ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/96-15
50-368/96-15

Licenses: DPR-51
NPF-6

Licensee: Entergy Operations, Inc.
1448 S.R. 333
Russellville, Arkansas

Facility Name: Arkansas Nuclear One, Units 1 and 2

Inspection At: Russellville, Arkansas

Inspection Conducted: February 26-29, 1996

Inspector: Michael P. Shannon, Radiation Specialist
Plant Support Branch

Approved: Blaine Murray 3/13/96
Blaine Murray, Chief, Plant Support Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the licensee's radiation protection program, which included the following activities: audits and appraisals; program changes; planning and preparation; training and qualifications; external exposure controls; internal exposure controls; control of radioactive materials and contamination, surveys and monitoring; maintaining occupational exposure as low as is reasonably achievable (ALARA); and a review of the updated final safety analysis report.

Results (Units 1 and 2):

Plant Support:

- Quality assurance surveillances were good management tools, which provided a good insight into the radiation protection organization performance. The two year rotational assignment program to develop professional level personnel from the radiation protection department as quality assurance auditors was a program strength (Section 2.1).

- The condition reporting system was appropriately used by the radiation protection organization to identify and correct problems (Section 2.1).

- The ALARA organization was actively involved in radiological work planning activities. Good pre-job briefings and appropriate radiological controls were discussed during ALARA briefings (Section 2.3).

- A good continuing training program was in place for radiation protection personnel. Radiation protection management was effectively involved in the radiation protection training program (Section 2.4).

- The external exposure control program was well implemented and maintained. High radiation area and locked high radiation area controls were effective (Section 2.5).

- Housekeeping within the radiological controlled area was good (Section 2.5).

- Internal exposure controls were effectively maintained and implemented (Section 2.6).

- Good programs were in place concerning radiation surveys, personnel contamination monitoring equipment and contamination controls (Section 2.7).

- Overall, an effective ALARA program was maintained (Section 2.8).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

During the inspection period, Unit 1 operated at 100 percent power and Unit 2 operated at 98 percent power.

2 OCCUPATION RADIATION EXPOSURE CONTROL (83750)

The licensee's program was inspected to determine compliance with Technical Specifications and the requirements of 10 CFR Part 20, and agreement with the commitments of Chapter 12 of the Final Safety Analysis Report.

2.1 Audits and Appraisals

The inspector reviewed the licensee's surveillance, condition report and radiological information reporting programs, to determine the effectiveness of oversight of radiation protection activities. Particular attention was devoted to the licensee's self-assessment programs that identified and corrected programmatic weaknesses. The quality and timeliness of the responses to assessment findings were also reviewed.

2.1.1 Audits

The most recent audit of the radiation protection program was performed during February and March of 1995. This audit was reviewed during a previous NRC inspection. The licensee was in the process of performing an audit of the radiation protection program for 1996 during this inspection.

2.1.2 Surveillance Reports

The inspector reviewed the following quality assurance surveillance reports issued by the licensee's quality assurance department that involved radiation protection activities.

- Surveillance Report 95-028, "ALARA Plans," dated September 14, 1995.
- Surveillance Report 95-026, "Response Checks of Radiation Protection Instrumentation," dated October 30, 1995.
- Surveillance Report 95-035, "ALARA Plan Implementation," dated October 31, 1995.

The inspector determined that appropriate reference procedures and guidance documents were used to perform the above surveillances. The surveillances were balanced and provided a thorough review of that portion of the radiation protection program being reviewed.

The inspector noted that the surveillances were conducted to answer condition report findings. The licensee's quality assurance supervisor stated that due

to man-power restraints the remainder of radiation protection surveillances scheduled for 1995 were re-scheduled for 1996 to accommodate closing action items from condition reports. The inspector reviewed the quality assurance's radiation protection surveillance schedule for 1996 and determined the areas identified were appropriate to ensure a thorough review of the program.

In addition to performing an independent review of the radiation protection program, the inspector noted that the quality assurance department solicited areas that the radiation protection organization believed needed to be reviewed.

The inspector reviewed the qualification of the quality assurance personnel assigned to perform surveillances of radiation protection activities. The inspector determined that these individuals had a good understanding of radiation protection practices enabling them to assess radiation protection performance. The inspector noted that the licensee had established a two year rotational assignment program to develop personnel from the radiation protection department to qualify as quality assurance auditors. The inspector determined the rotational assignment program was a strength.

2.1.3 Condition and Radiological Information Reports

The licensee's corrective action program consisted of (1) the condition reporting system and (2) the radiological information reporting system. The condition reporting system was an upper level system used by the plant to report and track significant station wide issues of all types. The radiological information reporting system was used to track and trend less significant radiological issues.

Selected examples of both reporting systems were reviewed by the inspector. The inspector noted no adverse trends in the radiation protection program during the review of these reports. The inspector determined that the condition reporting system was effectively used by the licensee to identify, track, and resolve radiological issues.

During the review of selected radiological informational reports, the inspector noted some examples of repeat problems. One such example was radiological information reports, 95-136, 95-137, 95-138 and 95-141 which were written within three weeks of each other. These radiological information reports pertained to the failure to process air samples in accordance with plant procedures. The inspector noted that the immediate corrective actions addressed each radiological information report individually, but that there were no additional corrective actions which addressed programmatic weaknesses. When this was discussed with radiation protection management, they stated that they had recognized this weaknesses in their evaluation process of some radiological information reports and planned to re-evaluate the process.

2.2 Changes

The inspector interviewed licensee personnel to determine if there had been major changes since the last inspection, in organization, personnel, facilities, equipment, programs, and procedures.

The inspector concluded that there had been no major changes in organization, personnel, facilities, equipment, programs, and procedures other than the implementation of the use of electronic, alarming dosimeters and computerized access system for entering the radiological controlled area.

2.3 Planning and Preparation

The inspector discussed planning and preparation activities with representatives in the radiation protection organization. The inspector also reviewed ALARA job packages for completeness and the inclusion of lessons-learned from previous similar work.

Based on discussions and field observations, the inspector determined that the radiation protection department provided proper staff, equipment, and protective clothing to support radiological work activities.

The inspector reviewed Unit 2, ALARA job packages for the removal/replacement of steam generator manways including, platform activities and full and partial entries which was estimated to involve 55 person-rem, and reactor head removal/replacement work which was estimated to involve 9.5 person-rem. The inspector determined that both ALARA job packages were complete and thorough. Past lessons learned from the industry and the site were evaluated in the development of the ALARA packages.

In discussions with the ALARA supervisor, the inspector determined that for radiological work activities, the ALARA organization was involved in the early planning stages to allow adequate time to research and provide meaningful input into the work package to ensure that proper ALARA practices were implemented.

The radiation protection department had assigned two ALARA radiation protection representatives, one for each unit, to work with the plant's planning department. These individuals worked with the maintenance planners incorporating ALARA considerations in the maintenance work packages during the developmental stage of the packages. Additionally, these individuals wrote radiation work permits for scheduled work, utilizing historical radiological data, and lessons-learned from previous similar work.

The inspector attended the Unit 1 daily plant status meeting and noted good exchange of information among all groups. Radiation protection representatives provided person-rem status and discussed support for work to be performed in the radiological controlled area.

The licensee made an entry into the Unit 1 reactor building to remove some equipment that was needed in support of another licensee's refueling outage. The inspector attended the pre-job briefing for the entry and noted that in addition to the workers and supervisors who were involved in the task, industrial safety representatives were also present and provided meaningful input during the briefing. The inspector noted that the radiation protection supervisor provided a thorough review of the radiation work permit and ALARA considerations required for the task. There was a good exchange of ideas and comments among all individuals at this briefing.

2.4 Training and Qualifications

The inspector reviewed the radiation protection continuing training program, professional development of the radiation protection personnel and training staff qualifications.

2.4.1 Radiation Protection Technician Continuing Training Program

The inspector determined, by review of the summary of continuing training topics and selected examination material, that continuing training content was appropriate. A continuing training schedule was developed for 1996, and included discussions of current industry and site events, technical issues, new equipment topics, and the review of certain plant procedures. The inspector noted that the radiation protection manager was appropriately involved in the continuing training program and approved all lesson plans. The inspector noted that approximately 30 percent of the radiation protection staff had received certification by the National Registry of Radiation Protection Technologists.

2.4.2 Training Staff Qualifications

From interviews held with instructors in the training department, responsible for providing training to the radiation protection staff, the inspector determined that the staff had many years of health physics, technical and operational field experience. The inspector noted that the training staff did not routinely work with the plant radiation protection organization during non-outage conditions in an effort to assess the effectiveness of the continuing training program. When this was discussed with licensee representatives they stated that they would re-assess that portion of the program.

The radiation protection department assigned a management level individual on a 18 month rotational assignment to the training department. This helped to ensure that the training department was involved and updated with the plant's radiological work practices. The inspector determined that this was a program strength.

2.5 External Exposure Control

The inspector reviewed the external exposure control program, which included: personnel dosimetry program, access control, posting and labeling, radiation work practices and procedures, licensee supervisory oversight of radiological work activities, control of high radiation areas and locked high radiation area key control. Additionally, the inspector conducted several independent radiation surveys within the radiological controlled area and protected areas to verify that these areas were properly surveyed, posted, and controlled.

2.5.1 Dosimetry Controls

The inspector verified that individuals entering the radiological controlled area wore the required personnel monitoring devices. Electronic dosimetry was worn by all workers observed in the radiological controlled area. All workers questioned by the inspector were knowledgeable of the proper response to the electronic dosimeter alarms.

The inspector noted that Arkansas Nuclear One processed dosimetry for all Entergy sites. The licensee was certified in all eight National Voluntary Laboratory Accreditation Program processing categories to process thermoluminescent dosimeters. The inspector reviewed the results of the licensee's 1995 third and fourth quarter thermoluminescent dosimetry blind spiking test and noted no problems with the program.

The inspector reviewed the process used to resolve discrepancies between thermoluminescent dosimetry and self reading dosimetry and noted no problems.

2.5.2 Access Controls

The inspector reviewed the access control requirements, including selected radiation work permits. The radiation work permits reviewed by the inspector were written clearly, easy to read, and understand.

The licensee used electronic dosimetry to monitor all personnel entering the radiological controlled area. The inspector determined by interviews with workers and observation that the electronic access control system was a user friendly system. Personnel were aware of their dose limits and electronic dosimeter alarm settings.

2.5.3 Posting and Labeling

The inspector conducted several tours of the radiological controlled area and performed independent radiation measurements to confirm the appropriateness of radiological postings. All high radiation areas and locked high radiation areas were found to be appropriately surveyed, controlled, and posted in accordance with regulatory requirements.

The inspector noted, during the initial tour of the radiological controlled area, that only one of seven radiological information signs, designed to have flashing lights and alert workers of low dose waiting areas, were operational. During later tours, all radiological informational signs were found operational.

All radioactive material containers/packages observed by the inspector were properly marked, posted and controlled.

2.5.4 High Radiation Areas, and Housekeeping

The inspector determined that appropriate access control had been established for high radiation areas greater than 100 millirem per hour. Appropriate barricades and postings were found to be in place. Locked high radiation area control, required for areas greater than 1000 millirem per hour, was effective, and all doors challenged by the inspector were found to be secured.

The inspector noted that housekeeping conditions in the radiological controlled area were acceptable.

2.5.5 Locked High Radiation Area Key Control

The inspector reviewed the program for locked high radiation area key control and performed an inventory of all locked high radiation area and very high radiation area keys. The inspector reviewed a number of monthly locked and very high radiation area key inventory sheets and noted no discrepancies with the inventory. A review of the radiological information reporting summary had not identified unauthorized entries into these areas during this inspection period. During the inventory the inspector identified that there was a duplicate key to the Unit 1 refueling canal lock that was not accounted for on the inventory sheet. When this was identified to the licensee representatives, they took appropriate, timely action to resolve the discrepancy.

2.6 Internal Exposure Control

The inspector reviewed the internal exposure control program, including: use of respiratory protection equipment, whole-body counting program, air sampling and air filtration use.

At the time of this inspection, the licensee had not identified any elevated whole-body counts that required an internal dose assessment as a result of radiological work. No respirators had been issued for protection against airborne radioactive materials for radiological related work at the time of this inspection.

During tours of the radiological controlled area, the inspector observed that the licensee had established appropriate air sampling equipment and air filtration units in the work place. In addition to job-specific air samplers, the licensee also had appropriately positioned continuous air monitors throughout the radiological controlled area. The inspector observed that all air sampling equipment located in the work place had current calibration dates. Air filtration units had been placed in some potentially high contaminated areas to ensure worker safety.

2.7 Control of Radioactive Materials and Contamination, Surveys and Monitoring

Areas reviewed by the inspector included: adequacy of the surveys necessary to assess personnel exposure; proper use of personnel contamination monitors and friskers; supply, maintenance, calibration, and performance testing of portable radiation detection instrumentation; and the control of contaminated areas.

2.7.1 Surveys and Use of Portal Monitors and Whole Body Friskers

The inspector reviewed a number of radiological surveys performed in both units and noted that all surveys were written in a clear and consistent manner. High radiation area and contaminated boundaries were properly identified. Although, some of the workers interviewed by the inspector stated that there was too much information on the survey maps and they found them difficult to read at times.

The inspector noted that personnel contamination monitors and whole body counters were properly maintained and performance checked. The inspector noted that this equipment was properly used by radiological workers.

2.7.2 Portable Instrument Performance Testing and Contamination Controls:

The inspector examined a number of portable radiation survey instruments in use and found that all instrumentation was calibrated and had been properly performance checked.

The licensee provided good controls to prevent the spread of radioactive contamination. Contaminated areas were posted and marked with tape or rope. Step-off pads were placed at the entrances and exits to these areas to alert workers to a change from a contaminated area to a non-contaminated area. The undressing areas were neatly kept to prevent inadvertent spread of contamination. After leaving a contaminated area and removing potentially contaminated protective clothing, appropriate radiological instruments were maintained for workers to check their hands and feet for contamination. Personnel contamination monitors were used to detect radiological contamination or potential intakes when personnel exited the radiological controlled area. Monitoring equipment was performance checked and had current calibration stickers.

2.8 Maintaining Occupational Exposure ALARA

The inspector reviewed ALARA committee activities, selected ALARA work packages, hot-spot reduction program, temporary shielding program, and the ALARA-improvement program.

2.8.1 ALARA Committee and Work Packages

The inspector reviewed the minutes of meetings for the third and forth quarters of 1995 and determined that the committee was fully supported by all plant departments. Meeting minutes were documented and distributed in a timely manner and the committee was appropriately involved with the plant's exposure setting goals and monitoring of these goals.

All ALARA work packages reviewed by the inspector were determined to be thorough and included such items as pre-job briefings, radiation work permit recommendations, and specific ALARA concerns. Lessons learned for previously performed site work and industry experiences were incorporated in the work package. ALARA work packages reviewed by the inspector indicated that adequate ALARA evaluations were routinely performed.

2.8.2 Hot-Spot Reduction and Temporary Shielding Programs

The inspector reviewed the radiation protection monthly hot spot trending reports for November and December of 1995. During this time, the ALARA group had worked with operation personnel from both units in the successful reduction of a number of hot spots. At the end of 1995, the licensee identified a total of 17 hot spots, 12 in Unit 1 and 5 in Unit 2. Hot spots were updated during routine surveys performed by the radiation protection personnel.

During tours of the radiological controlled area, the inspector noted that temporary shielding was used as part of the licensee's comprehensive ALARA program.

2.8.3 ALARA Improvement Program

The inspector reviewed the status of suggestions submitted to the ALARA improvement program. The licensee had received 25 suggestions for 1995. All suggestions received had been evaluated in a timely manner. The inspector interviewed licensee individuals from various plant departments, such as operations and maintenance. The inspector asked the individuals questions pertaining to the ALARA improvement program. The inspector received comments which indicated that some workers were not familiar with certain features of the ALARA improvement program. After reviewing comments about the ALARA improvement program with the licensee, the radiation protection representative stated that he would review the effectiveness and implementation of the program.

The inspector noted that each plant department selected an individual as an ALARA representative. These representatives solicited ways to improve the ALARA program from members of their departments and brought the ideas to the monthly ALARA representative meetings. The inspector determined this a program strength.

2.9 Review of The Updated Final Safety Analysis Report Commitments

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR descriptions. While performing the inspection discussed in this report, the inspector reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspector verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

The inspector reviewed selected topics presented in Section 12.3, "Health Physics Program," of the UFSAR to ensure agreement with commitments. The following areas were reviewed: program and staff organization; radiation protection program; radiation protection facilities; portable survey instrumentation; and radiation and contamination surveys. No deviations to commitments of the UFSAR were identified by the inspector.

ATTACHMENT

1 PERSONS CONTRACTED

1.1 Licensee Personnel

B. Allen, Unit 1 Maintenance Manager
J. Bacquet, Health Physics Supervisor
B. Bement, Radiation Protection/Chemistry Manager
B. Bishop, Radwaste Supervisor
T. Chilcoat, Health Physics Supervisor
S. Cotton, Training/Emergency Preparedness Manager
D. Deal, ALARA Supervisor
R. Edington, Unit 1 Plant Manager
R. Espolt, Events Analysis Manager
D. Mims, Nuclear Safety Director
S. Pyle, Licensing Specialist
M. Ruder, Assessment Specialist
J. Smith, Health Physics Operations Superintendent
D. Snellings, Radiation Protection Technical Support Superintendent
B. Starkey, Health Physics Supervisor
D. Wagner, Quality Assurance Supervisor
L. Waldinger, General Manager Plant Operations

1.2 NRC Personnel

T. Andrews, Radiation Specialist, Region IV
K. Kennedy, Senior Resident Inspector, Region IV

The above individuals attended the exit meeting on February 29, 1996. In addition to the personnel listed above, the inspector met and held discussions with other personnel of the licensee's staff during the inspection.

2 EXIT MEETING

An exit meeting was conducted on February 29, 1996. During this meeting, the inspector reviewed the scope of the inspection. The licensee did not express a position on the inspection documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspector.