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OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Reports No. 50-266/80-16; 50-301/80-16

Docket Nos. 50-266; 50-301 Licenses No. DPR-24; DPR-27

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

Facility Name: Point Beach Nuclear Power Plant, Units 1 and 2

Inspection At: Point Beach Site, Two Creeks, WI

Inspection Conducted: September 8-19, 1980

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Inspection Summary

Health Physics Appraisal on September 8-19, 1980 (Reports No. 50-266/80-16; 50-301/80-16

Areas Inspected: Special, announced appraisal of health physics program, including organization and management, training and qualifications, exposure controls, radiological controls, surveillance, instrumentation, facilities and equipment, ALARA, and emergency response. The inspection involved approximately 300 inspector-hours on site by four NRC inspectors.

Results: No significant weaknesses were identified in the health physics program. Two apparent items of noncompliance were identified (infraction - two individuals received doses exceeding 10 CFR 20.101 limits - Section 4.1; infraction - improper use of a radwaste shipping package - Section 8.3).

DETAILS

1. General

The Point Beach health physics program was evaluated during a special appraisal that began at approximately 10:00 a.m. on September 8 and ended September 19, 1980. The Appraisal Team consisted of two inspectors from the NRC Region III office and two DOE contractor health physicists.

Upon arrival, the team met onsite with senior plant management to discuss the purpose and scope of the appraisal. Training required for unescorted access was obtained by team members the first afternoon. Thereafter, the team had free access to the entire plant, subject only to the licensee's normal controls for posted and/or locked areas. The team complied with a licensee request for prior notification of visits to the controlled area of the plant during backshifts or the weekend. Throughout the appraisal, the team emphasized direct interactions with workers and direct observation of work.

During the appraisal, direct radiation and contamination surveys were made by the team to independently ascertain plant radiological status and to make comparisons with licensee measurements. Most of the appraisal was conducted during the day shift when routine sampling and surveillance normally are performed by Chemistry and Health Physics (C&HP) Group personnel. Units 1 and 2 were at power during the appraisal period.

The Appraisal Team observed a health physics program that apparently is effective and efficient even though the staff is small and nearly all necessary records are hand recorded and tabulated. The program appears to be well managed and to have adequate support of upper management. The C&HP Group staffing, however, is marginally adequate for nonroutine plant operations.

The team perceived that the ingredients which make the good health physics program at Point Beach include a stringent personnel selection process, an entry level tour as Radiation Control Helpers for most new hires, and, perhaps most importantly, the pervasive influence of certain radiation safety oriented managers and supervisors.

Housekeeping at Point Beach is excellent.

2. Organization and Management

The licensee's Chemistry and Health Physics (C&HP) Group apparently is well managed and the health physics program has substantial support from upper management. The appraisers believe that: the proposed increase in Radiation Control Operator (and RCO Trainee) cadre is needed; C&HP Group upper management should have closer contact with the group's operators, helpers, and Radiochemical Technicians; routinely scheduled independent technical review of the health physics program should be initiated.

2.1 Organization and Staffing

The licensee's onsite C&HP Group, staff of 28, is directed by the Radiochemical Engineer, who reports to the Superintendent, Technical Services, who reports to the Manager, Nuclear Operations (plant manager). The group's chemistry and health physics functions are separated, with both the Plant Chemist and the Health Physicist reporting to the Radiochemical Engineer. The station organization chart indicates an alternate direct reporting to the Manager, Nuclear Operations by the Health Physicist for matters of radiological safety. A Nuclear Plant Engineer also reports directly to the Radiochemical Engineer. Two Nuclear Plant Specialists and two Health Physics Supervisors report to the Health Physicist. At the time of the appraisal, three Radiation Control Operators (RCOs) and nine Radiation Control Helpers (RCHs) reported to the Health Physics Supervisors. One Nuclear Plant Specialist and one Chemistry Laboratory Supervisor report to the Plant Chemist. Six Radiochemical Technicians report to the Chemistry Laboratory Supervisor.

The RCH positions are plant entry level positions for nonprofessional employees. The helper does supervised routine decontamination and health physics work while receiving formal and on-the-job health physics training. After a six-month stay, helpers may bid on operations maintenance, or RCO openings for which they qualify. During outages, several Auxiliary Operators return to the C&HP Group to work as RCHs. The licensee attempts to schedule all Auxiliary Operators for at least one tour as a helper every two years.

The current RCO staffing appears to be marginally adequate to provide the necessary on-the-job training of RCHs, to perform the portion of the routine health physics program that require advanced training, and to provide time to receive retraining and advanced training.

The licensee intends to increase RCO staffing to four and establish a RCO trainee position with a maximum staffing of two. The title of RCH would be replaced by Auxiliary Operator Trainee with a maximum projected staff of five.

Offshift health physics coverage is provided by Auxiliary Operators. Discussions with Auxiliary Operators indicated that very little work requiring health physics support is done on back shifts. The operators stated that they are adequately trained and experienced to determine radiological conditions and establish protective requirements for routine work if need be. They stated, however, that they could not determine isotopic content of air samples and have not been trained in short term lessons learned sampling, handling, and analysis. When asked what they would do in an emergency condition, the operators stated that their training in health physics should permit them to respond safely and perform tasks aimed at event mitigation. They

stated that the C&HP "duty on call" individual would be informed and that help should arrive within 30 minutes. The operators stated that the call-in system is used when abnormal plant conditions exist or are suspected and can include both health physics and chemistry support. According to the operators and other licensee representatives, the system has been working adequately.

Corporate support of the C&HP Group appears to be limited to report submittals, annual ALARA audit, radwaste management audit conducted every two years, and some work on the new emergency plan.

Based on the above, this portion of the licensee's program appears to be acceptable; however, the Appraisal Team believes that the proposed increase in RCO (and RCO Trainee) cadre is needed and recommends that the change be made promptly.

2.2 Management and Control

The Radiochemical Engineer is responsible for the chemistry and health physics program. The health physics program is directed by the Health Physicist, to whom two Health Physics (HP) Supervisors and two Nuclear Plant Specialists report. The day-to-day program is run by the HP Supervisors. Auxiliary Operators who return to the department to work as helpers during outages and contract health physics technicians who are hired to assist are directed and supervised by the HP Supervisors. Supervisory overview and mutual cooperation does not seem to be significantly affected by RCOs and RCHs being part of a bargaining group.

The licensee uses good management control tools, such as job descriptions, assignment of responsibilities, and periodic personal performance evaluations. Professional HP evaluation of routine program implementation and of RCO and RCH performance appears to be strong. The Appraisal Team noted that HP Supervisors spend time in-plant observing and providing supervision.

2.3 Management Support

Management support for health physics appears strong. The Radiochemical Engineer and the Health Physicist are members of the Manager's Supervisory Staff and have input into station policy. They also attend routine staff and scheduling meetings.

Discussion with RCOs and RCHs revealed that they have management backing and the authority to stop a job. They stated that when there is a conflict of views, management resolution is usually fair and supportive of good health physics practices.

The Health Physicist informally maintains a "Health Physics Procedural Failure Review" system whereby failures to follow HP

procedures and corrective actions are recorded. Frequently, action is taken by the supervisor of the individual at fault or by the station manager. A review of the failure review system indicated that corrective actions are taken for both individual and generic matters. No evidence was found to indicate that habitual offenders are tolerated.

Station management appears to have a good understanding of what constitutes a workable health physics program.

2.4 Communications

Communications within the C&HP Group upper management and between C&HP Group management and station management appear to be very good. Communications between C&HP Group upper management and RCOs, and RCHs appear to be poor. Operators and helpers stated that a chasm seems to be developing between them and C&HP Group upper management. One factor that may affect this poor communication is the physical isolation that exists between them. The C&HP Group upper management, housed in the security building, often is not conveniently available for consultation and assistance. Another factor may be the added workload placed on the staff by TMI-related activities.

The Radiochemical Engineer and Health Physicist, being members of the Manager's Supervisory Staff, attend all staff meetings and are represented at all scheduling meetings. There is no separate maintenance meeting.

Based on the appraisal review, the team recommends that C&HP Group upper management spend additional time in direct interaction with RCOs and RCHs.

2.5 Audit Program

Audits of the health physics program have been essentially limited to an annual ALARA audit and an occasional radwaste audit conducted by the corporate Nuclear Projects Office (NPO). Quality Assurance audits have been limited to radwaste and dosimetry vendor audits. An unscheduled independent audit of the health physics program was conducted by a consultant and a health physicist from the NPO during August 1980. The Emergency Plan, procedures, and drills are audited by the Off-Site Review Committee. Members of the Manager's Supervisory Staff review new health physics procedures and changes to procedures.

Portions of health physics program implementation are reviewed during the annual ALARA audit. However, based on discussions with plant personnel and the review of audits performed, it appears that the audits were generally oriented toward procedural implementation and conformance and not toward the technical adequacy of the program.

Based on the appraisal review, audits of the health physics program appear to be adequate. However, the Appraisal Team believes that the audit program would be enhanced by including routinely scheduled independent technical reviews of the health physics program.

3. Selection, Qualifications, and Training

3.1 Selection

Recruitment to fill technical positions is done by placing newspaper advertisements in cities serviced by Wisconsin Electric Power Company. Respondents are interviewed by the Administrative Services Supervisor to screen out people incapable of advancement to operator positions. Those remaining must take a series of tests administered by the corporate office. Selection is based upon above average scores, but not necessarily the highest scores, and mechanical aptitude. Mechanical aptitude is viewed as a better indicator of possible future achievement than I.Q. or previous academic experience.

Nearly all newly hired technical persons begin employment as Radiation Control Helpers (RCH), where they remain for a minimum of six months. Therefore, the employee's 90-day probationary period is spent in the health physics group, and a Health Physics Supervisor must evaluate the employee's performance and capabilities and recommend continued employment. Exceptions are made for individuals with prior extensive nuclear training and experience. Such individuals may spend only four weeks in the RCH position.

3.2 Qualifications

The Radiochemical Engineer, Health Physicist, Plant Chemist, Chemistry Laboratory Supervisor, and Health Physics Supervisors meet or exceed the qualification requirements of ANSI N18.1-1971.

Formal training records for long-standing Radiation Control Operators (RCO) are incomplete. Currently, the RCOs have from three and a half to ten years experience at Point Beach. Based on the available records and on discussions with individual RCOs and their supervisors, RCOs appear to meet the techician requirements listed in ANSI N18.1-1971.

The tenure of the nine current RCHs ranges from several months to one and a half years. As described in Section 3.3 below, formal training received by RCHs has been minimal with reliance placed on close supervision and on-the-job training. Through discussions with individual RCHs and direct observation of their work, the Appraisal Team found them competent to perform the routine tasks assigned. Because of the nature of their training and a high reliance on close supervisory contact, few records concerning an individual's qualifications to perform specific tasks are generated. This subject is further discussed in section 3.5 below.

Based on the appraisal, this portion of the licensee's program appears to be adequate.

3.3 Orientation Training

An initial entry health physics slide and video tape orientation is given to all new employees, contractors, and visitors. The extent of orientation is determined by the type of work to be performed by the individuals in attendance. Testing is performed after the initial slide presentation.

The slide and tape presentations are frequently supplemented by additional oral presentations given by the Health Physicist or a Health Physics Supervisor. Also, a health physics information sheet and an orientation summary are given to all attendees.

Based on the appraisal, the overall effectiveness of the training sessions appears to be good. However, the poor quality of the videotape should be improved.

3.4 Retraining

Point Beach employees and long term contractors are "retrained" throughout the year during monthy safety meetings. This training consists of 30-minute presentations on special health physics topics. Topics are selected for amplification or reiteration based upon complaints or misunderstandings about procedures. Last year, twelve topics were presented.

Based on the appraisal, this portion of the licensee's program is acceptable.

3.5 Radiation Control Operator and Helper Training

The Appraisal Team reviewed the training department during a time of transition. Training needs are changing, because of increasing plant staff and a proposed increase in permanent health physics staff needed to provide a technically qualified cadre to respond to emergencies. Health physics instruction, formerly performed by the health physics staff, is now performed by a permanently assigned instructor having Navy Nuclear health physics, and training experience. Formal lesson plans for Radiation Control Helper (RCH) training and advanced Radiation Control Operator (RCO) training are being developed. According to the licensee, advanced RCO training will begin by the end of 1980.

Journeyman level RCOs are trained in three phases. The first is training provided to bring entry level RCH's to a common level of understanding regarding radiation hazards, precautions, instrument use, plant controls, and regulations. Student performance in the 30-hour course is tested by written examination.

The second training phase consists of twice monthly departmental meetings held by Health Physics Supervisors to discuss problem areas and future operations. RCOs and RCHs also attend monthly safety meetings wherein 30 minutes or more is dedicated to formalized health physics lectures or discussions.

The third phase is direct interaction between RCOs and RCHs, with varying levels of experience, and Health Physics Supervisors. Point Beach procedures enable the supervisor to make frequent tours and inspections of working areas in the plant. This direct interaction appears to be an important training tool at Point Beach.

The Appraisal Team believes that the 14-hour RCH health physics course taught in previous years was not adequate. The person-to-person on-the-job training received by the RCHs, however, permitted them to perform routine duties quite well. The current 30-hour course apparently provides the RCHs with an adequate scientific background and knowledge of plant health physics procedures. The team recognizes the need to provide further technical training to RCOs, who could be called upon to make important decisions during off-normal plant conditions. The planned program for advanced training, along with other training assignments and formalization, appears too ambitious to be conducted without additional help.

Based on the appraisal, this portion of the licensee's program is acceptable if the proposed advanced training for RCOs is adequately prepared and is presented as scheduled.

4. Exposure Control

4.1 External Exposure Control

External exposure is monitored by vendor-supplied thermoluminescent dosimeters (TLD) and self-reading pocket dosimeters (pencils). The TLDs are used to determine the official radiation dose to workers. The pencils are used to monitor daily radiation dose. Neutron exposure is determined by timekeeping in neutron exposure fields which have been measured with a PNR-4 survey meter.

The licensee has discovered a problem with their TLD quality control program. Spiked TLDs show a nonconservative bias. Results for the past four years show the vendor results to be consistently lower than the calculated exposure. The spiked TLDs have been exposed with different radiation sources and in different geometries. The licensee is continuing to evaluate the discrepancy and has scheduled a quality assurance audit of the vendor's program.

Quality assurance tests of self-reading pencils include a TLD/pencil comparison procedure (HP 10.1.2). New pencils receive a drift/response check before being placed in service; however,

only the pencils used by nonstation personnel routinely receive bimonthly drift and response checks. Pencils issued to station personnel receive a drift/response check only when TLD/pencil comparison results or continuous high readings indicate a problem.

Adequate procedures and documentation have been established for assessing skin dose, evaluating lost or damaged TLDs, evaluating off-scale pencil results, and assessing personal contamination. Personal exposure records contain each individual's entire history of exposure received at the plant. At present, the exposure records are maintained by hand. Use of a computer for exposure records is limited to daily dose, monthly totals, and TLD/pocket dosimeter comparisons. The present exposure record system, though cumbersome, is easily utilized and has means for quick retrieval.

In a letter dated August 4, 1980, the licensee notified Region III that one 18-year-old in 1975 and one in 1979 received whole body doses exceeding 1.25 rem in a calendar quarter. This is an item of noncompliance with 10 CFR 20.101, which limits whole body dose to 18-year-olds to 1.25 rem in a calendar quarter. The licensee had discovered that procedure HP 1.1 "Maximum Permission Exposure" was not clearly written and checked to see if any 18-year-olds had been permitted to exceed 1.25 rem in a calendar quarter. Having discovered two, the report was issued to Region III. During the appraisal, team members reviewed the licensee's corrective actions, which included a procedure change and instruction of health physics personnel. The appraisers have no further questions and this matter is considered closed.

Based on the appraisal findings, this portion of the licensee's program appears adequate; however, the following program improvements should be considered:

a. Perform routine drift and response checks on pocket dosimeters issued to station personnel.

b. Quickly resolve the spiked TLD discrepancy.

4.2 Internal Exposure Control

The licensee controls internal exposure through the use of engineering controls, approved respiratory equipment, whole body counting, urine analysis, and a plant commitment to contamination control.

The whole body counting system is supplied by a vendor, who also performs the quality control on the system. The station uses a vendor-supplied phantom containing approximately 0.05 μCi of Co-60 and 0.2 μCi of Cs-137 to check the system. Neither repeat counting of individuals nor empty bed counting is performed for quality control

purposes. Also, the station has requested that K-40 results not be reported. Therefore, the station is totally dependent upon the vendor for quality control.

The licensee's respiratory protection program appears to comply with 10 CFR 20.103 requirements. Due to the cleanliness of the plant, respirator use is low. An adequate supply of respirators is available for outage and emergency use. Maintenance and inspection of respirators and associated equipment is timely and well documented.

Based on the above, this portion of the licensee's program appears to be acceptable. However, the development of a station QA program for the whole body counter, based on ANSI N 343-1978, should be considered for program improvement.

5.0 Access Control

5.1 Restricted Area Access

The restricted area is basically the same as the protected area defined for security purposes; all major buildings are within this area. Access through a guardhouse requires an identification security badge or escort. The security badges are coded to indicate levels of unescorted access permitted.

Based on the appraisal, this portion of the licensee's program appears adequate.

5.2 Controlled Area Access

Unescorted access to the controlled area requires completion of health physics and security orientation training. Also, baseline whole body counting is required of most persons who will perform work in the controlled area. Persons entering the controlled area are required to wear a film badge and pocket dosimeter. After issue, the dosimetry is picked up at the guardhouse and returned each day. Security guards stationed at the guardhouse and at access control are instructed to check that persons are properly badged and are wearing the required dosimetry. Entry to and exit from the controlled area are recorded.

Based on the appraisal, this portion of the licensee's program appears adequate.

5.3 Radiation Area Access

Not all of the controlled area is designated a radiation area. Radiation levels within the posted radiation areas vary significantly. "Hot spot" signs are used to draw attention to areas where

localized higher radiation levels exist. Some old "hot spot" indicated radiation information that disagreed with more recent licensee or appraisal team surveys.

Based on the appraisal, this portion of the licensee's program appears acceptable. However, more diligence is needed in maintaining local postings up-to-date.

5.4 High Radiation Area (HRA) Access

As required by the technical specifications, HRAs which contain whole body dose rates exceeding 1000 mrem/hr are maintained locked. HRAs are adequately posted and have instructional signs which provide information showing the exposure rates at various locations within the area. Physical barriers appear adequate.

The three keys to locked HRAs are in the possession of the Shift Supervisor,an Auxiliary Operator, and a Radiation Control Operator. Persons authorized to enter HRAs are required to carry a dose rate survey instrument and to wear an alarming dosimeter, if not under the surveillance of a health physics representative. Due to time constraints, the adequacy of key controls and positive control over each entry were not specifically reviewed. This matter will be included in a later inspection.

Based on the appraisal, this portion of the licensee's program appears adequate.

5.5 Contaminated Areas

Contaminated areas in the plant are generally well identified by standard means such as barriers, postings, and step-off pads. As a result of diligent decontamination efforts, there are few contaminated areas within the controlled area, other than cubicles housing reactor coolant system components.

Based on the appraisal, this portion of the licensee's program appears adequate.

6.0 Surveillance

6.1 Routine

The Point Beach radiation survey program was examined, including: (1) formal procedures, (2) RWPs and other formal supporting records, (3) a sampling of routine and special surveys, and (4) special surveys performed in containment.

The licensee has well written up-to-date procedures for each phase of routine surveillance and related control activities. Health

Physics Procedure 8.4 provides a survey schedule defining daily to monthly routine surveillance for 144 areas. A similar schedule defines the airborne sampling schedule for 22 locations.

Radiation Work Permit (RWP) controls, which are utilized extensively, cover all but the most routine operator functions. In July and August 1980, 72 and 122 RWPs, respectively, were issued covering everything from containment inspections to steam generator repairs and eddy current testing. RWPs were found to be complete and detailed in their instructions as were all other surveillance program records. The Appraisal Team noted that radiation control activities are comprehensive and that elements of control are regularly implemented by RWP.

Radiation Control Helpers (RCH) in various stages of training were observed performing routine surveillance assignments. Surveillance measurements, recording of results, and posting were generally done competently.

Airborne contamination sampling in the auxiliary building is primarily limited to fixed sampling stations. Containment is sampled both by fixed sampling stations and by high volume air samples during routine weekly entries. During an outage, one or two additional high volume air samples are taken each shift on the platform where steam generator entries are made. Generally, however, respiratory protection is posted based upon contamination, or the threat of contamination, exceeding 30,000 dpm/100 cm^2. Air sample data are recorded separately from other survey data.

In reviewing air sample coverage, several possible areas of oversight were noted. The laundry, hot waste cell, and solid waste compactor area have not been viewed by the licensee as potential dust generators and are not routinely monitored for airborne activity.

The Appraisal Team noted that Radiation Control Supervisor(s) make daily inspections throughout the plant and provide direct supervision of RCHs. The team witnessed several examples of direct person-to-person supervision and on-the-spot training during frequent auxiliary building tours.

Based on the appraisal, this portion of the licensee's program is well done. However, the licensee needs to review the air sampling program to determine whether an airborne activity potential exists in currently unmonitored areas.

6.2 Emergency Monitoring Onsite

The Chemistry and Health Physics (C&HP) Group is responsible for onsite emergency monitoring. During backshifts, according to the licensee, Auxiliary Operators would perform necessary onsite

surveys until C&HP Group members arrive (approximately 30 minutes). The Auxiliary Operators, all of whom have worked as Radiation Control Helpers, have been trained to collect samples and perform simple analyses. They are not qualified to collect post-accident liquid samples or determine isotopic content. However, the specific duties of Auxiliary Operators between the time an incident occurs and the time C&HP personnel arrive onsite are not described by procedure nor has training been conducted.

The licensee has developed and implemented written procedures describing the duties of C&HP Group personnel during an emergency. Also, procedures have been implemented for post-accident reactor coolant and containment atmosphere sampling and analysis and for determination of release rates from plant effluent vent stacks. The C&HP Group personnel have been trained in their emergency duties, including collection and analysis of high activity samples and quantification of effluents.

The licensee intends to construct a technical support center (TSC), adjacent to the current office building, which will contain limited laboratory facilities for measuring airborne and liquid samples should the normal laboratories be uninhabitable. The licensee also can utilize the facilities at Kewaunee Nuclear Power Plant located several miles away. Appraisal Team members discussed with C&HP personnel their emergency duties and responsibilities as described in the health physics procedures. In general, they appeared well acquainted with their emergency duties.

Based on the appraisal, this portion of the licensee's program appears adequate. However, Auxiliary Operators should be instructed in their specific health physics emergency response duties.

6.6 Emergency Environmental Monitoring

The licensee's Radiochemical Engineer, who has the overall responsibility for the routine and nonroutine radiological monitoring program, acts as the licensee's liaison with the environmental monitoring contractor (Hazleton Environmental Sciences Corporation). During an emergency, the Health Physicist provides direction and guidance to the station's emergency environmental survey teams. Initially, the C&HP staff is responsible for emergency offsite monitoring. The licensee's environmental contractor assumes the job of emergency environmental monitoring upon arrival at the site.

Licensee procedure HP 17.4.3, "Health Physics Site Emergency Guidelines," specifies team member work assignments, communications, and equipment needs. The procedure provides no guidance on the use of portable instruments for plume monitoring or specific instructions on what samples must be collected. The procedure states that the Health Physicist will designate the nature of the surveys to be taken. The licensee has special survey forms and maps at the Site Boundary Control Center for emergency environmental team use.

Appraisal Team members discussed with C&HP Group personnel their emergency environmental duties and responsibilities. In general, those individuals contacted appeared well acquainted with their duties.

The Appraisal Team selectively observed environmental sampling stations and found the air samplers operable and the TLDs properly placed. Meteorological equipment was properly calibrated and operational.

This portion of the licensee's program appears to be acceptable.

7.0 Instrumentation

7.1 Portable Instruments

An adequate supply of portable dose rate survey instruments is available for routine and emergency use. Of the approximately 50 instruments, seven were out of service and eleven were in emergency supply storage. During emergency situations, additional instruments could be acquired from the nearby Kewaunee Nuclear Power Plant. The inventory contains two instruments with a dose rate measuring range of 0-5000 R/hr and two instruments capable of measuring up to 10,000 R/hr. The bulk of the remaining instruments are capable of measuring radiation fields of 0-1000 R/hr.

The instruments are calibrated with the Eberline Multiple Source Calibrator, Model 1000 B. The calibrator sources are decay checked yearly with an NBS traceable condensor R-meter. The calibrator has a maximum range of about 800 R/hr. Procedures for the calibration of each instrument type are well written and calibration records are adequately maintained. The calibration frequency for portable instruments is every six months. A source check is performed on each instrument before issue and a weekly source check is performed on each available instrument. The source used for checking instruments gives a reading of 8-30 mR/hr and is available only at the health physics station. No fan sources are used in the plant. ANSI N 323-1978 recommends that source check readings be obtained for one point on each scale or decade normally used.

The neutron monitoring instruments used are the PNR-4, RM-16 with a NRD-1 detector (a nine inch cadmium loaded polyethylene sphere), and the PNC-4 (a fast - slow neutron detector). These instruments are pulse calibrated and checked with a five-curie PuBe neutron source at dose rates of 4, 40, and 400 mrem/hr.

Instruments are stored at and issued from the health physics station at the access control point. The storage area appears adequate, and instrument control is maintained by use of a checkout sheet (CHP-45). The checkout sheet lists the instrument issued, to whom and by whom it was issured, and when the instrument was returned.

Instrument maintenance is performed by work order and records are maintained. Repair time for most instruments is minimal.

Based on the appraisal, this portion of the licensee's program appears acceptable. However, the Appraisal Team recommends that the guidance for periodic performance testing listed in ANSI N 323-1978 be followed.

7.2 Personnel Contamination Monitors

The licensee uses GM friskers at the access control point and portal monitors at the guardhouse to detect personal contamination. The procedures for maintenance, calibration, and source checking appear generally adequate. However, source checks of the friskers and portal monitors are single source response and alarm trip checks, which would not detect changes in detector sensitivity. Use of additional source strengths and/or geometries could provide a more meaningful check.

The use of the friskers by station and contractor personnel was observed by Appraisal Team members. No problems were noted. A guard stationed at the control point ensures that persons frisk properly when leaving the controlled area.

Based on the appraisal, this portion of the licensee's program appears acceptable. However, the licensee should consider the use of check sources or geometries which would detect changes in frisker or portal monitor sensitivity.

7.3 Air Monitors

The licensee utilizes moving filter constant air monitors, fixed filter particulate air monitors, and portable air samplers during routine operation. Procedures are written concerning maintenance, air flow calibration, leak testing, and, in the case of the moving filter air monitors, detector calibration.

Based on the appraisal findings, this portion of the licensee program appears acceptable.

7.4 Area, Process and Effluent Monitors

Sixteen area monitors are located throughout the controlled area of the plant. Twenty-five process/effluent monitors are utilized to monitor particulate, gaseous, and liquid in-plant systems and effluents. The monitors have control room readout, hard copy printout, and control annunciators. A multipoint recorder is used to plot the readout of most process, effluent, and area monitors. Unlike most multipoint recorders, the plots were legible and relatively easy to read. The use of various colors

of ink and routine maintenance of the printer head may contribute to the legibility. In addition to reactor operator review of the charts, readouts in the control room are inspected daily by a radiation control operator.

Meter readings are recorded for comparison and alarm set points are checked.

Process/effluent monitors are calibrated in the same geometry in which they are used. Liquid monitors are calibrated using a series of Cs-137 and Co-60 calibration jigs, which were constructed to maintain the correct detector geometry. Gaseous monitors are calibrated using a gas sample, which is analyzed on the GeLi counting system and then allowed to flow past the detector at controlled flow rates. Most of the monitors, including the area monitors, are periodically source checked with a 100 mCi Cs-137 source, which is placed in a fixed geometry with respect to the detector. Before each refueling, the I&C Department performs electronic calibration and preventative maintenance; the C&HP Group then performs the radioactive calibrations.

During the appraisal review of noble gas monitor calibrations, changes in slope of the calibration curve and changes in sensitivity were observed. According to the licensee, these changes result from the use of grab samples with differing isotopic content because of their age, and the quality of fuel cladding during the time grab samples were collected. Appraisal Team members discussed with the licensee the desirability of periodically using calibration gases such as Xe-133 and Kr-85 to establish known response curves with which to compare the results obtained by calibration with plant gases.

Based on the appraisal, this portion of the licensee's program appears acceptable. However, the periodic use of commercially available calibration gases would enhance the gas monitor calibration program.

8.0 Radwaste Management

Based on the appraisal, this portion of the licensee's program appears to be acceptable, except for the misuse of a solid radwaste package described in Section 8.3.

8.1 Gaseous Radwaste

Review of Point Beach gaseous radwaste management was expedited by the availability of a new series of procedures prepared by the radiochemist in September 1979. The Airborne Release Accountability Manual ABR 1 through 6 summarizes pertinent information regarding sources of airborne contamination, sampling points and methods, flow rates, and methods of calculation.

Continuous gross count rate detector systems monitor noble gas discharges at seven locations in the ventilation system. The count rate is recorded in the control room and input data are processed by computer to give a daily record of curies of noble gas releases (Xe-133 equivalent). Airborne particulates and iodine are sampled from the same locations as the noble gas monitors by means of filters and charcoal cartridges which are changed weekly. Supporting grab samples are collected and counted in the laboratory. Grab sample data are introduced into the monthly record when it becomes apparent that the gross count rate of an effluent monitor has been influenced by direct radiation. Monthly releases are normally less than 1% of technical specification limits. There have been no unscheduled releases since 1975.

Any unusual performance by effluent monitors is investigated. In July, a series of transients was related to sampling room usage. After tracing drain lines and leak testing, a hidden cross connect was found to exist in the sump under the charging pump room. The sump vented to the auxiliary building exhaust vent monitor by way of the charging pump drain lines. Correction is in process.

Vent monitors are calibrated at approximately seven-month intervals during shutdown. Air ejector gas grab samples are first counted in the laboratory by gamma spectrometry. The "calibrated" grab sample is then introduced upstream of the detector at three different flow rates designed to produce three calibration points.

8.2 Liquid Radwaste

Liquid radioactive waste is discharged mainly via the Waste Distillation Tank and steam generator blowdown to Lake Michigan after extensive dilution with circulation water. The Waste Distillate Tank is discharged about three times weekly following sampling and analysis. The discharge line is monitored using a shielded NaI detector that reads out in the control room. Batch releases are controlled by a permit system whereby counting data, applicable MPC's, percent MPC, discharge rate, dilution flow, and total activity are calculated before release is authorized.

Steam generator blowdown is being discharged without processing, except for solids removed, on a continuous basis. Average flow rate appears to be 2 E 5 gallons per day through two blowdown tanks which are monitored by externally mounted monitors (GM probes) and by shielded NaI detectors in the steam generator blowdown sampling lines upstream from the tanks. Monitors continuously record in the control room. Routine grab sample results are used to quantify release activity and to compare actual monitor response with expected response.

Liquid monitors are calibrated using dummy pipe sections to which the detector is temporarily attached in a representative geometry. Standard cobalt-60 and cesium-137 reference solutions are maintained in the dummy pipe sections to permit six calibration concentrations.

In addition to the routine discharge pathways, fuel pool and monitor tanks are infrequently released using the permit system.

8.3 Solid Radwaste

In June 1980, a Nuclear Plant Engineer assigned to the C&HP Group was given overall control of solid radwaste activities. This task was formerly the responsibility of a Radiation Control Supervisor.

Both persons were interviewed by Appraisal Team members.

According to those interviewed, approximately 350 drums of dry active waste (DAW) are being generated annually. Ninety-five percent of the DAW is compactible waste from operations and maintenance activities, and five percent is process filter elements. Demineralizer resins and blowdown evaporator bottoms are processed at about six-month intervals using an ATCOR cementing system which has been in use for about two and a half years. Two to four 65-cubic-foot liners are filled per year using the ATCOR system. In addition, HEPA filter elements are repackaged in their original cartons, then packed in authorized plywood boxes for shipment and disposal.

Identification of drum and liner contents are based upon records concerning waste origin, isotopic analysis of reactor coolant and spent fuel water, and gamma spectrometer measurements of sample DAW drums. Water samples and resin sample analysis have been performed to quantify Sr-90 and transuranic elements and to establish DOT transport group classification. On this basis, drums are routinely identified as having Co-60 and Co-58 as the limiting isotopes. Total Activity is determined by equating exposure rates at four or five points on the drum or box surface with curies by graphs developed from Rockwell equations.

During discussions with the licensee before the appraisal, an appraiser found that the licensee was using Model No. Al-33-90 packaging incorrectly. NRC Certificate of Compliance Number 9108, Revision 2, dated May 6, 1980, listing Wisconsin Electric Power Company as a user of the Model No. Al-33-90 packaging, states that the contents may be greater than Type A quantities of dewatered or solidified waste meeting the requirements of low specific activity (LSA) in secondary containers which meet the requirements for Type A (49 CFR 173.389(j)) packaging.

The secondary container used by the licensee was a 65-cubic-foot cylindrical liner having a 55-gallon drum top mounted on a sleeve which is welded to the top of the cylindrical liner. The liner construction

does not meet the requirements for Type A packaging listed in 49 CFR 173.389(j). Because of descriptive material sent by the packaging supplier and a misinterpretation of the certificate of compliance, the licensee mistakenly thought that the Model No. AL-33-90 packaging itself qualified as Type A packaging.

Concreted blowdown evaporator bottoms meeting the requirements for LSA were the normal contents of the liners. Frequently the licensee also placed spent filters in the liner during the solidification process. When filters were added, the licensee conservatively called the packaged material normal form radioactive material, rather than LSA materials, and labeled the completed package with yellow radioactive labels rather than LSA markings. Since the certificate of compliance lists only LSA materials as permitted contents, the packaging of normal form materials in the Model No. AL-33-90 was not in accordance with the certificate of compliance.

Specifically, on June 10 and 13, 1980, Type B quantities of normal form radioactive material were shipped in the described packaging in noncompliance with 10 CFR 71.3, which requires either a license or an exemption for such shipments. The described packaging was not licensed for such shipments nor was the shipper exempted from Part 71 license requirements. (In addition, shipments of Type A quantities of normal form material, made in the same packaging, were in noncompliance with the general packaging requirements of 49 CFR 173.395(a)).

The packaging misuse, however, did not constitute a hazard to the public. The licensee stated that the packaging would not be used until the matter is satisfactorily resolved.

During the appraisal, no further findings of package misuse were identified. The licensee agreed to perform an extensive review of other packaging use to ensure compliance with DOT regulations.

9.0 Facilities

9.1 Laundry

Contaminated protective clothing is laundered onsite by radiation control helpers. Two 40-pound wet washers and a dryer are installed in a 10-foot by 18-foot room in the health physics station area. Because of a lack of space, a second dryer is located just inside the auxiliary building (down the hall). The laundry is to be expanded and converted to dry cleaning.

Due to the relatively low incidence of severely contaminated work sites, the routine laundry workload is 50 to 60 pounds per day of low level contaminated lab coats. Coveralls and rubbers contaminated to higher levels are laundered separately. After drying, clothes are individually folded and then surveyed using an Eberline RM-14 frisker.

A sample of 24 laundered garments was retested by the Appraisal Team. All garments were well below the station's acceptance limit. During outages, the laundry operates 20 hours per day.

A Victoreen area monitor "VAMP" is located at the sorting table to monitor ambient radiation levels. During the appraisal, the radiation level in the area ranged up to 0.5 mR/hr. The floors, tables, and equipment were surveyed and found clean. The source of ambient radiation was determined to be garments in the high level washer, dust accumulated beneath all the major equipment, and the drain filters and plumbing.

Based on the Appraisal Team review, the accumulation of dirt and dust under the dryers is a potential source of airborne contamination that should be removed.

9.2 Equipment Decontamination and Storage

Decontamination of pumps, valves, and tools is performed in a 12-foot by 14-foot decontamination cubicle in the machine shop. The cubicle has exhaust ventilation and eight-inch-thick concrete block shielding. The cubicle, which was found to be neat and orderly, is equipped with a stainless steel sink, an ultrasonic cleaner, and metal storage shelves. A Victoreen "VAMP" mounted just outside the door is set to alarm at 3.0 mR/hr. The cubicle entry is posted as a contaminated area and has a stepoff pad.

Hot components brought out of the auxiliary building pass two area alarms before reaching a tool clearance table, where they are checked for contamination and direct radiation. As a rule, tools are decontaminated before being stored. There are no hot tool boxes in the machine shop area.

No special control rod drive assembly and decontamination areas apparently are required. According to the licensee, control rods are maintained under special environmental conditions in the reactor during outages, preventing corrosion and frequent overhaul.

A barricaded and posted storage area approximately 100 feet long by 25 feet wide is located on the auxiliary building 66-foot level to provide for storage of reusable contaminated equipment. Items in the area were double bagged and identified. Though the area is maintained clean, it is controlled as a contaminated area.

Based on the Appraisal Team review, this portion of the licensee's program appears to be acceptable.

9.3 Health Physics

The offices of the Radiochemical Engineer, Health Physicist, one Health Physics Supervisor, and the Nuclear Plant Specialists are

located in the security building, which is physically separated from the main plant buildings. This separation appears to have a minor adverse affect on the health physics program (Section 2.4). All other health physics related facilities appear to be adequate for routine use.

Based on the Appraisal Team review, this portion of the licensee's program appears to be acceptable.

9.4 Emergency Facilities and Supplies

The licensee maintains emergency supplies and kits in the control room, Technical Support Center (TSC), Operations Support Center (OSC), Site Boundary Control Center (SBCC), and special emergency room at the Two Rivers Community Hospital. Stretchers, respiratory equipment, and first aid kits are distributed throughout the station.

During a tour of the SBCC, Appraisal Team members found that equipment and supplies were well organized, identified, and in adequate supply. Radiation detection instruments were found operable and recently calibrated. Two-mile boundary airborne radiation survey maps and isopleth overlays to estimate offsite dose were available.

The licensee has an emergency vehicle to transport injured persons to the Two Rivers Community Hospital. In addition, the Two Rivers Fire Department has several vehicles available as backup.

Based on the appraisal findings, this portion of the licensee's program appears acceptable.

9.5 Analytical Laboratory Facilities

Analytical laboratory facilities (cold and hot laboratory areas and counting room) appear to be marginally adequate for routine operations. The laboratory is divided into a cold area and hot area separated by a laboratory bench. Each area is limited in space to a two person operation. The counting room, a small separate room adjacent to the laboratory area, is designed primarily for a one person operation.

Analytical equipment in the laboratories appeared adequate, except that the alpha/beta proportional counter should be upgraded. All equipment appeared to be adequately calibrated.

The cold and hot laboratory areas are equipped with fume hoods and sinks with drains routed to holding tanks. The fume hoods in the hot area, however, are located on a wall adjacent to the counting room. High backgrounds in the counting room could result if high activity samples were inadequately shielded in the hoods. Shielding materials are readily available. The licensee stores radioactive samples in a lead brick cave on a bench in the hot

laboratory area near the entrance to the laboratory. The licensee should consider relocating this cave to a more remote location.

The laboratories and counting room are located near equipment and piping which could affect the habitability of these areas during an accident. A new facility for sample handling, chemical analysis, and counting is in the proposed new Technical Support Center building. The licensee is considering transfering some of the older counting equipment to the new facility and purchasing a portable GeLi gamma spectrometer for emergency use. The licensee has made arrangements with Kewaunee Nuclear Power Plant to utilize their analytical facilities and equipment when needed.

The Appraisal Team observed poor handling techniques in collecting radioactive fluids, transporting them to the laboratory, and analyzing them in the laboratory. Also, there is no frisker located in the laboratory. Given that the hot and cold laboratories are not well separated and that the counting room is adjacent, handling practices need to be impeccable. Also, good handling practices are fundamental to a well run radiochemistry laboratory.

The licensee recently established a Plant Chemist position, which was filled by a C&HP Group member. According to the licensee, this change provides an additional layer of supervision and permits closer supervision of radiochemical operations.

Based on the appraisal findings, sample handling practices need to be improved.

10. ALARA

A partially structured formal ALARA program exists at Point Beach. A strong awareness of ALARA concepts among station employees is promoted by plant management. There is evidence that significant effort is expended to reduce radiation doses at the plant. An ALARA audit is performed annually by a corporate health physicist. A station employee has recently been given the title of ALARA Coordinator.

The station management commitment to ALARA is presented as a forward to the plant's Health Physics Administrative Control Policies and Procedures Manual. The forward commits to an annual ALARA audit conducted by the corporate Nuclear Projects Office. The purpose of the audit is to review station procedures, memos, safety meeting minutes, and dose summaries to assess the adequacy of dose reduction efforts and to recommend improvements.

The appraisers noted that steam generator work is done under the direct control of health physics personnel, using health physics procedures, and that there is a continuing effort to improve methods and reduce dose. Station management currently is investigating the possible acquisition of a mock-up in which to train steam generator

workers. Other high exposure rate jobs are given informal ALARA review by the Health Physicist and other station supervisors. It does not appear that facility changes, and routine and nonroutine work done in less significant radiation areas, receive a significant ALARA review.

The duties of the newly assigned ALARA coordinator include recommending needed program improvements to plant management. The coordinator has established a dose accounting system which may provide information for future ALARA evaluation of specific tasks performed and identify areas which could be improved.

Based on the appraisal findings, this portion of the licensee's program appears acceptable. However, improvements in areas such as ALARA review of radiation work permits and facility changes need to be considered. Also, the licensee should consider implementing a more formalized program for ALARA review during outage planning.

11. Accident/Re-entry

The scope of appraisal was limited to the C&HP Group's accident and re-entry preparedness capability. The appraisal focused primarily on six areas: instrumentation, analytical capability, re-entry capability, expanded support capability, training, and environmental capability.

A separate NRC evaluative effort is being conducted regarding nuclear reactor emergency planning activities. The emergency planning evaluation for the Point Beach Nuclear Power Plant has been initiated but is not complete. In light of this ongoing effort, the Health Physics Appraisal Team confined its evaluation to those aspects of the licensee's inplant emergency response capabilities in place on January 1, 1980.

Emergency monitoring onsite, emergency environmental monitoring, and emergency facilities and supplies are discussed in Sections 6.2, 6.3, and 9.4, respectively, in this report.

Interim procedures for emergency plan response, iodine sample collection and counting, post-accident sampling of containment atmosphere, and post-accident determination of release rates from plant effluent vent stacks have been written. The licensee's Radiochemical Technicians are trained in implementing these procedures. Members of the Appraisal Team discussed procedure implementation with the licensee and inspected collection sites, equipment, and monitoring equipment. Based on the above, the Appraisal Team found no problems that would significantly limit the licensee's capability to respond to accident situations.

12. Exit Interview

The results of the appraisal were discussed with representatives of licensee station management (Section 13) at the close of the appraisal on September 19, 1980.

The following matters were discussed:

a. The purpose and scope of the appraisal.

b. The items of noncompliance listed in Appendix A. The appraisers stated that corrective actions taken to prevent recurrence had been reviewed during the appraisal, that they appear to be adequate, and that no written response concerning the items would be required.

c. The appraisers stated that no significant findings had been identified during the appraisal. Findings of lesser significance, yet considered instrumental in improvement of the licensee's health physics program, as summarized at the conclusion of subsections of this report, were discussed.

13. Persons Contacted

R. Bredvad, Health Physics Supervisor
L. Epstein, Health Physics Supervisor
T. Fredrichs, Nuclear Plant Engineer
H. Gleason, Training Specialist
*C. Harris, Radiochemical Engineer
E. LeClair, I&C Supervisor
*R. Link, Assistant to the Manager
J. Mielke, Admin. Services Supervisor
J. Moniot, Nuclear Plant Specialist
M. Moseman, Nuclear Plant Specialist
A. Pohl, Nuclear Plant Engineer
*G. Reed, Manager - Nuclear Operations
*R. Weedon, Health Physicist
*J. Zach, Supt. - Technical Services
*F. Zeman, Office Supervisor
W. Rudolph, Reactor Operator
*J. Jacovitch, Engineer, WE Nuclear Engineering (Corporate)
*W. Guldemond, Resident Inspector USNRC
*R. Hague, Resident Inspector, USNRC

The inspectors also contacted several other licensee employees, including members of the technical and engineering staffs.

*Denotes those attending the exit interview.