

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

DEC 30 1976

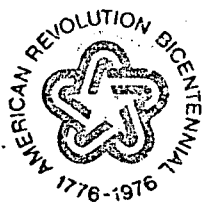
Wisconsin Public Service  
Corporation  
ATTN: Mr. E. W. James  
Senior Vice President  
Power Generation and  
Engineering  
P. O. Box 1200  
Green Bay, Wisconsin 54305

Docket No. 50-305

Gentlemen:

Thank you for your letter of November 22, 1976 in response to the noncompliance item which was originally identified as "A.3" in our inspection report No. 76-08 and was reviewed by Mr. Schumacher on October 6, 1976. As indicated in our previous correspondence, the issue is simply one of demonstrating that monitors reasonably measure effluents in monitored pathways. Our inspector was unable to determine from information at the Kewaunee plant that certain monitors had been appropriately calibrated to achieve this. Had data, either from an original vendor calibration or from verifications made by the plant staff, been available to indicate that the monitors had been appropriately calibrated, the citation would not have been issued. Your revelation of process radiation monitor calibration data, which were not made available during the May 1976 inspection (76-08), in part suffices as corrective action for this noncompliance. However, even with the information contained in your November 22, 1976 letter and our subsequent telephone discussions with Mr. M. Marchi of your staff, our concerns were not entirely satisfied. Thus, we found it necessary to obtain from the Westinghouse Nuclear Instrumentation and Control Department calibration information which should have been available to your staff and our inspector at the Kewaunee plant.

Having finally been able to determine that this noncompliance largely involved inadequate documentation, we now agree that the matter is not serious enough to be considered an infraction. Consequently, the records will be changed to show this noncompliance as a deficiency rather than an infraction.



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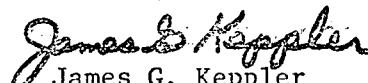
DEC 30 1976

We understand from telephone discussions with Mr. Marchi and with Mr. G. Jarvela, Plant Health Physics Supervisor, on December 9, 1976, that additional calibration steps are underway which should satisfy our remaining concerns. Specifically, we understand that liquid monitors have been calibrated, using reference sources in appropriate geometry, and that similar equipment suitable for calibration of gaseous monitors will be used when standard krypton 85 and xenon 133 sources are received.

We do not agree with your statement that any further questioning of the relationship of the Westinghouse calibration curves to the cap calibrations provided is generic in nature. We feel that it is incumbent upon each licensee to establish or verify the calibration of his monitors and to maintain appropriate documentation for use by his technical staff and for review by the Commission.

We assume that the corrective action described in your letters of June 21, 1976 and November 22, 1976 and described orally to Mr. Schumacher during and since his May 3-7, 1976 and October 6, 1976 inspections will prevent future such noncompliance. This corrective action will be examined during a future inspection.

Sincerely yours,

  
James G. Keppler  
Regional Director

cc: C. Luoma, Plant  
Superintendent

✓ cc w/ltr dtd 11/22/76:  
Central Files  
Reproduction Unit NRC 20b  
PDR  
Local PDR  
NSIC  
TIC

WISCONSIN PUBLIC SERVICE CORPORATION



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

November 22, 1976

Mr. J. G. Keppler, Regional Director  
Office of Inspection & Enforcement  
Region III  
U. S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Dear Mr. Keppler:

REF: Docket 50-305  
Operating License DPR-43  
IE Inspection Report No. 050-305/76-13

Your letter of October 27, 1976, refers to the referenced inspection report by Mr. Schumacher of your office on October 6, 1976. The purpose of the inspection was to review pertinent information concerning Infraction Item A3 in your letter of May 28, 1976 (IE 050-305/76-08) which we took exception to in our letter of June 21, 1976.

As mentioned in the referenced report, your review indicated that the available documentation was insufficient to establish traceability of certain cap calibration sources used in our calibrations to the calibration curves supplied by the vendor for certain process monitors. It had been pointed out to the inspector that Westinghouse, as our prime nuclear supplier, supplied the process radiation monitors in question, the vendor technical manual for the instruments, and the cap calibration sources. The vendor technical manual described the calibration technique and referenced the cap source count rates to use for calibration. In our agreement with Westinghouse, the primary calibration data was to remain with them in their QA files, since we would have no operational need for the data. The inspector, in his exit interview, persisted in his argument that since the documentation was not available in the plant records, there remained a question as to the reliability of the process monitor calibrations. Further information as to our source traceability was later relayed to the inspector by phone prior to the issuance of the referenced report. Enclosure A is information we requested from Westinghouse to further substantiate the traceability of the calibration sources used in our process monitor calibrations.

Enclosure A, column 1, lists the standard Westinghouse monitors supplied to Kewaunee. Column 2 lists the primary calibration data taken by Westinghouse for each detector using a known source concentration. Column 3 lists the secondary source calibration data for Westinghouse's standard cap sources.

NOV 24 1976

November 22, 1976

Column 4 lists the count rate recorded for the calibration cap sources Westinghouse supplied to us for future calibrations. The sources indicated in column 3 were then used by a Westinghouse representative to set up and calibrate the radiation monitors at the Kewaunee site. This calibration was performed in April, 1973 (data presented to inspector October 6, 1976). Another preoperational calibration was performed by us prior to initial start-up in February-March of 1974, using the sources in column 4.

In closing, we believe we have taken the steps necessary to provide adequate documentation of the traceability of sources used for the calibrations as specified in Section 4.11 of our Technical Specifications. We feel that any further questioning of the relationship of the Westinghouse calibration curves to the cap calibration sources provided is generic in nature and should be undertaken with Westinghouse. We also feel that an item of non-compliance pertaining to an apparent lack of documentation from a major vendor with a well established Quality Assurance Program is not serious enough to amount to an infraction as described in the Atomic Energy Commission's "Criteria for Determining Enforcement Action and Categories of Noncompliance with AEC Regulatory Requirements" issued to all Licensees December 31, 1974.

Very truly yours,



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

EWJ:sna  
Enc.

Enclosure A  
Traceability Data  
for  
Original Calibration Caps

Detector Type	Original Cal. Count Rate	W 2nd Standard Count Rate	WPS	
			Cal. Count Rate	
Area	100cpm at 1 mr/hr	S/N 06-001 2589 cpm on 5/72	S/N 03-001 2565 cpm on 11/73	
Liquid Recessed Monitors	3 cpm at $10^{-6}$ $\mu$ ci/cc for Cs-137	04-002 101462 cpm on 5/72	*S/N 04-A8 100656 cpm on 10/76	
		Cs-137-2C 3100 cpm on 3/70		
Moving Filter Particulate Monitors	10 cpm at $10^{-11}$ $\mu$ ci/cc for Cs-137	04-200 101462 cpm on 5/72	*S/N 04-A8 100656 cpm on 10/76	
		Cs-137-2C 3100 cpm on 3/70		
Radio Gas Normal Range	35 cpm at $10^{-6}$ $\mu$ ci/cc for Kr-85	01-S17 19452 cpm on 5/72	S/N 01-S34 19271 cpm on 11/73	
		Co-60-36 5145 cpm on 3/70		
Radio Gas Extended	40 cpm at $10^{-2}$ $\mu$ ci/cc for Kr-85	01-S17 19452 cpm on 5/72	S/N 01-S34 19271 cpm on 11/73	
		Co-60-36 5145 cpm on 3/70		

Date: 11/19/76

\*New source provided by Westinghouse; source was lost out of original cap provided by Westinghouse.

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

JUL 8 1976

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

Docket No. 50-305

Gentlemen:

Thank you for your letter dated June 21, 1976, informing us of the steps you have taken to correct the noncompliance items identified in our letter of May 28, 1976.

We have reviewed the correspondence concerning Item A.2 and have no further questions.

With reference to Item B, the correct Technical Specification reference should be Section 6.9.3.b(1) as you stated. We will examine your corrective action during a future inspection.

With reference to Item A.3, we agree generally with your interpretation of the monitor calibration requirements; that is, the monitor response produced by reference sources should be relatable to effluent activity through the monitor. It is further our position that this relationship may be established with reference to vendor calibration curves, provided that the calibrations were done under conditions of geometry and source characteristics appropriate to the particular monitors as used at Kewaunee. Your letter referred to vendor supplied materials not made available to the inspector during his review. We will examine this material during a future inspection to assess your compliance with the applicable Technical Specifications.

Your cooperation with us is appreciated.

Sincerely yours,

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



bcc w/ltr dtd 6/21/76:  
Central Files  
PDR  
Local PDR  
NSIC  
TIC  
IE Mail and File Unit

WISCONSIN PUBLIC SERVICE CORPORATION



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

June 21, 1976

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

ATTN: Mr. James M. Allan  
Fuel Facility and Materials Safety Branch

Gentlemen:

REF: Docket 50-305  
Operating License DPR-43  
Letter to Wisconsin Public Service  
Corporation from Mr. James M. Allan  
dated May 28, 1976

This letter is in response to certain apparent items of non-compliance or deficiencies reported in IE Inspection Report No. 050-305/76-08 conducted by Mr. M. C. Schumacher of your office.

The following are our responses to apparent items of non-compliance listed in the report.

A.1 No response required.

A.2 "Contrary to 20.201(b), the licensee's evaluation of airborne exposure to three station employees was inadequate to determine compliance with 10 CFR 20.103(a)."

Response: The implication stated in Infraction A.2 is that proper surveys were not performed by the licensee to insure that individuals will not be exposed to an exposure greater than the limits in 10 CFR 20 Appendix B. In a letter to Mr. Ernest Volgenau from Mr. E. W. James, dated March 19, 1976, we reported the circumstances resulting in the exposure of one individual to a concentration of radioactive material in excess of Part 20 limits. In the letter to Mr. Ernest Volgenau from Mr. E. W. James dated April 5, 1976, updated by a letter dated May 17, 1976, a full report of the incident including estimated exposures was provided as required by 10 CFR 20.405. These reports detail the cause of the incident and corrective measures taken to prevent reoccurrence.

- A.3 "Licensee calibrations of liquid and gaseous effluent monitors were inadequate to meet Technical Specification 4.1a."

Response: Technical Specification 4.1a requires liquid and gaseous radiation monitors to be calibrated each refueling outage. Channel calibration as defined by Kewaunee Technical Specifications consists of the adjustment of channel output such that it responds, with acceptable range and accuracy, to known values of the parameter which the channel monitors. A more detailed requirement of liquid calibration for liquid effluents is required by Technical Specification section 4.11 a.(4), "The liquid effluent radiation monitor shall be calibrated at least quarterly by means of a check source and annually with a known radioactive source." For airborne effluents Technical Specifications section 4.11 b.(3) states in part that, "the calibration procedure shall consist of exposing the detector to a referenced calibration source in a controlled reproducible geometry. The source and geometry shall be referenced to the original monitor calibration which provides the applicable calibration curves."

The liquid and gaseous monitors at Kewaunee are calibrated employing a known radioactive source which has reproducible geometry supplied by the monitor vendor. These sources have been related to effluent activity through the monitor by the monitor vendor. Since documentation of this cross calibration is provided in the plant records, our calibration procedures do comply with the intent of Technical Specifications section 4.1a, 4.11 a.(4) and 4.11 b.(3). Although we are in conformance with the Specifications, we are currently investigating the feasibility of upgrading our liquid and gaseous radiation monitor calibration procedures to more directly relate the activity flow through the release path to the detector read out.

The following is our response to an apparent deficiency in reporting requirements:

- B. "Failure to report maximum gross radioactivity in airborne releases as required by Technical Specification 6.6.1.b.6."

Response: Section 6.6 of the Kewaunee Technical Specifications has been deleted and the Technical Specification reference of the deficiency appears to be in error. We believe the reference to Technical Specifications should have been section 6.9.3.b.(1). In the second half of 1975, release rates for continuous airborne radioactive releases and batch mode airborne radioactive releases were reported.



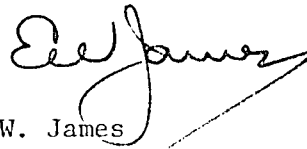
U. S. Nuclear Regulatory Commission

Page 3

June 21, 1976

Through an oversight, the total release rate was not tabulated. However, sufficient data is provided to estimate a conservative value for the radioactive release rate by adding the continuous and batch mode release rates. Corrections to the second half of 1975 effluent report will be made.

Very truly yours,

A handwritten signature in cursive script, appearing to read "E. W. James".

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

EWJ:sna

cc - Mr. Dwane Boyd, US NRC

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

CENTRAL FILES

MAY 28 1976

Wisconsin Public Service Corporation      Docket No. 50-305  
ATTN: Mr. E. W. James, Senior Vice President  
Power Generation and Engineering  
P.O. Box 1200  
Green Bay, Wisconsin 54305

Gentlemen:

This refers to the inspection conducted by Mr. M. C. Schumacher of this office on May 3-7, 1976, of activities at Kewaunee Nuclear Power Plant authorized by NRC Operating 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. During the inspection, the inspector determined that corrective action had been taken with regard to Enforcement Item A.1 and that measures had been taken to ensure that a similar, future item of noncompliance will be avoided. Consequently, no reply regarding this item is required.

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.



Wisconsin Public Service  
Corporation

- 2 -

MAY 28 1976

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,

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

Enclosure:  
IE Inspection Report  
No. 050-305/76-08

cc w/encl:  
C. Luoma, Plant  
Superintendent

bcc w/encl:  
Central Files  
PDR  
Local PDR  
NSIC  
TIC  
IE Mail and File Unit

UNITED STATES NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Radwaste Management Inspection

IE Inspection Report No. 050-305/76-08

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 (W) 560 MWe

Type of Inspection: Routine, Unannounced

Dates of Inspection: May 3-7, 1976

Principal Inspector: M. C. Schumacher

*W.L. Fisher for*

5/21/76  
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: W. L. Fisher, Chief  
Fuel Facility Projects and  
Radiation Support Section

*W.L. Fisher*

5/21/76  
(Date)

## SUMMARY OF FINDINGS

### Inspection Summary

Radwaste management inspection of May 3-7, 1976 (76-08): Reviewed follow-up on unresolved item regarding possible airborne overexposure identified in IE:III Inspection Report No. 76-03, as well as procedures and records relating to radioactive effluents and process monitor calibrations. Four items of noncompliance related to airborne overexposure, process monitor calibrations and failure to report maximum gaseous release rates were identified.

### Enforcement Items

The following items of noncompliance were identified during the inspection:

#### A. Infractions

1. Contrary to 10 CFR 20.103(a), a licensee employee was exposed to an average airborne concentration in excess of the limits of Appendix B, Table 1 of 10 CFR 20. (Paragraph 8, Report Details)
2. Contrary to 20.201(b), the licensee's evaluation of airborne exposure to three station employees was inadequate to determine compliance with 10 CFR 20.103(a). (Paragraph 8, Report Details)
3. Licensee calibrations of liquid and gaseous effluent monitors were inadequate to meet Technical Specification 4.1.a. (Paragraph 6, Report Details)

#### B. Deficiency

Failure to report maximum gross radioactivity in airborne releases as required by Technical Specification 6.6.1.b.6. (Paragraph 2, Report Details)

### Licensee Action on Previously Identified Enforcement Items

None pending.

#### Other Significant Items

A. Systems and Components

A modification to the steam generator blowdown system eliminates the blowdown flash tank vent as a possible release pathway during normal operations. (Paragraph 9, Report Details)

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

The possible overexposure of a plant employee to airborne radionuclides, identified in IE:III Inspection Report No. 76-03, was confirmed. (Paragraph 8, Report Details)

#### Management Interview

The results of the inspection were discussed in a management interview with Mr. Luoma, Plant Superintendent, and members of his staff at the close of the inspection and in a telephone conversation with Messrs. Luoma and Richmond on May 14, 1975.

A. The inspector noted the following items of noncompliance:

1. Exposure of a licensee employee to an airborne concentration in excess of the limits of 10 CFR 20.103(a). (Paragraph 8, Report Details)

2. Evaluation of airborne exposure inadequate to determine compliance with 10 CFR 20.103(a), because of unsupported assumption of solubility of airborne material. An apparent error in the licensee's 30-day letter was also noted. (Paragraph 8, Report Details)
3. Inadequate calibration of liquid and gaseous effluent monitors, because of failure to relate monitor readings to flow of effluent radioactivity. (Paragraph 6, Report Details)
4. Failure to report maximum gross radioactivity release rate in airborne effluent during the second half of 1975, as required by Technical Specification 6.6.1.b.6. (Paragraph 2, Report Details)

The inspector stated that he had reviewed the licensee's follow-up actions with respect to item 1 and that no response to that item would be required.

- B. The inspector discussed the licensee's methods of quantifying radioactive effluents, noting the need for improved calibration of effluent monitors, the need for improvement to the strontium sampler, and the need for periodically confirming iodine collection efficiencies in the fixed sampler.

The licensee acknowledged these comments and stated that the sampling concerns would be addressed. (Paragraph 2, Report Details)

- C. The inspector discussed the April increase in liquid waste release and the technical specification requirement to operate the radwaste equipment.

The licensee acknowledged the requirement to operate this equipment during the current quarter. (Paragraph 3, Report Details)

- D. The inspector discussed tests made on the shield building and Zone SV air cleaning systems.

The licensee stated his intention to perform tests on the containment vent and purge system. (Paragraph 7, Report Details)

- E. The inspector noted the licensee's modification of the gate to the solid waste drumming facility. (Paragraph 4, Report Details)

## REPORT DETAILS

### 1. Persons Contacted

C. Luoma, Plant Superintendent  
J. Richmond, Technical Supervisor  
G. Jarvela, Health Physics Supervisor  
D. MacSwain, Instrument and Control Supervisor  
J. Hannon, Instrument Man  
D. Snyder, Instrument Man  
M. Marchi, Licensing and Nuclear Systems Engineer, WPS Green Bay

### 2. Airborne Radioactivity Release

Records of continuous and batch mode releases for the period April 1975 to April 1976 were reviewed and compared with those reported in the licensee's semiannual reports for 1975. It was noted that the licensee failed to report his maximum 1-hour gross radioactivity release rate during the second half of 1975, as required by Technical Specification 6.6.1.b.6. An apparent error was noted in the noble gas release for September 1975, for which 52 curies was reported instead of 270 curies. No releases in excess of regulatory limits were observed.

Release quantification was based on continuously running iodine and particulate samples and grab samples for noble gases taken along the release path. In addition, batches are sampled before release, but these data are no longer used for release quantification. In late 1975, the licensee modified the containment air monitors (R11/R12) to permit discharge through the auxiliary building vent. As a result, the frequency of containment venting to relieve pressure, and thereby the total radioactivity released, have been reduced.

The inspector examined the licensee's effluent monitoring and sampling system. Flow paths for sampling the auxiliary building vent (R13A) and the containment vent (R21) had been improved by removal of the flow totalizers with their associated 90° bends. It was also noted that the strontium 89, 90 sampler on the auxiliary building vent may be nonrepresentative because of a right angle bend.



3. Liquid Radioactive Effluents

Liquid release records for April 1975 through April 1976 were examined. Discharges appeared to have been made after required analyses, with the liquid waste monitor operable and without exceeding any regulatory limits. Through March 1976, discharges were approximately 0.2 curies of gross activity (excluding tritium) per quarter and 70 curies of tritium per quarter.

During April 1976, 1.23 curies of gross activity were discharged, bringing the licensee near the quarterly design objective of 1.25 curies, which requires use of the waste treatment system for all wastes. A licensee representative stated that wastes will be treated by use of the boric acid evaporator or the steam generator blowdown system, which is available because no primary to secondary leaks are being experienced. The waste evaporator was described as having limited usefulness, because of low throughput capacity and limited efficiency. The licensee is making a study of improved liquid radwaste treatment schemes.

4. Solid Wastes

The records of the four solid waste shipments made during the period April 1975 through April 1976 were reviewed. An estimated 32 curies in 182 drums was shipped by sole use vehicle. Drum and truck surveys were properly documented.

During a tour of radwaste, the inspector noted that gate number 18 had been modified so that it was no longer loose-footed and subject to bypass by wedging between the gate and the wall. This problem had been discussed during the radiation protection inspection of October 1975.<sup>1/</sup>

5. Reactor Coolant Quality

Licensee records of primary and secondary coolant activity surveillance for radioactivity were reviewed for the period April 1975 through April 1976. Gross beta gamma radioactivity in the primary coolant was in the range of 0.1 to 1  $\mu\text{Ci/ml}$ . No radioactivity above an MDA of about  $1\text{E-}7$   $\mu\text{Ci/ml}$  has been observed in the secondary coolant. Sampling appeared to be consistent with the technical specifications.

<sup>1/</sup> IE Inspection Rpt No. 050-305/75-17.

6. Radiation Monitoring System Calibration

Records of the required refueling outage calibration (Technical Specification 4.1.a) of the Radiation Monitoring System were reviewed. The calibrations of the liquid and gaseous process monitors appeared to be inadequate to satisfy the definition of calibration given in the technical specification, in that instrument readings had not been related to activity flow through the monitored release paths. No problems were noted in the calibration of the area radiation monitors. Monthly tests appeared to be in order.

7. Containment Air Cleaning System Tests

The inspector reviewed the results of Freon and DOP tests of charcoal and HEPA filters in the shield building ventilation system and the auxiliary building special ventilation zone system. The tests were done by a licensee contractor between March 16 and 19, 1976, in accordance with licensee surveillance procedures. No discrepancies were noted and leakages within limits permitted by Technical Specification 4.4 were observed by the in-place tests. Results of laboratory tests on charcoal samples taken from these filters had not been returned.

Charcoal and absolute filters on the containment ventilation and purge system, although not addressed in the technical specification, are scheduled for testing in the near future.

8. Internal Exposure Incident

The inspector reviewed data developed by the licensee regarding the internal exposure incident which occurred on February 19, 1976.<sup>2/</sup> Three men cleaning conoseal bolts from the reactor head became contaminated. They were decontaminated, and within 2½ hours a program of whole body counting and urine and feces collection was begun.

The licensee initially made the nonconservative assumption that the material observed in the whole body scan, mainly cobalt-58 and cobalt-60, was soluble and that the main intake mode was ingestion. Thus he concluded that the highest individual was subjected to a time integrated exposure of less than the 40 MPC-hour limit of 20.103(a). However, the excreta data do not appear to support the case for

2/ IE Inspection Rpt No. 050-305/76-03.

soluble material and this evaluation was apparently inadequate. The licensee now concludes that one of the men was exposed to a time integrated concentration of about 4 times the 40 MPC-hour limit.<sup>3/</sup> This agrees generally with the inspector's estimate of 5.5 times the limit, with the principal difference attributable to an arithmetic error.

The licensee identified failure to follow procedures governing Radiation Work Permits (RWP) as the cause of the incident. Decontamination of the bolts went beyond the scope of the existing RWP and a new one should have been written. Thus, Health Physics would have been consulted. A more immediate cause was also identified by the licensee -- the use of acetone in decontamination by the overexposed individual. The other two men used wire brushing. The efficacy of acetone in creating an airborne condition was apparently already known by the licensee's radiation protection staff and was again demonstrated to their satisfaction in an experiment performed subsequent to the incident.

The licensee's corrective action to prevent future occurrences was to relieve the involved contractor supervisor and to re-emphasize the importance of following RWP's to station supervisors and other outage personnel. The inspector had no further questions in this regard.

9. Modification of Steam Generator Blowdown

The licensee has modified the steam generator blowdown by adding regenerative heat exchangers to heat a fraction of the condensate before its return to the steam generator. The modification, which was completed during the recently completed refueling outage, is intended for use during operation above hot shutdown, at which time the vented flash tank will be valved out of the system, thus removing a possible airborne release path when primary to secondary leakage exists.

3/ Ltr. James to Volgenau, dtd 4/5/76.