

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report: 50-285/82-30

Docket: 50-285

License: DPR-40

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

Facility Name: Fort Calhoun Station, Unit 1

Inspection At: OPPD Corporate Office, Omaha, NE and
Fort Calhoun Station, Blair, NE

Inspection Conducted: November 29-December 3, 1982

Inspector: Blaine Murray 3/7/83
for H. D. Chaney, Radiation Specialist Date

Approved: Blaine Murray 3/7/83
B. Murray, Chief, Facilities Radiation Date
Protection Section

W.D. Johnson 3/14/83
W. D. Johnson, Chief, Reactor Project Date
Section C

Inspection Summary

Inspection Conducted on November 29-December 3, 1982 (Report: 50-285/82-30)

Areas Inspected: Special, unannounced inspection of licensee's actions on 18 previous inspection findings involving violations, open items, and unresolved items concerning the licensee's radiation protection program; and a review of selected portions of the licensee's radiation protection program, including a site tour. The inspection involved 30 onsite inspector-hours and 6 inspector-hours at the corporate offices by one NRC inspector.

Results: Of the 18 previous inspection findings reviewed, seven were closed (see Section 3 for details). One violation (see Section 10) and one new open item (see Section 4) were identified in this report.

Details

1. Persons Contacted

Omaha Public Power District (OPPD)

- *W. C. Jones, Division Manager, Production Operations
- *R. L. Andrews, Section Manager, Operations
- *G. Gates, Manager, Fort Calhoun Station (FCS)
- *K. J. Morris, Manager, Administrative Services
- *F. A. Thurtell, Division Manager, Quality Assurance and Regulatory Affairs
- *M. C. Winter, Manager, Quality Assurance
 - R. Jaworski, Section Manager, Technical Services
- *F. Franco, Manager, Radiological Health and Emergency Planning
 - R. Mueller, Supervisor, Instrument and Control
- *G. L. Roach, Acting Supervisor, Chemistry and Radiation Protection (C&RP) Group
 - B. Hickle, Supervisor, C&RP Group
 - J. Mettice, ALARA Coordinator
 - R. Pignotti, I&C Technician
 - F. Smith, Plant Chemist
 - K. Miller, Test Engineer
 - J. Gass, FCS Training Supervisor
 - M. R. Christensen, C&RP Group Training Coordinator
 - D. Bruening, Supervisor, Reactor Performance Analysis

Others

- *L. A. Yandell, FCS Resident NRC Inspector
- D. Alvord, Health Physics (HP) Technician, Institute for Resource Management (IRM)
- C. Williams, HP Technician, IRM

*Denotes those present during the exit interview.

2. Scope of Inspection

The purpose of this inspection was to review licensee actions on various NRC inspection findings identified during the years 1978, 1980, and 1981. The 18 findings (radiation protection items) involve high radiation area control, 10 CFR Part 19 document posting, internal dosimetry, audits, ALARA program, contractor HP qualification screening, radiation detection instrument (fixed and portable) calibration, personnel dosimetry calibration, non-engineer safety feature (ESF) HEPA filtered ventilation systems, and breathing air quality.

3. Licensee Action on Previous Inspection Findings

(Open) Open Item (285/7805-03): Installation of Remote Containment Air Sampler - This item was discussed in NRC Inspection Report Nos. 50-285/78-03, 50-285/79-14, 50-285/81-12, and 50-285/82-04 and

involved the licensee's use of personnel to obtain the routine weekly air sample from within the reactor containment during reactor operation. The licensee had constructed and tested a remote containment air sampling system; the system failed to produce representative samples and was abandoned. The licensee plans on using, when installed, the Postaccident Sampling System (PASS) to obtain the weekly containment air samples. This item (285/7805-03) remains open.

(Open) Open Item (285/8016-03): QA/QC Program for Gamma, Beta, and Neutron Personnel Monitoring Devices - This item was first discussed in NRC Inspection Report No. 50-285/80-16 and also again in NRC Inspection Report No. 50-285/81-28 and involved the failure of the licensee to provide full range calibration for personnel radiation exposure monitoring devices.

Gamma TLD: This portion was previously closed out on NRC Inspection Report No. 50-285/81-28.

Neutron TLD: This portion was found to be satisfactory by the NRC inspector and is considered closed. See Section 12 for details.

Beta TLD: The licensee is still performing evaluations and testing of TLD's for proper beta energy response. This portion of open item (285/8016-03) is still considered open. See Section 12 for details.

(Open) Open Item (285/8016-04): Internal Dosimetry Procedures - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and involved the licensee's failure to establish an internal dosimetry program that meets the recommendations of ANSI Standard N343-1978 and NRC Regulatory Guide 8.26. The NRC inspector determined that the licensee had not, as of this inspection (50-285/82-30), provided suitable procedures that will ensure indirect bioassay sampling is performed properly, or provide suitable instructions for extrapolation of whole body counting data back to initial intake of radioactive materials. See Section 11 for details. This item (285/8016-04) is still considered open.

(Open) Open Item (285/8016-05): Portable Instrument Calibration - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and involved the licensee's lack of an established calibration program for several types of portable radiation monitoring instruments, as noted below.

Gamma: This portion was previously closed out on NRC Inspection Report No. 50-285/81-28.

Beta: The licensee has procured a strontium-90 beta source of significant activity and is in the process of obtaining National Bureau of Standards (NBS) certification for the source. Development of station instrument calibration procedures is in progress. See Section 13 for details. This portion of open item (285/8016-05) is still considered open.

Neutron: The licensee has implemented calibration of station neutron measuring instruments by NBS using a moderated californium-252 source. The licensee had not completed development of calibration contracts with NBS or developed station procedures implementing the new calibration process. See Section 13 for details. This portion of open item (285/8016-05) is still considered open.

Instrument Performance Check: The licensee has implemented a suitable preuse instrument performance check program that provides for the checking of up to 3 points on an instrument and provides rejection criteria. This portion of open item (285/8016-05) is considered closed.

Pocket Dosimeters (PDs): The licensee had procured a multiple PD calibrator and had located it within the auxiliary building. The licensee had established a semiannual functional check procedure for PDs that meet the recommendations set forth in NRC Regulatory Guide 8.4. This portion of open item (285/8016-05) is considered closed.

Lapel Air Samplers: The licensee had not implemented procedures that provide for the routine use of lapel samplers to substantiate MPC-hour data gathered by other air sampling programs, or incorporated the lapel air samplers into an approved maintenance and calibration program. See Section 13 for details. This portion of open item (285/8016-05) is still considered open.

(Open) Open Item (285/8016-18): Documentation of Air Quality - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-21 and involved the failure of the licensee to establish a program to verify both station-supplied and vendor-supplied breathing air met NUREG-0041 recommendation for Grade D breathing air. The licensee still had not fully implemented a satisfactory quality control program for breathing air that satisfies NUREG-0041 criteria. The licensee is currently procuring analytical standards and developing procedures for the breathing air QC program. This item (285/8016-18) is still considered open.

(Open) Open Item (285/8016-31): Testing of Auxiliary Building HEPA Filters - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-21 and involved the licensee failure to implement surveillance, maintenance, and testing programs for the auxiliary building filtered ventilation system in order to satisfy the recommendations of NRC Regulatory Guide 1.140. The licensee had only partially implemented the aforementioned NRC recommendations. See Section 15 for details. This item (285/8016-31) is still considered open.

(Open) Open Item (285/8016-32): Effluent Monitor Calibrations - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-21 and involved the licensee's lack of full range and energy calibrations for process and effluent monitors to satisfy the recommendations of ANSI Standards N323-1978 and N42.18-1980. The licensee had not completed implementation of a suitable effluent monitor calibration program. See Section 14 for details. This item (285/8016-32) is still considered open.

(Open) Open Item (285/8016-33): Curie Content of Packages - This item was discussed in NRC Inspection Report Nos. 50-285/80-16, 50-285/81-21, and 50-285/82-26 and involved the licensee's method of determining the curie content of waste packages. The licensee had not completed implementation of a new curie estimate procedure. This item (285/8016-33) is still considered open.

(Open) Open Item (285/8016-38): Local Exhaust for Fume Hood - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-21 and dealt with the lack of sufficient air flow across the face of the radio-chemical laboratory fume hood. The licensee had not finalized plans or obtained necessary approvals for modifying the existing ventilation system. This item (285/8016-38) is still considered open.

(Open) Open Item (285/8128-01): ALARA Program - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and involved the licensee's failure to establish an ALARA program. The licensee had established an ALARA program; however, the program is considered inadequate in several areas. See Section 9 for details. This item (285/8128-01) is considered open.

(Open) Open Item (285/8128-03): Evaluation of Contract HP Technicians - This item was discussed in NRC Inspection Report No. 50-285/81-28 and involved the licensee's failure to establish procedures that provided guidance in the evaluating the work experience of contract HP technicians. The licensee's procedures to resolve this item do not agree with the NRC staff position on accounting of hours worked for each year of creditable experience. See Section 7 for details. This item (285/8128-03) is still considered open.

(Closed) Violation (285/8004-04): Failure to Control High Radiation Area - This item was discussed in NRC Inspection Report No. 50-285/80-04 and involved the licensee's failure to properly barricade and post a high radiation area in the containment building, and the lack of controls to ensure each entry of personnel into the subject areas was properly controlled. The licensee had instituted a training program for FCS personnel reemphasizing compliance with station procedures dealing with the control of high radiation areas. The licensee's current program for training related to control of high radiation areas were reviewed and found satisfactory. See discussion on this item in Section 8. This item (285/8004-04) is considered closed.

(Closed) Violation (285/8004-05): Failure to Control a Very High Radiation Area - This item was discussed in NRC Inspection Report No. 50-285/80-04 and involved the licensee's failure to properly barricade and post a very high radiation area in the containment building and the lack of controls to ensure each entry of personnel into the subject area was properly controlled. See discussion in Section 8 of this report and the discussion for previous inspection finding (285/8004-04) above. This item (285/8004-05) is considered closed.

(Closed) Violation (285/8004-07): Failure to Post Documents - This item was reported in NRC Inspection Report No. 50-285/80-04 and involved the licensee's failure to post the documents required by 10 CFR Parts 19.11(a)

and 19.11(b). The inspector verified that the required documents were conspicuously posted and at a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location. The licensee had also posted FCS Standing Order (SO) G-31 at several locations which provides information on where to obtain other items required by 10 CFR Part 19. This item (285/8004-07) is considered closed.

(Closed) Open Item (285/8016-09): SARC Audit of HP Program - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and involved the licensee's Safety Audit and Review Committee (SARC) audits of the FCS radiation protection group activities, and the lack of membership on the committee of a person experienced and qualified in the radiation protection field. The licensee had included the CPPD Manager of Radiological Health and Environmental Protection as a member of SARC, and conducted what appeared to be an acceptable audit of FCS C&RP group during November 29-30, 1982. See Section 6 for details. This item (285/8016-09) is considered closed.

(Closed) Open Item (285/8016-36): Improvement in HP Office Space, Respiratory Protection, and Calibration Facilities - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and concerned the inadequate space provided for HP activities involving HP technician and supervisor work areas, female decontamination facilities, respiratory protection equipment cleaning and maintenance facilities, and instrument calibration facilities. The licensee had remodeled the HP office and counting room to provide increased space allotment for HP technicians and supervisors, respiratory maintenance, and testing. The licensee procured new calibration equipment that is self-shielded and relocated the neutron and dosimeter calibrators to remote areas within the auxiliary building. Suitable restroom facilities for female workers have been provided. This item (285/8016-36) is considered closed.

(Closed) Open Item (285/8016-37): Relocation of HP Counting Area and Radiochemistry Lab - This item was discussed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 and involved the apparent lack of sufficient space for radiochemistry operations and the HP counting area. The licensee's actions to provide additional space for the above activities are considered adequate. This item (285/8016-37) is considered closed.

(Closed) Open Item (285/8128-02): Radiation Work Permit Program (RWP) - This item was discussed in NRC Inspection Report No. 50-285/82-28 and involved the licensee's failure to provide a suitable RWP program as part of the ALARA program. The licensee had improved the instructions in the RWP procedure contained in the Radiation Protection manual, and was noted to be providing increased emphasis on the proper functioning of the RWP program in general employee training. See Section 10 for details. This item (285/8128-02) is considered closed.

4. Open Item Identified During This Inspection

(Open) Open Item (285/8230-02): Radiation Protection Manager (RPM) Qualifications - The licensee's temporary replacement for the position of Supervisor of Chemistry and Radiation Protection does not appear to meet the qualification criteria for a RPM as recommended in NRC Regulatory Guide 1.8. See Section 5 for details.

5. Radiation Protection Organization

The NRC inspector reviewed the licensee's Supervisor of Chemistry and Radiation Protection's qualifications to the criteria established in the following documents:

- . NRC Regulatory Guide 1.8, "Personnel Selection and Training," Revision 1-R, dated May 1977
- . American National Standards Institute - ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel"
- . Memorandum (Office of Inspection and Enforcement (IE) staff position), Cunningham, L. J., IE-NRC, to Greenman E., NRC Region I, Subject: "Qualifications for Radiation Protection Manager (RPM)," August 5, 1982

The supervisor of the radiation protection group (Chemistry and Radiation Protection - C&RP) terminated OPPD employment during this inspection. The aforementioned position is the same as the RPM referenced in Section C of NRC Regulatory Guide 1.8. The NRC inspector reviewed the education and work experience history of the licensee's temporary replacement for the departed RPM and found that even though he has many years of experience in the chemistry and radiation protection field (approximately 10 years), the quality of this experience (being counted by the licensee) does not agree with a recent NRC staff position. The NRC staff position states that: ". . . . technician experience is not equivalent to professional experience," and has further been interpreted to address the fact that, professional experience is that obtained in the field of radiation protection only. The licensee's temporary replacement for the RPM appears to lack approximately 3 years of professional radiation protection experience. The NRC inspector noted that the licensee employed a person meeting the criteria noted above in the offsite general office, and the licensee indicated that this person was available to the FCS staff if the need arose.

This item (285/8230-02) is considered open pending licensee action to:

- . Permanently appoint a person to the position of supervisor of C&RP that satisfies the recommendations set forth in Regulatory Guide 1.8.

No violations or deviations were identified.

6. Audits and Reviews

The NRC inspector reviewed the licensee's internal audit/review program regarding radiation protection activities.

Documents Reviewed

- . Operations Quality Assurance (QA) Surveillance Schedule for 1983
- . OPPD Audit Plan No. 5-82, "Chemistry & Radiation Protection Programs and Implementing Procedures," dated November 5, 1982
- . OPPD memorandum, "Appointment as Safety Audit and Review Committee (SARC) Member (Fred F. Franco)," dated September 1, 1981

The licensee conducted the first SARC audit of the C&RP group activities at FCS during the period November 29-30, 1982. The NRC inspector determined that a member of SARC was knowledgeable of radiological protection practices. The SARC audit checklist appeared to adequately cover areas involving requirements of 10 CFR Parts 19 and 20, and specific plant operating procedures and Technical Specifications dealing with FCS radiation protection program activities. This area was previously discussed in NRC Inspection Report No. 50-285/80-16 and the licensee's actions taken appear to satisfactorily resolve this open item. In addition, the NRC inspector noted that the onsite FCS QA department has scheduled approximately 29 audits of various plant radiation protection activities during 1983 covering, but not limited to, the following:

- . Gas/Liquid Effluent Releases
- . Health Physics Surveys/Reports
- . Radioactive Material/Sources
- . Radwaste Processing
- . Posting of Notices
- . Respiratory Protection
- . Personnel Exposure Records

No violations or deviations were identified.

7. Selection and Qualification of Contractor HP Technicians

The licensee's program for evaluation and selection of contracted HP technicians was reviewed to determine compliance with FSAR commitments, FCS Technical Specification requirements, and the recommendations contained in ANSI Standard 18.1-1971, NUREG-0731, and NRC Staff Position, W. J. Morrison, NRC, subject: "Clarification of experience requirements for radiation protection technicians," Task No: RS 807-5, August 26, 1980.

Documents Reviewed

- . FCS Technical Specification (TS) 5.3.1, "Facility Staff Qualification"
- . FCS HP Procedure-16, "Selection of Contract Health Physics Technicians," Revision 0, dated January 14, 1982
- . Resumes of contract HP Technicians from Institute for Resource Management, Incorporated (IRM)

The NRC inspector determined by discussion with licensee representatives and review of available documents that even though the licensee had implemented a procedure for evaluating contract HP technician candidate's employment histories, the criteria used for establishing years of experience were not in accordance with an established NRC staff position. The NRC staff has established that 2,000 or more working hours accumulated during a total period of not less than 40 weeks is acceptable as representing 1 year of experience. When the aforementioned staff position is applied to the minimum qualification/experience criteria established in ANSI Standard N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel," an acceptable amount of experience for any HP technician (fully-qualified) would be no less than 4,000 hours of "quality" experience obtained in no less than a total of 80 weeks. The licensee's criteria allows for accepting experience of 4,000 hours in as short a time frame as 66 weeks. The NRC inspector noted that the licensee requires that newly hired contract HP technicians successfully complete station training involving the testing of HP knowledge and FCS specific HP practices. The contract HP technicians are also required to complete a detailed practical factors program prior to functional assignment.

This item (285/8128-03) remains open pending licensee action to:

- . Establish criteria for evaluation and selection of contract HP technicians that agrees with the NRC staff position on acceptable experience for contractor HP technician qualification.

No violations or deviations were identified.

8. High Radiation Area Control

The licensee's programs for control of high radiation areas were reviewed to determine compliance with the requirements contained in 10 CFR Part 20.203(c), FCS Technical Specifications, and the commitments made in regard to Notice of Violations reported in NRC Inspection Report No. 50-285/80-04 concerning high radiation areas.

Documents Reviewed

- . Letter, April 2, 1980, to G. L. Madsen (USNRC) from W. C. Jones (OPPD), "Reply to NRC IR No. 50-285/80-04"
- . FCS Technical Specifications 5.11.1 and 5.11.2

- . FCS Standing Order T-8, "Routine Health Physics Surveys"
- . FCS Radiation Protection Manual (RPM), Section 3, "Area Control"

The NRC inspector determined by tours of FCS work areas, discussions with the NRC resident inspector and licensee representatives, and review of training program outlines that the licensee appears to have satisfactorily resolved past high and very high radiation area control problems identified in NRC Inspection Report No. 50-285/80-04. Current FCS general employee and HP technician training appears to adequately address high radiation area identification, control, and access requirements.

No violations or deviations were identified.

9. ALARA Program

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

Documents Reviewed

- . FCS RPM, Section 7, "Operational ALARA Program," Revision 0, dated August 5, 1982
- . OPPD Corporate Policy No. 9.03, dated June 1, 1982
- . FCS Standing Order G-50, "ALARA Radiation Exposure Program," Revision 0, dated May 25, 1982
- . ALARA Committee meeting minutes for April, June, and September 1982
- . FCS Training Attendance Reports

The NRC inspector determined by review of licensee documents and discussions with licensee representatives that significant improvements in the area of implementation of an ALARA program had been made by the licensee that partially fulfilled the concerns that were addressed in NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28. The scope of the licensee's ALARA program encompasses the following aspects:

- . Provides a written policy from OPPD management in regard to an ALARA program commitment.
- . Provides a comprehensive assignment of station and corporate responsibilities in regard to the operation of the FCS ALARA program.
- . Provides for the creation and functional authority of an ALARA committee under the direction of the supervisor of C&RP and as a subcommittee to the Plant Review Committee (PRC).

- . Provides for the preplanning and review of: proposed work projects, modifications to the plant, evaluations of routine plant activities, and incorporating an ALARA philosophy into routine review of existing plant procedures.
- . Provides for specific task preplanning based on estimated man-rem for job completion.
- . Provides for use of detailed ALARA review checklists during review of RWPs, plant design changes, and new plant construction recommendations.
- . Provides for creation and maintenance of ALARA reports and records of station performances.
- . Provides for indoctrination and training of workers in ALARA program concepts and practices.

The NRC is concerned that the licensee's ALARA program does not specifically require that a person be designated as the "ALARA Coordinator," and that during this inspection period the incumbent ALARA coordinator was selected for advancement to plant health physicist without selection of a replacement for the ALARA coordinator. Also, the inspector noted that the licensee's ALARA Program did not provide for issuance of a periodic comprehensive assessment of the ALARA program performance or the establishment of ALARA goals for plant operations involving: personnel exposure by department; reduction of the number of areas requiring controls due to surface contamination; reduction in the generation of solid, gaseous, and liquid wastes; reduction in the number of areas or operations requiring respiratory protection; reduction in the frequencies of personnel contaminations, etc.

This item (285/8128-01) remains open pending licensee actions to:

- . Provide for designation of an ALARA coordinator in the FCS organization.
- . Designate an individual to fill the vacant ALARA coordinator position.
- . Establish procedures that provide for:
 - . Periodic and comprehensive management assessment of the ALARA program performance.
 - . Establishment of ALARA goals for FCS activities involving radioactive wastes, personnel contaminations, employee group radiation exposures, respiratory protection use frequency, and other activities involving exposure to radioactive materials or control of radioactivity.

10. Radiation Work Permit (RWP) Program

The licensee's RWP program was reviewed to determine compliance with the recommendation set forth in NRC Regulatory Guide 8.8, and evaluate program improvements resulting from findings identified in NRC Inspection Report No. 50-285/81-28.

Documents Reviewed

- . Radiation Protection Procedure (RPP)-20, "Radiation Work Permits," Revision 0, dated March 11, 1982
- . RPM, Section 2.7, "Radiation Work Permits," Revision 19, dated March 11, 1982
- . RWP Logs (FCS Form FC-229), for the period November 29-December 2, 1982

The licensee had made significant improvements in the RWP program via revision of the RWP form (FC-236) and Personnel Sign-in Log form (FC-229), increasing emphasis on use of RWPs in general employee training (GET), and providing a separate procedure (RPP-20) for initiating, maintaining, and closing out of RWPs. The NRC inspector determined that the licensee had satisfactorily resolved the findings presented in NRC Inspection Report No. 50-285/81-28 involving RWPs, with the exception of the item dealing with updating RWPs which is discussed below.

During a review of the licensee's existing RWPs, on November 30, 1982, it was determined that 18 RWPs had not been currently updated (weekly - as required by paragraph IV.I.1 of RPP-20) since November 12, 1982. This appears to be a violation of station Technical Specification 5.11 which requires, in part, adherence by all FCS personnel to the requirements of the Radiation Protection Manual, of which RPP-20 is a part. (285/8230-01)

11. Internal Dosimetry Program

The licensee's program for internal dosimetry was reviewed for compliance with the requirements of 10 CFR Parts 20.103; the guidance and recommendations contained in NRC Regulatory Guides 8.9, 8.20, 8.26, and ANSI Standard N343-1978.

Documents Reviewed

- . IE Information Notice No. 82-18, "Assessment of Intakes of Radioactive Material by Workers," dated June 11, 1982
- . HP Procedure-1, "Whole Body Counting," Revision 3, dated June 9, 1982

- . HP Procedure-10, "Whole Body Count Evaluation," Revision 1, dated April 8, 1982
- . RPP-4, "RPP for Possible Inhalation or Ingestion Hazards (Airborne Activity)," Revision 6, dated October 19, 1977

The licensee currently uses the services of an offsite contractor for bioassay analyses and evaluations involving both indirect and direct whole body bioassay methods (different contractors). Direct/in vivo whole body and organ radioactivity counting are performed onsite using a contractor-supplied whole body counter. The licensee also utilizes the emergency services of the University of Nebraska Medical Center, Radiation Health Facility (UNMC/RHF) for backup bioassay activities (both direct and indirect). The NRC inspector determined that the licensee had not fully implemented a suitable calibration phantom or completed revising of the calibration procedures for the whole body counter. The licensee stated that the new calibration and functional check procedures would be implemented by January 1983. The licensee stated that the contractor for the whole body counter performed a two geometry (lung and thyroid) calibration check of the WB counter using mock iodine, cesium, and cobalt sources and determined that the counter was satisfactory for determining both lung and thyroid burdens down to less 5 percent of maximum permissible organ burdens (MPOB).

The NRC inspector determined that the licensee had not yet fully implemented satisfactory bioassay procedures that will provide sufficient proceduralized guidance to HP personnel for accurately back-calculating MPC-hours of intake based on bioassay results. This requirement is considered necessary for the determination of compliance with the requirements of 10 CFR Part 20.103. The licensee's procedures did not contain detailed instructions on the sampling and evaluation of radionuclides in a person's excreta (indirect bioassay) as recommended in ANSI Standard N343-1978, "Internal Dosimetry for Mixed Fission and Activation Products." The licensee stated that in lieu of providing FCS procedures for indirect bioassay they would employ the expertise of the UNMC/RHF. The NRC inspector determined that the licensee had not performed a documented appraisal of the UNMC/RHF indirect bioassay procedures, employee qualifications, or quality control for analytical measurements to ensure that all applicable aspects of ANSI Standard N343-1978 and applicable NRC Regulatory Guides would be satisfied. The NRC inspector determined that the licensee's internal dosimetry procedures provide internal dose calculation models based on both ICRP 2 and ICRP 30 dose commitment assessment methodologies.

The licensee's training program for HP technicians does not appear to provide for indepth instruction in internal dosimetry methodology or WB counting criteria, and focuses on only ensuring that personnel know how to operate the WB counter which requires very little skill above basic typing. HP technicians that were interviewed by the NRC inspector did possess knowledge about the licensee's requirement to notify C&RP supervisory personnel if peak WB counts exceeded a single predetermined level. The licensee has included in the Radiation Protection Manual criteria for determining when personnel should be WB counted outside routine evaluations.

This item (285/8016-04) remains open pending licensee action to:

- . Develop station procedures that adequately address collection, preparation, handling, and required analytical measurements for indirect bioassay sampling.
- . Implement a WB counter calibration and preuse performance verification program that satisfies the recommendations of ANSI Standard N343-1978.
- . Provide necessary procedures and training for HP personnel for the performance of internal radioactivity assessment calculations, including back counting to establish MPC-hours of intake.

No violations or deviations were identified.

12. Personnel Radiation Exposure Monitoring Programs

The licensee's applied quality assurance and quality control over TLD's used in the personnel external radiation exposure monitoring program were reviewed to determine agreement with the recommendations set forth in NRC Regulatory Guide 8.14, and ANSI Standards N13.11 and N319-1976.

Documents Reviewed

- . Letter, June 14, 1982, to W. C. Seidle (USNRC) from W. C. Jones (OPPD), "Beta Dosimetry Program at the Fort Calhoun Station"
- . Letter, October 5, 1982, to B. J. Hickie (FCS) from J. K. Gaspar (OPPD), "Summary of TLD Personnel Dosimetry System Quality Control Results for December 1981-September 1982"
- . Letter, June 21, 1982, to R. L. Andrews (OPPD) and W. G. Gates (FCS) from R. L. Jaworski (OPPD), "Single Chip Fort Calhoun Containment Neutron TLD Calibration"
- . Letter, November 23, 1981, to E. P. Wilkinson (INPO) from W. C. Jones (OPPD), "OPPD Neutron TLD Description"

Background

NRC Inspection Report Nos. 50-285/80-16 and 50-285/81-28 discussed deficiencies in the licensee's calibration of TLD's for gamma, beta, and neutron radiation. The deficiencies involving TLD calibration for gamma radiation were resolved in NRC Inspection Report No. 50-285/81-28. The remaining NRC concerns involve the licensee's QA/QC programs applied to beta and neutron monitoring TLDs, and the energy range calibrations of the TLDs.

Current Inspection Findings

The licensee notified the NRC that studies of FCS beta dosimetry program (scheduled completion by June 30, 1982) would not be completed until early 1983, with an improved program implemented by June 30, 1983.

The licensee plans to have a contractor perform extensive studies of FCS beta source energy spectrums and evaluate effectiveness of OPPD's current TLD to measure personnel beta radiation exposure during work operations. The licensee's representative for OPPD's TLD program indicated that preliminary studies by the TLD vendor indicate that the current 2 chip TLD used for beta exposure monitoring was overestimating low energy beta exposures and underestimating high energy beta exposures. The TLD vendor may provide a prototype 4 chip TLD for experimental monitoring of beta exposure during the upcoming 1983 outage. The anomalies appear to be caused by the TLD holder (badge) and TLD chip filters. This portion of open item (285/8016-03) remains open pending further licensee action.

The licensee's neutron exposure monitoring program was evaluated by a contractor in 1981, and a recalibration of FCS albedo type TLD was implemented based on the contractor findings. The licensee currently participates in a contracted TLD intercomparison cross-check program. The contractor's results indicate that the licensee satisfies the specifications set forth in ANSI Standard N13.11, "Criteria for Testing Personnel Dosimetry Performance," and those set forth in NRC Regulatory Guide 8.14, "Personnel Neutron Dosimeters." The licensee had participated in the University of Michigan study of TLD processors (Study No. 3) and appeared to have satisfactorily passed all categories entered, including the combined gamma and neutron exposure category. The licensee had made clerical errors in one category of Test 3 which have since been resolved. This portion of open item (285/8016-03) is considered closed.

No violations or deviations were identified.

13. Radiation Protection Instruments Calibration

The licensee's calibration of portable radiation protection instruments was reviewed to determine agreement with the recommendations of NRC Regulatory Guides 8.4, 8.25, and those contained in ANSI Standard N323-1978.

Documents Reviewed

- . U. S. Department of Commerce, National Bureau of Standards (NBS) Test Report No. 228594, "Determination of Dose Equivalent Rates for Neutron Meter PNR-4," dated August 10, 1982
- . RPP-19, "Multiple Source Gamma Calibrator, Source Curve Verification," Revision 1, dated November 11, 1982
- . FCS Standing Order No. T-13, "Quality Control Program for Chemistry and Radiation Protection Equipment," Revision 13, dated December 5, 1981
- . FCS Calibration Procedure, "CP-Tele-1," Revision 1, dated December 19, 1980
- . FCS calibration Procedure, "CP-Rad Owl - (RO-1)," Revision 3, dated February 2, 1982

- . FCS Calibration Procedure, "CP-MINI-Rad (M-3006)," Revision 0, dated October 8, 1980
- . FCS Calibration Procedure, "CP-PNR-4," Revision 0, dated December 16, 1980
- . FCS Calibration Procedure, "CP-PNC-4," Revision 0, dated June 11, 1982
- . FCS Functional Check Procedure (FCP) HP-3, "Pencil Dosimeters," Revision 4, dated October 26, 1982

Background

This item was initially discussed in NRC Inspection Report No. 50-285/80-16 and again in NRC Inspection Report No. 50-285/81-28. The NRC inspectors found various shortcomings in the licensee's calibration programs involving beta and neutron survey instruments, PDs, breathing zone air samplers (lapel samplers), and the licensee's photon source calibrator.

Findings of This Inspection

The NRC inspector determined that the licensee had purchased a strontium-90 source for performing portable instrument high range beta component calibration. However, the licensee had not implemented procedures for use of the source due to the lack of NBS certification as to the true dose rate emanating from the source.

The licensee is currently establishing a cross-check program with NBS that will provide dose rate factors for licensee neutron measurement instruments based on exposure to moderated californium-252 sources of known dose rates. This cross-check produces numerical factors that can be used by the licensee during surveys within containment to determine more accurately the neutron exposure to personnel. The licensee had not changed their method of calibrating portable neutron dose rate measuring instruments from what was identified in NRC Inspection Report No. 50-285/80-16. The licensee's representative indicated that calibration of neutron instruments is still being evaluated.

The licensee is using a commercial (NBS traceable) multisource cesium-137 calibrator for portable gamma radiation detection instrument calibration. The licensee had recently (November 1982) performed a calibration of all sources used in the calibrator. The calibrator is of the type with integral shielding that produces exterior dose rate levels near background during use. The calibrator provides for dose rate instrument calibrations up to approximately 390 R/hr. The NRC inspector observed the licensee perform several portable instrument calibrations. The calibration technicians from the FCS I&C Department appear to be quite knowledgeable about calibration procedures, and demonstrated excellent knowledge of detector calibration principles involving instrument geometry effects and detector-to-source distances. The licensee had established a suitable instrument preuse response check program for the calibrator (up to three dose rate points in the range of 10's and 100's of mr/hr). The licensee calibrates

portable gamma dose rate instruments to within 10 percent of known values on at least 2 points of each dose rate scale. The licensee had implemented the use of special detector jigs for positioning all commonly used detectors within the calibrator. This portion of open item (285/8016-05) involving the instrument calibrator is considered closed.

The licensee's program of surveillance for alpha activity in air is addressed in NRC Inspection Report No. 50-285/32-26 as open item (285/8226-03). The licensee is currently modifying their air sampling program.

The NRC inspector determined that the licensee had personnel breathing zone air samplers (lapel samplers) available; however, the licensee does not reference use of the samplers in station procedures for determining validity of their routine air sampling program in work areas, as recommended in Section 4.2.1.1 of ANSI Standard N13.1-1969. Furthermore, the samplers do not appear to be provided any special care or maintenance other than battery changes and unofficial flow rate verification.

The NRC inspector reviewed the licensee's procedures for calibration and performance verification of self-reading PDs. The licensee had purchased a PD calibrator that uses an NBS traceable source, and implemented procedures providing for a 6-month interval function check of PDs that appear to satisfy NRC Regulatory Guide 8.4 recommendations.

This item (285/8016-05) remains open pending licensee action to:

- . Establish a beta radiation calibration program for portable instruments that satisfies ANSI Standard N323-1978 criteria.
- . Establish a calibration program for portable neutron instruments that utilizes a properly moderated californium-252 source, and that also satisfies ANSI Standard N323-1978 criteria.
- . Establish procedures for the routine use, care, maintenance, and calibration of personnel breathing zone air samplers.

14. Calibration of Process and Effluent Radiological Monitoring Instrumentation

The licensee's program for calibration of process and effluent monitors was reviewed to determine compliance with the recommendations contained in NRC Regulatory Guide 1.21 and ANSI Standards N42.18-1980, ANS-55.4-1979, and ANS-55.6-1979.

Documents Reviewed

- . FCS effluent and process monitor calibration procedures and records for the years 1973 through 1982 of the following instrumentation:
 - . RM-050-1, "Containment Particulate Monitor"
 - . RM-051-1, "Stack and Containment Gas Monitor"
 - . RM-052-1, "Stack Gas Monitor"
 - . RM-053-1, "Component Cooling Water Monitor"
 - . RM-54A, "Steam Generator Blowdown Sample Monitor-A"
 - . RM-54B, "Steam Generator Blowdown Sample Monitor-B"
 - . RM-55, "Monitor Tank Discharge Monitor"
 - . RM-055A, "Overboard Waste Discharge"
 - . RM-056A, "Raw Water Effluent Monitor-A"
 - . RM-056B, "Raw Water Effluent Monitor-B"
 - . RM-057, "Condensate Offgas Monitor"
 - . RM-059-1, "Waste Disposal Auxiliary Steam"
 - . RM-060, "Stack Iodine Monitor"
 - . RM-061, "Stack Particulate Monitor"
 - . RM-062, "Stack Gas Monitor"

Background

NRC Inspection Report No. 50-285/80-16 initially addressed the concerns of the NRC regarding the licensee's effluent and process monitoring instrument calibration program, and as to whether or not representative samples were being obtained by containment and stack monitors (050, 051, 061, and 062) due to the long runs of piping and piping installation methods.

Findings of This Inspection

The licensee did not have appropriate documentation to verify that radioactive effluent and process monitors were being calibrated by a method and with appropriate sources that were traceable to NBS. A review of calibration records for the monitoring instrumentation did not reveal that the following practices as set forth in NRC Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and

Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," and ANSI Standard N42.18-1980, "Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactivity in Effluents," were being implemented by the licensee:

- . ANSI N42.18-1980, Section 5.4.10 specifies that a thorough primary calibration of the entire system shall be performed at least once using a radionuclide (liquid, solid, or gaseous) of known concentration. The radionuclide shall permit calibrating the range of energy and rate capabilities intended for the system. Traceability to the NBS shall be maintained. The calibration shall be related to a secondary source or method which will be used for periodic inplant recalibration. The source-to-detector geometry shall be maintained identical to that established during the primary calibration. The surface dimensions of the secondary source shall be the same as the detector window.

Systems where the concentration of radionuclides change significantly between the sample point and the detector, as in offline particulate monitoring, shall be tested by using radioactive material or a known tracer such as dioctyl phthalate (DOP) to determine the loss in the sample lines.

The NRC inspector determined that most monitor calibrations did not provide for a true representation of the media being monitored, both radiological and physical characteristics, detector to source geometry, energy range, or evaluation of continuancy of the monitoring instrument's readout full-range linearity. The licensee explained that specially prepared sources were being used on several monitors for performance of the required sensitivity checks. The NRC inspector noted that these sources were not traceable to NBS, and that these post calibration sensitivity checks did not provide verification of each instrument's calibration since some checks only verified that the detector did not see/detect any radioactivity.

The NRC inspector did not review the licensee's documentation regarding representative sampling of RM's 050, 051, 061, and 062. This item will be reviewed during a future inspection.

This item (285/8016-32) remains open pending licensee action to:

- . Establish an effluent and process monitor calibration program that provides for verifying full range sensitivity, and linearity of response.
- . Evaluation of effluent monitors RM-050, 051, 061, and 062 ability to provide representative sampling of aerosols.

15. Auxiliary Building Ventilation System

The licensee's program for surveillance, maintenance, and testing of the nonsafety-engineered HEPA filter ventilation system for the auxiliary

building was reviewed to determine compliance with the recommendations of NRC Regulatory Guide 1.140, and ANSI Standards ASME N509-1976 and N510-1975.

Documents Reviewed

- . FCS Drawing 11405-M-2, "Auxiliary Building Heating and Ventilation Flow Diagram"
- . FCS Maintenance Order (MO) 14218, "Change HEPA On V-39 A, B, & C Bank," dated March 31, 1982
- . FCS Auxiliary Building Surveillance Logs
- . IE Information Notice No. 82-43, "Deficiencies in LWR Air Filtration/Ventilation Systems," dated November 16, 1982

The NRC inspector determined by review of documents, site tours, and discussions with licensee representatives that proper instrumentation had been installed on the auxiliary building HEPA filter banks, and surveillance of the filter differential pressure (DP) gauges was being accomplished each shift. The licensee had also changed out the HEPA filters (60 filters) of these units in early 1982; however, the filter changeout did not appear to involve any procedural or documented quality control (QC) activities, or provide for post maintenance testing of the HEPA filter bank. The NRC inspector also noted that the licensee's HEPA filter DP gauge surveillance only provided action limits for high DP (filter plugging) and not for low DP (filter bypass).

The NRC inspector reviewed with the licensee the need to provide a suitable surveillance program, maintenance (including quality control) program, and postmaintenance testing program of HEPA filter units to ensure that radiological protection ventilation systems are functioning as designed, and that ALARA concepts for effluent releases are being adhered to.

The licensee's representatives indicated that the placing of the nonsafety-engineered auxiliary building HEPA filtered ventilation system under a routine inspection and testing program would be investigated further.

The above-noted concerns involving quality controls during maintenance and postmaintenance testing of HEPA filter systems was noted to apply also to the HEPA filtered system installed on the solid waste compaction machine which exhausts directly into the auxiliary building.

This item (285/8016-31) remains open pending licensee action to:

- . Establish a suitable program of surveillance, maintenance, quality control, and testing of HEPA filtered ventilation units, both permanent and temporary, that complies with the recommendations in Regulatory Guide 1.140.

16. Exit Interview

The NRC inspector met with licensee representatives, identified in Section 1, at the conclusion of the inspection on December 3, 1982. The NRC inspector discussed the scope and findings of the inspection. The NRC inspector also expressed the NRC's concern over the fact that of the 18 previously identified findings inspected, the licensee had taken sufficient actions to resolve only 7 of them. The licensee representatives did not wish to make any specific commitments to the inspection findings until issuance of the inspection report, but did indicate that they wished to resolve these outstanding findings as soon as possible.