APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-285/88-05 Operating 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: February 1-5, 1988

Inspectors: R. E. Baer, Radiation Specialist, Facilities Radiological Protection Section, Region IV — Date 3/7/88

for H. D. Chaney, Radiation Specialist, Facilities Radiological Protection Section, Region IV — Date 3/7/88

for R. L. Pedersen, Health Physicist, Radiation Protection Branch, Office of Nuclear Reactor Regulation — Date 3/7/88

Approved: B. Murray, Chief, Facilities Radiological Protection Section, Region IV — Date 3/7/88

Inspection Summary

Inspection Conducted February 1-5, 1988 (Report 285/88-05)

Areas Inspected: Special, unannounced inspection of the radiation protection program including organization and management controls, training and qualifications, and radiological controls.

Results: Within the areas inspected, six violations were identified (failure to: provide a written policy statement for respiratory usage, maintain locked very high radiation area doors, maintain key control of very high radiation area doors, provide radiation protection technicians requalification training, and follow procedures for very high radiation area entries and posting of controlled contamination area; see paragraphs 4 and 5). Program weaknesses are also identified as open items; see paragraph 2.

DETAILS

1. Persons Contacted

OPPD

*R. L. Andrews, Division Manager, Nuclear Production
*A. D. Bilau, Acting Plant Health Physicist
*C. J. Brunnert, Supervisor, Operations Quality Assurance (QA)
M. R. Core, Supervisor, Maintenance
*F. F. Franco, Manager, Radiological Health and Emergency Planning
*J. K. Gasper, Manager, Administrative and Training Services
*W. G. Gates, Manager, Fort Calhoun Station
*W. Hansher, Licensing Engineer
*D. A. Jacobson, Supervisor, Training
W. C. Jones, Senior Vice President
*D. J. Matthews, Senior Engineer, Licensing
*K. J. Morris, Division Manager, QA and Regulatory Affairs
*C. W. Norris, Supervisor, Radiological Services
*T. L. Patterson, Supervisor, Technical
*A. W. Richards, Manager, QA
*G. L. Roach, Supervisor, Chemistry and Radiation Protection (C/RP)
*K. E. Steele, QA Inspector
*M. A. Tesar, Supervisor, Training Services
D. Trausch, Supervisor, Operations
*S. J. Willrett, Supervisor, Administrative Services and Security

NRC

*P. H. Harrell, Senior Resident Inspector
*T. Reis, Resident Inspector
*L. A. Yandell, Chief, Radiological Protection and Safeguards Branch

The NRC inspectors also interviewed several other licensee and contracto employees including C/RP, operations, maintenance, administrative, and training personnel.

*Denotes those individuals present during the exit interview on February 5, 1988.

2. Open Items Identified During This Inspection

An open item is a matter that requires further review and evaluation by the NRC inspectors. Open items are used to document, track, and ensure adequate followup on matters of concern to the NRC inspectors The following open items were identified:

Open Item (285/8805-07): Organization and Position Descriptions - This item involves the lack of position description for certain

radiation protection personnel and updating the Technical Specification organization chart (see paragraph 3).

Open Item (285/8805-08): Radiation Protection Procedures - This item involves the lack of organized and comprehensive radiation protection procedures (see paragraph 3).

Open Item (285/8805-09): Audits/Evaluations - This item involves the lack of a comprehensive audit/evaluation program (see paragraph 3).

Open Item (285/8805-10): Training of Radiation Protection Personnel - This item involves the lack of a systems training program for radiation protection technicians (see paragraph 4).

Open Item (285/8805-11): Backup Radiation Protection Manager - This item involves the use of an unqualified individual to serve as the acting supervisor, C/RP (radiation protection manager) at plant review committee meetings (see paragraph 4).

Open Item (285/8805-12): Contamination Limits - This item involves the lack of contamination limits that are consistent with NRC guidance (see paragraph 5).

Open Item (285/8805-13): Respiratory Protection Program - This item involves the lack of a respiratory protection program that meets the recommendations of Regulatory Guide (RG) 8.15 and NUREG-0041 (see paragraph 5).

3. Organization and Management Controls

The NRC inspectors examined the licensee's organization and staffing and compared it to the requirements contained in 10 CFR 20, Section 12 of the Updated Safety Analysis Report (USAR) and Section 5.3 of the Technical Specifications (TS). The NRC inspectors noted that a recent change of personnel in the radiation protection program had been made. The former Plant Health Physicist (PHP) has been reassigned to the position of ALARA Coordinator. The PHP position is being filled temporarily by the former Radwaste Coordinator. The licensee is currently in the process of selecting a permanent PHP.

The NRC inspectors noted that the official organization is in conformance with Figure 5-2 of the TS. However, the actual working organization has been expanded beyond the organization described in the TS. Specifically, the existence of a special projects group and the use of "Lead Techs" as first line supervision for radiation protection (RP) technicians is not reflected in the TS organizational chart. The official organization shows the PHP as the first line supervision for the RP technicians. Since the TS organization was first established, the scope and complexity of the PHP's responsibilities have grown such that it is now difficult for him to have adequate time to supervise RP technicians. The NRC inspectors noted that the current working organization is similar to radiation protection

organizations at other power reactors. However, since the working organization is not the official organization, no position descriptions or titles have been developed for the lead technician positions. Areas of responsibility and lines of authority for these positions have not been defined.

The fact that the TS do not reflect the actual working organization and that position descriptions have not been developed to define the responsibilities of the lead radiation protection technicians is a program weakness. This is an open item pending licensee action (285/8805-07).

Interviews with the RP technical staff revealed that they do not perceive a correlation between their performance and their opportunity for advancement. The NRC inspectors noted that licensee management had recently made an effort to upgrade the RP technician positions to make them economically competitive. However, administrative difficulties within OPPD have brought this effort to a halt. This situation has been perceived by the staff as a complete freeze on promotions and is causing a negative impact on morale.

The NRC inspectors noted that the plant management has limited authority to allocate resources in the radiation protection area. Expenditure of budgeted funds for supplies and equipment is made at the corporate level. Although support for the program is evident by the quality of some of the larger capital equipment (whole body counter, personnel friskers, etc.), this arrangement has not been effective in procuring the quality and numbers of expendable items (such as protective clothing) needed to support the program. Comments regarding inadequate numbers of protective clothing were noted in the licensee's QA audit (87-QA-453). The use of double disposable booties is taught in the General Employees Training (GET) program because the quality of the boots available do not ensure adequate protection with a single set of booties. This practice is contrary to the minimization of radioactive waste policy. The Supervisor, C/RP is aware of the situation, but has not been successful in procuring booties of adequate quality.

The NRC inspectors found the RP procedures to be fragmented, difficult to follow and generally not being used by plant personnel. Procedures governing radiation protection activities are included as chapters to the Radiation Protection Manual (RP-Manual) which is incorporated as a section of the Plant Operating Procedures. Procedural requirements are found in the general topic chapters of the RP-Manual as well as the chapters dealing with radiation protection procedures, health physics procedures, and radwaste procedures. Additional procedures were also found in Station Standing Orders.

Some procedures were not written in enough detail to ensure that a reasonably knowledgeable individual could follow the procedure and complete the task correctly. In some cases, procedures for a specific task are located in two or three different procedures.

The NRC inspectors noted several cases where a technician performing a task could not identify which procedure controlled the work he was performing or find it in the RP-Manual. The NRC inspectors found the RP technicians to be technically competent; however, the RP program relies too heavily on the working experience of operators and technicians rather than reliance on good quality procedures.

The lack of well organized and comprehensive procedures is a significant program weakness. This is considered an open item pending licensee action (285/8805-08).

The NRC inspectors reviewed the licensee's audit/evaluation program. The inspectors noted that audits had been performed; however, the inspectors expressed concern as to why weaknesses and violations identified in this report were not identified by the licensee. The lack of a comprehensive audit/evaluation program is a significant weakness. This is considered an open item pending licensee action (285/8805-09).

The NRC inspectors interviewed station personnel to determine the cooperation that existed between the various plant groups and the C/RP group. The NRC inspectors determined that while the cooperation between the RP technicians and other plant groups had improved in the past two months there was still room for improvement. The NRC inspectors also noted that there appeared to be a lack of cooperation between RP and other plant groups at the supervisory level.

No violations or deviations were identified.

4. Staff Training and Qualifications

The NRC inspectors reviewed the documents listed in Attachment 1, interviewed licensee personnel, and observed licensee activities to determine whether the licensee's training and qualification program: meets the commitments in the USAR; satisfies the requirements in the TS and 10 CFR Part 19 and 20; and agrees with the recommendations and guidance provided by ANSI/ANS N18.1-1971, 3.1-1983, RGs 1.33, 1.8, 8.15, 8.27, 8.29, and NUREG-0041.

The NRC inspectors reviewed the training department organization, facilities, staff qualifications, goals and objectives, implementing procedures, lesson plans, testing material and its control, records, and schedules, and observed ongoing training activities. The licensee is currently INPO accredited only in the area of reactor operator training, but expects to have the radiation protection, radiochemistry, maintenance, and other remaining training programs accredited in March 1988.

The GET programs (GET 1, 2, and S) for station personnel and visitors/contractors were reviewed for implementing procedures, lesson plan content and objectives, presentation, training facilities, practical work practice demonstration, testing of employee knowledge retention, and training oversight by the Supervisor, C/RP. The licensee's GET-1 was designed for personnel access into the protected area of the plant, but not for access into radiologically controlled areas. GET-2 was designed

for the qualifying of station workers to work in radiologically controlled areas and included respiratory protection equipment training. GET-S was designed for the quick training of personnel that only need site-specific training due to their having completed equivalent GET-2 (radiation worker) at another facility. Both courses 1 and 2 are undergoing modification due to changes in the training staff and an increase in budgeting for the GET programs. A review of the lesson plans, handouts, and video presentations did not reveal any problems. The licensee is constructing a new training facility (with reactor simulator) to replace the present facilities.

On February 1, 1988, the NRC inspectors noted during an inspection of the station's radiologically controlled areas that both plant workers and RP personnel do not follow the basic protective clothing (PC) dressing procedures specified in the GET practical factors class, and that the placement of radiological waste and used PC receptacles at an exit from a controlled surface contamination area (CSCA) did not comply with expected industry radiation protection practices. RP technicians and plant workers were not taping PC openings and wearing the appropriate amount of PC as referenced in GET-2 training sessions. The NRC inspectors noted that the licensee does not routinely post dressing or undressing instructions at the exits. These observations indicate that station personnel are not routinely critiqued on their work practices and that RP personnel do not ensure that radiation protection practices covered during GET are implemented by plant workers.

The implementation of the respiratory protection equipment (RPE) user training program was reviewed for agreement with the recommendations of RG 8.15, NUREG-0041, and ANSI Z88.2. The licensee provides a nonradiological (ANSI Z88.2) as well as a radiological (NUREG-0041) respiratory protection program. The licensee is currently implementing a program for the removal of asbestos insulation within the plant which requires the use of RPE. The NRC inspectors determined that the training program (classroom lecture and video presentation), while providing marginally adequate RPE training for full face air filtered respirators (FF-RPE), was inadequate for the training of personnel to use other equipment, especially self-contained breathing apparatus (SCBA). Interviews determined that all fire brigade personnel during the yearly fire fighters requalification training are required to don and use an SCBA. Discussions with RP personnel whom are part of the stations radiological emergency plan (which provides for the use of SCBAs by emergency teams) determined that not all RP technicians have received SCBA training or have not had to requalify since initial training. The following observations were noted regarding RPE training.

- Instructors providing RPE instruction have not had formal training in the application and use of RPE. The instructors are relying on their previous experience as a user of RPE and have not had sufficient experience in selection and use of RPE other than for airborne radioactive particulate protection (Section 8.1 of NUREG-0041).

- The current GET-2 video tape for demonstrating the donning of PC and a full-face respirator depicted an improper donning and testing of the mask. The mask was readjusted following a successful initial negative test of the mask without an additional negative test of the mask.

- Training does not identify the single person assigned the responsibility and authority at the station for the RPE program. (Section 3.5.2 of ANSI Z88.2, and Section 12.1 of NUREG-0041).

- The RPE training program does not cover the training or special qualifications required for the use of SCBAs.

The licensee's RP technician training program provides a structured training program for qualifying a person with very little RP experience or training as a fully qualified RP technician within 3 years. Formal classroom training is supplemented by a comprehensive on-the-job training (OJT) program (Performance Evaluation Checklist). Experienced RP (2 to 3 years) personnel can be qualified for stand alone shift work within 7 months depending on their experience and managements decision on the amount of supplementary training required for a given individual. The licensee uses oral review boards to supplement testing and OJT. The licensee's contract RP technician selection program is documented in procedures and requires that prospective contract radiation protection technicians pass a screening test and have as a minimum 4000 hours of radiation protection experience, of which 2000 hours (1 year) must be at an operating power reactor, to be considered a fully qualified radiation protection technician. The licensee screens contract technician work history resumes for determining the appropriate amount of time that can be credited to any work experience before determining the contract technician's qualification status.

Even though the licensee has excellent training program implementing procedures for the evaluation, training, and qualification of RP technicians, it was apparent that the amount of continuing and requalification training for the RP technicians as a whole is fragmented due to the fact that the majority of the training is not mandatory. The licensee provides approximately 250 hours of training per year to RP technicians. The licensee had created requalification and continued (special/training) training programs for RP technicians which included the review of industry and station events for presentation during the September through December 1987 training cycle. During this time period, only 2 RP technicians took requalification training, out of an estimated 11 RP technicians that has not been requalified during the past 15 months. Also during this period, only four RP technicians attended the continuing training program on industry and plant events during which time the licensee's problems with the locking of high radiation areas were discussed and reviewed. The licensee indicated that the Supervisor, C/RP had met with the RP personnel and discussed the current high radiation area problems. Training records indicated that not all RP personnel were in attendance at these meetings and that as of January 10, 1988, not all

RP technicians had been officially briefed (documented) on the high radiation area incidents either during staff meetings or by reading of the procedural changes brought about by the incidents.

Section 12.2.2.3 of the USAR states that following the initial training, retraining is done on a recurring basis to maintain and upgrade job proficiency. TS 5.4.1 requires that a retraining program for the plant staff shall be maintained and shall meet or exceed the requirements of Section 5.5 of ANSI N18.1-1971. Section 5.5 of ANSI 18.1-1971 states that a training program shall be established which maintains the proficiency of the operating organization through periodic training exercises, instruction periods, and reviews of those items and equipment which relate to safe operation of the facility. Section 8.2.2 of the Training Program Master Plan 14 (Revision 0, dated July 1, 1987, states that the Radiation Protection Technician will complete the minimum requalification training requirements yearly (not to exceed 15 months) as defined for their current job position.

The NRC inspectors determined on February 4, 1988, that the three individuals involved in the October 14, 1987, January 25, 1988, and February 4, 1988, high radiation area incidents were all RP technicians working in the Radwaste Section. These RP technicians had not been requalified as RP technicians even though they performed RP technician duties in support of radwaste operations that involved high radiation area surveillance, work operation radiological surveys and posting, and ensured compliance with Radiation Work Permit (RWP) requirements. Training records indicated that the elapse time since the last qualification for the three technicians varied between 37, 35, and 18 months.

The failure to maintain the three RP technician's qualification up-to-date is an apparent violation of TS 5.4.1. (285/8805-01).

The NRC inspectors also reviewed the licensee's 1988 training program schedule for plant RP technicians. Based on a review of training records and interviews with RP technicians and training department personnel, the NRC inspectors determined that training on reactor plant systems is not mandatory for RP personnel either as initial qualification training or upgrade training for RP personnel hired before the implementation of the plant systems training program. RP technicians that stand shift alone were not knowledgeable in the reactor plant systems to the extent of how various system's operation can effect plant radiological conditions. A review of training records indicated that most RP personnel had received only plant familiarization training which for the most part involved only the identification of which rooms of the plant contained certain systems. The previous experience of several RP technicians were noted to only involve naval nuclear power plants. The failure to provide plant reactor systems training for RP technicians is considered a significant program weakness in that the lack of such a program does not provide assurance that a RP technician's decisions and actions during all normal and abnormal conditions will be appropriate and ensure the safety of plant personnel.

The lack of a mandatory reactor plant system training program for all RP technicians is a program weakness. This is considered an open item pending licensee action to provide reactor plant system training (285/8805-10).

The NRC inspectors reviewed position descriptions, employee resumes, qualification evaluations, and licensee procedures governing the evaluation of an employee's qualifications. The licensee is committed in TS 5.3.1 to the recommendations in ANSI N18.1-1971. The licensee's RP staff (Supervisor, RP; ALARA Coordinator; Plant HP; Radioactive Waste Coordinator; and 24 RP technicians including 9 contract RP technicians) appear to meet the qualification guidance in Section 4.5.2 of ANSI N18.1-1971. The NRC inspectors noted that the licensee gave too much credit to personnel with U.S. Navy nuclear power, engineering laboratory technician (ELT), experience. The NRC inspectors discussed with the licensee that ELT experience for a standard 6-year tour of duty with the U.S. Navy really only amounts to 4 years of experience of which approximately 2 or more years is primarily radiochemistry work. A review of experience evaluation forms required by Standing Order G-53, "Personnel Certification - TS 5.3," indicated that up to 3 years of experience had been credited to several RP technicians due to their navy ELT experience.

The NRC inspectors noted that all staff personnel (except one trainee and four junior RP technicians) met 2-year minimum experience requirement of ANSI N18.1-1971 for the position of RP technician. Staff assignments were appropriate for the qualifications of the RP personnel. However, it was determined that the Plant Chemist had served as an alternate to the Supervisor, C/RP on the Plant Review Committee (PRC). Since the Supervisor, C/RP (Radiation Protection Manager) is expected to address radiological protection matters during the PRC meetings, it is considered inappropriate that a person with no technical training or professional experience in radiological protection matters, in order to satisfy RG 1.8-1975 criteria, represent the Supervisor, C/RP on the PRC. The use of the Plant Chemist as a radiological protection expert at the PRC meetings is a program weakness. This is considered an open item pending licensee action (285/8805-11).

5. Radiological Controls

a. ALARA Program

The NRC inspectors reviewed the licensee's ALARA program including management policies, assignment and responsibilities, procedures and standards, employee indoctrination and instruction, reviews of design and equipment selection, audits and appraisals, program changes, worker awareness and involvement, goals and objectives, and results and effectiveness to determine adherence to 10 CFR Part 20.1 requirements and guidance in RGs 8.8, 8.10, and 8.27.

The NRC inspectors reviewed the ALARA implementing procedures contained in the RP-Manual, Section 7, "Operational ALARA Program," Revision 6, dated August 28, 1987; training lesson plans; ALARA meeting minutes; ALARA policy statement, Number 9.03, dated August 1, 1984; ALARA committee staffing; ALARA suggestion program; and ALARA design reviews.

The NRC inspectors noted the ALARA policy statement contained in the OPPD Supervisors Manual, Number 9.03, was last updated in August 1984 and did not mention or encourage the Employee ALARA Concern Form to reduce radiation exposures. The NRC inspectors also noted the Employee ALARA Concern Forms receive limited use. If individuals felt strongly about a particular job where radiation exposure might be reduce, they would normally discuss this with their supervisor/foreman.

The ALARA program has not received the full support from plant departments. A procedure had been recommended by the ALARA committee, Draft Standing Order G-59, "Operational Containment Entry Evaluation," which required an evaluation of conditions prior to entry into the containment building, and was sent to the Plant Review Committee (PRC) for approval in April 1985. This standing order had not received PRC approval as of February 1988.

The licensee had made a long term commitment to INPO to reduce the overall person-rem exposure by the year 1991. As part of this commitment, the licensee's corporate management established a station goal of 320 person-rem for 1988. The goal for 1987 was 345 person-rem which was exceeded by 43.5 person-rem due to additional maintenance work during the outage. A comparison of 10 CFR Part 20.407 data for FCS and the national average of all operating pressurized water reactors as contained in NUREG-0713, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors," for the period 1983-87 is tabulated in Attachment 2, Table 1. Table 2 contains a tabulation of work functions that exceeded 5 person-rem in 1987.

No violations or deviations were identified.

b. Radioactive Materials and Contamination Control Practices

The NRC inspectors reviewed the licensee's radiation and contamination control program and implementing procedures for compliance with the requirements of TS 5.11 and 10 CFR Part 20; agreement with the commitments contained in USAR; and the guidance contained in RG 8.4, 8.7, 8.8, 8.10, 8.13, 8.15, 8.27, and Inspection and Enforcement Circular (IEC) 80-14, IEC 81-07, IE Bulletin (IEB) 80-10, IE Interim Position on Evaluation and Controls of Low Level Radioactive Volume Contamination of Materials From Nuclear Power Plants (dated July 17, 1981), IE Information Notice (IEIN) 83-05, and IEIN 85-92.

The NRC inspectors reviewed the licensee's program for the control of radioactive materials released from the control of the licensee for agreement with NRC guidance and regulations. The NRC has issued several documents discussing the inadvertent contamination of a normally nonradioactive plant system (IEC 80-14 and IEB 80-10), the surveying and contamination limits for material to be released from licensee control (IEC 81-07 and IEIN 85-92), and the radiological controls to be exercised over disposal of low-level radioactive waste (IEIN 83-05 and 85-92). The licensee's RP-Manual, radiation protection program implementing procedures, and RP technician training documents provided the following information concerning radiation and contamination limits for materials to be used or released from the plant:

Material	Contamination Limit (loose Surface Contamination)	Radiation Limit (Fixed Contamination)
Skin Decon (HP-18)	none detectable	As low as possible
Personal clothing (RP-Manual 2.22.2)	< 1000 dpm/100cm^2	_____
PC reuse (RP-Procedure 6)	_____	< 10000 dpm/probe
Reuse of RPE (RP-Manual 2.28.2)	< 500 dpm/100cm^2 inside	< 5000 dpm total fixed and loose
RPE Use Required (RP-Manual 2.30.2)	> 20000 dpm/100cm^2	_____
Tools Released to unrestricted area (RP-Manual 3.2.1)	< 100 dpm/100cm^2 alpha < 1000 dpm/100cm^2 beta/gamma	_____ < 5000 dpm total fixed and loose
Waste for Disposal in Uncontrolled Area (RP-Manual 3.2.1)	_____	none detectable
Leaking Packages Received (RP-Manual 6.1.4)	< 1000 dpm/100cm^2	_____
Leaking Source (RP-Manual 6.2.2) (RP-Procedure 17)	< 0.005 uci/swipe equivalent to 11000 dpm/swipe	_____

Shipping Trailer Arrival (RP-Manual 6.4.1)	< 2200 dpm/100cm² beta/gamma < 220 dpm/100cm²	< 0.1 mr/hr (waist high or contact with surface unknown)
Exterior of RAM Shipped (RP-Manual 6.4.1)	Same as above for Trailer Arrival	Varies (10 CFR 71)
Tools for use in Aux. Controlled Area (RP-Procedure 8)	< 2000 dpm	< 2000 dpm
Segregated clean waste (Controlled Unconditional Released, RW-7)	_____	< 1000 dpm/probe

The licensee's release limits do not agree with the NRC guidance, and overall are not consistent with preventing skin contamination at the station. It is noted that alpha contamination limits only apply to materials released from radiological control, but not on RPE or PC to be reused, contamination area posting requirements, RPE use requirements, or for the release of areas following decontamination. The licensee's ability to evaluate surface contamination at very low levels with existing laboratory counting equipment, the limits for loose surface, and also fixed contamination are several magnitudes too high for materials to be released for unrestricted use. The stipulation that RPE is to be used if loose surface contamination limits are above 20,000 dpm is not consistent with the minimization of the use of RPE and does not allow for the practical application of task evaluations in determining the need for RPE. The licensee's lack of consistent and conservative limits on surface and fixed contamination for materials to be worn/used and released by the licensee are significant program weaknesses. This is considered an open item pending licensee evaluation of the contamination control limits (285/8805-12).

The NRC inspectors made several inspections of the auxiliary building to determine the overall effectiveness of the licensee's radioactive material and contamination control program. During these inspections, the NRC inspectors identified several incidents which demonstrate a lack of adherence to procedures and industry practices. Some of the poor practices were:

- Two or more workers were performing the same work function each wearing different types of protective clothing.

- Access control points were established in a manner that required contaminated protective equipment to be placed in receptacles outside the controlled area.

- Used protective clothing was laying in "clean" areas of the radiologically controlled area.

- Frisker stations were not used to control the spread of contamination when exiting from contaminated areas.

TS 5.11.2 requires that areas where the radiation intensity is greater than 1000 millirem per hour (mrem/hr), a very high radiation area, be provided with locked doors to prevent unauthorized entry into such areas. Keys to these very high radiation areas shall be maintained under the administrative control of the shift supervisor on duty and/or the PHP.

On January 25, 1988, at approximately 4:25 p.m. a licensee representative performing a routine tour of the auxiliary building found the door leading to room No. 11 from corridor 4, which housed the liquid waste system filters, locked but not secured (i.e., the lock was in the locked position, but the door was not completely closed to ensure a fully locked door). At the time of discovery, no personnel were in room No. 11.

The licensee had initiated an investigation into this incident in accordance with Standing Order R-4, "Operating Incident Reports." The licensee determined that a radwaste radiation protection technician had removed some spent filters that were inside the room at approximately 2:20 p.m. on January 25, 1988. The technician was not aware that the door was not secured. The licensee's review of security and other records indicated that there had not been any entry into room No. 11 between 2:20 p.m. and 4:25 p.m. on January 25, 1988, while the door was not secured. The licensee informed the NRC senior resident inspector and Region IV of this very high radiation area door incident.

The NRC inspectors' review of this incident determined that the closure system on the door would secure the door, if the door was released from an open position of approximately 1 foot or greater. The lock latch engaged the door frame plate so that the door could not be forced open.

The NRC inspectors reviewed radiation survey results of room No. 11. The radiation levels inside the room, at the door were 8 mrem/hr and approximately 100 mrem/hr at 9 feet from the door. The room contained two filter housing assemblies. The filter housing in service produced radiation levels of about 4000 mrem/hr in the general area with a hot spot of 20,000 mrem/hr. The other filter housing had general radiation levels of about 500 mrem/hr.

The failure to control a very high radiation door is considered an apparent violation of TS 5.11.2 (285/8805-02).

This is a similar violation regarding the failure to control very high radiation areas previously identified in NRC Inspection Report 50-285/87-21, except in the present incident there was no unauthorized entry into the area.

The NRC inspector's review of the January 25, 1988, incident raised questions as to why the radwaste radiation protection technician did not sign out the very high radiation area key from the radiation protection shift technician's key box. Discussions with licensee representatives indicated that four keys, identified as key "911", a master type key to the auxiliary building doors had been given to various plant personnel during initial operation of the plant. Keys were recovered from the ALARA coordinator, PHP, acting radwaste coordinator, and a radwaste radiation protection technician. These keys were not issued to these specific individuals, as they were not required to sign a key control record, but rather given to them. The NRC inspectors discussed with members of the radiation protection staff the controls for "911" keys, and it was determined that individuals acting in the capacity of shift leader during refueling/maintenance outages had also been given these keys. The NRC inspectors asked a few individuals to check and see if they had a "911" key. As a result of these inquiries, a fifth key was returned on February 4, 1988, that a RP technician forgot he had at home.

The NRC inspectors expressed concern that the licensee had not performed an in-depth investigation of keys that had been issued or given to personnel and had not made a serious attempt to recover these keys. The NRC inspectors were informed that supervisory maintenance personnel also had been issued or given a master key for the auxiliary building doors, the NRC inspectors were not able to confirm this. The licensee had not determined how many "911" keys were initially made nor performed an investigation to determine if other keys were unaccounted.

The failure to maintain a positive administrative control for all keys with access to very high radiation areas is considered an apparent violation of TS 5.11.2 (285/8805-03).

During an inspection of the auxiliary building with the PHP on February 4, 1988, the NRC inspectors noted at approximately 11 a.m. a RP technician had exited room 25, the railroad loading and unloading area a posted very high radiation area, and failed to close and lock the door. The RP technician had travelled approximately 20 feet from the door when the NRC inspectors brought this situation to the attention of the PHP. The PHP discussed the NRC inspectors concern with the RP technician, in the presence of the NRC inspectors, to

determine the exact status of what appeared to be an unattended, unlocked, very high radiation area door.

The NRC inspectors determined that the RP technician had left the door unlocked because another RP technician was still in room 25. The PHP reminded the RP technician of the 2-man rule that had been established for very high radiation areas and instructed the individual to return to room 25 immediately.

TS 5.11 states that procedures for personnel radiation protection shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure. Procedure RPM, Section 3.0, "Area Control," Revision 20, dated January 26, 1988, paragraph 3.1.7.2.b.1, states that with the exception of emergency operator entry, a second person shall always accompany any entry by a qualified RP technician into a very high radiation area. The second person may or may not cross the very high radiation area boundary but, in all cases, the two persons must maintain line-of-sight or other communications while one or both persons remain within the very high radiation area.

The failure to maintain line-of-sight or other communications with an individual that remained in a posted very high radiation area is considered an apparent violation of TS 5.11 (285/8805-04).

TS 5.8.1 states that written procedures and administering policies shall be established, implemented, and maintained that meet or exceed the minimum requirements of Appendix A of USNRC RG 1.33. Section 7.e.4 of Appendix A to RG 1.33 states that radiation protection procedures should be written to cover contamination control. The licensee established Procedure HP-9, "Contamination Control," Revision 2, dated July 2, 1985, and in Section C.1.c.1 requires that controlled surface contaminated areas be conspicuously posted and an appropriate control point established if access is required.

On February 3, 1988, the NRC inspectors noted inadequate posting of a controlled surface contaminated area in Room 23 that contains spent regenerate tanks and pumps. A temporary barrier rope was observed on the floor with a posting sign lying face down. This condition was brought to the licensees attention on February 3, 1988, at approximately 3 p.m. The NRC inspectors observed the same condition and brought it to the licensees attention a second time, at approximately 9 a.m. on February 4, 1988.

The licensee's representative stated that a RP technician had attached the barrier rope and posting sign to the wall on February 3, 1988, but evidently it had come loose again. The failure to conspicuously post a controlled surface contaminated area is an apparent violation of TS 5.8.1 (285/8805-05).

c. Respiratory Protection

The NRC inspectors reviewed the licensee's management controls regarding the respiratory protection program to determine compliance with 10 CFR Part 20.103 and the recommendations in RG 8.15 and NUREG-0041. When respiratory protection equipment is used to limit the inhalation of airborne radioactive material, 10 CFR 20.103(c) requires that the licensee implement a respiratory protection program. Several procedures are in place to cover the elements of a program; however, no overall controlling procedure has been issued. The NRC inspectors noted that Standing Order T-11, "Respiratory Protection Program," has been recently deleted and not replaced.

10 CFR Part 20.103 requires programs for the use of respiratory protection equipment (RPE) to comply with certain criteria when the allowing credit for the established protection factors for a given piece of equipment during exposure to airborne radioactive materials. 10 CFR Part 20.103(c) requires that when respiratory protective equipment is used to limit the inhalation of airborne radioactive material, the licensee may make allowance for this use of respiratory protective equipment in estimating exposures of individuals provided that a written policy statement on respirator usage is issued. Section C.1 of RG 8.15 recommends that a written policy statement on respirator usage is to be issued from a high management level and that strong management backing is considered essential to an adequate respiratory protection program. Section 3.2 of NUREG-0041 states that no respiratory protection program is considered adequate without a written policy statement on respirator usage issued from a sufficiently high management level to ensure that its provisions may be adequately enforced.

Contrary to the above, the NRC inspectors determined on February 4, 1988, that the licensee had not issued a written policy for the respiratory protection program. The failure to issue a written policy for the respiratory protection program is an apparent violation of the requirements of 10 CFR Part 20.103(c)(3) (285/8805-06).

The NRC inspectors reviewed the OPPD Supervisors Manual, Nuclear Production Division Policy and Procedures, Station Standing Orders, RPM, Job/Position descriptions, and interviewed C/RP management and technical staff to assess the effectiveness of management oversite in this area. The following concerns were identified:

- NUREG-0041 recommends that one individual be vested with the responsibility of maintaining the respiratory protection program required by 10 CFR 20.103(c)(2). This respiratory protection supervisor should oversee the day-to-day operation of the program. Interviews with the Supervisor, C/RP revealed that he is also the supervisor of respiratory protection. It appears that the duties of supervising the entire C/RP group does not

provide adequate time to run an effective respiratory protection program.

- Respiratory protection equipment is provided on a self-serve basis to workers. Particulate filter respirators as well as SCBA are placed in open racks at the entrance to the radiation controlled area. Additional SCBA air bottles are located in an adjoining rack. This self-service issuance of respiratory protection equipment is a poor practice since it does not provide adequate controls to ensure that the user is qualified to use the equipment or that the equipment is maintained in proper working condition.

- The NRC inspectors noted two SCBA air bottles in the issue rack that should have been removed from use. One bottle was past due on the Department of Transportation 5-year hydrostatic pressure test requirement. The other bottle had taken a blow to the outlet nozzle damaging its threads and potentially compromising its structural integrity. If used in an emergency situation, either of these bottles could pose a significant threat to the user's life. Both SCBA bottles in question were eventually removed from service by placing a red tag on each. The procedure used to tag the bottles was Standing Order T-13, "Quality Control Program for Chemistry and Radiation Protection Equipment." T-13 requires that instruments without a valid calibration sticker be red tagged. This description does not adequately describe the damaged condition of the two SCBA bottles.

  The person in charge (Supervisor, C/RP) of the respiratory protection program lacks the necessary experience and technical training as recommended in Chapter 12 of NUREG-0041.

  Procedures for refilling SCBA bottles do not reference the verification that bottles are within the hydrostatic test period limitations prior to filling the high pressure SCBA bottles. (49 CFR Part 173.34)

  Procedures do not adequately address the respiratory protection equipment quality control, maintenance, and hazard evaluation programs (chemical, radioiodine, and particulate) as recommended in Chapters 4, 9, and 10 of NUREG-0041.

  Procedures do not adequately address the performance aspects of periodic inspection for stored respiratory protection equipment as recommended in Chapter 10 of NUREG-0041.

  The respiratory protection program does not provide for a periodic evaluation of the effectiveness of the respiratory protection program to ensure that all aspects are being

conducted in accordance with industry standards and applicable federal regulations as recommended in Chapter 12 of NUREG-0041.

The lack of a comprehensive and organized respiratory protection program is a significant weakness. This is considered an open item pending licensee action (285/8805-13).

6. Exit Interview

The NRC inspectors met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection of February 5, 1988. The NRC inspectors summarized the scope of the inspection and discussed the inspection findings.

DOCUMENTS REVIEWED DURING
NRC INSPECTION 50-285/88-05

TITLE	REVISION	DATED
Nuclear Production Division Organization Chart	0	01/01/88
Chemistry and Radiation Protection Group Position Descriptions (25)		
Chemistry and Radiation Protection Group Employment Resumes (25)		
HP Departmental Meeting Minutes for 10/13/87 meeting		10/27/87
HP Departmental Meeting Minutes for 10/16/87 meeting		10/27/87
ALARA Committee Meeting Minutes for 1/7/88 meeting		01/12/88
Radiation Work Permit 88-033-4		01/18/88
FCS Standing Orders		
G-5, Plant Review Committee	41	10/19/87
G-31, Posting of Notice to Workers	2	10/19/87
G-53, Personnel Certification Technical Specification 5.3	2	02/06/86
G-57, Installation of Temporary Lead Shielding	4	09/02/87
G-64, Medical Examination Program for Worker Qualification	10	09/04/87
G-69, FCS Asbestos Abatement	2	03/25/87
O-26, Plant Keys	14	08/24/87
T-1, Radiation Protection Manual	3	03/31/81
R-4, Operating Incident Reports	12	08/04/87
FCS Radiation Protection Manual		
Sections 1 thru 11		
RPP-1, RP Procedure for Radioactive Spills	8	08/20/87
RPP-2, RP Procedure for Control Area Injury	7	12/18/84

RPP-3, RP Procedure for Control Area Fire	6	10/19/77
RPP-4, RP Procedure for Possible Inhalation or Ingestion Hazards (Airborne Radioactivity)	6	10/19/77
RPP-5, RP Procedure for High Radiation Area Alarm	6	10/19/77
RPP-6, RP Procedure for Protective Clothing and Respiratory Equipment Cleaning	12	12/22/86
RPP-6c, Respirator Washer and Dryer	0	08/24/87
RPP-8, Radiological Decontamination	14	03/25/87
RPP-13, Recharging SCBA Cylinders	1	09/18/79
RPP-17, Radioactive Source Log Maintenance Use	3	10/08/86
RPP-20, Radiation Work Permits (RWP)	8	07/13/87
RPP-22, Controlled Use of Respiratory Equipment	1	02/23/87
HP-2, Respirator Fit Test Quantitative Polydispersed Aerosol Test	6	08/10/87
HP-4, Radioactive Source Control	2	09/23/83
HP-7, Annual Review of Personnel Authorized to Wear Respirators	6	07/02/87
HP-9, Contamination Control	2	07/02/85
HP-11, Whole Body Frisking	1	09/27/85
HP-16, Selection of Contract HP Technicians	1	07/13/83
HP-18, Personnel Decontamination	2	03/20/86
HP-20, Compressed Breathing Air Quality Surveillance	1	02/28/84
RW-7, In-Plant Collection and Disposal of Radioactive Waste	2	03/12/87

Nuclear Training Department Procedures/Documents

TOP-1, Qualification and Certification of Instructural Staff	2	05/01/87
TAP-1 CRPI, Qualification and Certification of Chemistry and Radiation Protection Instructor	2	04/30/87

TAP-1 GETI, Qualification and Certification of General Employee Training Instructor	2	04/30/87
TAP-2, Training Program Requirements: Identification, Analysis, Approval, and Authorization	2	10/29/87
TAP-6, Evaluation of Training Program Effectiveness	2	10/26/87
TAP-8, Examination Control and Administration	3	05/28/87
GAP-9, Maintenance of Training Records	2	04/28/86
TAP-10, Lessons Learned - Inputs to Training Programs - Required Reading Program	3	05/15/87
TAP-12, Conduct of On-the-Job Training	2	10/26/87
TAP-17, Review of Training Programs	2	10/23/87
TAP-27, Evaluation of Instructor Effectiveness	1	12/02/87
General Employee Training Level I Handout	1	01/20/87
General Employee Training Level II Handout	4	10/19/87
General Employee Training Level S Handout	1	10/15/87
Memorandum, FC-T-984-87, D. Jacobson to G. Roach, Subj: Identification of Short and Long Term Training Goals for Radiation Protection Based on the Incumbent Matrix Exam, dated November 19, 1987.		
Memorandum, FC-T-058-88, D. Jacobson to G. Roach, Subj: 1988 C/RP Training Schedule, dated January 21, 1988		
17 Lesson Plans for GET, Radiation workers and HP Technician Training		
Internal Audit Report #58, Health Physics and ALARA		12/02/87

TABLE 1

COMPARISON OF FORT CALHOUN STATION'S ANNUAL PERSON-REM EXPENDITURE TO NATIONAL SINGLE REACTOR PERFORMANCE

Year	1983	1984	1985	1986	1987
PWR Average	592	556	427	392	--
Fort Calhoun	433	563	632	74	338.5

TABLE 2

WORK FUNCTIONS THAT EXCEEDED
5 PERSON-REM IN 1987

Job Description	Person-Rem
Steam Generator (S/G) Eddy Current Testing	5.945
Install S/G Nozzle Dams	14.804
Remove Reactor Vessel Stud Plugs	5.307
Remove/Replace Reactor Coolant Root Valves	21.508
Decontaminate Upper and Lower Cavity	12.295
Fuel Transfer in Containment and Fuel Pool	5.872
Routine Health Physics Coverage in Containment	30.486
Pressurizer Spray Valve Upgrade	11.599
Remove/Replace Insulation for ISI Inspection	12.218
Radwaste Preparation and Shipment	14.978
S/G Blowdown Line Insp., Annulus Insp., Sludge Lance	20.638