

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/85-25

License: DPR-40

Docket: 50-285

Licensee: Omaha Public Power District (OPPD)
1623 Harney Street
Omaha, Nebraska 68102

Facility Name: Fort Calhoun Station (FCS)

Inspection At: FCS Site, Blair, Nebraska

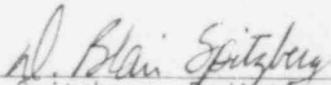
Inspection Conducted: November 4-8, 1985

Inspectors:



R. E. Baer, Radiation Specialist, Facilities
Radiological Protection Section

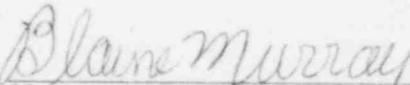
12/12/85
Date



D. B. Spitzberg, Radiation Specialist
Facilities Radiological Protection Section

12-13-85
Date

Approved:



Blaine Murray, Chief, Facilities Radiological
Protection Section

12/13/85
Date

Inspection Summary

Inspection Conducted November 4-8, 1985 (Report 50-285/85-25)

Areas Inspected: Routine, unannounced inspection of the licensee's radiation protection program for controlling occupational exposures during a refueling outage including advanced planning and preparation, training, external exposure control, internal exposure control, radwaste and contaminated materials control, posting, labelling, worker control, and independent measurements. In addition, the NRC inspectors reviewed the licensee's actions on three open items related to NUREG-0737 TMI Action Plan Requirements. The inspection involved 82 inspector-hours onsite by 2 NRC inspectors.

Results: Within the areas inspected, no violations or deviations were identified. Two unresolved items were identified in paragraph 3.

DETAILS1. Persons ContactedOND

- *W. G. Gates, Manager FCS
- A. Bilau, Radwaste Coordinator
- M. R. Christensen, Training Instructor
- R. A. Cords, Chemistry and Radiation Protection (C/RP) Senior Technician
- C. R. Crawford, ALARA Coordinator
- S. Dixon, C/RP Technician
- M. L. Ellis, Instrument and Control (I&C) Coordinator
- *J. J. Fisicaro, Supervisor - Nuclear Regulatory and Industry Affairs
- S. W. Gebers, Acting C/RP Crew Chief
- J. Glantz, C/RP Technician
- J. M. Hale, C/RP Specialist
- D. A. Jacobson, Training Instructor
- T. W. Jamieson, Acting C/RP Crew Chief
- *J. M. Mattice, Plant Health Physicist
- *K. J. Morris, Manager, Quality Assurance (QA)
- *G. L. Roach, Supervisor C/RP
- B. Schmidt, C/RP Technician
- F. K. Smith, Plant Chemist

Others

G. O. Maloy, Contractor Training Instructor

*P. H. Harrell, NRC Senior Resident Inspector

The NRC inspectors also interviewed other licensee and contractor employees including C/RP, administrative, maintenance, and construction personnel.

*Denotes those individuals present during the exit interview on November 8, 1985.

2. Licensee Action on Previously Identified Open Items

(Closed) Open Item (285/8226-14): NUREG-0737, Item II.B.3, Postaccident Sampling (PASS) Capability - This item had remained open pending the licensee's demonstration to the NRC of the PASS to perform its designed function. In reviewing this item, the NRC inspectors found that site acceptance testing, development of approved operating procedures, and operator training on the system had been found satisfactory as documented in NRC Inspection Report 50-285/84-28. Operation of the PASS was verified

by the NRC resident inspector during the period July 1 through August 31, 1985, and was documented in NRC Inspection Report 50-285/85-15. The NRC inspectors also reviewed records of PASS dilution calibrations performed in September 1984. The licensee had not as yet performed an evaluation of particulate and iodine plateout in the PASS containment atmosphere sampling line. This finding is noted as an observation in paragraph 4 of this report. Open item 285/8226-14 is considered closed.

(Closed) Open Item (285/8226-17): NUREG-0737, Item II.F.1 (Attachment 3), Containment High Range Radiation Monitor - This item, discussed in NRC Inspection Reports 50-285/82-26 and 50-285/83-22, was left open pending a revision of the monitors' calibration procedures to include calibration below 10 R/hr using a calibrated radiation source. The NRC inspectors reviewed containment high range radiation monitor calibration procedures CP-RM-091 A and B and found that they had been revised on November 11, 1984, to include radiometric calibration at 8.9 R/hr. Records showed the monitors to have been calibrated according to the revised procedures on November 20, 1984. Open item 285/8226-17 is considered closed.

3. Unresolved Items Identified During This Inspection

An unresolved item is a matter about which more information is required in order to ascertain whether it is an acceptable item, an open item, a deviation, or a violation.

Unresolved Item (285/8525-01): Calibration of Constant Air Monitoring Instrumentation - The licensee did not have documentation available for review of a calibration performed on particulate, iodine, and noble gas (PING) monitor serial number 214 in August 1985. See paragraph 8 for details.

Unresolved Item (285/8525-02): Inoperability of Wide Range Noble Gas Stack Monitor RM-063L.M.H - The licensee did not have documentation available for review of a special report on the inoperability of the wide range noble gas stack monitor RM-063M.H beyond September 14, 1984. See paragraph 11 for details.

4. Inspectors Observations

The following are observations the NRC inspectors called to the licensee's attention. These observations are neither violations nor unresolved items. These items were recommended for licensee consideration for program improvement, but they have no specific regulatory requirement. The licensee indicated that these items would be reviewed:

- a. NRC Form 4 - The date the individual signed the NRC Form 4 was not always present and the previous exposure history units were sometimes missing the decimal point. See paragraph 7 for details.
- b. Instrument Repair - The licensee had a large quantity of radiation protection survey meters, airborne radiation monitors, and personnel

contamination monitoring instruments out-of-service. See paragraph 5 for details.

- c. Decontamination Personnel - The contractor personnel assigned to decontamination duties in the auxiliary building were not performing all duties in a manner considered radiologically safe. See paragraph 5 for details.
- d. General Employee Training Building Decontamination Showers - The licensee had not developed procedures for controlling, sampling, and discharging the contents from the decontamination shower holding tank. See paragraph 9 for details.
- e. Radiographic Work - The licensee needs to exercise more control over radiography work being performed onsite including surveys of incoming and released vehicles and equipment. See paragraph 10 for details.
- f. Wide Range Noble Gas Monitor (WRNG) Calibration Procedures - The licensee's procedure for WRNG monitor calibration referenced model numbers for the count rate meter and detector element. The recorded data for these devices was not consistent with the procedure. See paragraph 11 for details.
- g. Particulate and Iodine Plateout Studies - The licensee had not performed a plateout study for particulate and iodine on the WRNG monitors. See paragraph 11 for details.
- h. Job Preplanning - The C/RP and ALARA groups are not involved with job preplanning. See paragraph 5 for details.

5. Advanced Planning and Preparation

The NRC inspectors reviewed the C/RP organization and determined that the licensee had augmented the radiation protection group with contractor technicians. The licensee assigned 17 senior and 8 junior technicians to operational support, 2 senior technicians to ALARA, and 2 senior and 4 junior decontamination technicians to containment building decontamination work. The licensee also contracted for 10 non-nuclear trained housekeeping personnel for cleanup and decontamination duties in the auxiliary building and 24 laundry workers. The licensee had established two 10 hour shifts with staggered working hours to provide 24-hour coverage.

The NRC inspectors reviewed the resumes and work histories of the contract senior technicians and determined that they met the recommendations of ANSI Standard N18.1-1971. The licensee had also evaluated the contractor technicians and provided site specific training and individual testing in accordance with Health Physics Procedure HP-16, "Selection of Contract Health Physics Technicians."

The NRC inspectors were concerned that personnel assigned to cleanup and decontamination duties in the auxiliary building were not demonstrating work practices which were radiologically acceptable when handling contaminated radioactive material. The licensee stated they had initiated a training course to provide these individuals with a better understanding of radiation and precautions for handling radioactive material.

The licensee had obtained additional portable survey instruments, personnel contamination monitors, and constant air sampling equipment prior to the refueling outage. The NRC inspectors expressed concern regarding the inoperability of a large quantity of dose rate survey instruments and personnel monitoring equipment. Although this inoperability of equipment created an inconvenience, the health and safety of personnel was not compromised. The licensee stated that an additional I&C technician had been assigned to radiological instrument repair and calibration and that should rectify this concern.

The NRC inspectors expressed concern that the C/RP and ALARA groups were not involved with job preplanning in the early development phase. The C/RP and ALARA groups were using daily briefings to update work on progress and delays in the outage schedule. Licensee representatives stated that on occasion, work was delayed because either ALARA reviews or radiation surveys were needed prior to starting work and that radiation work permits (RWPs) had been prepared for scheduled work that were not used.

No violations or deviations were identified.

6. Training and Qualifications

The NRC inspectors reviewed the routine and specialized training programs associated with the outage with emphasis on that training provided to contractor personnel. The NRC inspectors determined that the requirements of 10 CFR Part 19.12 were being met.

The NRC inspectors noted that the licensee had received a full size mock-up of the bottom portion of a steam generator, including the tube plate, for training. The licensee had used the mock-up to train personnel for eddy current testing and tube repair work.

No violations or deviations were identified.

7. External Exposure Control

The NRC inspectors reviewed the licensee's program for external radiation exposure control to determine compliance with the requirements of 10 CFR Parts 20.101, 20.102, and 20.202.

The NRC inspectors determined that all personnel entering the radiation controlled area (RCA) were issued a thermoluminescent dosimeter (TLD) which are processed monthly. The individual entering the RCA also wear direct-reading dosimeters (DRD) as required by the RWP. The licensee uses the DRD results for tracking personnel exposures with dose totals updates being made once per shift.

The NRC inspectors reviewed selected personnel exposure history files to determine that current NRC Form 4 and previous exposure histories were available prior to exceeding the 1250 mrem quarterly exposure limit. The NRC inspectors determined that individuals were not always dating the NRC Form 4 and that when previous radiation exposures were entered on the form the decimal point used to denote rem was not always in place. The licensee stated they had placed additional emphasis on these areas of the form.

The NRC inspectors reviewed selected records of work functions performed by the licensee and contractors that required other than routine radiation exposure monitoring, such as multibadging or extremity badging with TLDs. The licensee program for recording other than routine exposures appeared to be adequate.

No violations or deviations were identified.

8. Internal Exposure Control

The NRC inspectors reviewed the licensee's internal exposure control program to determine compliance with the requirements of 10 CFR 20.103, and the recommendations of Regulatory Guide (RG) 8.15, and NUREG-0041.

The NRC inspectors inspected the reactor auxiliary and containment buildings on several occasions during the inspection to observe internal exposure control practices. Procedures and associated records were also reviewed and discussions were held with licensee and contractor employees to determine if internal exposures during the outage were being controlled. The NRC inspectors reviewed a representative sample of the active and inactive RWPs posted for the outage and records associated with their implementation. This review verified that the permit process had been effective during the outage at disseminating the proper internal exposure control methods to be implemented by individuals for each task. The NRC inspectors observed the acquisition of area grab air samples and reviewed nonroutine breathing zone sample results used to track maximum permissible concentration-hours (MPC-hr) personnel exposures.

The NRC inspectors observed during a facility inspection on November 6, 1985, that a particulate, iodine, noble gas (PING) monitor in room 69 of the auxiliary building was alarming at the high level for the iodine channel. The same afternoon, one of the containment building PINGs was in alert level while the other was in high level alarm for the iodine channel. Action taken by the licensee in response to the alarms was to order special grab air samples to assess the airborne concentration of iodine. The NRC inspectors examined the PING calibration procedures and records of their calibration to ascertain the significance of the iodine alarms. In the course of this review it was determined that PING unit 214 located in room 69 of the auxiliary building did not have documentation on file showing the calibration performed on this unit on August 15, 1985. The licensee stated that the necessary calibrations had been performed, but the calibration records could not be located. This was identified as an unresolved item (285/8525-01) pending the licensee's search for this record.

The NRC inspectors examined the post alarm grab air samples in addition to the routine air samples and found that while iodine concentrations had showed an increase during the outage, measured levels had not exceeded 10 percent of MPC in any of the sample results reviewed. Special whole body counting results performed during the outage also provided verification of the absence of a significant iodine problem with the highest body burden showing 50 nanocuries (7.1 percent of ICRP maximum permissible body burden). Air sample results showed other isotopes to be near or below the lower limit of detection (LLD).

The NRC inspectors reviewed the licensee's use of respiratory protection equipment and verified that all users including outage contractor personnel had completed the licensee's qualification program. The NRC inspectors observed the cleaning of used respirators and reviewed the records of surveys of respirators prior to bagging and reissuance and found this to have been performed in accordance with Procedure RPP-6.

No violations or deviations were identified.

9. Radioactive and Contaminated Materials Control

The NRC inspectors observed the efforts being implemented during the outage to control contamination and radwaste in the RCA. The NRC inspectors observed instances of poor radiation safety practices among a few of the auxiliary building decontamination teams in the packaging of used protective clothing (PC) and improper controls at step off pad control points.

The NRC inspectors observed that workers were properly suited out in PC for the areas in which they were working and that removal of PC and step off pad procedures were being followed. All personnel exiting the RCA were required to monitor themselves in one of four gas proportional personnel contamination monitors. The NRC inspectors observed that articles which had been carried into the RCA were being surveyed prior to removal.

The NRC inspectors reviewed changes to facilities which had occurred since the last radiation protection program inspection. The NRC inspectors discussed with licensee representatives the status and basic design for the shower facilities in the general employee training building. The licensee stated that the effluent is collected in a 1000 gallon retention tank, fitted with a high level alarm, and has the ability to be discharged to either the sanitary sewer system or an external vessel. The NRC inspectors expressed concern that the licensee had not developed procedures to prohibit the discharge of potentially contaminated effluents via an unmonitored pathway. The licensee needs to: (1) determine the level the high alarm is activated, (2) provide for positive controls on the valve connecting the retention tank to the sanitary sewer line, and (3) develop a procedure which would address the isolation of the tank, collection of a representative sample from the tank, and an approved discharge or disposal form.

No violations or deviations were identified.

10. Posting, Labelling, and Worker Control

The NRC inspectors verified that the radiologically controlled areas were properly posted and they appeared to be in compliance with 10 CFR 20.203. A temporary storage area for packaged radwaste awaiting shipment had been roped off and posted outside of the fuel building. The NRC inspectors made independent exposure rate surveys and found them to be in agreement with licensee surveys and area postings.

The NRC inspectors reviewed RWPs to ensure that station and contractor personnel were following approved instructions in radiologically controlled areas. Specified RWP approved procedures appeared to have been followed in each case, and sign-in logs and dispensation of expired RWPs were found to be in order.

On November 6, 1985, the NRC inspectors observed that a byproduct material user licensed by the State of Nebraska had been on site to perform radiography in non-radiologically controlled areas. The NRC inspectors noted that no procedures had been established for controlling this type of

work although station health physics personnel had monitored the radiographic activities. The licensee was in agreement that more control over such activities in the future should be exercised to monitor radiographers entering the site protected area.

No violations or deviations were identified.

11. Wide Range Noble Gas Stack Monitor

The NRC inspectors reviewed the licensee's progress to resolve open item (285/8226-15) NUREG-0737, Item II.F.1 (Attachment 1), Noble Gas Effluent Monitor. The licensee had completed calibration of the low range channel of the wide range noble gas (WRNG) stack monitor RM-063L.M.H. The midrange and high range channels had not been calibrated. The NRC inspectors reviewed the calibration for the low range channel of the WRNG monitor. The NRC inspectors noted that this calibration procedure referenced count rate meter and detector model numbers that were not the same as those recorded during performance of the calibration. The NRC inspectors discussed with licensee representatives this inconsistency in equipment data and determined that the recorded data more accurately identified the count rate meter and detector. The licensee agreed that the calibration procedure needed to be revised to include consistent model numbers.

The NRC inspectors discussed with licensee representatives the status of the midrange and high range detector systems and FCS TS section 2.21 requirements. Table 2-10 requires that when less than the minimum number of channels are operable, alternate methods for monitoring be initiated and if the channels are not returned to operating status within 7 days a special report shall be submitted within 14 days to the Commission containing plans and schedules for returning the monitors to operable status. The licensee provided a copy of a letter LIC-84-301 dated September 5, 1984, which stated the monitors were expected to be operable by September 14, 1984.

The licensee stated that a second letter was written after September 5, 1984, which extended the date of expected operability for the monitors. However, the licensee was not able to locate a copy of the second letter. The NRC inspectors stated this is considered an unresolved item (295/8525-02) pending resolution of the notification to the Commission and expected operability of the monitors.

The NRC inspectors discussed with licensee representatives the status of particulate and iodine plateout studies for the WRNG monitors. The licensee had not performed any calculations using ANSI Standard 13.1-1969 as a guide. The licensee stated that they expect to start the plateout studies during calendar year 1986.

No violations or deviations were identified.

12. ALARA Program

The NRC inspectors reviewed the licensee's ALARA program to determine compliance with the requirements of 10 CFR Part 20.1 and the recommendations of Regulatory Guides 8.8 and 8.10.

The NRC inspectors determined that the licensee had established a goal of 491 manrem for the year 1985 and had expended 224 manrem as of November 6, 1985. The licensee projected that less than 400 manrem would be expended for the year. The licensee stated that the lower exposure was due to less steam generator work and decontamination efforts prior to working in the RCA.

No violations or deviations were identified.

13. Surveys

The NRC inspectors reviewed the licensee's program for implementing and performing radiation, contamination, and airborne radioactivity surveys to determine compliance with the requirements of 10 CFR Parts 20.103, 20.201, and 20.401.

The licensee's survey program appeared to be adequate for contamination and radiation surveys for prework evaluations and RWP generation. The NRC inspectors noted the licensee routinely collected an airborne radioactivity sample for particulate and radioiodine analysis from the auxiliary building once each day and from the containment building once each work shift. The NRC inspectors determined that the licensee performed other airborne surveys on an as needed basis when conditions warranted.

At various times during the inspection period, the NRC inspectors conducted independent surveys of the containment and auxiliary buildings to verify that radiological conditions were as recorded on radiation survey logs and depicted on station area maps. The NRC inspectors also observed housekeeping and temporary radioactive waste storage areas. All areas observed appeared to be acceptable.

No violations or deviations were identified.

14. Notifications and Reports

The NRC inspectors reviewed selected reports to determine compliance with 10 CFR Parts 19.13, 20.407, 20.405, and 20.409.

The NRC inspectors' review, in addition to radiological worker training, respiratory fit training, radiation exposure history, and radiation exposure data, included the radiation protection shift turnover log, radiological incident reports, and personnel contamination reports. The NRC inspectors noted the licensee had revised the criteria used for documenting personnel contamination incidents and now records all incidents where contamination is detected on an individual. This procedure should allow the licensee to track contamination incidents by craft, area of contamination, work function, repeat incidents, and determine the root cause and prescribe corrective action to prevent reoccurrence.

No violations or deviations were identified.

15. Exit Interview

The NRC inspectors met with the FCS NRC senior resident inspector and licensee representatives denoted in paragraph 1 at the conclusion of the inspection on November 8, 1985. The NRC inspectors summarized the scope and findings of the inspection including the unresolved items identified in paragraph 3, and the observations noted in paragraph 4 of this report. The licensee stated that these items and observations would be reviewed.

ATTACHMENT B

OPEN ACTION ITEMS LIST

Date: _____
 Docket No: 50-285
 (8)

Type Code: A=Allegation
 B=Bulletin
 C=Circular
 D=Deviation
 E=50.55(e)
 L=LER

M=Miscellaneous
 O=Open Item
 R=Part 21 Report
 T=Temporary Instructions
 U=Unresolved Item
 V=Violation

Note - Max characters allowed for each entry shown in (1)

1	2	3	4	5	6	7	8
Type Item (1)	Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)

U	8525-01	8	T-RP	(7)	CALIBRATION OF CONSTANT AIR MONITORING INSTRUMENTATION		
U	8525-02	11	T-RP		INOPERABILITY OF WIDE RANGE NOBLE GAS STACK MONITOR RM-063M & H.		