personnel and reviewed the following:

- Radiological controlled area access controls
- Job coverage by radiation protection personnel
- Housekeeping within the radiological controlled area

##### **b. Observations and Findings (83750)**

The inspector conducted several tours of the radiological controlled areas, including the reactor drywell. Radiological postings were verified to be appropriate by the performance of independent radiation measurements. All Technical Specification high, and high-high radiation areas observed were properly controlled and posted. However, upon review of PER (Problem Evaluation Request) 298-0449 the inspector noted that on April 28, 1998, the licensee identified that a high-high radiation area rope barricade was down and not conspicuously posted. Upon review, the licensee identified that the rope had been cut by a contract worker on the day shift of April 27, 1998. The worker admitted cutting the rope at approximately 2 p.m. Through interviews with the workers, the licensee determined that the worker cut the rope because it became entangled with several cables associated with the equipment he was using in performing weld examinations of the reactor recirculation system nozzle N6B. The worker stated that he retied the rope after untangling his equipment the same day; however, neither the worker nor those who were aware that the rope was cut informed health physics personnel. At 7 p.m. a health physics technician observed that the rope was sagging and retied it. On April 28, 1998, at approximately 5:33 a.m., a health physics technician performing a tour found the high-high radiation area boundary rope down.

Technical Specification 5.4.1.a states, in part, "Written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Regulatory Guide 1.33, Appendix A, Section 7.e.1, recommends procedures for access control to radiation areas. Section 5.2.7 of Procedure 11.2.7.3 entitled, "High and Very High Radiation Area



Controls," Revision 15, states, in part, "high-high radiation areas shall be barricaded, and conspicuously posted."

From review of PER 298-0449, the inspector noted that immediate corrective actions taken included reposting the area as a high-high radiation area and performing a walkdown of the reactor drywell to ensure all other high-high radiation area postings were in place. The radiation protection manager stopped all work in the drywell until he personally reviewed radiological posting requirements with contract craft personnel. The radiation protection manager and the contract worker's senior management also had independent discussions with the individual responsible for this event to discuss their expectations. Appropriate disciplinary action was taken.

Long-term corrective actions to prevent a recurrence included a meeting conducted by station management to all personnel working the R-13 outage to discuss lessons learned and to review fundamental expectations.

The inspector determined that a proper root cause analysis was performed for this issue. Immediate and comprehensive corrective actions taken were appropriate to prevent a recurrence.

This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-397/98007-01).

Prejob briefings were observed for workers entering the reactor wetwell and drywell. In general, these briefings covered the radiological conditions that the workers would encounter, including actions to take should an abnormal situation occur such as an alarming electronic dosimeter. However, one example of miscommunications during a briefing pertaining to carpenters who entered the reactor wetwell was identified to be a root cause of several unplanned intakes of radioactive material. See Section R1.3 for the details of this issue.

The inspector noted that dosimeter placement was proper to properly monitor exposure from both uniform and nonuniform photon radiation fields. Proper use of multiple dosimetry for both whole body and extremities were implemented for divers observed replacing emergency core cooling system strainers in the wetwell. Proper controls to prevent the divers from potential radiological hazards included: (1) electronically transmitted dose and dose rate data which was continuously monitored by health physics personnel, (2) preset dose and dose rate alarms to warn health physics personnel if the divers were in a potentially hazardous radiological environment, and (3) constant communications between monitoring health physics personnel, the dive master, and the divers working in the wetwell.

Overall, housekeeping with the radiological controlled area was good considering the station was in an outage. Materials and equipment used for outage activities were properly stored and controlled.



c. Conclusions

Overall, good external exposure control and dosimetry programs were implemented. All Technical Specification high, and high-high radiation areas observed were properly controlled and posted. Dosimeter placement was properly addressed in regards to exposure from both uniform and non-uniform photon radiation fields. All personnel observed wore their dosimetry properly. Housekeeping within the radiological controlled area was good. Materials and equipment used for outage activities were properly stored and controlled. Prejob briefings were generally good. A noncited violation of Technical Specification 5.4.1.a was licensee identified involving the failure to barricade and conspicuously post a high-high radiation area.

R1.2 Internal Exposure Controls

a. Inspection Scope (83750)

Selected radiation protection personnel involved with the internal exposure control program were interviewed. The following items were reviewed:

- Whole-body counting program, including the calibration of the counter
- The internal dose assessment program

b. Observations and Findings (83750)

Whole-body counters were verified to be calibrated using radioactive sources (standards) traceable to the National Institute of Standards and Technology (NIST). The inspector noted that the standard used covered the radionuclide gamma energy spectrum typically encountered at nuclear power plants; however, the standard was several years old and had decayed so that several photo peaks were not able to be identified by the whole-body counter during the calibration process. In review of Health Physics Instruction 5.27 R1 entitled, "Calibration of the Canberra Fastscan WBC System," Revision 1, Section 6.2.3, states, in part, "Use the suitable standard source of cesium-137 and cobalt-60," the inspector noted that the procedure only required a standard which took into account calibration from a gamma energy range of 662 keV (kiloelectron volts) to 1,332 keV, which does not include low energy gamma peaks. The health physics staff advisor responsible for the whole-body counter calibration program stated he planned on acquiring a new standard that would cover the radionuclide energy range encountered at the facility. Additionally, the staff advisor stated that he planned to review the calibration procedure to ensure it included proper calibration.

Internal dose assessments were reviewed. The inspector was informed that whole-body counting was performed for those individuals who alarmed the personnel contamination alarm and had an indication of facial contamination or no evidence of external contamination. Currently, the licensee utilizes no DAC hour tracking program to estimate internal exposures based on the amount of airborne radioactivity inhaled while in an airborne radiation area and solely relies on whole-body counting bioassay for estimating both committed effective dose equivalent and committed dose equivalent following an





intake of radioactive material. Upon review of internal dose estimates performed since January 1, 1998, the inspector identified no problems.

c. Conclusions

Whole-body counters were calibrated; however, the licensee stated that enhancement will be implemented to include proper energy spectra. Internal dose estimates conducted by the licensee were properly performed.

R1.3 Control of Radioactive Materials and Contamination: Surveying and Monitoring

a. Inspection Scope (83750)

- Portable instrumentation calibration and performance checking programs
- Posting and labeling
- Several events resulting in an unplanned intake of radioactive material
- Air sampling program

b. Observations and Findings (83750)

During tours in the radiological controlled area, the inspector noted that portable radiation survey instrumentation observed was properly calibrated and source response checked.

Contamination boundaries were marked and posted clearly.

Reactor Wetwell Event

The inspector reviewed an unplanned airborne problem that occurred on April 22, 1998, during work to support the replacement of emergency core cooling system strainers in the wetwell. At 2:05 p.m., a routine air sample of the wetwell was taken by a health physics technician. The sample filter used to collect the particulate activity present in the air exceeded the range of the radiation meter used indicating that the activity was greater than 50,000 cpm (counts per minute). The technician believed that the radiation meter indication was the result of cross contamination and discarded the filter in the trash receptacle. After discarding the first air sample, another was immediately started. The results of this air sample evaluated at 2:25 p.m. indicated that the airborne radioactivity levels were at 3.9 DAC (derived air concentration). All personnel in the wetwell were evacuated, and the area was properly posted as an airborne radioactivity area. Several personnel who exited the wetwell area alarmed the personnel contamination monitor and received whole-body counts indicating that low level intakes of radioactive material had occurred. The sample filter discarded in the trash was retrieved the following day (April 23, 1998) and analyzed by gamma spectroscopy indicating an airborne concentration of 7.8 DAC.



Upon review of this event, the licensee determined that prior to April 22, 1998, the water level in the wetwell was lowered approximately 3 feet to a point just below the horizontal stiffener. Carpenters entered the wetwell on April 22, 1998, using Radiation Work Permit 98000094, entitled, "R13 RX-471' WETWELL - MISC WORK." This radiation work permit allowed the carpenters to perform several tasks in the wetwell such as installing scaffolding and strainer hoists in support of removing the emergency core cooling system strainers. From interviews with the carpenters, the inspector concluded that a prejob briefing was conducted the morning of April 22, 1998, with health physics personnel. The carpenters had three separate tasks to perform in the wetwell and believed that the briefing they received pertained to all three tasks. However, in discussion with the health physics personnel who controlled access to the wetwell, the inspector was told that health physics personnel were only aware of two tasks that the carpenters were to perform, and the prejob briefing only applied to those tasks.

Technical Specification 5.4.1.a states, in part, "Written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Regulatory Guide 1.33, Appendix A, Section 7.e.2, recommends procedures for radiation surveys. Procedure SWP-RPP-01 entitled, "Radiation Protection Program," Revision 1, Section 5.13, states, in part, "Surveys shall be adequate to evaluate the concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present."

Due to the miscommunications between health physics personnel controlling access to the wetwell and the carpenters, the carpenters entered the wetwell and traveled along the horizontal stiffener that was previously underwater. This area had not been previously decontaminated or surveyed to determine the concentrations or quantities of radioactive materials and the potential radiological hazards that could be present prior to the carpenters entering the area. Following indications that a radiation airborne problem existed, an investigative survey of the wetwell was performed. This survey indicated that contamination levels on the horizontal stiffener were as high as 1.6 Rad per hour Beta per 100 square centimeters.

The inspector determined the root causes of this event to be poor radiological work planning and practices in relation to the potential radiological risks, in addition to poor communications between health physics personnel and the craftsmen entering the wetwell.

The failure to properly survey to adequately evaluate the concentrations or quantities of radioactive materials and the potential radiological hazards that could be present is identified as a first example of a violation of Technical Specification 5.4.1.a (50-397/98007-02).

#### Air Sampling

The inspector reviewed the wetwell airborne survey log entries from April 22, 1998, through May 4, 1998. During this review, the inspector noted that on April 23, 1998, from 10 a.m. through 11:10 p.m., five airborne surveys were logged; however, the health



physics technician did not log the activity of the air sample and, if a radionuclide analysis had been performed by chemistry as specified in the log. Section 6.7.9 of Procedure 11.2.13.8 entitled, "Airborne Radioactivity Surveys," Revision 5, states, in part, "If the result (of the air sample) is greater than or equal to 0.3 DAC send the sample to Chemistry for isotopic analysis." Section 6.7.10 then states, in part, "If the result is greater than or equal to 0.3 DAC post the area as an Airborne Radioactivity Area." The inspector interviewed health physics technicians at the wetwell access control point and obtained the airborne radioactivity analysis sheets used by both health physics technicians and chemistry personnel to evaluate the radiological airborne concentrations for those not documented in the log.

Upon review of the airborne radioactivity analysis sheets, the inspector noted that particulate airborne radioactivity levels calculated by health physics technicians in the field were substantially higher than the levels that were obtained by chemistry for high volume air samples. The inspector determined that the reason for the error resulted from chemistry technicians using an inappropriate correction factor. The inspector noted that high volume air samples were drawn using a larger filter than used when acquiring a low volume air sample so that more air can be drawn at a higher rate, thereby reducing the time needed to draw the sample. After the sample was drawn, the filter used was cut into one quarter of its original size; therefore, when the health physics technician counted the activity of the filter, using a frisker, the value is multiplied by four to account for only one fourth of the actual sample size. The inspector identified that chemistry personnel were using the same correction factor of four; however, chemistry was multiplying the total volume of the sample drawn by four, thereby reducing the activity concentration by a factor of four.

Table 1 illustrates the different results obtained by the health physics and chemistry technicians following their evaluation of both high volume and low volume air sample filters taken in the reactor wetwell on April 23, 1998.

Table 1. Air Sample Calculation Data

Sample Type	Survey #	Date Time	Field Result (Frisker)	Chemistry Result (Gamma Spectroscopy)
Low Volume	A/S-4-6010-98	4/23/98 10:05 a.m.	13 DAC	19.6 DAC
High Volume	A/S-4-6011--98	4/23/98 10:30 p.m.	0.8 DAC	0.038 DAC
High Volume	A/S-4-6015-98	4/23/98 11:17 p.m.	3.5 DAC	0.02 DAC

Sample A/S-4-6010-98 was a low volume air sample and had a correction factor of one; therefore, chemistry analysis performed by gamma spectroscopy did not result in a lower result. In fact, the result was substantially higher than the field evaluation. During discussion with the radiation support supervisor, the inspector commented that since by procedure, radionuclide analysis of the air sample was only performed when field observations indicate that an air sample was equal to or greater than 0.3 DAC, there would be a potential for an air sample to be slightly less than 0.3 DAC and not be sent to chemistry where the actual result could be above 0.3 DAC. This situation could potentially result in not posting an airborne radioactivity area when conditions would warrant such postings. The radiation support supervisor acknowledged the assessment and said a review of this procedure would be performed.

Air samples A/S-4-6011-98 and A/S-4-6015-98 were both high volume air samples and used a correction factor of four to determine the airborne radioactivity concentration results. The inspector noted that the field results were above the required airborne radioactivity posting threshold of 0.3 DAC, while chemistry results, when performed correctly, were a more accurate assessment of airborne radioactivity concentrations, indicated that posting of the area would not be required. The inspector reviewed the postings established for these areas and, fortuitously, for all cases were postings of an airborne radioactivity area would have been required. The areas were previously posted; therefore, the proper radiological controls were in place to inform and protect the worker from radiological hazards potentially present.

Technical Specification 5.4.1.a states, in part, "Written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Regulatory Guide 1.33, Appendix A, Section 7.e.2, recommends procedures for radiation surveys.

Procedure SWP-RPP-01 entitled, "Radiation Protection Program," Revision 1, Section 5.13, states, in part, "Surveys shall be adequate to evaluate the extent of radiation levels, the concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present."

The failure to properly survey to adequately evaluate the concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present, is identified as a second example of a violation of Technical Specification 5.4.1.a (50-397/98007-02).

#### Reactor Building Refuel Floor Event

On May 5, 1998, the inspector was informed by the radiation protection manager that, during the previous night, several personnel received unplanned intakes of radioactive material while performing decontamination activities on a carousel used for nondestructive inspection of the reactor vessel. The carousel, which supported hardware for the vessel inspection, was placed on the reactor shroud submerged in the reactor cavity/ vessel pool. Following the reactor vessel inspection, the carousel was removed and placed on the refuel floor. Later, three laborers and a health physics





technician, who provided job coverage, commenced decontamination efforts of the carousel. During this process, materials used by the laborers to decontaminate the carousel were surveyed by the health physics technician. The health physics technician surveyed this material and noted there was no radiation meter response above background. Therefore, the technician believed the carousel was free of any contamination.

Two of the laborers, who were decontaminating the carousel, left the area and alarmed the personnel contamination monitor. A whole-body count was conducted which indicated that both workers received an unplanned intake of radioactive material. During this time, no actions were taken to inform or remove the other laborer and health physics technician who were still performing decontamination activities of the carousel. The inspector was informed that a continuous air monitor alarm occurred on the refuel floor during the decontamination activities. No actions were taken by health physics personnel to remove personnel from the floor to determine the source of the airborne problem. The last laborer, who was decontaminating the carousel, along with the health physics technician also alarmed the personnel contamination monitor and whole-body counts indicated that these individuals also received intakes of radioactive material. A follow-up survey of the carousel was performed which indicated that contamination levels on the carousel were up to 5.6 Rad per hour Beta per 100 centimeters squared.

Technical Specification 5.4.1.a states, in part, "Written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2; Appendix A, February 1978." Regulatory Guide 1.33, Appendix A, Section 7.e.2, recommends procedures for radiation surveys.

Procedure SWP-RPP-01 entitled, "Radiation Protection Program," Revision 1, Section 5.13, states, in part, "Surveys shall be adequate to evaluate the concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present."

The failure to properly survey to adequately evaluate the concentrations or quantities of radioactive materials and the potential radiological hazards that could be present is identified as a third example of a violation of Technical Specification 5.4.1.a (50-397/98007-02).

Upon review of NRC Inspection Report 50-397/97-16, the inspector noted that a violation, with three examples, involving the failure to properly survey was identified. These three examples contained similar root causes as those identified in this inspection report. Specifically, root causes included: (1) poor radiological work planning and practices in relation to the potential radiological risks, (2) lack of sensitivity on the part of both maintenance and health physics personnel for the need to verify radiological conditions before starting work, and (3) poor communications between health physics personnel and outside departments.



c. Conclusions

Overall, a good program was in place for the proper calibration and response checking of radiation survey meters. A violation of Technical Specification 5.4.1.a, with three examples, was identified involving the failure to properly survey to adequately evaluate the concentrations or quantities of radioactive materials, or the potential radiological hazards that could be present. This is similar to a violation identified in NRC Inspection Report 50-397/97-16 in which similar root causes were determined.

R1.4 ALARA

a. Inspection Scope (83750)

Personnel involved with the ALARA program were interviewed. The following items were reviewed:

- ALARA yearly and outage goals
- ALARA preoutage planning

b. Observations and Findings

The licensee had made significant improvement to reduce person-rem for the period 1994-1997 as evident by yearly person-rem totals of 867 and 248 respectively. The 1998 person-rem projected dose is 255. The licensee's 1995, 1996, and 1997 (January 1-December 31) person-rem totals are shown below:

	1995	1996	1997
Licensee's Results	543.6	370	248
Licensee's 3-Year Average	626	594	387
National BWR Average	257	247	211

Improvement for nonoutage monthly person-rem was also noted. From September 1997 through February 1998 the nonoutage mean monthly person-rem was 4.5. The licensee stated that the 3.4 person-rem dose obtained in January of 1998 was their lowest nonoutage monthly dose since their first cycle of operation.

Outage goals appeared to be on target provided the last half of the outage proceeds as planned. The current exposure goal for outage R13 is 200 person-rem. The ALARA Group stated that they encountered some problems in the preparation of preoutage ALARA packages because outage planners did not provide maintenance/engineering work scopes in a timely manner. Even with these challenges, the inspector noted that outage activities were proceeding as planned in close agreement with projected doses. Efforts to reduce doses included permanent and temporary shielding, source term



reduction due to injection of iron and depleted zinc into the reactor coolant, and extensive flushing activities to remove hot spots.

c. Conclusions

An effective ALARA program had been implemented. The licensee had made significant improvement to reduce person-rem for the period 1994-1997, as evident by yearly person-rem totals of 867 and 248 respectively. The 1998 person-rem projected dose is 255. Outage and nonoutage ALARA person-rem goals were challenging and in close agreement with actual results.

R1.5 Chemistry Controls

a. Inspection Scope (83750)

Personnel involved with chemistry controls were interviewed. The following items were reviewed:

- Decision basis for not performing chemical decontamination of recirculation piping
- Results from injection of iron and depleted zinc

b. Observations and Findings

In a letter to the Commission dated February 19, 1997, the licensee requested deferral of Category C weld inspections and included a commitment by the licensee to perform a chemical decontamination of the reactor recirculation system discharge piping during the R13 outage (Spring 1998). The purpose for performing the chemical decontamination was to reduce drywell exposure rates and, therefore, reduce person-rem associated with work activities around the recirculation system. In this request, the licensee estimated that approximately 36.8 person-rem would be saved by performing a chemical decontamination of the recirculation system. In a follow-up letter, the Commission concluded that the requested extension was acceptable.

In a letter dated January 27, 1998, the licensee stated that due to errors made in their 1997 person-rem dose savings estimate of 36.8 person-rem that the total re-evaluated dose reduction from chemical decontamination would only be approximately 14 person-rem and, therefore, performing a chemical decontamination would not be cost effective.

The licensee concluded that the differences between the 1997 and 1998 dose saving estimates was the result of using a different set of assumptions. The 1997 estimate was based on a belief that chemical decontamination was expected to reduce doses for 14 of the 17 welds requiring inspection; whereas, the 1998 evaluation determined that reduced dose savings would be expected for only ten of the seventeen welds. The 1998 dose savings estimate also evaluated the dose reduction due to the injection of iron and

implemented in late 1996, and therefore the licensee stated that the dose savings for implementing injection of iron and depleted zinc could not be used in their 1997 evaluation because they had limited data for analysis. The 1998 evaluation, however, determined that this injection of iron and depleted zinc indicated that dose reductions on the recirculation piping were approximately 10 percent per year since it was implemented.

The inspector reviewed an analysis, performed by an outside contractor, in determining the cobalt-60 activity per square centimeter deposited on the recirculation piping. This data indicated that the activity concentration reduced on average from 17.6 to 11.44 microcuries per square centimeter from 1996 through 1998 respectively. The inspector also reviewed dose rate survey data taken on the recirculation system from 1996 through 1998. This data, using the same survey points each year, indicated on an average that the dose rates for both on contact and general area (30 centimeters from pipe) also reduced by approximately 10 percent per year since 1996.

Without performing chemical decontamination of the recirculation system, the licensee's estimated dose for the inspection of 17 nozzles was 70 person-rem. As stated previously, the licensee predicted that only 14 person-rem would be saved by performing chemical decontamination resulting in a total of 56 person-rem. The licensee was in the last stages of performing the inspections of the recirculation system welds and have projected that the total job dose will be approximately 71 person-rem. The inspector noted the total dose was slightly higher than the projected 70 person-rem, however, the licensee performed four extra nozzle inspections that were not included in the 1998 projected dose estimates.

The inspector reviewed PER (Problem Evaluation Report) 298-0065 which addressed the basis errors for estimating the person-rem dose estimate provided to the Commission in the letter dated February 19, 1997. The licensee determined that the root cause for providing conflicting information to the Commission was, "management methods in that the dose estimate was accepted without an adequate technical review." Corrective actions by the licensee to prevent a recurrence included procedural changes incorporating a requirement to ensure that a second independent review be performed on dose estimates used for cost benefit analysis or for an analysis submitted to regulating groups.

The inspector determined that corrective actions were appropriate and through review of selected problem evaluation requests, no similar issues were identified.

c. Conclusions

The technical merit for deferral of a licensee commitment to perform chemical decontamination of the recirculation system during Outage R13 was acceptable. Corrective actions to prevent a recurrence were appropriate, and no similar issues were identified.

**R5 Staff Training and Qualifications in Radiological Protection**

**R5.1 Staff Training and Qualifications**

**a. Inspection Scope (83750)**

Personnel involved with radiation protection technician training were interviewed. The following items were reviewed.

- Contract radiation protection technician screening program
- Contract radiation protection technician training program
- Qualifications of radiation protection technician instructors

**b. Observations and Findings**

The inspector interviewed the instructor responsible for the development and implementation of the radiation protection technician training program. It was noted that 59 contractor health physics technicians consisting of 45 senior and 14 junior technicians were hired to support the outage. Appropriate screenings, such as administering the Northeast Utilities examination, along with in-house training standards were implemented. It was also noted that 36 hours of training time was given to contractor health physics technicians of which 8 hours were devoted to review station procedures. A review of the qualification process for the contract health physics technicians identified no problems. The training specialist in charge of the program was well experienced.

**c. Conclusions**

The licensee had implemented an effective training program for contract radiation protection technicians.

**R8 Miscellaneous Radiological Protection and Chemistry Issues**

**8.1 (Closed) Inspection Followup Item 50-397/97001-01: Ensure adherence to commitments made to the NRC**

The inspector determined that actions associated with this item were appropriate. Specifically, the inspector reviewed changes to Procedure 1.12.1 entitled, "Radioactive Waste Management Program," Revision 9, which was revised to ensure that technical reviews of procedure changes related to the shipment of radioactive materials would be performed by an individual with the necessary expertise.

**8.2 (Closed) Violation 50-397/97019-01: Failure to lock or guard High-High Radiation Area.**

The inspector verified that the corrective actions described in the licensee's response letter dated January 19, 1998, were implemented. No similar problems were identified.





8.3 (Closed) Violation 50-397/97019-02: Failure to survey w/possible internal contamination

The inspector verified that the corrective actions described in the licensee's response letter dated January 19, 1998, were implemented. No similar problems were identified.

V. Management Meeting

X1 **Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management at an exit meeting on May 8, 1998. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Atkinson, Quality Manager  
A. Barbes, Quality Services Supervisor  
I. Borland, Radiation Support Supervisor  
D. Coleman Regulatory Affairs Manager  
Y. Derrer, Licensing Engineer  
F. Diya, Engineering Programs Manager  
J. Hanson, Chemistry Manager  
D. Hillyer, Radiation Protection Manager  
P. Inserra, Licensing Manager  
J. McDonald, Planning, Scheduling, and Outage Manager  
A. Mouncer, Vice President Operations Support  
W. Oxenford, Operations Manager  
G. Smith, Plant General Manager  
R. Webring, Acting CEO

NRC

S. Boynton, Sr. Resident Inspector  
B. Murray, Chief, Plant Support Branch, RIV

INSPECTION PROCEDURE USED

83750 Occupational Radiation Exposure

LIST OF ITEMS OPENED AND CLOSED

Opened

50-397/98007-02      VIO      Failure to survey

Opened and Closed

50-397/98007-01      NCV      Failure to barricade and conspicuously post a high-high radiation area

Closed

50-397/97001-01      IFI      Ensure adherence to commitments made to the NRC  
50-397/97019-01      VIO      Failure to lock or guard High-High Radiation Area  
50-397/97019-02      VIO      Failure to survey w/possible internal contamination

LIST OF DOCUMENTS REVIEWED

Procedure 11.2.7.3, "High and Very High Radiation Area Controls," Revision 15

Procedure SWP-RPP-01, "Radiation Protection Program," Revision 1

Health Physics Instruction 5.27 R1, "Calibration of the Canberra Fastscan WBC System,"  
Revision 1

Procedure 11.2.13.8, "Airborne Radioactivity Surveys," Revision 5

Procedure GEN-RPP-02, "Radiation Work Permit," Revision 1

Procedure GEN-RPP-04, "Entry Into, Conduct In, and Exit from Radiologically Controlled Areas,"

Procedure 11.2.15.7, "Release of Material from Radiologically Controlled Areas,"

Procedure 11.2.15.12, "Evaluation of Personnel Contamination Monitor Alarms,"