U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-409/82-14(DETP)

Docket No. 50-409 License No. DPR-45

Licensee: Dairyland Power Cooperative
2615 East Avenue - South
LaCrosse, WI 54601

Facility Name: LaCrosse Boiling Water Reactor

Inspection At: LaCrosse Boiling Water Reactor Site, Genoa, WI

Inspection Conducted: August 9-13, 1982

Inspector: R. A. Paul 9/20/82

Approved By: L. R. Greger, Chief 9/20/82
Facilities Radiation
Protection Section

Inspection Summary

Inspection on August 9-13, 1982 (Report No. 50-409/82-14(DETP))
Areas Inspected: Routine, unannounced inspection of reactor coolant water quality, radiation protection procedures, in-plant radiation protection program, transportation activities, radioactive liquid release incident, and status of post-TMI requirements. The inspection involved 41 inspector-hours onsite by one NRC inspector.
Results: Three apparent items of noncompliance were identified in two areas (radiation levels in excess of DOT regulations - Section 7; failure to meet the burial sites acceptance criteria - Section 7; uncontrolled release of radioactive liquids - Section 8).

DETAILS

1. Persons Contacted

*J. Parkyn, Plant Superintendent
*P. Shafer, Radiation Protection Engineer
B. Zibung, Health and Safety Engineer
*L. Nelson, Radiation Protection Engineering Assistant
*M. Branch, NRC Senior Resident Inspector

*Denotes those present at the exit interview.

2. General

This inspection, which began at 11:00 a.m. on August 9, 1982, was conducted to examine the licensee's radiation protection activities during normal operations and to review the status of post-TMI requirements. The inspection included several plant tours, review of licensee records and reports, and discussions with licensee personnel.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (409/80-15/01): Water samples taken from a well point near the west wall of the turbine building to determine if contamination was present due to a blocked drain header. Water samples collected indicated no presence of radioactivity.

4. Reactor Coolant Water Quality

The inspector reviewed selected licensee records to determine compliance with technical specification requirements for reactor coolant periodic tests, chemical control, and radioactivity control.

Records from CY1982 to date were reviewed. The licensee has a recurring problem of primary coolant alpha activity exceeding technical specification limits. These increased activity levels apparently result from residual irradiated fuel material in the coolant system as a result of previous fuel failures. The licensee was found to be in noncompliance by the resident inspector in June 1982 for violating the technical specifications surveillance requirements following an increase in the reactor coolant alpha activity. No further problems were noted during this inspection.

5. Procedures

Selected operating and administrative procedures were reviewed. Some discrepancies were noted in the use and content of Procedures HSP-04.3 (Solid Waste Disposal) and HSP-04.7 (Derived Specific Activities

Inside Common Radioactive Material Packages by External Gamma Photon Dose Rate Measurements Method). The Radiation Protection Manager stated these procedures will be reviewed and the necessary corrections will be made.

6. In-Plant Radiation Protection Program

a. Surveys

The inspector reviewed selected radiation, contamination, and airborne radioactivity surveys conducted to meet surveillance requirements and determine radiation work permit requirements. No problems were noted.

b. Posting and Access Controls

The inspector reviewed the licensee's posting and control of radiological hazards including: radiation areas, high radiation areas, airborne radioactivity areas, and contaminated areas. Postings and controls were adequate.

7. Transportation Activities

The inspector reviewed the licensee's program for receipt, packaging, and transport of radioactive materials. The radiation protection group is responsible for providing radiological monitoring of all operations involving transportation of materials.

Selected records of shipments from June 1981 to date were reviewed. Shipments were made under procedure HSP-04.1 "Radioactive Material Shipments." The inspector noted the procedure contained sufficient instructions to satisfy the requirements of 49 CFR Parts 170-189 and 10 CFR 71. The licensee's program appears adequate to implement program requirements for Type B quantities and spent fuel.

On August 3, 1982, the NRC Region II office informed Region III of apparent violations associated with a shipment of low level waste from LACBWR that had arrived at the Barnwell waste burial site on the previous day. Subsequently, the State of South Carolina confirmed the items of noncompliance. In a letter dated August 4, 1982, the State imposed a civil penalty of $2000 and suspended the licensee's burial site permit for 30 days. The two items of noncompliance identified by the State were as follows:

a. Radiation levels at two meters from the side surface of the trailer exceeded the DOT limit of 10 mR/hr. The State concluded from several measurements made with more than one instrument that radiation levels were 12 mR/hr. (Open Item 409/82-14-01)

b. Drums in the rear of the trailer had been placed on their sides to serve as bracing for the load rather than in an upright position. This is contrary to the burial site's acceptance criteria. (Open Item 409/82-14-02)

Two items of noncompliance were identified.

8. Release of Radioactive Liquid to an Unrestricted Area

On July 2, 1982, approximately 1200 gallons of water from the Condensate Demineralizer Tank were released to the turbine building floor. Approximately 1100 gallons were recovered in the radioactive waste water tanks. A portion of the remainder spilled out on the ground in the radiologically controlled area outside the west turbine hall door and the turbine hall truck bay door, and the rest flowed through a nonradioactive turbine building sump to the oil separator sump. A portion of the water that flowed to the oil separator sump reached the river. The licensee estimated that about 25 gallons of the radioactive water reached the river; at most, under 100 gallons could have been released to the river.

The spill was caused because a valve on the resin inlet valve tank failed to close. When the condensate system was started, the gaskets on the sight glass could not hold the pressure, allowing water to spill onto the floor. The floor drain system in the condensate demineralizer room was not functional due to a previous problem (Report No. 50-409/80-15). When the water flowed out of the condensate demineralizer room, some of the contaminated water flowed into a non-contaminated drain system. The flow path from this drain system is to the oil separator sump, which normally discharges to an onsite retention pit (ash pit). However, a concrete plug used to block flow to the river from the oil separator had eroded and contaminated water was released to the river.

Analysis of the condensate water indicated the radioactive concentration to be 12.6 MPC (12.6 times the maximum permissible concentration for unrestricted areas). Since regulatory limits allow averaging of release concentrations over the calendar year, this release concentration did not exceed regulatory limits. However, it did represent a violation of Technical Specification 2.11.1 which requires that all liquid wastes be collected and processed to reduce their radioactive concentration prior to discharge to the river. (Open Item 409/82-14-03) Contaminated soil outside the turbine building was removed and treated as radioactive waste.

Licensee actions to prevent recurrence of this incident include: replacing a defective relay which opens and closes the resin inlet valve; a drop gate between the west turbine sump and oil separator was closed; a plate disc was installed in the oil separator overflow sump and sealed in place with concrete; and a facility change has been initiated to modify the existing floor drain system.

One item of noncompliance was identified.

9. Contamination Control

Following routine tours of the reactor building, the resident inspector frequently experiences shoe contamination. Licensee personnel who more frequently visit the reactor building apparently do not detect contamination of their shoes as frequently. This same observation has been made by regional radiation specialists during previous inspections and again during this inspection. The inspectors suspect this problem stems from cursory shoe surveys by personnel at the turbine building access control point, and the practice which allows rewearing protective shoe rubbers located at the step-off-pads. The inspectors do not believe the problem is caused by an inadequate routine contamination surveillance program. This matter was discussed at the exit interview.

10. TMI Action Plan Task II.B.3 Post Accident Sampling

The licensee has installed a Post Accident Sampling System (PASS) for reactor coolant and containment atmosphere in the Feedwater Heater area located on the 640' level of the turbine building. The reactor coolant PASS obtains primary coolant from an incore flux monitoring flushing system. The containment air PASS takes suction on the containment atmosphere at the 714' level. The reactor coolant PASS sample container is a 10cc stainless steel cylinder which can be diluted by a factor of 10 to permit analysis. The containment atmosphere sampler includes 10cc and 300cc quick disconnect stainless steel cylinders. Physical removal of the samples container is required for analysis. This portion of the system is tested and operational.

The licensee has calculated that both the primary coolant and containment air samples can be analyzed by one of two GE(Li) detectors located in the Radioanalytical Chemistry Laboratory.

As a result of a demonstration of the collection, transfer, and analysis functions of the reactor coolant PASS using demineralized water (approximately 70-80 psi) during this inspection, the licensee found that dilution flow could not be increased to greater than 1 gpm without cutting off the primary coolant flow; and that additional training is required in collection, transfer, and analysis of the PASS samples. Procedures for sample collection and analysis for post-accident sampling (LACBWR Operating Manual, Volume XI, Reactor Containment Building and Emergency Plan Procedure EPP-6) need revision to indicate that the primary coolant flow should be established before the dilution flow is initiated; and to include additional instructions in the handling, transfer, and analysis of the samples. In addition, the demonstration also indicated the need

for a reevaluation of the projected radiation exposures workers would receive performing these functions to ensure the exposure limits defined in Clarification 6 (ability to obtain and analyze samples without exceeding 5 rems whole body and 75 rems extremities) are not exceeded.

These matters were discussed at the exit interivew. This TMI Action Plan item remains open.

11. TMI Action Plan Tasks II.F.1.1.B.2, II.F.1.2.B.2 and II.F.1.3.B.2

a. Noble Gas Effluents Monitor (II.F.1.1.B.2.)

The licensee has installed a SPING-4 extended range noble gas monitor, which takes a sample from the stack through an isokinetic nozzle, to meet the requirements of this TMI Action Plan item. The SPING-4 monitor readout is located in the control room. As a backup to the SPING-4, a stack gas PASS has the capability of diverting a portion of the isokinetic sample from the stack to a collection cannister in the Feedwater Heater area.

The noble gas monitors were calibrated using solid sources Kr-85 gas in December 1980. The results of the calibration appear acceptable.

The SPING-4 monitoring system is located adjacent to the containment building escape hatch. Reduced shielding due to the presence of the escape hatch may result in excessive radiation levels in this area and render the monitoring system was unusable during and following an accident. The licensee needs to evaluate accident radiation fields around the monitors to establish that the requirements of Clarification Item 2 will be met.

Clarification Item 4(b) requires the use of procedures or calculational methods for converting instrument readings to release rate based on, among others, radionuclide spectrum distribution. The licensee assumed the use of energy compensated Geiger-Mueller (G-M) tubes in the intermediate and high range detectors would allow them to meet this requirement. However, the licensee did not possess documentation to establish that the energy compensated G-M tubes could meet this requirement over the expected energy range.

This matter was discussed at the exit interview. This TMI Action Plan Item remains open.

b. Sampling and Analysis of Plant Effluents (II.F.1.2.B.2)

The sampling system (SPING-4) discussed in Section 11.a is used to collect particulate and iodine samples for isotopic analysis to meet the requirements of this TMI Action Plan item. As backup to the SPING-4, the licensee has the capability of collecting iodine and particular samples in the Feedwater Heater area.

Clarification Item 1 requires continuous sampling of plant gaseous effluent for postaccident releases of radionuclides and particulates to meet certain criteria set forth in Table II.F.1-2. Although the use of the backup system to the SPING-4 may meet these criteria, the SPING-4 was installed to meet the intent of this requirement. As noted in Section 11.a, further evaluation is necessary to determine if the accident radiation fields in the vicinity of the SPING-4 will be excessive.

Clarification Item 2 requires that radiation exposures not exceed 5 rem whole body and 75 rem extremities during sample removal, replacement, and transport during the duration of the accident. At the time of this inspection, procedures concerning transfer and analysis during accident conditions to ensure exposure limits would not be exceeded had not been developed, nor were persons adequately trained

This matter was discussed at the exit interview. It is TMI Action Plan Item remains open.

c. Containment High Range Radiation Monitor (II.F.1.3.B.2)

The licensee has installed two high range containment radiation detectors inside containment with readout modules in the control room. The monitors are located on the east and west walls of the containment above the refueling floor. Each detector has two channels which provide a range of 1 RAD/hr to 1E8 RAD/hr (beta gamma) and 1R/hr to 1E7 R/hr, gamma. The detectors were source calibrated from 1 R/hr to 24.5 R/hr with a cesium-137 source on December 23, 1981. All criteria set forth in Table II.F.1-3 appear to have been met.

12. Exit Interview

The inspector met with licensee representives (denoted in Section 1) at the conclusion of the inspection on August 13, 1982. The inspector summarized the scope of the inspection. In response to certain items discussed by the inspector, the licensee:

a. Stated that upon completion of a review to determine if employee shoe survey techniques are adequate, changes would be made as necessary. (Section 9)

b. Stated that procedural revisions and training of personnel for sample collection, transfer, and analysis for postaccident sampling would be accomplished. Also, additional information concerning TMI Action Plan Item II.B.3 has been furnished to NRR for a post-implementation review. (Section 10)

c. Stated a review would be made to determine if the SPING-4, in its present location, would be capable of functioning during and following an accident. (Section 11)

d. Stated that information concerning the response characteristics of the energy compensated G-M tubes would be sent to Region III when they become available from the vendor. (Section 11)

e. Stated that procedures concerning transfer and analysis of particulate and iodine samples (Task Item II.F.1.2.B.2) would be developed and persons trained. (Section 11)