U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No:	50-346/98016(DRS)
Licensee:	Centerior Service Company
Facility:	Davis-Besse Nuclear Power Station
Location:	5503 N. State Route 2 Oak Harbor, OH 42449
Dates:	August 31-September 4, 1998
Inspectors:	Wayne Slawinski, Senior Radiation Specialist Kara Selburg, Radiation Specialist
Approved By:	Gary Shear, Chief, Plant Support Branch 2 Division of Reactor Safety

EXECUTIVE SUMMARY

Davis-Besse Nuclear Power Station
NRC Inspection Report 50-346/98016

This announced, routine inspection was conducted to review aspects of the operational radiation protection and chemistry programs. Specifically, the inspectors reviewed the external exposure monitoring program, and the programs for the unconditional release of material from the radiologically restricted area and for the calibration and testing of radiation monitoring equipment. Additionally, the chemistry staff's response to a condensate system resin intrusion incident, the radiological controls for a containment entry during power operations and portions of the as-low-as-is-reasonably-achievable (ALARA) program were also reviewed. In these areas, the following conclusions were made:

Plant Support

- ALARA plans and practices were effective in reducing doses during the eleventh refueling outage. Outage dose goals were achieved as a result of more effective work processes, and enhanced use of remote monitoring and communications equipment (Section R1.1).

- Staff response to the June 24, 1998, condensate demineralizer resin intrusion into the steam generators was appropriate. Increased management attention ensured that the staff's actions were timely and consistent, and frequent coordination with vendor personnel ensured that the licensee's actions and long term recovery plans were technically sound (Section R1.2).

- Radiological controls for a containment entry during power operations on September 1, 1998 were properly established and effectively implemented. The pre-job briefing was thorough, worker's roles and responsibilities were clearly communicated and relevant information was obtained and exchanged in accordance with procedure. The radiation protection (RP) staff's response to a worker skin contamination that occurred during the entry was prompt and appropriate (Section R1.3).

- The licensee effectively implemented an external dosimetry quality control (QC) program, and continued to maintain good oversight of the dosimetry processor. Periodic QC checks were performed to ensure the accuracy of processed dosimetry, and anomalous results were evaluated in accordance with station procedure (Section R1.4).

- The station's neutron energy spectrum was evaluated, and the survey and external dose monitoring programs were adjusted to ensure worker dose from neutron radiation was accurately determined. Administrative dose levels were established to maintain dose ALARA, and controls were effective in maintaining worker dose, including the dose to declared pregnant workers, within regulatory limits (Section R1.5).

- The program for the unconditional release of materials from radiologically restricted areas was consistently implemented by the RP staff. However, portions of the procedure governing the program were unclear and inconsistent with station practices (Section R1.6).

- The calibration and test program for the portal and whole body contamination monitors, and the small article and tool monitors was generally sound and implemented in accordance with station procedures. Monitor alarms were set at levels consistent with industry practice, and instrument sensitivity and alarm operation was routinely verified. A deficiency was identified with the calibration acceptance criteria specified in the procedure for the small article monitors (Section R2.1).

REPORT DETAILS

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 As Low As Is Reasonable Achievable Program

a. Inspection Scope (IP 83750)

The inspectors reviewed the effectiveness of the as-low-as-is-reasonably-achievable (ALARA) program for the recently completed refueling outage. The inspectors interviewed radiation protection staff and other station personnel, and reviewed ALARA reports and related documents.

b. Observations and Findings

The licensee successfully achieved the dose goal of 168.5 person-rem for the eleventh refueling outage (11RFO), and expended a total dose of 142.5 person-rem as recorded by electronic dosimeters. Based on the historical thermoluminescent dosimeter to electronic dosimeter comparison data, the actual dose of record was anticipated to be between 107 and 130 person-rem.

The licensee attributed the dose savings to several factors, including the use of remote technologies, the judicious use of shielding, and more effective work processes. Remote monitoring and communications equipment was extensively used, and the licensee experienced greater reliability of the technologies than observed during previous outages. Specifically, remote monitoring reduced the total dose received by radiation protection (RP) personnel by approximately 15 percent, compared to previous refueling outages. Temporary shielding was installed earlier in the outage and remained in place longer, which resulted in reduced dose rates throughout containment. Also, while an expanded outage work scope had been anticipated and incorporated into the initial dose goal, little additional work and rework was performed.

The most significant dose contributors during the outage included 26.2 person-rem for work on the steam generators, 28.6 person-rem for work associated with reactor services and refueling, and 22 person-rem for work on the reactor coolant pumps. The steam generator work included eddy current tube testing and repair, modifications for a chemical cleaning scheduled for the twelfth refueling outage (12RFO), internal inspections of the auxiliary feedwater ring, and removal of steam generator tubing for laboratory analysis. Although the time to complete individual tube testing and repair was reduced due to more efficient work processes, additional testing impacted the total dose savings. Remote equipment was instrumental in reducing doses during steam generator tube pulling and welding.

Work associated with reactor head disassembly, reassembly, and refueling (reactor services) included the replacement of source range neutron detectors. In-service-

inspection activities were also significant contributors to dose, particularly those activities conducted in the southwest quadrant of the reactor vessel, where higher dose rates were experienced compared to previous outages.

Approximately 90 percent of the dose from work on the reactor coolant pumps was attributed to the bearing repairs on reactor coolant pumps 2-1 and 2-2. These repairs occurred in the east D-ring where higher than expected dose rates existed. The elevated dose rates were caused, in part, by the head vent line and the pressurizer spray and surge lines. The licensee was considering future source term reduction efforts for the east D-ring area, particularly for the head vent line. While these efforts were still in the early planning stage, the ALARA department anticipated that some dose reduction steps would be implemented for the 12RFO.

c. Conclusions

ALARA plans and practices were effective in reducing doses during the eleventh refueling outage. Outage dose goals were met as a result of more effective work processes and enhanced use of remote monitoring and communications equipment.

R1.2 Response to June 1998 Resin Intrusion Incident

a. Inspection Scope (IP 84750)

The inspectors reviewed the licensee's response to the June 24, 1998, condensate demineralizer resin intrusion into the once through steam generators, which occurred during a loss of off-site power when a tornado struck the site. The inspectors reviewed primary and secondary water chemistry data from June through August 1998, interviewed knowledgeable personnel, and reviewed the results of the licensee's root cause evaluation.

b. Observations and Findings

The event was described in NRC Inspection Report 50-346/98013, which concluded that the licensee took conservative actions to address the relatively high secondary side sulfate concentrations caused by a resin intrusion. Specifically, the licensee voluntarily shut down the reactor and completed multiple steam generator fill, soak and drain operations.

The inspectors reviewed the licensee's response and the long term actions planned to address the problems caused by the resin intrusion incident. The inspectors noted that the licensee contacted other nuclear facilities who had encountered similar problems, and coordinated a program assessment and plan of action with the steam generator vendor. These communications helped to solidify the licensee's plans for intermediate and long term actions necessary to ensure that the steam generators would not be subject to unnecessary corrosion. Although the licensee deviated from the Electric Power Research Institute (EPRI) Secondary Water Chemistry Guidelines for sulfate concentration and cation conductivity during initial power operations after recovery from the event, the

deviation was justified as part of a dual phase systematic approach to reduce secondary side resin. During phase one, which occurred over the course of about two weeks, the secondary system was "velocity flushed" at 100% power. Subsequently, the reactor was returned to hot shutdown and additional steam generator flush and fill operations successfully brought conductivity and sulfate concentration within EPRI guidelines. The inspectors reviewed the licensee's documentation associated with the event and noted that the mechanism for implementing the deviation followed chemistry procedures. The deviation was approved by station management and was thoroughly documented in the licensee's Potential Condition Adverse to Quality (PCAQ) program.

The inspectors also reviewed the licensee's long term plans to further reduce the sulfate concentration and cation conductivity in the secondary side water. The licensee, with vendor assistance, was reevaluating the shut down process to ensure it did not adversely affect water chemistry, but was not anticipating any significant changes in the process. The licensee had also scheduled a chemical clean of the secondary side of the steam generators for the next refueling outage. The chemical clean was expected to effectively reduce any residual effects of the intrusion and eliminate long term corrosion possibilities.

c. Conclusions

Station response to the June 24, 1998, condensate demineralizer resin intrusion into the steam generators was appropriate. Increased management attention ensured that the staff's actions were timely and consistent, and frequent coordination with vendor personnel ensured that the licensee's actions and long term recovery plans were technically sound.

R1.3 Radiological Controls for Containment Entry

a. Inspection Scope (IP 83750)

The inspectors reviewed the radiological controls established for a containment entry during power operations on September 1, 1998, and witnessed the licensee's response to a worker contamination that occurred during the entry. The inspectors reviewed the radiation work permit (RWP) and ALARA plan developed for the entry, attended the pre-job brief, reviewed station procedures and supporting documentation, and discussed the entry with radiation protection (RP) staff.

b. Observations and Findings

The containment entry was performed to inspect valve leakage and reduce boron buildup on a leaking valve in the pressurizer valve room. Expected radiological conditions were based on surveys performed during a similar entry made in June 1998, and supplemented by containment area radiation and airborne monitor trending data and results of a grab air sample collected prior to the entry. The total effective dose equivalent (TEDE) ALARA evaluation and associated ALARA plan was reviewed by the inspectors and determined to be technically sound to support the decision not to use

respiratory protection equipment, and to reduce protective clothing requirements based on heat stress concerns.

An inspector attended the pre-job brief on September 1, 1998, and noted that the briefing was thorough and well structured, and attended by those staff involved and supporting the entry, including representatives from the industrial safety staff. The work scope and worker's roles were clearly discussed; radiological, operational and environmental information was exchanged including heat stress limits and stop work conditions; and good communication between work groups was evident.

Inspector review disclosed station procedure DB-OP-01101, "Containment Entry," to be comprehensive and concise, and effectively implemented during the entry. The inspector verified that worker dosimetry was provided in accordance with procedure, that calibrated survey instrumentation was used to measure neutron radiation, that neutron dose was properly calculated for the workers, and that calibrated lapel air samplers were appropriately used. The collective neutron dose for the entry was about eight millirem, based on integrated dose measurements made by the RP tester that provided job coverage.

Although containment work was successfully completed within the heat stress dictated time constraint, the lip and nasal area of one worker was contaminated (about 15,000 disintegrations per minute (dpm)), because the worker apparently brushed his face against the valve actuator while closely inspecting the leakage problem. The RP staff quickly identified the contamination and responded appropriately. Nasal smears were collected and the worker was promptly decontaminated. The worker's skin dose was assessed and determined to be below the licensee's threshold warranting a dose assignment (i.e., less than 1% of 20.101 limits). A whole body count identified no activity above the licensee's minimum detectable activity of approximately three nanocuries.

c. Conclusions

The radiological controls for a containment entry during power operations on September 1, 1998, were properly established and effectively implemented. The pre-job briefing was thorough, worker's roles and responsibilities were clearly communicated and relevant information was obtained and exchanged in accordance with procedure. The RP staff's response to a worker skin contamination that occurred during the entry was prompt and appropriate.

R1.4 Personnel Dosimetry Quality Control

a. Inspection Scope (IP 83750)

The inspectors evaluated the licensee's personnel dosimetry quality control (QC) program for compliance with regulatory requirements in 10 CFR 20 and station procedures, and reviewed the licensee's oversight of its dosimetry processor. The inspectors reviewed station procedures and results of dosimetry performance checks, and discussed the dosimetry QC program with the licensee's health physics staff.

b. Observations and Findings

The licensee utilized the services of a dosimetry vendor to supply and process personal external exposure monitoring devices. Thermoluminescent dosimeters (TLDs) were used to monitor worker doses from exposure to beta, gamma and neutron radiation, and were exchanged for vendor processing on a quarterly basis. In accordance with 10 CFR 20.1501, the vendor was accredited under the National Voluntary Laboratory Accreditation Program (NVLAP). The accreditation was valid through September 30, 1998, for American National Standards Institute (ANSI) N13.11 test categories corresponding to the type of radiation for which workers wearing dosimetry were monitored. The accreditation included both moderate energy fission spectrum neutron radiation and unmoderated high energy neutrons.

The licensee implemented a QC program to assess the dosimetry vendor's performance. Specifically, the licensee compared quarterly TLD results reported by the vendor to electronic dosimetry (ED) data, and investigated discrepancies which differed by prescribed amounts. In addition, TLDs were irradiated (spiked) quarterly for vendor processing, and performance trended by the licensee. Spiked TLD results that exceeded the licensee's tolerance level (performance criteria) of 20%, a value more conservative than the criteria specified in ANSI N13.11, were investigated and documented by the licensee.

The inspectors selectively reviewed quarterly ED/TLD comparison data, and spiked TLD trending results for 1996 through the first quarter of 1998. The review disclosed that ED results were generally within 10% of the TLD results; however, approximately 20 outliers were noted for 1996. The outliers were investigated by the licensee as required by procedure and attributed, in part, to ED circuitry problems. Irradiated TLDs met ANSI performance criteria; however, instances were noted when the licensee's 20% tolerance was exceeded, including most of the TLDs irradiated for the first quarter of 1998. Licensee investigation of these recent problems revealed that the dosimetry element correction factors applied by the vendor may have drifted since the factors were determined at the time of the vendors last annual NVLAP accreditation. According to the licensee, the TLD vendor's QC program did not include spiked cross checks between accreditations for several TLD categories, and that correction factor drift effects had occurred previously. Subsequently, the licensee's acceptance criterion was satisfied after backup TLD chips present in each dosimeter were reprocessed, and new factors applied by the vendor.

c. Conclusions

The licensee effectively implemented an external dosimetry QC program, and continued to maintain good oversight of its dosimetry processor. Periodic QC tests were performed by the licensee to ensure the accuracy of processed TLDs, and anomalous results were evaluated by the licensee in accordance with station procedure.

R1.5 External Dose Controls

a. Inspection Scope (IP 83750)

The inspectors reviewed the licensee's administrative external dose control prog[illegible] worker dose summary information for 1996 to date. A prior neutron energy spe[illegible] evaluation, and the application of the results of that evaluation to the neutron sur[illegible]d monitoring programs were also reviewed.

b. Observations and Findings

In 1992, the licensee assisted a contractor to evaluate the plant's neutron spectrum. The evaluation was performed to better define the station's neutron energy spectrum during full power operations, and make adjustments to the neutron survey and dose monitoring program. Neutron spectral and dose rate measurements performed at 100% power in various areas of the reactor containment and auxiliary buildings disclosed that the plant's neutron energy spectrum was lower than presumed, and that previously applied neutron to gamma dose ratios were overly conservative. As a result, beginning in 1993, neutron TLD quality factors for converting absorbed dose to dose equivalent were reduced to coincide with those specified in 10 CFR 20.1004 for the appropriate energy. Station procedures were revised to ensure that correction factors were applied to future neutron survey results. Also, since that time, separate neutron TLDs were issued to workers dependent on the type of work performed, to allow appropriate quality factors to be applied during TLD processing. The study concluded that neutron exposures determined prior to 1993 were conservatively reported by a factor of about five.

The inspectors reviewed neutron exposure summary information for 1992 to present, which showed that both collective and individual worker doses from at power containment entries were minimal since completion of the study, with one exception. The exception involved several containment entries in May 1998, to address an emergency sump screen problem. During these entries, one worker received a neutron dose of about 100 millirem, while several others received lesser doses, raising the station's collective neutron dose through the second quarter of 1998 to 310 millirem.

The licensee established administrative dose levels to ensure that personal doses were maintained ALARA. For example, station procedure DB-HP-01201, "Administrative Dose Control Levels," required documented approval by the radiation protection manager (RPM) before an individual was authorized to receive an annual TEDE from work at the station greater than one rem, or an annual TEDE from all occupational sources of radiation greater than two rem. Worker's names were placed on dose control alert lists should their dose approach administrative limits, and doses were more closely tracked by RP management. According to the licensee, over the last several years, no worker surpassed the one rem administrative limit for work at the station. The inspectors selectively reviewed dose control alert lists for 1997 and 1998, and verified that the list was maintained in accordance with procedure and that workers obtained written approval before administrative dose limits were approached.

The inspectors determined that adequate exposure control for female radiation workers that voluntarily declared pregnancies were implemented. Although the declared pregnant worker (DPW) dose monitoring and control program was not specifically dictated by station procedure, adequate mechanisms were implemented to closely monitor the doses of those that declared. The inspectors reviewed exposure information for 1995 to date for those that declared pregnancy, and verified that doses to those workers were maintained below regulatory limits. In most instances, no entry was made by those workers into the RRA during the gestation period; consequently, no dose was obtained following the declaration. For those instances where entries were made, dose restrictions were placed into the access control system for the individual, to ensure regulatory limits would not be exceeded.

c. Conclusions

The licensee previously evaluated the station's neutron energy spectrum and adjusted its survey and exposure monitoring program to ensure worker doses from neutron radiation were accurately determined. Administrative external dose levels were established to ensure that personnel doses were maintained ALARA, and dose controls were effective in maintaining personnel doses including doses to declared pregnant workers within limits.

R1.6 Control of Materials for Unconditional Release From Radiologically Restricted Areas (RRAs)

a. Inspection Scope (IP 83750)

The inspectors reviewed the implementation of the program for the unconditional release of tools, equipment and other materials from RRAs. The review consisted of interviews with RP staff involved in material release, a review of the instrumentation used to conduct surveys of items released, and a review of the procedure governing the program.

b. Observations and Findings

Instrumentation used to conduct unconditional release surveys was appropriate to identify the necessary small quantities of radiation that may be present on materials. Unconditional release surveys of most small items and articles were conducted primarily with small article monitors (SAMs), excluding those items with self-shielding that may attenuate and mask contamination. Self-shielded items or those with inaccessible surfaces were typically dismantled and surveyed with conventional Geiger-Mueller (GM) survey instruments for direct radiation, and/or smear surveyed as determined by RP staff. Micro R meters were used to augment the program for aggregate surveys of trash bags and bundled or accumulated materials in boxes, bags or other containers, prior to unconditional release. Materials were unconditionally released provided no NRC-licensed material was detected, when measured in a low background area, as defined by procedure.

The inspectors reviewed station procedure DB-HP-01706, "Release of Material From Radiologically Restricted Areas," and discussed its implementation with several RP staff.

Based on this review and a review of the licensee's PCAQ data base for 1997 to present, the inspectors concluded that the unconditional release program was adequately executed. The PCAQ data base showed only two, unrelated instances when contaminated or potentially contaminated materials were removed from the RRA. Both instances were attributed by the licensee to personnel error, because workers forgot to notify RP prior to removing equipment from the RRA. However, while the release program was consistently implemented by the RP staff, the inspectors noted that portions of the procedure lacked clarity and were inconsistent with station practices. For example:

- The procedure indicated that personal items such as flashlights, clip-boards and work packages brought into the RRA could only be released after survey by qualified RP staff. However, in practice, these items were not routinely surveyed separately unless they were used in contaminated areas, or set on surfaces in the RRA. Surveys of personal items were typically performed at the discretion of the RP tester that manned the RRA egress.

- The procedure indicated that tool contamination monitors (TCMs) could be used to survey and release items, unless the item was self-shielded or had porous surfaces. However, TCMs were used only for screening surveys of items returned to the tool cribs, and not for items released from the RRA.

- The procedure lacked clarity concerning the circumstances when supplemental smears or direct surveys of items that did not alarm the SAM were necessary.

- The procedure indicated that dirt, concrete rubble and other dispersible solids could be released if no radioactivity was detected by direct survey with a GM frisker. However, in practice, the release of volumetric solids and liquids was generally evaluated on a case by case basis as prescribed by RP management, and samples were normally collected and analyzed by gamma spectroscopy and the item released only if no activity was detected above environmental concentrations.

These procedure deficiencies were discussed with RP management, who indicated that the procedure would be reviewed and revised, as necessary.

c. Conclusions

The program for the unconditional release of materials from the RRA was consistently implemented by the RP staff. However, portions of the procedure governing the program were unclear and inconsistent with station practices.

R2 Status of RP&C Facilities and Equipment

R2.1 Calibration and Test Program for Radiation Monitoring Equipment

a. Inspection Scope (IP 83750)

The inspectors reviewed the calibration and test program for whole body contamination and portal monitors, and for tool and small article monitors. The inspection included a walkdown of selected monitors, independent tests of monitor alarms and set points, observation of calibration source condition, and review of station procedures and calibration and test results.

b. Observations and Findings

The inspectors reviewed calibration and test activities for the licensee's Bicron SPM 904C monitors. These gamma radiation sensitive detectors replaced older less efficient monitors, and were installed at the security gate house and calibrated in July 1998. The inspectors reviewed the results of the calibrations and noted no problems. The monitors were set to alarm at approximately 70 nanocuries of cobalt-60 equivalent. The inspectors also observed a radiation protection tester simulate a calibration on one monitor, and demonstrate the daily source response check. The inspectors noted that the tester was knowledgeable of the system, and comprehensively described the reasons behind each procedural step.

During normal operations, the 904C monitors continuously stored background radiation information. When occupied by a worker, the monitoring system compared the stored information with the current background radiation level, and alarmed if the difference exceeded a predetermined amount. Since the monitor updated the background radiation level at a set frequency, changes in background radiation level also caused a monitor to alarm. A change in the background level could occur if the monitor was occupied for a long period of time by someone who passed through the monitor too slowly, or if several individuals "tail-gated" through the monitor. The inspectors observed several workers pass through the monitors during an afternoon shift change over, and noted that some workers passed through the monitors in rapid succession, causing alarms. The inspectors noted that the workers' responses to these alarms were appropriate and in accordance with procedure. The licensee planned to install signs in the area, directing workers on the appropriate use of the monitors.

The inspectors reviewed the licensee's program for calibration, operation and maintenance of the Eberline portal contamination monitors (PCMs) and the tool contamination monitors (TCMs). These beta radiation sensitive detectors were calibrated annually, using radioactive sources traceable to the National Institute of Standards and Technology (NIST). Monitor count times were set to yield detector efficiencies of 10-20% for both the PCMs and TCMs, and monitor alarms were set at 5,000 disintegrations per minute cesium-137 equivalent beta radiation. Surveillance activities were conducted quarterly on both the PCMs and TCMs to check individual detector response and alarm function, and daily surveillances were performed on the TCMs and PCMs to check overall system alarm function and electrical response, respectively. Alarm sensitivity checks

were performed using radioactive sources with activities equivalent to the alarm set point, as appropriate.

Small article monitor (SAM) calibrations were performed annually with NIST traceable cobalt-60 and cesium-137 sources, and count times were established to yield an overall (cobalt and cesium) system efficiency of approximately 20%. The SAMs were set to alarm at 5000 dpm, and daily checks were performed to verify alarm response using a cesium-137 source with an activity equivalent to the alarm set point. Sources used for SAM calibrations were observed in good physical condition; however, the Mylar cover on the cesium-137 source used for daily checks of the SAM located at the main RRA egress was deteriorated and replaced by the licensee during the inspection.

The inspectors reviewed the calibration and test procedure for the SAMs and identified a deficiency with the calibration acceptance criteria. Specifically, calibrations were acceptable if the total system efficiency was within 5% of the efficiency determined during the previous calibration. The procedure did not specify a minimum acceptable efficiency. Consequently, the monitor's efficiency could degrade over an extended period of time, yet continue to meet the acceptance criteria. This matter was discussed with the RP management who agreed that the calibration acceptance criteria should be revised.

c. Conclusions

The calibration and test program for the portal and whole body contamination monitors, the SAMs and the TCMs was generally sound and implemented in accordance with station procedures. Monitor alarms were set at levels consistent with industry practice, and instrument sensitivity and alarm operations were routinely verified by the licensee. One problem, however, was identified with the calibration acceptance criteria for the SAMs, which the licensee planned to address.

R7 Quality Assurance in RP&C Activities

R7.1 Radiation Protection Program Self Assessment (IP 83750)

The inspectors reviewed the licensee's post outage radiation protection program self-assessment. The inspectors noted that the licensee identified both adverse and positive trends, and was tracking these trends through the licensee's outage critique documentation. Additionally, the inspectors verified that proposed improvement items were assigned to the appropriate personnel, to ensure that lessons learned were incorporated into planning 12RFO.

R8 Miscellaneous RP&C Issues

R8.1 (Closed) Inspection Follow-up Item 50-246/97012-02: Post Accident Sampling System (PASS) Safety Feature Actuation System (SFAS). Due to a licensee event report that was unrelated to the September 16, 1997, occurrence of the SFAS actuation during a PASS sample acquisition, a license amendment was requested and approved to

eliminate the alarm function from the SFAS system. Specifically, Amendment Number 221 to Facility Operating License NPF-3, dated April 15, 1998, revised technical specification section 3/4.3.2.1, "Safety Feature Actuation System Instrumentation" by removing line 1.a, Containment Radiation - High in Table 3.3-3. Since this radiation monitor input was no longer required by technical specifications, the engineering department disabled the alarm function. Since the alarm was disabled, there could be no further actuation of the system during PASS acquisitions. Since the initial problem no longer existed, this item is closed.

R8.2 (Closed) Violation 50-346/98007-01(a): Failure to Survey Annulus Area During Movement of Incore Detectors. The inspectors verified that the forms associated with procedure DB-HP-04003, "Locked High Radiation Area Boundary Verification," had been revised to ensure that the annulus area between the containment vessel and the wall of the shield building would be controlled as a Locked High Radiation Area during handling of activated incore probes. Additionally, a "tailgate" (informal training meeting) was conducted with radiation protection personnel to discuss lessons learned, and training was provided on the revised procedural requirements. The licensee planned to discuss this event with contractor personnel hired for future refueling outages, and planned to track this issue through the PCAQ system. These corrective actions were adequate, and this item is closed.

R8.3 (Closed) Violation 50-346/98007-01(b): Failure to Evaluate Potential Radiological Hazards Prior to Removing Steam Generator Insulation. In addition to the short term corrective actions described in the subject inspection report, the licensee performed other immediate and long term corrective actions. A detailed decontamination effort was planned and executed to correct the high contamination levels that resulted from the insulation removal from the east steam generator in order to recover the immediate work area effected. Increased supervisory oversight of further insulation jobs was provided to ensure proper contamination control methods were taken. The inspectors verified that no further contamination events related to insulation removal occurred during the remainder of the outage. The licensee planned to prepare a special radiation work permit that required a specific pre-job brief to maintain personnel exposure ALARA for future outages. The inspectors verified that this action was tracked in the licensee's outage critique, and through the PCAQ system. The inspectors also verified that training was conducted for radiation protection personnel on the timeliness of pre-job briefs, on management expectations regarding compliance with pre-job briefs, and on the process for documenting changes to radiation work permits. This training was conducted on September 1, 1998, and through numerous interviews, the inspectors noted that radiation protection personnel were aware of the appropriate requirements. These corrective actions were adequate, and this item is closed.

V. Management Meetings

X1 Exit Meeting Summary

The licensee acknowledged the inspection findings that were presented by the inspectors to members of licensee management on September 4, 1998. The licensee did not identify any of the documents reviewed or obtained by the inspectors as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

D. Apling, Senior Health Physics Serviceman, Radwaste Services
M. Beier, Manager, Quality Assurance
R. Brown, Senior Radiation Protection Tester
B. Coad, Superintendent, Radiation Protection
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J. Reuter, Master Radiation Protection Tester
J. Rogers, Manager, Plant Engineering
J. Scott, Health Physicist
J. Simon, Senior Radiation Protection Tester
B. Sutton, Supervisor, Radiation Protection

INSPECTION PROCEDURES USED

IP 83750	Occupational Radiation Exposure
IP 84750	Radioactive Waste Treatment and Effluents and Environmental Monitoring
IP 92904	Follow Up - Plant Support

ITEMS OPENED AND CLOSED

Opened

None

Closed

50-346/97012-02	IFI	Post Accident Sampling System Actuating Safety Feature Actuation System.
50-346/98007-01(a)	VIO	Failure to Survey Annulus Area During Movement of Incore Detectors.
50-346/98007-01(b)	VIO	Failure to Evaluate Potential Radiological Hazards Prior to Removing Steam Generator Insulation.

LIST ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
ANSI	American National Standards Institute
DPM	Disintegrations Per Minute
ED	Electronic Dosimetry
GM	Geiger-Mueller
IFI	Inspection Follow-up Item
NIST	National Institute of Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
PCAQ	Potential Condition Adverse To Quality
QC	Quality Control
RFO	Refueling Outage
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
RPM	Radiation Protection Manager
RRA	Radiologically Restricted Area
RWP	Radiation Work Permit
SAM	Small Article Monitor
TCM	Tool Contamination Monitor
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
VIO	Violation