



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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June 3, 2003

Mr. Harold B. Ray, Executive Vice President
Southern California Edison Co.
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, California 92674-0128

SUBJECT: NRC INSPECTION REPORT 050-00206/2003-08

Dear Mr. Ray:

An NRC inspection was conducted on May 5-8, 2003, at your San Onofre Nuclear Generating Station, Unit 1 facility. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspection included an examination of selected procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of that inspection.

Overall, the inspection determined that you are conducting decommissioning activities in compliance with regulatory and license requirements, with one exception. Based on the results of this inspection, the NRC identified a violation involving your failure to conduct continuous sampling during operation of the plant ventilation stack. The violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the San Onofre Nuclear Generating Station facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Southern California Edison Co.

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Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Mr. Robert J. Evans, Senior Health Physicist, at (817) 860-8234.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Docket No.: 50-206
License No.: DPR-13

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NRC Inspection Report
050-00206/2003-08

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No: 50-206

License No: DPR-13

Report No: 050-00206/2003-08

Licensee: Southern California Edison Co.
P.O. Box 128
San Clemente, California 92674

Facility: San Onofre Nuclear Generating Station, Unit 1

Location: San Clemente, California

Dates: May 5-8, 2003

Inspectors: Robert J. Evans, PE, CHP, Senior Health Physicist
Fuel Cycle & Decommissioning Branch

Thomas W. Dexter, Physical Security Inspector
Fuel Cycle & Decommissioning Branch

Approved By: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Inspection Information

ADAMS Entry: IR05000206-03-08 on 05/05/2003 - 05/08/2003; Southern
California Edison Co., San Onofre Nuclear Generating Station;
Unit 1. Decommissioning Report. 1 NCV.

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Unit 1 NRC Inspection Report 050-00206/2003-08

This inspection was a routine, announced inspection of decommissioning activities being conducted at San Onofre Nuclear Generating Station, Unit 1. The inspection included a review of the safety review and design change program, the spent fuel pool, maintenance and surveillance activities, decommissioning performance and status review, occupational radiation exposures, and physical security program. Overall, the licensee was conducting decommissioning in accordance with regulatory and procedural requirements, with one exception (discussed below).

Safety Reviews, Design Changes, and Modifications

- The licensee's safety review and design change program was in compliance with 10 CFR 50.59 requirements (Section 1).

Spent Fuel Pool Safety

- The licensee was maintaining the spent fuel pool within permanently defueled technical specifications and procedural requirements (Section 2).

Maintenance and Surveillance

- Surveillance testing of the plant ventilation stack radiation monitor was conducted in accordance with procedural requirements (Section 3).

Decommissioning Performance and Status Review

- Radiation protection controls were in place to support decommissioning activities (Section 4.2.a).
- The licensee experienced a loss of power incident at Unit 1 during February 2003, but took appropriate contingency actions in response to the incident (Section 4.2.b).
- The licensee dropped a plastic barrel in the Unit 1 industrial area resulting in a spill of cleaner material into a local sump. Preliminary information suggests that the cause of the incident may be related to an inadequate rigging procedure and worker training (Section 4.2.c).
- The licensee plans to reduce onsite operations personnel staffing at Unit 1 during nights and weekends. The proposed staffing policy change was determined to be in compliance with regulatory requirements (Section 4.2.d).

- A non-cited violation of permanently defueled technical specifications occurred when the licensee continued to operate the plant ventilation stack with both permanent and alternate sampling equipment out of service for 8 hours (Section 4.2.e).

Occupational Radiation Exposures

- The licensee had an effective exposure monitoring program that accurately monitored internal and external doses to radiation. No individual exceeded the regulatory limit for total effective dose equivalent exposures during 2002. The licensee also had an effective ALARA program that helped minimize exposures (Section 5).

Physical Security Program

- The auditing program was being effectively and objectively implemented. The licensee had an effective program for the identification, classification and resolution of problems (Section 6.2).
- Revision 1 to the Consolidated Defueled Physical Protection Plan did not decrease the effectiveness of the plan (Section 6.3.a).
- Alarm station and security radio communication systems were effectively maintained. Alarm station operators were alert and well trained. An adequate number of portable radios were available for members of the security organization. The local law enforcement agency provided excellent support (Section 6.3.b).
- A thorough program for searching personnel, packages and vehicles entering the protected or security area was being maintained (Section 6.3.c).
- A properly maintained records and reports program was in place. The security staff was correctly reporting security events (Section 6.3.d).
- The testing and maintenance of security equipment were completed in a timely manner and were properly documented (Section 6.4.a).
- Very good protective area barrier and detection systems were in place that would provide delay and detection of individuals attempting unauthorized entry. All alarms annunciated in a continuously manned alarm station, and daily tests of the protected area detection aids were performance based (Section 6.4.b).
- Assessment aids provided very good assessment of the protected area and produced a clear image on the monitors in the security alarm station (Section 6.4.c).
- The compensatory measures program was effectively implemented. Security force personnel were well trained on program requirements (Section 6.4.d).
- The licensee had a reliable backup power supply system to ensure the security system continued to be effective during loss of primary power incidents (Section 6.4.e).

- An excellent lock and key program was implemented and maintained (Section 6.4.f).
- All training was conducted in accordance with the approved security, training, and contingency plans (Section 6.5).
- Management support for the licensee's security program was excellent (Section 6.6.a).
- On shift staffing of security officers was properly maintained (Section 6.6.b).
- The licensee implemented the NRC Interim Compensatory Measures Order dated May 23, 2002, in a timely and effective manner. The NRC may undertake a focused review of the implementation of the Order in the future using guidance being developed (Section 6.7).

Followup

- The inspectors conducted a followup of a 10 CFR Part 21 notification received on Whiting Cranes. The licensee determined that it possessed two Whiting Cranes but that these cranes were not affected by the problem discussed in the 10 CFR Part 21 notification (Section 7).

Report Details

Summary of Plant Status

San Onofre Nuclear Generating Station, Unit 1, was permanently shut down during November 1992 and was permanently defueled by March 1993. The unit remained in SAFSTOR until June 1999, when decommissioning was initiated. At the time of this inspection, the licensee was conducting decommissioning activities under the DECON option as stated in its Post Shutdown Decommissioning Activities Report dated December 15, 1998.

Work completed since the previous inspection included removal of the west reheaters, removal of containment spray piping, and completion of the spent fuel storage installation (ISFSI) roadway. Work in progress during the inspection included removal of main condenser tubes, removal of miscellaneous piping and components in containment, installation of the ISFSI security fence and electronic surveillance equipment, and mobilization of crew and equipment to conduct sphere enclosure building wall removal. The licensee plans to begin demolition of the sphere enclosure building wall during June 2003.

The reactor pressure vessel was still onsite. The vessel was being stored in its shipping container adjacent to the sphere enclosure building. The reactor pressure vessel package is currently scheduled to be shipped to a disposal site in South Carolina during November 2003.

1 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (37801)

1.1 Inspection Scope

The purpose of this portion of the inspection was to ascertain whether design changes, tests, experiments, and modifications were effectively reviewed, conducted, managed, and controlled during plant decommissioning.

1.2 Observations and Findings

The inspectors reviewed the licensee's safety review process to determine whether the program was in conformance with 10 CFR 50.59 requirements. Since the previous inspection of this program area, no safety reviews were conducted by the licensee. Instead, the inspectors reviewed the licensee's 10 CFR 50.59 screening forms. These forms were used to determine if formal safety reviews were necessary. The inspectors reviewed screening forms discussing the deletion of the containment area radiation monitor, replacement of the existing turbine gantry crane trolley with a new single failure proof trolley, and demolition of the sphere enclosure building walls.

Area radiation monitor R-1232 was previously used to monitor containment radiation levels. The monitor provided local and remote alarms. The licensee kept the monitor in service to support the reactor pressure vessel segmentation and large component removal projects. During August 2002, the monitor failed its channel functional test. The licensee subsequently decided to delete the monitor, in part, because of the

difficulties and cost of repairing or relocating the monitor. During early-April 2003, the licensee formally removed the monitor from service. At the time of this inspection, the need for a permanent area radiation monitor was reduced because a criticality accident in containment was not a credible incident. Future decommissioning activities that require radiation monitoring, such as the removal of the highly radioactive mirror insulation, will be monitored using portable instrumentation.

The licensee planned to replace the existing turbine gantry crane trolley with a new single failure proof trolley. The new trolley will be used to facilitate the transfer of spent fuel casks from spent fuel pool (SFP) in Unit 1 to the ISFSI pad. The upgrade will increase the crane capacity from 100 to 105 tons. The licensee intends to complete the upgrades by March 2004 to support Unit 1 fuel movement. The licensee planned to submit the trolley upgrade as a license amendment request to the NRC.

During June 2003, the licensee plans to begin demolition of the sphere enclosure building. The work has to be controlled, in part, to ensure that heavy lift restrictions over the SFP area are being maintained. In addition, personnel will be performing work inside containment concurrent with demolition of the sphere enclosure building, and lift restrictions are necessary to help protect worker safety. This decommissioning activity will be reviewed in detail by the NRC during a future inspection.

In summary, each screening form provided an adequate description of the issue and the technical justification as to why a formal 10 CFR 50.59 safety review was not required. The inspectors compared selected screening form conclusions to the guidance provided in the defueled safety analysis report. No conflicts were identified between the screening form conclusions and the requirements of the defueled safety analysis report.

1.3 Conclusions

The licensee's safety review and design change program was in compliance with 10 CFR 50.59 requirements.

2 Spent Fuel Pool Safety at Permanently Shutdown Reactors (60801)

2.1 Inspection Scope

The inspectors reviewed the safe wet storage of spent fuel including pool siphon and drain protection; pool instrumentation, alarms, and leakage detection; pool chemistry and cleanliness control; criticality controls; pool support equipment operation; and power supplies.

2.2 Observations and Findings

The permanently defueled technical specifications (PDTS) provide the safety limits, limiting conditions of operation, and surveillance requirements for the SFP. Plant tours, record reviews, and interviews with plant operators were conducted to verify if the SFP was being maintained in accordance with PDTS and procedural requirements.

Safety Limit D2.1 specifies that the water level in the SFP shall be maintained above plant elevation 16 feet whenever fuel assemblies are stored in the SFP. Further, a water level limit of 40-foot, 3 inches was specified in plant procedures. The inspectors reviewed the operations logs for the period of January-May 2003 and noted that the pool was maintained between 40-foot, 7 inches and 40-foot, 10 inches during that time frame.

Table D3.1.3-1 of TS requires that both chloride and fluoride be maintained less than or equal to 0.15 parts per million. The pool was sampled monthly by the licensee. The sample results for September 2002-May 2003 were reviewed. The sample results document that chloride and fluoride concentrations were less than 0.01 parts per million during this time frame.

The SFP was routinely sampled for other chemical constituents such as boron concentration, pH, conductivity, sulfate, tritium content, and gamma ray activity. The inspectors reviewed the chemistry results for September 2002-May 2003. No parameter was outside of the ranges that were established in the applicable chemistry procedure.

The procedural limit for SFP temperature was 150 degrees Fahrenheit with a high temperature alarm setpoint of 125 degrees. The pool temperature varied between 64 and 68 degrees during January-May 2003 indicating that pool temperature remained well below the procedural limit during that time frame.

A leak chase system monitors for leakage from the SFP liner. Procedures require pumping of the leak detection well whenever the water level in the well exceeds approximate elevation, 2.5 feet. The inspectors reviewed the SFP liner leak detection records to ascertain whether leakage was increasing or decreasing. According to the licensee's records, the liner leak rate was 0.33-0.35 gallons per day since January 2003. The liner leak rate included condensation and groundwater in-leakage into the collection system. This leak rate has been relative constant in recent years.

2.3 Conclusions

The licensee was maintaining the SFP within PDTS and procedural requirements.

3 Maintenance and Surveillance at Permanently Shutdown Reactors (62801)

3.1 Inspection Scope

The inspectors observed the performance of selected maintenance and surveillance activities to verify if structures, systems, and components were being maintained in compliance with PDTS and procedural requirements.

3.2 Observations and Findings

The radioactive gaseous effluent monitor RT-1254 was used to monitor the containment stack releases. Monitor operability and reliability has been problematic for the licensee

in the recent past. The licensee recently implemented a program to restore the monitor to a reliable condition. A work plan was developed to rework or replace rusted, corroded, worn, and failed components. The components replaced included valves, controls, connectors/adaptors, tubing, and wires.

Following rebuild, the licensee conducted a channel calibration using Radiation Monitoring Procedure SO1-XXV-4.154, "Surveillance Requirement Plant Vent Stack Radiation Monitor R-1254 WRGM Channel Calibration," Revision 6. Next, the licensee conducted a channel functional test using Procedure SO1-XXV-4.254, "Surveillance Requirement Plant Vent Stack Wide Range Gas Monitor R-1254 Channel Functional Test," Revision 5.

The inspectors observed the licensee conducting both channel calibration and channel functional tests. The inspectors confirmed that the licensee established high and alert alarm setpoints that were below the offsite dose calculation manual (ODCM) setpoint limitation. The inspectors observed that the technicians were using approved procedures and appeared fully knowledgeable of the tasks being conducted. The inspectors concluded that the licensee's decision to rebuild the monitor skid and to allocate a significant amount of staff time in an attempt to improve the reliability of the monitor was proactive on the part of site management.

3.3 Conclusions

Surveillance testing of the plant ventilation stack radiation monitor was conducted in accordance with procedural requirements.

4 **Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801)**

4.1 Inspection Scope

The inspectors evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with license and regulatory requirements.

4.2 Observations and Findings

a. Site Tours/Control of Radioactive Material

The inspectors conducted tours of the Unit 1 facility to observe decommissioning work in progress. The inspectors observed radiological area postings, boundaries, and housekeeping. Access to the restricted and contaminated areas was controlled by radiation caution signs, barricades, boundary lines, locked doors, and gates. Radiological boundaries were well defined and posted in all areas. The inspectors noted that housekeeping was adequate for the work in progress.

The inspectors conducted radiological ambient gamma radiation surveys of the Unit 1 restricted areas using a Ludlum Model 2401-EC2 survey meter (NRC No. 077380), in part, to confirm the accuracy of the restricted area postings. The radiation areas and high radiation areas were properly posted with warning signs and barriers as appropriate.

b. Loss of Electrical Power Incident

Since the previous inspection, the licensee experienced a loss of power incident that impacted Unit 1 operations. On February 25, 2003, the 12-kilovolt electrical supply grid experienced a momentary interruption, followed a few minutes later by a momentary loss of power. Power was lost to equipment in the SFP cooling, primary plant makeup water, component cooling water, and salt water cooling systems. Control room operators immediately entered the abnormal operating procedure for loss of SFP cooling. The loss of power event had no impact on the SFP level, and the licensee still had the capability to provide makeup water to the pool in an emergency situation through alternate means.

The cause of the loss of power incident was attributed to a transformer failure. The 12-kilovolt transformer at the multi-purpose handling facility experienced a phase-to-ground fault. Short term corrective actions taken included replacing the transformer.

Power outages were previously experienced at Unit 1 during July-August 2002 and December 2002 for similar 12-kilovolt power supply problems. The licensee implemented an equipment replacement program for older transformers, distribution switches, and underground cables. The licensee's goal was to improve the reliability of the electrical grid that supplies power to Unit 1 and other plant areas. The results appear to be successful because Unit 1 has not experienced a power outage since February 2003.

c. Incident Resulting in a Dropped Load

The licensee recently experienced an incident that resulted in a dropped load. On March 7, 2003, the control room was notified that a 55-gallon plastic barrel filled with a cleaner was dropped while being transported by the Unit 1 turbine gantry crane. At that time, workers were using a steel barrel sling to transport the plastic barrel. The barrel fell out of the sling and spilled its contents. The licensee estimated that about 40 gallons of cleaner material reached a drain and was routed to the reheater sump pit. Several days later, the contents of the reheater sump pit were pumped to portable barrels. The sump was returned to service on March 13, 2003.

The licensee issued an action request to investigate the cause of the incident. At the conclusion of the onsite inspection, the investigation was still in progress. Apparently, the causes could be attributed to deficient training and procedures. Barrel lifting devices were not discussed in the rigging procedure. The licensee planned to update the rigging procedure to include use of barrel slings. In addition, the workers apparently were not fully cognizant that this sling was not appropriate for the load suggesting that worker training may have been deficient. Action request assignments included the performance

of an apparent cause evaluation. This evaluation was incomplete at the end of the onsite inspection but was to include an analysis of site operating experience. The licensee's control of lifted loads will be continuously reviewed by the NRC during future inspections.

d. Change in Control Room Staffing Routines

Section D6.2.2 of PDS provides the on-duty shift staffing requirements. Table D6.2-1 states that the minimum shift crew composition is one shift supervisor and one shutdown operator. Section D6.2.2.b further states that at least one individual from the minimum shift crew shall be located at Unit 1 whenever fuel is situated in the SFP.

Currently, the licensee has two operators assigned to Unit 1, the shift supervisor and a shutdown operator. At least one of the two individuals remains in the control room at all times. The second individual is allowed to leave the control room area as necessary for breaks or to conduct routine operational activities in the plant.

Starting around July 2003, the licensee plans to move the Unit 1 shift supervisor to Units 2/3 on nights and weekends. The shutdown operator would remain in the Unit 1 industrial area to comply with PDS requirements. Following implementation of this program, the Unit 1 control room would no longer be manned at all times.

The licensee conducted a review of the proposed staffing change and concluded that the change does not violate any license condition. Amendment 160 to PDS dated October 30, 2001, eliminated the requirement to continuously man the Unit 1 control room. In the safety evaluation for this change, the NRC acknowledged the licensee's commitment to provide continuous coverage using electronic paging or equivalent systems to assure that communications and alarm monitoring functions are not interrupted. The NRC understood this to mean that the operators, at all times, while anywhere in the unit, will have two-way communications capability and notification of alarm activation including fire alarms. The licensee planned to satisfy these commitments by forwarding the Unit 1 control room alarms and telephones to the Unit 2/3 control room area where a qualified Unit 1 operator will be stationed.

The inspectors reviewed the proposed changes and discussed these changes with the Unit 1 operations superintendent. The inspectors concluded that the proposed staffing changes were allowed by PDS requirements. The implementation of the licensee's proposed Unit 1 staffing changes will be reviewed during a future inspection of the licensee's organizational structure.

e. Radioactive Gaseous Effluent Monitoring Instrumentation Operability

Wide range gas monitor R-1254 was used to monitor the plant ventilation stack for radioactive particulates, iodides, and noble gases. The monitor has three ranges. The low range is required for routine operations, the mid-range is required for fuel movement activities, and the high range is no longer required to be operable. Operability of the monitor is required by PDS which refers to the ODCM. When the monitor is out of

service, contingency actions have to be taken to comply with ODCM requirements. Contingency actions include sample collection through alternate means.

On March 19, 2003, the wide range gas monitor R-1254 was out of service. A temporary sample pump had been installed to continuously collect ventilation air samples per ODCM Action 23. Samples were being collected at 8-hour intervals in accordance with chemistry procedure requirements. At approximately 4:00 p.m., chemistry department personnel discovered that the temporary sample pump switch was in the off position, meaning that the temporary sampler was not in service. The most recent sample had been collected around 8:00 a.m. that day, suggesting that the temporary sampler had been out of service for about 8 hours.

Section D6.8.1 of PDTS states, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in the ODCM. Further, PDTS Section D6.8.4 states, in part, that the radioactive effluent controls program shall include monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with the methods and parameters contained in the ODCM. Action 23 of the ODCM states that with the number of channels functional less than required by the minimum channels functional requirement (in this situation, one channel is the minimum number), effluent releases via the affected pathway (the ventilation stack) may continue, provided that samples are continuously collected with auxiliary sampling equipment.

Contrary to the above, for about an 8-hour period on March 19, 2003, both the permanent wide range gas monitor and the auxiliary sampling equipment were out of service with the plant ventilation system in operation. Particulate and iodine sample collection did not occur for about 8 hours. The licensee's failure to continuously collect samples for about 8 hours was a violation of PDTS Sections D6.8.1 and D6.8.4. However, this non-repetitive, licensee-identified and corrected violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy. The most likely cause of the incident was accidental shutdown of the temporary sampler, contrary to applicable procedural requirements. Upon discovery of the problem, the chemistry department notified the control room, returned the temporary pump to service, and generated an action request form. At the time of the incident, no abnormal plant activities were in progress that would have increased the potential for a release of radioactive material. Analysis of the samples collected before and after the incident were less than minimum detectable activity suggesting that there were no dose consequences to members of the public. Longer term corrective actions, if any, will be determined through the action request process.

4.3 Conclusions

Radiation protection controls were in place to support decommissioning activities. The licensee experienced a loss of power incident at Unit 1 during February 2003, but took appropriate contingency actions in response to the incident. The licensee dropped a plastic barrel in the Unit 1 industrial area resulting in a spill of cleaner material into a local sump. Preliminary information suggests that the cause of the incident may be related to an inadequate rigging procedure and worker training. The licensee plans to reduce onsite operations personnel staffing at Unit 1 during nights and weekends. The

proposed staffing policy change was determined to be in compliance with regulatory requirements. A non-cited violation of PDS occurred when the licensee continued to operate the plant ventilation stack with both permanent and alternate sampling equipment out of service for 8 hours

5 Occupational Radiation Exposures (83750)

5.1 Inspection Scope

The inspectors verified that occupational radiation exposures for calendar year 2002 were within the limits specified in 10 CFR Part 20. This review focused on the licensee's internal and external occupational radiation exposure monitoring programs as well as the as low as reasonably achievable (ALARA) program.

5.2 Observations and Findings

Occupational exposures consisted of both external and internal exposures. To measure external exposures, plant personnel entering the radiologically restricted areas were assigned both thermoluminescent dosimeters (TLDs) and direct reading dosimeters (DRDs). The licensee maintained records of external exposure based on DRDs until the TLD results were available. Whole body counting and in vitro bioassays were used to detect the presence of radioactive material in the body. Internal exposure assessment was conducted if a whole body count or a bioassay identified internal deposition of radioactive material.

The inspectors reviewed the Unit 1 occupational exposure records for 2002. During 2002, 1420 TLDs were issued, down slightly from 2001. Of that number, 308 individuals received a measurable dose. The combined total effective dose equivalent for all 308 individuals was 61.2 person-rem based on TLD results and 61.8 person-rem based on DRD dose measurements.

Selected individual exposure records were reviewed. During 2002, the highest total effective dose equivalent to an individual working in Unit 1 was 1.21 rems. This individual was an ironworker/welder. The second highest dose was 1.131 rems to a laborer/helper. As a comparison, the highest dose during 2001 was 0.897 rems. The regulatory dose limit is 5 rems.

Initial whole body counts were conducted on individuals prior to entry into the radiologically restricted areas. The licensee also conducted exit whole body counts whenever possible. Additional whole body counts were conducted whenever ingestion or inhalation of radioactive materials was suspected to have occurred. During 2002, no contamination events or whole body count results resulted in an assigned dose. Therefore, all total effective dose equivalents assigned to workers were based on TLD results.

The inspectors reviewed the ALARA program and its effectiveness. Overall, the licensee had a strong ALARA program in place for Unit 1. Performance indicators were

tracked and evaluated, including ALARA exposure goals. Exposures were consistently under the exposure goals for the last four years. The exposure goal for 2002 was 64 person-rem for planned work but the actual total exposure was 53.3 person-rem (based on combined DRD dose readings). The remainder of the 61.2 person-rem dose (8.5 person-rem) was the exposure received from unplanned, contingency work. Total exposures have declined in recent years and should continue to decrease as the decommissioning work is completed and sources of radiation are removed from the site.

The licensee held quarterly ALARA meetings during 2002, and a quorum of individuals was always present. The committee discussed Unit 1 goals and decommissioning activities at all meetings. Discussions included lessons learned. The inspectors noted that the value of a person-rem for cost-benefit analyses was raised from \$10,000 to \$20,000 during the fourth quarter 2002 ALARA committee meeting. This value was well above the industry median of about \$12,800. This increased value was representative of management's commitment to dose reduction efforts and support for the ALARA program.

5.3 Conclusions

The licensee had an effective exposure monitoring program that accurately monitored internal and external doses to radiation. No individual exceeded the regulatory limit for total effective dose equivalent exposures during 2002. The licensee also had an effective ALARA program that helped minimize exposures.

6 Physical Security Program for Power Reactors (81700)

6.1 Inspection Scope

The purpose of this portion of the inspection was to assess the capability of the licensee to protect its Unit 1 facility against radiological sabotage and to determine whether the licensee met safeguards program commitments and regulatory requirements.

6.2 Self Assessments, Audits, and Corrective Actions

The inspectors reviewed the licensee's audits of the security program, corrective action program and self-assessments. The inspectors reviewed one audit report, six surveillance reports, two leadership observation program reports and four operable determination reports. The inspectors confirmed those members of the audit and surveillance teams were independent of plant security management. The inspectors determined that the audit team personnel were qualified and the audit and surveillance(s) were performance based. The security department promptly resolved all identified observations. The audits and surveillance's were comprehensive and of very good quality.

6.3 Conduct of Security and Safeguards Activities

a. Security Plans

The inspectors reviewed the changes to the Consolidated Defueled Physical Protection Plan (CDPPP), Revision 1, dated January 9, 2002, to determine if they decreased the effectiveness of the protection plan and to determine if the requirements of 10 CFR 50.54(p) were being met. The CDPPP incorporated the contingency plan and the training and qualification plan. The inspectors determined from a review that the plan changes did not decrease the effectiveness of the plan. The inspectors determined that the licensee maintained an effective management system for the development and administration of procedures and verified that the procedures were consistent with the requirements of the CDPPP.

b. Alarm Station and Communications

The alarm station and security communication capabilities were inspected to determine compliance with the requirements of the security plan. The areas inspected included the requirements and capabilities of the alarm station, protection of the alarm station, systems security, operability of the radio and telephone systems, and the capability to effectively communicate with the local law enforcement agencies through both communication systems.

By observation and interviews, the inspectors determined that the alarm station was located in a hardened facility within the security area. The alarm station was equipped with appropriate alarm, surveillance, and communication capability. An alarm station operator whose duties did not interfere with the execution of assessment and response functions continually manned the alarm station. The inspectors determined that the alarm station operators were alert, well trained, and capable of calling for assistance from the local law enforcement agency. The inspectors verified that the licensee had effective radio and telephone systems capable of meeting communication requirements. The licensee maintained an adequate number of portable radios for use by members of the security organization. Communication checks with the local law enforcement authority were conducted at least once each 24 hours.

c. Protected Area Access Control of Personnel, Packages, and Vehicles

The access control program for personnel, packages, and vehicles was inspected to determine compliance with the requirements of the security plan. Through observation and interviews, the inspectors determined that upon entering the protected area, authorized personnel must have a current security identification badge and be approved by the on-duty Unit 1 operations shift supervisor. Personnel not authorized with a security identification card were escorted within the protected area.

Additionally, through observations, the inspectors determined that the licensee's search program for firearms, explosives, incendiary devices, and other unauthorized material met the requirements of the security plan. The personnel search function for firearms, explosives, and incendiary devices was accomplished through the use of portable

detection equipment capable of detecting those devices. A security force member responsible for monitoring access into the protected area will conduct hands on search for those devices of all persons entering the protected area if the portable is not available. In addition to the protected area at the spent fuel building, the licensee also controlled access into the alarm station. Authorized personnel used their protected area security photo identification card to access this area.

All vehicles entering the security area surrounding the protected area were searched at a vehicle barrier located an adequate distance from the facility to meet the land vehicle bomb blast requirements.

d. Records and Reports

The safeguard events logs for the first quarter of 2003 were inspected to determine compliance with the requirements of the CDPMP. The inspectors determined that the licensee conformed to the regulatory requirements regarding the reporting of events. The necessary records were available for review and were maintained for the time required by regulations.

6.4 Status of Security Facilities and Equipment

a. Testing and Maintenance

The testing and maintenance program was reviewed to determine compliance with the requirements of the protection plan. From interviews with security officers and supervisors, the inspectors determined that repairs to security equipment were completed in a timely manner. Through a review of testing records, the inspectors verified that security equipment and tamper alarms were performance tested as required by the protection plan. On May 7, 2003, the inspectors observed a member of the security staff perform functional testing of security equipment. The equipment performed as designed.

b. Protected Area Barrier and Detection Aids

The protected area physical barriers and detection aids were inspected to determine compliance with the physical protection plan. The areas inspected included the features of the protected area barrier and the design and capabilities of the detection aids system. The licensee had no vital areas or vital equipment as defined in 10 CFR 73.2.

Through observation, the inspectors determined that doors in the protected area (the fuel storage building and the alarm station) barrier were locked and alarmed, and that the doors were installed and maintained as described in the physical protection plan. The inspectors also determined that the protected area barrier provided penetration resistance to both forced and surreptitious entry and was adequate to ensure delay of a potential adversary.

The inspectors confirmed that all alarms annunciated in a continuously manned alarm station. The inspectors verified that the licensee's daily tests of the protected area

detection aids were performance based to ensure that system failures were discovered and corrected.

c. Assessment Aids

The assessment aids were inspected to determine compliance with the physical security plan. The areas inspected included the closed-circuit television monitors located in the alarm station. The inspectors observed the assessment aids and determined that the system was effective. Through observations, the inspectors verified that each closed-circuit television camera produced a clear image on a monitor in the security alarm station. Through interviews, the inspectors determined that prompt maintenance support was provided to ensure that system problems were corrected in a timely manner.

d. Compensatory measures

The compensatory measures were inspected to determine compliance with requirements of the physical protection plan. The areas inspected included deployment of compensatory measures and the effectiveness of those measures.

Through interviews with security officers and plant management personnel and a review of the physical protection plan, the inspectors confirmed that the licensee deployed compensatory measures in a manner consistent with the requirements of the physical security plan. Through interviews, the inspectors determined that the security personnel available for assignment to compensatory security posts were properly trained for those duties.

e. Security System Power Supply

The security system power supply was inspected to determine compliance with the physical protection plan. The security plan requires that sufficient backup power be provided to the security computer, alarm system, and radio communications system. The licensee has provided this backup power through an uninterruptible power supply system. Through observations, interviews, and a review of testing records, the inspectors determined that the system could perform as designed.

f. Security Locks, Keys, and Combinations

The locks, keys, and combination program were inspected to determine compliance with the security plan. Through a review of lock and key procedures and records, the inspectors determined that inventories were completed as required. The records indicated that the locks and keys were rotated or changed as required. Records of keys, locks, core sets, and all changes were being maintained.

6.5 Security Staff Training and Qualification

The licensee's security training and qualification program was inspected to determine compliance with the requirements of the training and qualification plan. The inspectors

observed and interviewed security officers during the performance of their duties. The security officers generally demonstrated excellent knowledge of the procedural requirements for the task that they performed.

All training was conducted in accordance with the approved security, training, and contingency plans. The inspectors confirmed, by a review of seven security officer's training records, that the required training had been conducted within the time frame required by the training and qualification plan.

6.6 Security Organization and Administration

a. Management Support

The effectiveness and adequacy of management support to the physical security program was inspected. The inspectors interviewed security officers on duty and determined from their comments that licensee management support of the security organization was excellent. The inspectors determined that a well trained and qualified security staff implemented the security program. All members of the security organization had a clear understanding of their duties and responsibilities.

b. Staffing Levels

Staffing levels of the security shifts was inspected to determine compliance with the physical protection plan. The inspectors determined from discussions with security supervisors and reviewing the security shift personnel rosters that there were an adequate number of security officers always available to meet the number specified in the physical security plan.

6.7 Miscellaneous Security and Safeguard Issues

The licensee's implementation of the NRC Interim Compensatory Measures Order issued on May 23, 2002, was inspected to determine if the licensee had satisfactorily implemented all provisions of the Order within the required time frame specified.

During the course of the inspection, the inspectors determined by observation, discussion with security and plant management staff, and a review of the security, emergency, and contingency plan and security procedures that the licensee had effectively implemented paragraphs B.1-4 of the Order. [The Order is a safeguards document and consequently only paragraph or section numbers and titles are addressed in this Inspection Report.] The inspectors reviewed engineering calculations, discussed the computer program the engineer used to conduct the barrier calculations, and walked down the barriers. The inspectors interviewed plant management, security officers, reviewed the security plan and procedures, and determined that the licensee had revised their procedures, and trained personnel on the new and changed procedures. The inspectors confirmed that the licensee had established specific patrols, coordinated activities with law enforcement agencies, and verified that all responders could effectively communicate and that communications could be maintained. The inspectors also reviewed the physical security plan and the site emergency plan and

determined those emergency action levels and mitigate measures had been addressed. The inspectors determined that the licensee had effectively implemented the NRC Order. The NRC may undertake a focused review of the implementation of the Order in the future using guidance being developed.

6.8 Conclusions

The auditing program was being effectively and objectively implemented. The licensee had an effective program for the identification, classification and resolution of problems.

Revision 1 to the CDPPP did not decrease the effectiveness of the plan. Alarm station and security radio communication systems were effectively maintained. Alarm station operators were alert and well trained. An adequate number of portable radios were available for members of the security organization. The local law enforcement agency provided excellent support. A thorough program for searching personnel, packages and vehicles entering the protected or security area was being maintained. A properly maintained records and reports program was in place. The security staff was correctly reporting security events.

The testing and maintenance of security equipment were completed in a timely manner and were properly documented. Very good protective area barrier and detection systems were in place that would provide delay and detection of individuals attempting unauthorized entry. All alarms annunciated in a continuously manned alarm station, and daily tests of the protected area detection aids were performance based. Assessment aids provided very good assessment of the protected area and produced a clear image on the monitors in the security alarm station. The compensatory measures program was effectively implemented. Security force personnel were well trained on program requirements. The licensee had a reliable backup power supply system to ensure the security system continued to be effective during loss of primary power incidents. An excellent lock and key program was implemented and maintained.

All training was conducted in accordance with the approved security, training, and contingency plans. Management support for the licensee's security program was excellent. On shift staffing of security officers was properly maintained.

The licensee implemented the NRC Interim Compensatory Measures Order dated May 23, 2002, in a timely and effective manner. The NRC may undertake a focused review of the implementation of the Order in the future using guidance being developed.

7 Followup (92701)

7.1 Followup of 10 CFR Part 21 Notification

On January 29, 2003, the NRC received notification (Event No. 39545) from Whiting Corporation regarding a potential problem with its heavy lift cranes. This notification involved Whiting Cranes sold to utility companies prior to 1980. The concern was specific to the Whiting #25 hoist unit gear case.

The licensee conducted a review of onsite cranes to ascertain whether the notification was applicable to this site. Through the action request process, the licensee determined that it possessed two Whiting Cranes, the cask handling cranes in Units 2 and 3. The licensee confirmed with the manufacturer that these cranes were not affected by the problem discussed in the 10 CFR Part 21 notification.

8 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the exit meeting on May 8, 2003. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Beaty, Supervisor, Unit 1 Security
D. Calhoun, Engineer 3
W. Craig, Security Training Instructor
J. Custer, Superintendent, Unit 1 Operations
J. Fee, Manager, Maintenance
M. McBrearty, Engineer, Nuclear Regulatory Affairs
D. Nunn, Vice President, Engineering & Technical Services
J. Reilly, Director, Unit 1 Decommissioning
R. St. Onge, Manager, Unit 1 Decommissioning Project
A. Scherer, Manager, Nuclear Regulatory Affairs
J. Sills, Project Manager, Unit 1 Health Physics
J. Todd, Security Manager
T. Vogt, Manager, Operations
R. Waldo, Station Manager
J. Wambold, Vice President, Nuclear Generation

INSPECTION PROCEDURES (IP) USED

IP 37801	Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
IP 60801	Spent Fuel Pool Safety at Permanently Shutdown Reactors
IP 62801	Maintenance and Surveillance at Permanently Shutdown Reactors
IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750	Occupational Radiation Exposures
IP 81700	Physical Security Program for Power Reactors
IP 92701	Followup

ITEMS OPENED AND CLOSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
CDPPP	Consolidated Defueled Physical Protection Plan
DRD	direct reading dosimeter
IP	NRC Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
NCV	Non-Cited Violation
ODCM	Offsite Dose Calculation Manual
PDTS	Permanently Defueled Technical Specifications
SFP	spent fuel pool
TLD	thermoluminescent dosimeter