UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

FEB 23 1977

Wisconsin Public Service Corporation
ATTN: Mr. E. W. James
Senior Vice President
Power Generation and Engineering
P. O. Box 1200
Green Bay, Wisconsin 54305

Docket No. 50-305

Gentlemen:

This refers to the inspection conducted by Messrs. T. L. Harpster, J. Barker and W. S. Little of this office on February 8 and 9, 1977, of activities at Kewaunee Nuclear Power Plant authorized by NRC License No. DPR-43 and to the discussion of our findings with Mr. C. Luoma and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

GP

We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

Gaston Fiorelli

Gaston Fiorelli, Chief
Reactor Operations and
Nuclear Support Branch

Enclosure:
IE Inspection Rpt No.
050-305/77-02

cc w/encl:
C. Luoma, Plant
Superintendent
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Operations Inspection

IE Inspection Report No. 050-305/77-02

Licensee: Wisconsin Public Service Corporation
P. O. Box 1200
Green Bay, Wisconsin 54305

Kewaunee Nuclear Power Plant
Kewaunee, Wisconsin

License No. DPR-43
Category: C

Type of Licensee: 560 MWe (W) PWR

Type of Inspection: Routine, Announced

Dates of Inspection: February 8 and 9, 1977

Principal Inspector: T. L. Harpster — 2/22/77 (Date)

Accompanying Inspectors: J. Barker — 2/22/77 (Date)

W. S. Little

Other Accompanying Personnel: None

Reviewed By: W. S. Little, Chief
Nuclear Support Section — 2/22/77 (Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on February 8 and 9, (77-02): Inspection of refueling activities, procedures, and plans for startup.

Enforcement Action

None.

Licensee Action on Previously Identified Enforcement Items

Not inspected.

Other Significant Findings

A. Systems and Components

None.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Deviations

None.

E. Status of Previously Reported Unresolved Items

Not inspected.

Management Interview

The following subjects were discussed at the conclusion of the inspection on February 9, 1977, with Messrs. Luoma (Plant Superintendent), Lange, and Truttman. No items of noncompliance were identified.

A. Refueling Procedures. (Paragraph 2, Report Details)

B. Prefueling Surveillance Activities. (Paragraph 3, Report Details)

C. Fuel Handling Activities. (Paragraph 4, Réport Details)

D. Plant Startup Preparations. (Paragraph 6, Report Details)

REPORT DETAILS

1. Personnel Contacted

C. Louma, Plant Superintendent
R. Lange, Assistant Plant Superintendent
W. Truttman, Operations Supervisor
C. Steinhardt, Assistant Operations Supervisor
R. Zube, Shift Supervisor
J. Krueger, Shift Supervisor
R. Leeman, Reactor Operator
R. Hanson, Reactor Operator
E. Hooper, W Startup Services Engineer
B. James, W Fuel Surveillance Engineer

2. Refueling Procedures

The inspector verified that station refueling procedures contained both function and administrative controls governing:

a. Fuel movements;

b. Fuel inspection;

c. Core verification;

d. Containment integrity; and

e. The status of systems required for refueling.

3. Prefueling Surveillance Activities

The inspector verified that the following prefueling surveillance activities had been completed:

a. Technical Specification requirements;

b. Refueling machine operation and indexing;

c. Fuel storage area ventilation requirements;

d. Refueling interlocks;

e. Crane testing;

f. Refueling deck radiation monitors;

g. Communications systems; and

h. Cooling capability for stored fuel.

The inspector noted during review of the master refueling procedure signoffs, that gaskets were not placed on the vessel closure head storage pad before storage of the head as specified in the refueling procedure. The licensee stated this step had been omitted to prevent possible damage to the vessel closure head O-rings, however, a procedure change had not been initiated. A procedure change was initiated to reflect the gasket deletion and the basis for the deletion. The inspector had no further concerns.

4. Fuel Handling Activities

The inspector observed activities on the refueling deck and the control room during both a day and evening shift to verify that refueling operations were being conducted in accordance with the technical specifications and approved procedures. Specific items audited were:

a. Core monitoring;

b. Containment integrity;

c. Fuel insertion and removal;

d. Fuel accountability methods;

e. Core internals storage;

f. Refueling deck housekeeping;

g. Control room/refueling crew licensee requirements;

h. Cavity water level; and

i. Boron concentration.

5. Plant Startup Preparations

The inspector reviewed the licensee's startup procedures and discussed provisions with the licensee to ensure that systems disturbed or tested during the refueling outage will be returned to an operating status prior to startup. The licensee stated that complete lineups will be performed on all safety related systems.

CENTRAL FILES

MAR 7 1977

Wisconsin Public Service Corporation
ATTN: Mr. E. W. James
Senior Vice President
Power Generation and Engineering
P.O. Box 1200
Green Bay, WI 54305

Docket No. 50-305

Gentlemen:

Please replace page 4 of IE Inspection Report No. 050-305/77-02, dated February 23, 1977, with the attached corrected page 4.

Sincerely,

Caston Fiorelli, Chief
Reactor Operations and Nuclear Support Branch

Enclosure: Corrected page 4 to IE Inspection Report No. 050-305/77-02

cc w/encl:
Mr. C. Luoma, Plant Superintendent
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

OFFICE	RIII	RIII	RIII	RIII	RIII	
SURNAME	Harpster/jb	Barker	Little	Fiorelli	Hunter	
DATE	3/4/77					

NRC FORM 318 (9-76) NRCM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1976 — 626-624

REPORT DETAILS

1. Personnel Contacted

C. Louma, Plant Superintendent
R. Lange, Assistant Superintendent, Maintenance
W. Truttman, Operations Supervisor
C. Steinhardt, Assistant Superintendent, Operations
R. Zube, Shift Supervisor
J. Krueger, Shift Supervisor
R. Leeman, Reactor Operator
R. Hanson, Reactor Operator
E. Hooper, W Startup Services Engineer
B. James, W Fuel Surveillance Engineer

2. Refueling Procedures

The inspector verified that station refueling procedures contained both function and administrative controls governing:

a. Fuel movements;

b. Fuel inspection;

c. Core verification;

d. Containment integrity; and

e. The status of systems required for refueling.

3. Prefueling Surveillance Activities

The inspector verified that the following prefueling surveillance activities had been completed:

a. Technical Specification requirements;

b. Refueling machine operation and indexing;

c. Fuel storage area ventilation requirements;

d. Refueling interlocks;

e. Crane testing;

f. Refueling deck radiation monitors;

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAR 22 1977

Docket No. 50-305

Wisconsin Public Service
Corporation
ATTN: Mr. E. W. James
Senior Vice President
Power Generation and
Engineering
P. O. Box 1200
Green Bay, WI 54305

Gentlemen:

Thank you for your letter of March 4, 1977, in response to noncompliance items identified in our Report No. 77-01. As discussed with Messrs. Richmond and Jarvella on March 16, 1977, Infraction A in that report was issued because of failure to make adequate evaluation of airborne activity during work on the afternoon of March 12, 1976, in the controlled zone on the 606' level of containment. Your records indicated that a single air sample was taken in the area at about 1700, several hours after work was started. This was, apparently, the air sample referred to in your internal correspondence dated March 18, 1976, which indicated that personnel were removed from the area and an air sample was taken along with surface swipes. Because the sampling was not done under conditions representative of those prevailing during work in the area, the matter is regarded as an inadequate evaluation, not simply a record keeping deficiency.

From our telephone discussions with your representatives at the site, we understand that the following practices have been adopted to avoid future occurrences of this type:

1. Increased use of continuous air samples in general areas of radiation work,

2. Representative evaluation grab samples at the beginning of jobs having the potential for generating airborne activity, and

3. Supplementary grab samples each shift for continuing jobs.

These corrective actions appear to be responsive to our concerns in this matter and we will review their implementation together with the corrective actions for Infraction B during a future inspection. At that time, we will also review the additional documentation mentioned in your letter to clear up the unresolved items relating to the extent of the airborne

radioactivity exposure to contractor personnel on March 12 and the adequacy of your evaluation of their bioassay data.

Your cooperation with us is appreciated.

Sincerely,

James M. Allan, Chief
Fuel Facility and
Materials Safety Branch

cc: C. Luoma, Plant
Superintendent

cc w/ltr dtd 3/4/77:
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

OFFICE	RIII	RIII	RIII	RIII	RIII	RIII
SURNAME	Schumacher/lb	Fisher	Allan	Hunter	Norelius	Keppler
DATE	3/21/77					

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

March 4, 1977

U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Attention: Mr. James M. Allen
Fuel Facility & Materials Safety Branch

Gentlemen:

Ref: Docket 50-305
Operating License DPR-43
IE Inspection Report No. 050-305/77-01

This letter is in response to certain apparent items of non-compliance reported in the referenced report of the inspection conducted by Mr. Schumacher of your office on January 11-14, 1977.

Infraction A. "Contrary to 10 CFR 20.201(b), surveys adequate to ensure compliance with 10 CFR 20.103 were not made for work in containment on March 12, 1976."

Response: The implication stated in Infraction A is that proper surveys were not performed by the licensee to ensure compliance with 10 CFR 20.103 for an incident generated due to work on containment on March 12, 1976. At the time of inspection, the inspector was not shown the evaluation package that was assembled along with a report to the plant PORC committee detailing the action taken by the HP Department in regards to evaluating the contamination incident resulting from work in containment on March 12, 1976, and the conclusions that these actions were in compliance with 10 CFR 20. These conclusions were based on surface swipes and air samples which showed that no particulate air activity was present in the working area where this incident took place. As of this date, we cannot locate the air sample gamma scans referred to in the report to the PORC Committee. We view this as a deficiency in record keeping and believe that the documentation existing in the report to PORC is adequate to remove this item from an Infraction status. Mr. Schumacher of your office was informed of this documentation via telephone and will review it in his next visit to the plant. Meanwhile, we have taken steps to insure that the Health Physics Supervisor will review all survey scans to determine final disposition of data pertinent to ensuring compliance with 10 CFR 20 regulations.

Infraction B. "Contrary to 10 CFR 20.101(b), temporary workers were permitted doses in excess of 1,250 millirems per quarter without completing the determination of accumulated occupational dose on Form NRC-4 or equivalent."

Response: This incident was caused by a deficiency in our Spring of 1976 refueling indoctrination program. Due to the experience gained in that, our first refueling outage, we have revised our refueling indoctrination program to include a control signoff sheet for each worker and an administrative review under the cognizance of a WPS supervisor. These changes have been implemented and provides the assurance that discrepancies of this nature will not occur for future outages where temporary workers are employed.

Very truly yours,

E. W. James
Senior Vice President
Power Supply & Engineering

EWJ:cmn

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

FEB 8 1977

Wisconsin Public Service Corporation
ATTN: Mr. E. W. James
Senior Vice President
Power Generation and Engineering
P. O. Box 1200
Green Bay, Wisconsin 54305

Docket No. 50-305

Gentlemen:

This refers to the inspection conducted by Mr. M. C. Schumacher of this office on January 11-14, 1977, of activities at Kewaunee Nuclear Power Plant authorized by License No. DPR-43 and to the discussion of our findings with Mr. Luoma and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described under Enforcement Items in the Summary of Findings section of the enclosed inspection report.

Two additional items of possible noncompliance relating to overexposure of two contractor employees and the adequacy of your evaluation of the relevant biossay data are carried as unresolved items in the enclosed report. Their resolution will await the inspector's review of additional information revealed to him by telephone following the inspection.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within twenty days of your receipt

of this notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this notice, the enclosed inspection report, and your response to this notice will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this notice, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

James M. Allan

James M. Allan, Chief
Fuel Facility and
Materials Safety Branch

Enclosure:
IE Inspection Report
No. 050-305/77-01

cc w/encl:
Mr. C. Luoma, Plant
Superintendent
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Radiation Protection Inspection

IE Inspection Report No. 050-305/77-01

Licensee: Wisconsin Public Service Corporation
P.O. Box 1200
Green Bay, Wisconsin 54305

Kewaunee Nuclear Power Plant
Kewaunee, Wisconsin

License No. DPR-43
Category: C

Type of Licensee: PWR 560 MWe (W)

Type of Inspection: Routine, Unannounced

Dates of Inspection: January 11-14, 1977

Principal Inspector: M. C. Schumacher — 2/7/77 (Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section — 2/7/77 (Date)

SUMMARY OF FINDINGS

Inspection Summary

Annual radiation protection inspection of January 11-14, 1977, (77-01): Review of followup action on previously identified enforcement items, in addition to normally reviewed items associated with the radiation protection program. Two infractions relating to inadequate evaluation of airborne exposure hazards and incomplete radiation exposure histories for temporary workers. Two unresolved items relating to magnitude of airborne exposures to two contractor employees and to the adequacy of the licensee's evaluation of these exposures.

Enforcement Items

The following infractions were identified during the inspection.

A. Contrary to 10 CFR 20.201(b), surveys adequate to ensure compliance with 10 CFR 20.103 were not made for work in containment on March 12, 1976. (Paragraph 8.a., Report Details)

B. Contrary to 10 CFR 20.101(b), temporary workers were permitted doses in excess of 1,250 millirems per quarter without completing the determination of accumulated occupational dose on Form NRC-4 or equivalent. (Paragraph 7, Report Details)

Licensee Action on Previously Identified Enforcement Items

The licensee has fabricated a calibration chamber for use in calibration of gaseous effluent monitors. This deficiency, originally Item A3 of IE:III letter dated May 28, 1976, remains open pending satisfactory completion of monitor calibrations using the improved techniques. (Paragraph 12, Report Details)

Other Significant Items

A. Systems and Components

Elevated noble gas levels in containment are believed by the licensee to be the results of a leaking RTD valve, which is scheduled for repair during the February 1977 refueling outage. (Paragraph 8.a., Report Details)

B. Facility Items (Plans and Procedures)

A system to perform objective evaluation of respirator fitting for individuals has been installed. (Paragraph 4.a., Report Details)

Unresolved Item. A contractor employee was possibly exposed to airborne radioactivity in excess of 40 MPC-hours on March 12, 1976. (Paragraph 8.c., Report Details)

Unresolved Item. The licensee's evaluation of whole body counting data relative to determination of individual exposures in the above episode may have been inadequate. (Paragraph 8.c., Report Details)

C. Managerial Items

None.

D. Deviations

None.

E. Status of Previously Reported Unresolved Items

None.

Management Interview

The inspector's findings, below, were discussed at the close of the inspection with Messrs. Luoma, Jarvella and Marchi, and in telephone conversations with Mr. Richmond, Technical Supervisor, on January 21 and with Mr. Luoma on January 24, 1977.

A. The inspector stated that two instances of apparent noncompliance were identified during the inspection:

1. Failure to make adequate evaluation of airborne conditions attendant to work of two contractor employees on the reactor head on March 12, 1976. (Paragraph 8.a, Report Details)

2. Failure to determine and/or record previous dose history for several transient workers exposed to greater that 1,250 millirems in a quarter as required by 10 CFR 20.101(b). (Paragraph 7, Report Details)

B. The question of possible exposures to greater than 40 MPC-hours of two contractor employees and the question of possibly inadequate evaluation of these exposures remain unresolved pending review of additional information not available to the inspector during the inspection. (Paragraph 8.c., Report Details)

C. The number of workers showing greater than ten percent of maximum permissible body burden for cobalt isotopes following the refueling outage suggests either a possible problem with the respirator fitting program in force at the time or the need for better airborne exposure evaluation. The requirements of newly revised 10 CFR 20.103 for maintaining cognizance of airborne exposures were discussed. (Paragraphs 8.b. and 8.c., Report Details)

D. The licensee agreed to reevaluate his method of reporting whole body counting results in termination reports to individuals and to the NRC. (Paragraph 11, Report Details)

E. The inspector questioned the adequacy of QA audits to meet the Nuclear Safety Review and Audit Committee (NSRAC) responsibilities in the area of radiation safety because of their lack of depth and because NSRAC, which reviews the audits, does not appear to have a sitting member who provides expertise in the field.

The licensee stated that radiation safety expertise is provided by a consultant to NSRAC as allowed by the Technical Specifications and that a thorough audit was performed by him in 1974. (Paragraph 3, Report Details)

F. In response to a question by the inspector, the licensee produced a letter dated February 9, 1976 requesting a change to Technical Specification 3.9.b.4 to correct an apparent error in the equation governing airborne releases.

G. The licensee stated that elevated noble gas levels in containment appeared to result from a leaking RTD valve and that plans have been made to repair it during the February outage. (Paragraph 8.a., Report Details)

H. The inspector stated that some of the problems observed during this inspection may signal the need for additional manpower in the radiation protection area.

The licensee indicated that additional clerical help is already being considered as is full-time assistance in the radwaste area.

REPORT DETAILS

1. Persons Contacted

C. Luoma, Plant Superintendent
G. Jarvella, Health Physics Supervisor
W. Winnowski, Chemistry Supervisor
D. Ristau, Training Supervisor
T. Moore, Administrative Assistant
D. Ruege, Performance Engineer
M. Reinhart, Lead Health Physics Technician

2. Organization

The radiation protection organization consists of the health physicist and five technicians, including a leadman, an increase by one in this category since the last radiation protection inspection. One technician had resigned and two new ones were added since the last radiation protection inspection. Both new men had nuclear navy health physics experience and one had industry experience as well.

3. Licensee Audits

a. Internal Audits

The licensee's corporate quality assurance organization performs occasional audits of selected aspects of the radiation protection program. The only such audit noted for the Radiation Protection Department was an audit of the Radiation Protection Manual, reported in December 1975, that identified five small calibration sources that were not being leak tested. This problem was corrected by the licensee.

The licensee indicated that the results of the QA audits are presented to the Nuclear Safety Review and Audit Committee (NSRAC), which has the responsibility for review and audit of designated activities in several areas, including radiological safety. The meeting minutes, which are kept at the licensee's corporate headquarters in Green Bay, were not reviewed by the inspector. A licensee representative indicated that radiological safety expertise for NSRAC is provided by a consultant rather than a sitting member of the committee. No thorough audit of radiation protection appears to have been done since the consultant's audit of November 1974.

b. Audits of Services and Contractors

The licensee continues his quarterly audit of the TLD contractor by submitting badges given a known exposure.

4. Radiation Protection Training

a. Respirator Training

The licensee installed a Frontier Enterprise FE 560 NaCl Aerosol System to perform respirator fitting in June 1976. Personnel are exposed to the aerosol in a sealed room and concentrations inside and outside of the respirator are measured to determine the protection factor afforded. All on-site personnel have been tested with the various respirators' used at the plant. Personnel brought in for the upcoming refueling outage (February) will also be tested. Individuals unable to achieve a suitable fit with a given device will be restricted from its use and identified at the health physics office at the controlled area entry. Testing records, including retests of individuals who failed their first test, appeared to be satisfactory.

b. New Employee Training

Training tapes for the new plant employee orientation course have been updated and put in color. This program, basically unchanged, consists of twelve hours of training with examinations.

Contractors cleared for work on the controlled side are given radiation protection training, respirator training, whole body counts, and physical examinations. A packet including previous exposure history forms is given to the trainees. The program is given by the station training department, but the health physicist is present for discussion following the radiation protection films. A licensee representative estimated that about sixteen hours would be required for an individual to complete the program. WPS peak maintenance force (non-plant company employees) will also be given the training, according to a licensee representative.

Contractors scheduled for work outside of controlled areas are given a shorter training course and are identifiable by a blue stripe on their ID badges. Most outage personnel are given the controlled area indoctrination.

c. Retraining

Retraining for plant employees, backup staff from the corporate office, and contractors who remain onsite from year to year is a four-hour course with an examination tailored for four identified groups: Operations and Radiation Chemistry; Administration; Supervision; and Maintenance, including Instrumentation and Control Technicians. Retraining records were found to be satisfactory. It was noted that the program for operators required them to demonstrate use of survey meters.

5. Radiation Protection Procedures

Approximately twenty procedures from the Health Physics Procedures Manual dealing with operational radiation protection had been revised or added in the period since the last Radiation Protection Inspection. Review of these by the inspector revealed no significant problems. The procedures were noted to have been approved by the plant superintendent.

6. Instruments and Equipment

The licensee's inventory of portable survey instruments appeared to be adequate. Instruments bore current calibration stickers. Calibration and test records indicated conformance with licensee procedures and Technical Specification 4.1.

Licensee records indicated that semiannual calibration checks are made of self-reading dosimeters. Those reading in error by more than 15% are discarded.

Review of counting room logs for AC counting instruments showed that background and efficiency determinations were made daily. Beta-gamma instrument backgrounds have shown occasional periods of elevated and variable level, but significant impairment of analytical capabilities does not appear to have occurred. A licensee representative indicated that the condition occurs during use of the Auxiliary Building Special Ventilation System and a budget request has been submitted to modify the counting room ventilation to divorce it from the auxiliary building ventilation.

The licensee continues to maintain control charts as a monitor of instrument performance.

7. External Exposure Control

Personal monitoring records for the period February 1976 through November 1976 were reviewed. No individual doses greater than

3,000 millirems per quarter were noted. The maximum annual accumulated dose through November observed was 3,020 millirems. External doses generally appeared to be well controlled, with in-house TLD badges, which are processed daily, being worn by individuals on jobs with higher dose potential in addition to the vendor processed badge.

A spot check of forms NRC-4 for transient workers who received more than 1,250 millirems per quarter during the February to May 1976 outages showed four persons for whom exposure histories had not been completed as required by 10 CFR 20.101(b). In one of these cases there was no form NRC-4 in the individual's file and in two others the form had also not been signed by the individual. These forms are given to workers during their indoctrination, and failure to properly complete them appears to signal a training deficiency. Failure to complete the exposure histories suggests the need for additional help in the radiation protection program.

8. Internal Exposure Control

a. Air Sampling

The licensee conducts an apparently adequate program of air sampling during normal operations, as indicated by a review of samples taken in controlled areas and containment. Samples are analyzed for noble gases, particulates, and halogens, with isotopic analyses being done for halogens, particulates greater than 3×10^{-10} µCi/ml, and gaseous activity.

Containment samples are used in conjunction with brief inspection entries. Since September 1976 these samples have been isotopically analyzed and weekly stay times have been computed using 10 CFR 20, Appendix B, Table 1 limits. Stay times observed were normally less than thirty minutes, except following infrequent purges, when stay times were increased to several hours. The stay times reflect the overwhelming influence of xenon-133, which has been observed in concentrations up to 1.7×10^{-3} µCi/ml. The licensee believes the source of this activity to be a leaking RTD valve, which is scheduled for repair during the February refueling outage.

During outages, air samples are taken at work areas in containment. Licensee records show that samples were taken one to two times per shift during the February-March refueling outage, with more frequent samples being taken during such operations as head removal. Continuous air monitors with alarms were used to warn of changes. The program appeared generally adequate but for an incident that occurred on March 12, 1976.

Whole body counts made on March 12, (Paragraph 8.c.) identified two contractor employees with initial counts in excess of maximum permissible body burden (MPBB). The men had worked that afternoon on the 606' level of containment cleaning head seal grooves and replacing "O" ring seals. The licensee's report of the incident stated that the men were supposed to wear respirators when working under the head, but failed to follow these instructions and had to be reminded twice to wear their respirators. At an adjacent location within the same control zone on March 11 and 12, wire brushing of reactor head bolts was done in a tent erected to control dispersion of the generated particulates. Airline respirators were required inside the tent, where contamination levels up to about 5E6 cpm/100cm^2 had been observed. Continuous health physics coverage was provided in the control zone. However, no air samples appear to have been taken during representative working conditions to assess the adequacy of the specified respirators, to support the distinctions made between areas where respirators were or were not required, and to ensure compliance with 10 CFR 20.103.

b. Respirator Program

The licensee conducts a respirator program in apparent compliance with Technical Specification 6.12. No unapproved respirators were observed. The program for inspection and maintenance appeared to be satisfactory. The fitting program has been significantly improved with the acquisition in June 1976 of an aerosol system permitting objective tests (Paragraph 4). The increase of whole body counting results showing body burdens above 10% following the 1976 outage suggests that either the previous qualitative fitting program may not have been satisfactory or that better evaluation of airborne conditions is needed. The licensee expects significant improvement in the future.

c. Bioassay Program

The licensee conducts a generally satisfactory bioassay program based primarily on whole body counting done at a facility shared with the nearby Point Beach Plant. Whole body counts are given yearly for all plant employees and after each refueling for those who worked in controlled areas. Contractors who work on the controlled side are counted before beginning work and before termination. Additional whole body counts are done after incidents where uptakes are suspected. A review of 802 whole body counts indicated 37 individuals with greater than 10% of MPBB for cobalt-58 or cobalt-60.

On March 12, 1976 whole body counts of two contractor employees contaminated while working with the reactor head seals (Paragraph 8.a.) showed both with greater than maximum permissible body burdens (MPBB) of cobalt-58 plus cobalt-60. By 40 hours both men showed below MPBB for the combination of cobalt-58 and cobalt-60. A licensee report summarizing the event concluded that the early counts were suspect, as they reflected surface contamination as well as internal, and that no overexposure had occurred. Analysis supporting this conclusion was not available for review. The inspector's review of the data suggested the possibility of exposures of 90 and 30 MPC-hours and that the licensee's evaluation may have been inadequate. By telephone on January 21, 1977, additional evaluation material was discussed with the Technical Supervisor, who had been absent during the inspection. Included were the results of additional whole body counts done at the University of Pittsburgh at the request of the mens' employer. The inspector's evaluation of the exposures based on these counts, using standard man data, indicates that exposures were probably less than 40 MPC-hours. These exposures and the adequacy of the licensee's evaluation of them is considered unresolved until the additional material is reviewed during a future inspection.

9. Surveys

Records of routine and special surveys for external radiation hazards, including neutron exposures and contamination surveys, indicated a satisfactory program in effect during 1976. Routine contamination surveys are made daily at about 45 locations in the controlled area. Routine external radiation surveys are done weekly at about 60 locations in the controlled area. Refueling outage surveys appeared to be generally satisfactory. The records indicated frequent contamination surveys and frequent decontamination.

Leak test records indicated that sealed sources are being leak tested every six months, including the calibration sources identified in the licensees QA audit (Paragraph 3).

10. Posting, Labeling, and Control

The inspector toured selected portions of the controlled area in company with licensee representatives. Areas visited included radiochemistry laboratories, counting room, radwaste, and other areas within the auxiliary building. Licensee furnished instruments were used to observe radiation levels and to verify the adequacy of high radiation area controls. No inadequacies were noted. Controls were satisfactory and good house keeping was evident. Postings pursuant to 10 CFR 19 were satisfactory.

The licensee's control of radiation work with his system of Radiation Work Permits (RWP) appears generally satisfactory. Entries to the controlled area require authorization on an RWP. Copies of these are kept at the entry point and in the control room. Dosimeter readings before and after entry are logged at the control point.

11. Notifications and Reports

Termination reports to individuals and to the NRC are apparently being executed. Review of individual files of terminated workers contained copies of these notifications and external radiation dose information consistent with other licensee records. Whole body count information on the reports were given as the net increase in body burden of identified isotopes between the intial and final count. This practice was questioned by the inspector in the case of individuals for whom intermediate counts were done because of suspected intakes. The licensee agreed to review this practice.

12. Effluent Monitor Calibrations[1/]

The licensee has constructed a large, gas-tight calibration chamber with fittings capable of accepting all of the plant gas monitors. Krypton-85 and xenon-133 gas cylinders have been ordered for use in calibration of the monitors. This enforcement item remains open pending satisfactory use of the revised calibration scheme.

1/ Letter, Keppler to James, dtd 12/30/76.