

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-266/89028(DRSS) 50-301/89027(DRSS)

Docket Nos. 50-266; 50-301

Licenses No. DPR-24; DPR-27

Licensee: Wisconsin Electric Power Company
231 West Michigan Street - P379
Milwaukee, WI 53201

Facility Name: Point Beach Nuclear Plant (PBNP), Units 1 and 2

Meeting Location: NRC Region III Office, Glen Ellyn, Illinois

Meeting Conducted: September 6, 1989

Type of Meeting: Enforcement Conference

Approved By: W.G. Snell
W. G. Snell, Chief
Radiological Controls and
Emergency Preparedness Section

10/25/89
Date

Meeting Summary

Meeting on September 6, 1989 (Reports No. 50-266/89028(DRSS);
No. 50-301/89027(DRSS))

Areas Discussed: An enforcement conference was conducted to discuss the licensee's apparent lack of post-accident sampling capabilities demonstrated during a recent emergency preparedness exercise and recurrent high radiation area entry control incidents.

Results: Three Severity Level IV violations of regulatory requirements were identified (failure to meet Technical Specification requirements on three occasions regarding high radiation area entry control procedural adherence and failure to comply with a confirmatory order regarding the requirement to have a procedure to accurately measure inplant airborne radioiodine under predicated accident conditions).

DETAILS

1. Meeting Attendees

Wisconsin Electric Power Company

- E. Lipke, General Superintendent, Nuclear Plant Engineering and Regulations
- J. Zach, Plant Manager
- M. Baumann, Project Engineer, Radiological Design
- D. Johnson, Superintendent, Health Physics
- C. Krause, Senior Project Engineer, Licensing
- J. Knorr, Regulatory Engineer
- D. Stevens, Emergency Preparedness Coordinator

Nuclear Regulatory Commission

- C. Paperiello, Deputy Regional Administrator
- B. Berson, Regional Counsel
- R. DeFayette, Chief, Reactor Projects Section 3A
- J. DelMedico, Enforcement Specialist, OE
- J. Foster, Senior Emergency Preparedness Analyst
- C. Gill, Senior Radiation Specialist
- L. Greger, Chief, Reactor Programs Branch
- M. Kunowski, Radiation Specialist
- C. Norelius, Director, Division of Radiation Safety and Safeguards
- R. Paul, Radiation Specialist
- W. Schultz, Enforcement Coordinator
- W. Snell, Chief, Radiological Controls and Emergency Preparedness Section
- C. Vanderniet, Senior Resident Inspector, Point Beach
- F. Witt, Senior Chemical Engineer, NRR

2. Enforcement Conference Details

As a result of apparent violations of NRC regulatory requirements, an enforcement conference was held in the NRC Region III office on September 6, 1989. The preliminary findings, which were the bases for these apparent violations, were documented in NRC Inspection Reports No. 50-266/89022(DRSS); No. 50-301/89021(DRSS) and were transmitted to the licensee by letter dated August 30, 1989. The attendees at this enforcement conference are listed in Section 1 above.

The NRC Region III staff summarized the inspection findings, apparent violations of regulatory requirements, and other regulatory concerns. The concerns discussed by the Region III staff included the apparent lack of post-accident sampling capabilities demonstrated during a recent emergency preparedness exercise and recurrent high radiation area entry control incidents. The primary reason for the enforcement conference was to obtain additional information from the licensee regarding the apparent violations in order to determine if regulatory violations occurred and the safety significance of the incidents.

Concerning the inability to obtain a containment atmosphere sample when predicated containment pressure exceeded 5 psig, the licensee agreed with the event description discussed in Section 3 of the aforementioned inspection reports but stated they considered their modified system met the time criterion required by a Commission Confirmatory Order dated March 14, 1983, because the text of NUREG-0737 states that the three-hour time period begins when a decision is made to collect a sample, rather than at the initiation of the accident. This position was supported by F. Witt, NRR; however Mr. Witt pointed out that no formal interpretation of this aspect of NUREG-0737 had been rendered. The licensee stated that, under all but one analyzed scenario the system, as installed, is capable of providing analytical results within three hours of accident initiation. The licensee also indicated that the planned system upgrade, as discussed in a letter to the NRC Regional Administrator dated August 30, 1989, is sufficient to meet the more restrictive three-hour criteria under all analyzed accident conditions.

Concerning the inability to count inplant air samples which had predicted high radiation levels from radioiodine and/or noble gases, the licensee's presentation did not deviate significantly from the event description discussed in Section 3 of the aforementioned inspection reports. The licensee contended that they possessed the capability during the exercise to measure airborne radioiodine inplant, but acknowledged that the measurement was delayed because of lack of an appropriate procedure such that the exercise was over before the measurement could be completed. The licensee also updated the corrective actions stated in the letter to the NRC Regional Administrator, dated August 30, 1989, by stating that an appropriate procedure was approved on September 5, 1989, and would be issued for use in the near future (issued on September 15, 1989).

Regarding the recurrent high radiation area (HRA) entry control incidents, the licensee indicated that there have been approximately 15 such incidents during the last 18 months; most occurred during the last three outages. The licensee's presentation did not deviate significantly from the incident descriptions discussed in Section 10 of the aforementioned inspection reports; however, the licensee also presented information which indicates that while the three apparent violations were intentional, they were of no significant radiological concern, the individuals involved were apparently aware of the lack of significant radiological concern, and the actions would have been acceptable had the workers consulted the Health Physics Department regarding permission for entry. The following completed/planned corrective actions were outlined.

- A training session has been essentially completed for all plant personnel regarding the HRA entry control incidents, including discussions of applicable regulations and Technical Specifications, summary of events, consequences of inappropriate worker actions, management intolerance of such worker behavior, and each worker's responsibilities and obligations. This training was conducted by the Health Physics Superintendent who met with individual groups of about ten workers each.

- A video tape training session is to be presented to all outage contractor employees as part of general employee training for the upcoming fall outage. Contractors already onsite will be required to show the video tape to all employees currently employed at Point Beach.
- Enhanced training on radiation barriers is to be presented as part of the contractor health physics technician (HPT) training module conducted prior to the upcoming outage.
- A memorandum will be issued to all plant personnel reinforcing Technical Specification requirements and HP procedure conformance prior to the start of the outage.
- For outage work inside the HRAs, the RWPs will provide specific instructions regarding boundary control responsibilities. HP Supervisors will be provided instructions to assure inclusion of barrier responsibilities on the RWPs.
- Better operator aids/instructions will be placed, as needed during the upcoming outage, on HRA barriers and postings regarding restrictions and responsibilities.
- The licensee will continue efforts to upgrade HRA barriers, including eliminating troublesome rope barriers by replacing these with swinging gates, where possible. A specific modification to be made during the Unit 2 fall outage will be to install swinging gates at pressurizer and upper reactor cavity entrances.
- The licensee will continue efforts to eliminate the need for HRA barriers including additional shielding of the Unit 1 Regeneration and Heat Exchanger Cubicle.
- The refueling barrier procedure has been revised for clarity and a training needs analysis has been issued to evaluate training needs for operations personnel.

In response to an NRC request that the licensee address the effectiveness of their commitment tracking system, the licensee presented a description of their commitment tracking system, and noted that confirmatory orders without accompanying safety evaluation reports (SERs) may not be effectively tracked. The licensee agreed to review such confirmatory orders to ensure that previous commitments have not been unknowingly compromised. This matter will be reviewed further during future inspections (Open Item 266/89028-01; 301/89027-01).

After the licensee completed their presentation, the senior NRC representative summarized the NRC's tentative positions on the issues discussed at the enforcement conference, including:

- The licensee's corrective actions regarding the inplant radioiodine measurement capability seem appropriate.

- The licensee's commitment to review actions implemented pursuant to confirmatory orders for which SERs were not written appears needed.
- Region III intends to request technical assistance from NRR to determine the acceptability of the licensee's planned containment atmosphere sampling system modification.
- The licensee should not focus the corrective actions regarding the HRA entry control problems too narrowly. Worker attitude regarding HRA compliance may be indicative of a wider problem concerning compliance with other HP procedural requirements.

The senior NRC representative acknowledged the licensee's presentation and stated that the Region III recommendation concerning enforcement action would be forwarded to the NRC Office of Enforcement for its concurrence. After review by that Office, the licensee would be notified in writing of the NRC's proposed enforcement action. The licensee was also informed that careful consideration would be given the additional information presented by the licensee at the enforcement conference when the NRC determination regarding the disposition of the apparent violations was made pursuant to the enforcement policy; Section 3 below addresses this decision.

3. Previously Identified Findings

Based on the licensee's responses during the enforcement conference, additional information supplied to the Regional Administrator from the licensee by letter dated August 30, 1989, and further NRC review of the apparent violations, the NRC concluded on October 23, 1989 that escalated enforcement is warranted. The disposition of each of the apparent violations from the aforementioned inspection reports is as follows:

- a. Failure to Maintain the Post-Accident Sampling Systems Capability to Obtain Containment Atmosphere Samples (266/89022-01; 301/89021-01):
During the March 15, 1989 emergency preparedness exercise, the licensee demonstrated an inability to obtain a containment atmosphere sample when predicated containment pressure exceeded 5 psig. Since Figure 14.3.4-7 of the licensee's FSAR indicates that under at least one predicated accident condition the containment pressure would not decline to 5 psig until approximately five to eight hours post-accident, the preliminary findings discussed in the aforementioned inspection reports was that the licensee was in apparent violation of a confirmatory order that required the licensee to maintain the ability for sampling and analysis of containment atmosphere within a combined allowed time of three hours or less.

As discussed in Section 2 above, the licensee presented arguments in the August 30, 1989 letter to the Regional Administrator and during the enforcement conference which indicated, under all but "worst case" scenario assumptions, the sampling system, as installed,

is capable of satisfying the three-hour criterion, and that the wording of NUREG-0737 concerning this matter was ambiguous with respect to the time requirements. After due deliberation, the NRC has determined that the licensee's arguments are of sufficient merit to indicate that no violation occurred; therefore, this item is closed. However, as also discussed in Section 2 above, Region III intends to obtain confirmation from NRR that the licensee's planned containment atmosphere sampling system modification (15-20 psig capability) is sufficient.

- b. Failure to Maintain a Procedure for Measuring Post-Accident Inplant Radioiodine (266/89022-02; 301/89021-02): During the March 15, 1989 emergency preparedness exercise, it was noted that the licensee lacked a procedure for measuring inplant radioiodine under predicted accident conditions. On October 24, 1980, the licensee established such a procedure which made use of the analytical ability of a single channel analyzer (SCA); however, the licensee cancelled this procedure in 1984 when the SCA was removed from service and did not replace it with a new procedure. The preliminary finding, discussed in the aforementioned inspection reports, was that the licensee was in apparent violation of a confirmatory order that required the licensee to maintain the procedural means to accurately measure airborne radioiodine inplant during predicated accident conditions.

As discussed in Section 2 above, the licensee presented arguments in the August 30, 1989 letter to the Regional Administrator and during the enforcement conference which indicated the capability existed since 1984 to measure airborne radioiodine inplant but that no written procedure was available to accomplish this task. During this exercise the measurement was delayed because of the lack of an appropriate procedure such that the exercise was over before the measurement could be completed. Based on this information, the NRC has concluded that escalated enforcement is not warranted; however, the violation did occur as stated in the aforementioned inspection reports and meets the Severity Level IV enforcement policy criteria (Violation 266/89022-02; 301/89021-02).

- c. Failure to Meet High Radiation Area Barrier and Entry Control Procedural Requirements (266/89022-03; 301/89021-03): As discussed in the aforementioned inspection reports, during the last 18 months the licensee has had recurrent violations (about 15) of high radiation area (HRA) barrier and entry control procedural requirements. The preliminary finding discussed in these reports was that three recent (on April 11, 14, and 17, 1989) HRA incidents were apparent violations of HRA barrier and entry requirements specified by Procedures No. HP 3.2.3 and No. HP 2.5 and are representative of violations that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation.

As discussed in Section 2 above, the licensee presented arguments during the enforcement conference which indicated that while the three apparent violations were intentional, they were not of

significant radiological concern, and the individuals involved were apparently aware of the lack of significant radiological concern. Based on the willful aspects of these violations, the NRC has concluded that escalated enforcement is warranted. The three examples of the violation of Technical Specification 15.6.8 did occur as stated in the aforementioned inspection reports and meet the Severity Level IV enforcement policy criteria (Violation 266/89022-03; 301/89021-03).

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Reports No. 50-266/89022(DRSS); 50-301/89021(DRSS)

Docket Nos. 50-266; 50-301

Licenses No. DPR-24; DPR-27

Licensee: Wisconsin Electric Power Company
231 West Michigan Street - P379
Milwaukee, WI 53201

Facility Name: Point Beach Nuclear Plant (PBNP)

Inspection At: PBNP; Units 1 and 2, Two Rivers, Wisconsin

Inspection Conducted: July 25 through August 24, 1989

Inspectors: *R. A. Paul*
R. A. Paul

8/29/89
Date

C. F. Gill
C. F. Gill

8/29/89
Date

Approved By: *C. F. Gill / for*
W. G. Snell, Chief
Radiological Controls and
Emergency Preparedness Section

8/29/89
Date

Inspection Summary

Inspection on July 25 through August 24, 1989 (Reports No. 50-266/89022(DRSS); 50-301/89021(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program (IP 83750), including: organization and management controls; staffing; external and internal exposure controls; control of radioactive materials and contamination; audits and appraisals; and the ALARA program. Also reviewed were several recent incidents regarding degradation and breaching of high radiation area (HRA) barriers (IP 93702) and compliance with certain TMI Action Plan Items (TI 2515/65).

Results: Although the licensee's radiation protection program generally continues to be effective in protecting occupational workers, the inspectors perceived weaknesses in the keyway (reactor cavity pit) entry control policy (Section 5), the personal contamination control program (Section 7), and the ALARA program (Section 9). One procedural violation with three examples was identified (failure to suitably barricade a HRA on two occasions and failure to follow requirements for entry into another HRA, Section 10). The violation is indicative of a significant recurrent programmatic problem regarding HRA entry control. Followup of previously identified problems concerning inability to meet TMI Action Items II.D.3.3 and III.D.3.3 during an exercise identified two potential violations for failure to comply with TMI Action Plan Confirmatory Orders (Section 3). An enforcement conference will be held to determine appropriate enforcement action.

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DETAILS

1. Persons Contacted (h)

- #M. Baumann, Project Engineer, Radiological Design
- #R. Bredvad, Plant Health Physicist
- #W. Doolittle, Nuclear Specialist (Health Physicist)
- *F. Flentje, Administrative Specialist, Regulatory Services
- #T. Fredriqs, Superintendent, Chemistry
- #*D. Johnson, Superintendent, Health Physics
- #*J. Knorr, Regulatory Engineer
- *G. Maxfield, General Superintendent, Operations
- *J. Zach, Plant Manager

- *J. Gadzala, NRC Resident Inspector

The inspectors also contacted other licensee employees.

*Denotes those present at the onsite exit meeting on July 28, 1989.

#Denotes those contacted by telephone during the period July 31 through August 24, 1989.

2. General

This inspection was conducted to review the radiation protection program. The inspection included tours of the onsite facilities, observation of work in progress, review of records, and discussions with licensee personnel.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (266/89003-01; 301/89003-01): Use of alpha activity results from air samples and smears performed in the fuel transfer canal. Two procedures involving the alpha analysis program have been revised to require alpha analysis of air samples taken from the reactor cavity and fuel transfer canal. About 15-20 percent of all smear swipes taken from the transfer canal are analyzed for alpha activity.

(Closed) Open Item (266/89003-02; 301/89003-02): Use of CAMs in the auxiliary building during fuel transfer canal work and fuel handling. The licensee is currently using alarming CAMs on the auxiliary building refueling floor during outage conditions to alert workers of changing conditions.

(Closed) Open Item (266/89003-03; 301/89003-03): Weaknesses associated with the use of rope barriers for HRA controls. The licensee is attempting to replace all rope barriers and has installed permanent swinging barriers to replace most rope barriers in the Unit 1 containment; the rope barriers used in Unit 2 containment will be replaced during the 1989 fall outage.

(Closed) Open Item (266/89015-03; 301/89014-03): Corrective actions to prevent recurrence of an unplanned extremity exposure event. An inspector reviewed the adequacy of the licensee's corrective actions to prevent recurrence; no problems were noted. The corrective actions are delineated in Section 4 of Inspection Reports No. 50-266/89015(DRP); No. 50-301/89014(DRP).

(Closed) Violation (266/88013-02): Failure to follow HP Procedure 3.2, Posting of Radiological Areas. The corrective actions outlined in the licensee's response dated June 17, 1988 were reviewed; no problems were noted.

(Closed) Open Item (266/88022-03; 301/88020-03): Lack of an audit program to perform periodic surveillances of liquid and gaseous radwaste activities including audits to ensure performance of required surveillance tests of effluent monitoring systems. The inspectors verified that the 1989 Quality Assurance Project Plan included an audit of the liquid and gaseous radwaste effluent activities (scheduled for late 1989) and T/S Surveillance Requirements for the effluent monitoring systems were audited as part of T/S Long Frequency Surveillance Audit (No. A-TS-89-02) during the period from March 20 through May 19, 1989. This matter is closed.

(Closed) Open Item (266/89088-06): During the March 15, 1989 emergency preparedness exercise, the licensee demonstrated an inability to obtain and analyze a containment atmosphere sample when predicted containment pressure exceeded 5 psig. The technical and procedural problems and proposed corrective actions are discussed in Subsection 2.j of Inspection Reports No. 50-266/89023(DRSS); 50-301/89022(DRSS). The regulatory significance of the licensee's failure is discussed below.

On March 14, 1983, the Commission issued an Order confirming the licensee's commitments on certain Post-TMI related issues. The Order states, in part, that the licensee shall implement and maintain the specific items described as complete in the attachments to the Order. Attachment 1 to the Order described as complete the licensee's commitment to install upgraded post-accident sampling capability for NUREG-0737, Item II.B.3, "Post-accident Sampling." NUREG-0737, "Clarification of TMI Action Plan Requirements," states, in part, that the licensee must provide capability to remove grab samples of containment atmosphere within an allowed combined time of three hours or less for sampling and analysis. Figure 14.3.4-7 of the licensee's FSAR indicates that under predicted accident conditions the containment pressure would not decline to 5 psig until greater than three hours post-accident.

Plant Procedure No. EPIP 7.3.3, Post-Accident Sampling of Containment Atmosphere, Revision 20, October 10, 1988, Step 4.1.2.d, states that the sample pump seals are rated for 5 psig and to prevent an inadvertent airborne release, the containment pressure must be less than 5 psig before proceeding. As discussed in Subsection 2.j of the aforementioned inspection reports, the pump seals are not at risk at 5 psig; however, a glass drain trap collection bowl in the system does have a pressure

limitation of 5 psig. Therefore, although the procedural reason for the pressure limitation is erroneous, the limitation value of 5 psig appears valid. (According to the licensee personnel, the pump seals have a 15 psig limitation.) According to the licensee, the 5 psig pressure limitation was added to EPIP 7.3.3 in Revision 5, July 1, 1983, after the containment atmosphere sampling subsystem was modified. The licensee's failure to maintain the post-accident sampling system's capability to obtain grab samples of containment atmosphere under predicated accident conditions within an allowed time of three hours or less for sampling and analysis is an apparent violation of 10 CFR 50.54(h) which states, in part, that the licensee shall be subject to the provisions of the orders of the Commission. Because the resolution of this matter will be tracked as an apparent violation, this item is closed (Violation 266/89022-01; 301/89021-01).

(Closed) Open Item (266/89008-07): During the March 15, 1989 emergency preparedness exercise, it was noted that the licensee lacked a procedure for counting an inplant air sample which had a predicated high level of radioiodine present. Proposed corrective actions are discussed in Subsection 2.k of Inspection Reports No. 50-266/89023(DRSS); 50-301/89022(DRSS). The regulatory significance of the licensee's failure is discussed below.

On July 10, 1981, the Commission issued an Order confirming the licensee's commitments on certain Post-TMI related issues. The Order states, in part, that the licensee shall satisfy the specific requirements described in the Attachment to the Order no later than 60 days after the effective date of the Order. The Attachment to the Order requires the licensee for NUREG-0737 Item III.D.3.3, "Improved Inplant Iodine Monitoring," to have available means to accurately measure airborne radioiodine inplant during an accident. NUREG-0737, "Clarification of TMI Action Plant Requirements," states that these means shall include procedures.

As discussed in Inspection Reports No. 50-266/80019; 50-301/80019, the licensee initially intended to use the analytical ability of a single channel iodine spectrophotometer to accurately measure airborne radioiodine inplant during an accident. Use of this instrument for this purpose was specified in Health Physics Administrative Control Policies and Procedures Manual Section HP 17.6.5, Revision 0, October 24, 1980. According to the licensee, this procedure was incorporated into an Emergency Preparedness Implementation Procedure (EPIP) circa 1982-1983, was cancelled in 1984 when the single channel analyzer was removed from service, and was not replaced by a new procedure. The licensee's failure to maintain the procedural means to accurately measure airborne radioiodine inplant during predicated accident conditions is an apparent violation of 10 CFR 50.54(h) which states, in part, that the licensee shall be subject to the provisions of the orders of the Commission. Because the resolution of this matter will be tracked as an apparent violation, this open item is closed (Violation (266/89022-02; 301/89021-02).

4. Organization, Management Controls, and Staffing (IP 83750)

The inspectors reviewed the licensee's organization and management controls for radiation protection, including changes in the organizational structure and staffing, effectiveness of procedures and other management techniques used to implement the program, and experience concerning self-identification and correction of program implementation weaknesses.

The organization structure for the Health Physics Group remains the same as discussed in Inspection Reports No. 50-266/88003(DRSS); No. 50-301/88003(DRSS), except that the Radiation Control Operator (RCO) positions are now designated as Health Physics Technologist (HPT) positions. Currently, all 20 HPT positions are filled and HPT staffing remains generally stable with two replacements in 1988 and three to date in 1989. The licensee's policy to usually hire replacement HPTs with health physics associate degrees and/or several years applied experience aids in assuring the maintenance of an experienced and technically competent staff. Regardless of the educational and experience background of new HPT hires, they are designated as trainees who must complete a rigorous qualification program (usually two years) before they may be promoted to HPTs; six of the HPT staff have not yet completed the qualification program. The inspectors reviewed the qualification program and the continuing education program for qualified HPTs; no problems were noted. The supervisory and professional HP staffing (10 members) has remained stable over the past two years. The inspectors selectively reviewed the education and experience background of these staff members; their qualifications, generally, are good. Upper management support for the radiation protection program appears good, with the exceptions due mainly to budgetary constraints.

No violations or deviations were identified.

5. External Exposure Control and Personal Dosimetry (IP 83750)

The inspectors reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in facilities, equipment, personnel, and procedures; adequacy of the dosimetry program to meet routine needs; required records, reports, and notifications; effectiveness of management techniques used to implement these programs; and experience concerning self-identification and correction of program implementation weaknesses.

The licensee's estimated 1989 total dose of 400 person-rem compares well with previous annual doses. Through June 1989 the total (station) exposure was about 185 person-rem which includes a major refueling/maintenance outage. No exposures greater than 10 CFR 20.101 limits were noted, no individual exceeded the licensee's administrative quarterly whole body limit of 2500 mrem.

Portable instruments are typically calibrated quarterly. The inspectors reviewed records of recent calibrations of selected portable instruments; no significant problems were noted. The licensee's inventory, control and calibration programs appear adequate.

The inspectors reviewed the licensee's reactor cavity pit entry control policy (Draft Guideline No. HPGD 16, Routine Keyway Entry Guideline) and discussed their resultant concerns with appropriate members of the licensee's staff. The inspectors expressed concerns regarding the lack of a unique HRA lock for the entryway (any HRA key may be used on the keyway lock), questioned the need for Auxiliary Operators (AOs) to have keys for the keyway lock, and noted that there were no specific instructions to the Duty Shift Supervisor (DSS) or the AO to inform the HP group prior to keyway entry. Upon notification of the inspector concerns, the HP Superintendent stated that serious consideration would be given to apparent need to establish more stringent keyway entry controls. This matter was discussed at the exit meeting and will be reviewed further during a future inspection (Open Item 266/89022-04; 301/89021-04).

No violations or deviations were identified.

6. Internal Exposure Control and Assessment (IP 83750)

The inspectors reviewed selected aspects of the licensee's internal exposure control and assessment programs, including: determination whether engineering controls, respiratory equipment, and assessment of intakes meet regulatory requirements; and planning and preparation for maintenance tasks including ALARA considerations.

Air sample data were selectively reviewed. Air samples appear to be taken, counted, and evaluated in accordance with procedural requirements. The procedures appear adequate for use in determining air sample results, placement, and type. Special air samples are collected to establish RWP requirements and job conditions, and it appears the licensee adequately uses air sample results to establish RWP requirements for use of respirator and protective clothing.

The licensee's whole-body count and calibration program is discussed in Inspection Reports No. 50-266/89003(DRSS); No. 50-301/89003(DRSS); no significant changes have been made to the program. Review of licensee records indicated that no intakes in excess of the 40 MPC-hour control measure occurred in 1988 or 1989 to date. The WBC was calibrated by the vendor in March 1989; a standard masonite phantom and NBS traceable sources were used. The inspectors reviewed the calibration results; no problems were identified.

No violations or deviations were identified.

7. Control of Radioactive Materials and Contamination (IP 83750)

The inspectors reviewed the licensee's program for control of radioactive materials and contamination, including: adequacy of supply, maintenance, and calibration of contamination, survey, and monitoring equipment; effectiveness of survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; and effectiveness of methods of control of radioactive and contaminated materials.

a. Whole Body Frisker Calibration Program

The inspectors reviewed records and relevant calibration procedures for the Eberline Model PCM-1E whole body frisker (WBF). Calibrations of the WBFs are performed annually using nominal 100-nanocurie cesium-137 (100-cm² area) standards. Detector efficiencies are about 11%; the efficiency for the foot portion of the WBF is about 16%. Frisker alarms are nominally set at two nanocuries. A two-nanocurie cesium standard is used monthly on all zones, and a ten-nanocurie technetium check source is used daily on one zone to ensure the detectors alarm at the established setpoint. The inspectors reviewed calibration records for selected monitors, and using the vendors technical manual, verified the vendors calculation to determine alarm set values for each unit; no problems were noted.

b. Personal Contamination Events

Station Health Physics Procedure HP 2.1.1 requires all personal (skin or clothing) contaminations detected as a result of hand-held frisking to be reported on Form CHP-39(a). Similarly, HP 1.11 requires reporting of contamination initially detected by portal monitors on CHP-39(a). All personal contamination reports are entered in a computerized Personal Contamination Tracking System which identifies several parameters, including detection method, location of contamination, and probable cause, and allows tracking/trending.

Through the second quarter of 1989, there were 164 personal contaminations identified, about 40 percent of which were below the INPO reporting criteria of 100 cpm above background with a hand-held frisker and detected on skin or clothing. During 1988 there were 645 personal contamination events, about 40 percent of which were also below the INPO reporting criteria. Although there appears to be a significant decrease of contamination events in 1989, the number of events seems inordinately high for a station with a strong contamination control program. To improve this condition, the licensee initiated special training classes emphasizing acceptable work practices and use of proper protective clothing and survey techniques. In addition, the licensee plans on using longer rubber gloves and prohibiting the reuse of low-cut toe rubbers in the RCA; high-top plastic disposable shoe covers will be used instead. Also contributing to the number of events is the current practice of hand frisking each laundered piece of protective clothing; a practice other licensees have found less efficient in identifying contamination than the use of laundry monitors. The licensee intends to purchase a new laundry monitor in the near future. This matter was discussed at the exit meeting.

c. Hot Particle Program

During a previous refueling outage in 1988, the licensee identified several hot particles on and around a step-off-pad (SOP) leading from

the reactor cavity. As a result, the licensee increased area and personal surveillances during cavity work, implemented more stringent clothing requirements at SOPs, and improved cavity decontamination practices.

During the spring 1989 Unit 1 refueling outage, the licensee found approximately 28 hot particles in the lower and upper cavity; predominately niobium-95, zirconium-95, cerium-144, and ruthenium-106. The particles were found on large area masslinn-smears direct surveys. Portable ion chamber readings of the particles at contact indicated they ranged up to 58 R/hour with the beta window open and 8 R/hour with the window closed. Based on intermittent surveys of personnel working in the cavities, it appears none of the hot particles were on any of the workers or their removed protective clothing, nor were any transferred from the cavity to the refueling floor.

No violations or deviations were identified.

8. Audits and Appraisals (IP 83750)

The inspectors reviewed reports of audits and appraisals conducted for or by the licensee including audits required by Technical Specifications. Also reviewed were management techniques used to implement and audit the program, and experience concerning identification and correction of programmatic weaknesses.

The inspectors selectively reviewed portions of the QA audit and surveillance reports and corporate health physics group audit reports for 1988 and 1989. The licensee's QA and corporate HP audit/surveillance program appears adequate to assess technical performance, compliance with requirements, and personnel training/qualification relating to the radiation protection program. The QA and corporate HP auditors assigned to review this functional area appear to have the necessary expertise and experience prerequisites. Interviews with appropriate licensee personnel indicate that responses to audit/surveillance findings are generally thorough, timely, and technically sound.

No violations or deviations were identified by the inspectors.

9. Maintaining Occupational Exposure ALARA

The inspectors reviewed the licensee's program for maintaining occupational exposures ALARA, including: changes in ALARA policy and procedures; ALARA considerations for maintenance and refueling outages; worker awareness and involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them. Also reviewed were management techniques used to implement the program and experience concerning self-identification and correction of implementation weaknesses.

The ALARA program is coordinated by the Exposure Reduction Committee (ERC) which meets monthly or on an as-needed basis. The ERC chairman is a Nuclear Specialist (Health Physicist) in the HP Group; the committee contains a member from each plant work group. The ERC reviews radiation exposure reduction suggestions; work group and contractor collective exposure trends; successful and unsuccessful exposure reduction practices; ALARA reviews completed for plant modifications, procedures, and regulatory commitments; work activity exposure on specific plant systems; and exposure reducing products, procedures, and techniques for plant-wide benefit. From these review activities, the ERC evaluates the effectiveness of the program and makes recommendations for improvements. The ALARA program is implemented by Procedure PBNP 3.7.2, PBNP Exposure Reduction Program, which requires that annual person-rem goals be developed by each plant work group, reviewed by the HP Superintendent, and approved by the Plant Manager. PBNP places much of the responsibility for employee exposure control on individual employees, first line supervisors and group heads; work groups are held responsible for meeting goals; and program oversight responsibility is shared by the HP Superintendent and the ERC.

The inspectors reviewed the effectiveness of the ALARA program by reviews of documentation and interviews with licensee personnel. The plant workers are presented with the opportunity to enhance the ALARA program under the provisions of Procedures PBNP 3.7.3, Employee ALARA Feedback Program, and HP 12.2, Radiation Exposure Reduction Suggestion Program. The inspectors found evidence that both of these programs are implemented adequately and most suggestions are resolved in a timely manner. The exposure goals established by each work group appear reasonable, based on historical data and anticipated work activities. The 1988 station goal was 393 person-rem, the actual total dose was approximately 388 person-rem; the station goal for 1989 is 414 person-rem which includes provisions for extensive outage activities. The plant-wide ALARA policy and management commitment to the ALARA program is specified in Procedure PBNP 8.2.1, PBNP ALARA Program. The involvement of management, the HP group, other work groups, first line supervisors, and individual workers in the ALARA program has historically resulted in annual total doses which were generally well below the national average for PWRs.

A review of the licensee's documentation of the 1989 accumulated person-rem for each work group indicates most work groups are staying within their established goals; although some individual work groups have exceeded or will likely exceed their goals because of unanticipated work activities. The exposure reduction program required radiological reviews of planned work activities are specified by Procedure PBNP 3.7.4, Radiological Review Guideline, which currently are categorized into two distinct levels of review. Level 1 radiological reviews apply to routine dose activities, utilizes the RWP system, and review responsibility rests with the work group desiring to do the work. Level 2 radiological reviews apply to activities with the potential of high dose to personnel, also utilizes the RWP system, and review responsibility rests with the Health Physics Group. Level 1 tasks are for activities where the total estimated dose to any individual will not exceed one rem and the total estimated

collective dose will not exceed two person-rem; Level 2 tasks for any activities where the Level 1 estimated doses may be exceeded. Because of this two tiered review system, PBNP nominally has one "standing" RWP for each work group and a limited number of specific task RWPs. The licensee is in the process of revising PBNP 3.7.4 to initiate a Level 3 radiological review for tasks which could exceed 15 person-rem and are of a repetitive nature; development of formal job history files and more detailed ALARA review would likely be required for this type of task. The inspectors also reviewed the shielding control program specified by Procedures PBNP 3.4.12 Guidelines for Applying Temporary Shielding, and HP 9.3, Lead Blanket Control Procedure; no significant problems were noted.

Although PBNP annual doses have generally been less than the national PWR average since the plant began operation, during recent years PBNP does not appear to exhibit the same downward trend as the national PWR average annual dose. This may portend a need for reevaluation of the ALARA efforts by the licensee. The inspectors discussed with the ERC Chairman and the HP Superintendent the features of other licensee's ALARA programs with which the inspectors are familiar and the apparent desirability for the licensee to consider adapting portions of some of these features into the PBNP ALARA program. The ALARA program features discussed which seem to merit serious licensee consideration included the appointment of a full time ALARA Coordinator; ALARA shift coverage during outages; and the development of formal job history files, a photo library of equipment and components, video tapes of certain tasks as a diagnostic and training tool, lessons learned and dose-savings documentation, more formal procedures and documentation methodology for ALARA reviews and pre/post-job briefings, and a long-term exposure reduction plan. At the licensee's request, the inspectors discussed the successful implementation of the above ALARA features at several regional nuclear power plants; the licensee indicated that consideration would be given to sending appropriate personnel to other plants to review their ALARA programs to ascertain whether certain features of their programs might be beneficial if incorporated into the PBNP ALARA program. This matter was discussed at the exit meeting.

No violations or deviations were identified.

10. High Radiation Area (HRA) Barrier Degradation Incidents (IP 93702)

In 1988, repeated incidents occurred involving degraded HRA rope barriers at areas where dose rates were between 100 and 1000 millirem per hour, most of which occurred during the Unit-2 outage (see Section 11 of Inspection Reports No. 50-266/89003(DRSS); No. 50-301/89003(DRSS)). Corrective actions included installation of swing-type gates at most locations in containment in lieu of rope barriers. However, in addition to the degradation of HRA rope barriers, on October 19, 1988, the licensee discovered two HRA doors had been forcibly breached to gain access to an area located beneath the fuel transfer canal (see Section 6 of Inspection Reports No. 50-266/88022(DRP); No. 50-301/88022(DRP)). Because the licensee concluded that the probability was extremely small that anyone could have unintentionally received a significant radiation dose during

the time the HRA doors were out of service and the licensee appeared to meet all the criteria of 10 CFR Part 2, Appendix C, for self-identification and correction of problems, a Notice of Violation was not issued and the matter was closed (see Section 3 of Inspection Reports No. 50-266/89003(DRSS); No. 50-301/89003(DRSS)).

In addition to the HRA barrier degradation incidents discovered by the licensee in 1988, during a tour on April 20, 1988, NRC inspectors observed that a procedurally required flashing red light, used as a warning device in HRAs where radiation fields exceed 1000 mrem/hr, was installed but not in use. Also as a result of surveys requested by the inspectors, two HRAs that exceeded 100 mrem/hr during fuel transfer were identified that were not posted and controlled as required by Procedure 3.2, Posting of Radiological Areas. Because the licensee did not meet all the criteria of 10 CFR Part 2, Appendix C, for self-identification and correction of problems, a Notice of Violation was issued for these NRC-identified procedural violations (see Section 11 of Inspection Reports No. 50-266/88013(DRSS); No. 50-301/88013(DRSS)). In the response, dated June 17, 1988, to the Notice of Violation, the licensee acknowledged that the night-shift refueling supervisor regarded the flashing red light as a distraction and arranged with a HPT to remove the flashing red light from service and to expand the HRA rope barrier to provide better access control to the area. Licensee corrective actions included immediate establishment of proper HRA barriers, an information session was conducted with HP staff members regarding the HRA barrier degradations and the HRA control and posting requirements of T/S 15.6.11 and Procedure HP 3.2, and a commitment to formally retrain HPTs and HP supervision on HRA control and posting requirements on a much broader scope than the specific incidents by October 1, 1988.

In addition to the corrective actions associated with the individual 1988 HRA barrier incidents discussed above, the Plant Manager sent a memorandum, dated October 27, 1988, to all plant employees stating that when barricades or barriers or other warning devices are propped open or breached (whether intentionally or unintentionally) plant management's concern is that some employees do not appreciate the importance of those barriers and there may be a casual attitude toward barriers and warning devices being demonstrated by a few employees. The Plant Manager concluded the memorandum by stating that if barriers or other warning devices are found in a degraded condition, the cause of the condition will be investigated and appropriate action will be taken including discipline, if necessary. Despite the licensee's attempts to institute effective corrective action to prevent recurrence of the 1988 HRA barrier degradations, the licensee identified six incidents which occurred between April 5-17, 1989, which involved either HRA barrier degradation or willful violation of a HRA barrier. Although the NRC endeavors to encourage licensee identification and correction of problems through appropriate discretionary use of the enforcement policy (10 CFR Part 2, Appendix C), the licensee's failure to implement corrective actions to prevent recurrences of HRA barrier degradation and the apparent willful (intentional) failures to follow the procedural HRA posting and control requirements precludes application of such discretion for these incidents.

On April 5, 8, and 15, 1989, during the recent Unit 1 outage, the HRA barrier rope at the entrance to the pressurizer was found not to be in place; licensee representatives stated that it is not known if there were actual breaches of the barrier by plant personnel. On April 11, 1989, the HRA barrier rope at the SOP for the Unit 1 Regenerative Heat Exchanger Cubicle was found to be moved in toward the cubicle entry by about 18 inches on one corner; the corner stanchion was unbolted from the grating, moved, and refastened to the grating at the new location inside of the HRA. On April 14, 1989, the same correctly replaced stanchion was found bent over such that the barrier rope was again inside the HRA. On April 17, 1989, a HPT observed three operators violate the HRA boundary on the 66-ft south walkway to the spent fuel pool. The area was posted "HRA, RWP, no entry during fuel movement." The RPT reported that this area was not authorized by the operators' job-specific RWP and they did not have a dose rate instrument when the entries were made; however, the operators who enter the area were, according to the licensee, aware that no fuel movement was occurring. These last three incidents are apparent willful (intentional) violations of HRA barrier and entry requirements specified by procedures HP 3.2.3 and HP 2.5 and are representative of violations that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation (Violation 266/89022-03; 301/89021-03).

One violation with three examples was identified.

11. Exit Meeting (IP 30703)

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the onsite inspection July 28, 1989, and by telephone through August 24, 1989. The inspectors summarized the scope and findings of the inspection. The inspectors also discussed the likely informational content of the inspection report with regard to documents and processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary. The following matters were discussed specifically by the inspectors:

- a. The perceived weaknesses in the keyway (reactor cavity pit) entry control policy. (Section 5)
- b. Inspector concerns regarding the number of personal contamination events. (Section 7)
- c. The effectiveness of the ALARA program. (Section 9)
- d. Recurrent violations of procedural HRA posting and control requirements. (Section 10)
- e. The licensee's failure to comply with TMI Action Plan Confirmatory Orders. (Section 3)