

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-40R/97001(LNMS)

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

Facility: La Crosse Boiling Water Reactor

Location: La Crosse Site, Genoa, Wisconsin

Dates: December 9-11, 1997
January 7, 1998

Inspectors: D. Nelson, Radiation Specialist
R. Landsman, Project Engineer

Approved By: Bruce L. Jorgensen, Chief 
Decommissioning Branch

EXECUTIVE SUMMARY

La Crosse Boiling Water Reactor NRC Inspection Report 50-409/97001(DNMS)

This routine decommissioning inspection covered aspects of licensee management and control, decommissioning support activities, spent fuel safety, and radiological safety.

- The licensee performed the appropriate safety reviews before conducting limited dismantling of reactor components and systems.
- The licensee had established a program to maintain the temperature in the containment building and respond if normal heating is lost to the containment building. Loss of heat could result in the freezing of systems necessary to retain the integrity of the fuel element storage well (FESW).
- Short term loss of cooling to the FEWS was not a concern. The licensee can easily accommodate various conditions that might challenge integrity of the fuel.
- The radiation protection program was effective in implementing the requirements of the Decommissioning Plan, the Quality Assurance Plan and the license.
- Concerns were identified in the licensee's facilities training program. Specifically, deficiencies were noted in the training provided for conducting safety reviews (Paragraph I.1.b) and the documentation of training provided to individuals who ship radioactive materials (Paragraph IV.10.b).

REPORT DETAILS

Summary of Plant Activities

I. Facility Management and Control

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

a. Inspection Scope

The inspection evaluated whether the licensee had established an adequate program to identify if an unresolved safety question results from any facility design change, test, experiment, or modification during "safstor".

b. Observations and Findings

The licensee was removing equipment that no longer is needed to maintain the plant in a safe storage (safstor) condition. Contaminated equipment was thoroughly surveyed and was disposed of as low level solid radioactive waste (See Section IV.9). The removal of plant equipment was performed in accordance with the Decommissioning Plan and Technical Specifications. Prior to removal of equipment, the licensee performed appropriate management, technical and safety reviews to ensure that safety issues had been addressed.

A facility change concept may be originated by any personnel at the plant. The concept is then discussed at an Operations Review Committee (ORC) meeting that meets at least quarterly. If approval is recommended, a design change coordinator is assigned from plant staff. The coordinator is responsible for performing a safety analysis to ensure that the change does not involve an unreviewed safety question. When the review is complete it is presented to the ORC for approval. An offsite committee, the Safety Review Committee (SC), meets at least annually to review all implemented plant changes.

All fourteen changes completed in 1996 and the nine changes completed in 1997 to the date of inspection were reviewed by the inspectors. The evaluations applied the appropriate rigor of engineering and management review required for each activity. There were no unreviewed safety questions or changes to technical specifications made.

The ORC and SC appeared to be properly staffed with personnel knowledgeable of the plant equipment. They also appeared to have the appropriate technical expertise necessary to accomplish their safety function. The personnel met ANSI 18.1, 1971 requirements. However, there was no formal training program for the individuals performing safety evaluations or reviews. Although in house training did appear to accurately present any new facility change or configuration to the staff, the licensee had formed a committee to improve in house training. The inspectors were told that this issue will be brought up to the committee for resolution.

c. Conclusions

The licensed configuration of the facility was not changed without the appropriate licensee safety review.

II. Decommissioning Support Activities

II.1 Maintenance and Surveillance of Permanently Shutdown Reactors (62801)

(Closed) IFI 50-409/96001-01: Review Zebra Mussel intrusion. The only significant population of Zebra Mussels in the plant was found to be in the plant's river intake bay. There was no degradation of flows observed during the routine testing of the fire protection system or the cooling supply to the Component Cooling Water (CCW) cooler (the only two systems required for safstor that use river water). During August and September 1997 the licensee closed the river intake bay structure from the river and batch treated the bay with an oxygen scavenger, sodium metabisulfite, with 100 percent mortality observed. The licensee is continuing to monitor for any system flow changes. The treatment may or may not be done annually depending on their findings. The licensee developed a procedure to introduce a biocide into various systems if Zebra Mussels are found to be present. This item is closed.

II.2 Cold Weather Preparations (71714)

a. Inspection Scope

The inspection evaluated whether the licensee had effectively implemented a cold weather program to protect required systems against extreme cold weather.

b. Observations and Findings

There was no cold weather checklist, but in response to the Dresden Unit 1 event the licensee developed a procedure for loss of heat to the containment building that would preclude any freezing of essential equipment. Systems that are required to maintain the integrity of the fuel element storage well are all located within the containment building or can be isolated from the building, leaving the storage well isolated.

Temperature in the containment building is monitored in the control room. Heat is supplied to the containment building from two air handlers within the building. The air handlers as well as the station heating boiler that supplies steam to the air handlers receive routine surveillances and preventative maintenance. To ensure electrical power to the air handlers and the heating boiler, electrical power was transferred to the station essential electrical buses which can also be powered from the two emergency diesel generators. As an added measure, two additional radiant heaters were installed inside of containment which also can be powered off of the essential buses if regular power is lost.

c. Conclusions

The licensee had established a program to maintain the temperature in the containment building and/or respond if normal heating is lost to the containment building to prevent the freezing of systems necessary to retain the integrity of the fuel element storage well and any other systems necessary to contain radioactive material.

III. **Spent Fuel Safety**

III.1 Spent Fuel Pool Safety at Permanently Shutdown Reactors (60801)

a. Inspection Scope

The inspection evaluated whether the licensee had provided appropriate controls and maintained required systems to prevent adverse conditions from affecting the stored fuel.

b. Observations and Findings

The only postulated accident that can drain the fuel element storage well (FESW) is a FESW pipe break in the CCW System pump discharge piping between the redundant check valves and the FESW liner. Due to FESW leakage, corrosion products have been observed on these check valves and associated piping. In response to this, the licensee had developed a yearly surveillance to document and remedy the condition of those check valves and associated piping. The procedure prevents any degradation that could possibly lead to a premature failure of those components.

FESW instrumentation consists of level and temperature, which are displayed and provided with alarms in the control room. These are adequate to assure the safe wet storage of spent fuel. The FESW level/loss collects in the containment sump and is trended to calculate the average daily leak rate. An apparent increase in the amount occurred after the licensee turned off continuous FESW cooling because it wasn't needed due to decreased fuel decay heat loss. The licensee was quantifying if the change is due to the increased evaporation from the surface of the pool, because of the increased temperature in the FESW, or represented increased leakage from some system. The licensee had to delay the calculations until the winter months in order to be sure that most of the incoming liquid into the containment sump was from the FESW leakage. During warmer weather, the sump input is composed of containment condensation, air conditioning condensation, various system leaks, and the FESW leakage. The licensee has estimated that at the most, the increase is 2-3 gallons per day of liquid. They are in the process of quantifying where this is coming from; either from the FESW itself or another leak somewhere in the containment.

The licensee has trended those times that there is no pool cooling. From an analysis of the data, it appears that if the cooling were stopped permanently, the pool evaporation and temperature would reach equilibrium at some higher temperature than the pool is presently kept (it increases from approximately 70°F to 105°F). However, due to the required monthly surveillances on the CCW pumps, the "test" has been limited to one month. The licensee turns on cooling water to the CCW heat exchanger as long as the pumps are running and cools the pool down to approximately 70°F.

Electrical power supplied to required systems has either been supplied from essential buses (initial design), has been rerouted to essential buses, or there are redundant supplies of water. Either of two diesel fire pumps can supply service water to the CCW coolers if normal, non-essential power is lost to the low pressure service water pumps (river water). Both CCW pumps are powered from essential power. One FESW cooling pump is powered from essential power. Initial plant design had the other pump supplied from normal, non-essential power. This was accommodated for by the plant having the capability of cross-tying essential power to the bus supplying this pump.

Water chemistry and cleanliness controls were observed to be adequate. The licensee maintained a cover over the FESW. Critical concerns do not exist because no fuel has moved in the FESW since the reactor has been shutdown.

c. Conclusions

Short term loss of cooling to the FEWS is not a concern. The licensee can easily accommodate various conditions that might challenge integrity of the fuel.

IV. **Radiological Safety**

IV.1 Radiological Safety Staffing

There have been no significant changes in the staffing or management of the radiation protection (RP) program since the last inspection. The Radiological Safety program is staffed by three technicians, one foreman and the supervisor (Health and Safety Supervisor).

IV.2 Radiological Safety Audits (83750)

a. Inspection Scope

The inspectors reviewed the results of the 1997 audit of the Radiation Safety program.

b. Observations and Findings

The audit had good scope and range and the auditor identified several Open Items and Non-Conformances. The Open Items and Non-Conformances were minor in nature and each was appropriately addressed and resolved in a timely manner.

IV.3 Training (83750)

a. Inspection Scope

The inspectors reviewed the General Employee Training (GET) records for 1996 and 1997. The inspection included reviews of the material covered during training and a review of the attendance records for the training.

b. Observations and Findings

The records indicated that all station personnel who were required to receive GET training had attended the GET training classes. The records also indicated that required radiation worker training had been conducted during the GET training classes.

IV.4 External Exposure Control (83750)

a. Inspection Scope

The inspectors reviewed the dosimetry records to determine if workers had been issued the proper external dosimetry and the external dosimetry records had met regulatory requirements.

b. Observations and Findings

The reviews of the external dosimetry records indicated that approximately 50 personnel were issued external dosimetry (film badges) in 1996 and 1997 at LACBWR and all personnel who were required to be monitored had been issued dosimeters. Individuals entering restricted areas were also issued pocket chambers. The film badges were issued every six months and supplied by a NAVLAP certified vendor.

The maximum individual worker external doses for 1996 and 1997 were 410 mrem and 216 mrem respectively. The inspectors reviewed the work records for the individuals receiving the dose and determined that the doses reflected good controls, considering the work performed.

IV.5 Internal Exposure Control (83750)

a. Inspection Scope

The inspectors reviewed the internal dosimetry records to determine if workers had been properly evaluated for internal exposures.

b. Observations and Findings

The licensee's procedures require that all individuals who enter contaminated areas be body counted every six months. The records indicated that for 1996 and 1997 the licensee had complied with this requirement. The records indicated that none of the individuals who had been body counted in 1997 had received an uptake of radioactive materials.

IV.6 Surveys and Monitoring (83750)

a. Inspection Scope

The inspectors reviewed the direct radiation survey results for 1997. The inspectors also reviewed the results of smear samples collected during 1997.

b. Observations and Findings

Direct radiation surveys were required to be performed quarterly in all accessible areas of restricted areas. The 1997 records indicated that the licensee had complied with this requirement.

Smear surveys were required to be performed once a week in normally clear areas of the restricted areas and once a month in contaminated areas within restricted areas. Selected reviews of the 1997 records indicated that the licensee had complied with this requirement. The inspectors noted that contamination levels within restricted areas were generally very low and even in the most contaminated areas (reactor sub basement) the contamination levels were less than 60,000 counts per minute (cpm).

To save dose, surveys in high radiations were only performed when authorized individuals required entry into high radiation areas. To prevent entry prior to conducting surveys, all doors leading into high radiation areas were posted "Contact Health Physics Prior to Entry".

All personnel leaving contaminated or potentially contaminated areas were required to survey themselves using survey instruments posted at the exit points. All personnel were also required to pass through a Personnel Contamination Monitor before leaving the Reactor Building. The inspectors observed individuals using the exit point survey instruments and the Personnel Contamination Monitor. No problems were noted.

IV.7 ALARA (83750)

a. Inspection Scope

The inspectors reviewed the report of the licensee's 1996 annual ALARA review.

b. Observations and Findings

Inspection Report 50-409/94004(DRSS) reported concerns raised by licensee Quality Assurance (QA) auditors about the overall effectiveness of LACBWR's ALARA program. In response to those concerns, the licensee took actions to improve job specific ALARA reviews and the annual ALARA review process. The inspector noted significant improvement in the annual ALARA reviews to those performed prior to the 50-409/94004(DRSS) inspection. The 1995 and 1996 ALARA reviews were broader in range and scope and the reviewers provided concrete dose reduction proposals. Implementation of just one of those proposals, a reduction in the number of radiation surveys, resulted in reductions of station dose of as much as 300 person-mrem per year.

IV.8 Process and Effluent Radiation Monitors (IP 84750)

a. Inspection Scope

The inspectors reviewed the 1997 calibration records for the licensee's primary and secondary stack monitors and the containment monitor.

b. Observations and Findings

The primary and secondary stack monitors were operational during 1997 and had been properly and timely calibrated. The containment monitor was also operational during 1997 and had been properly and timely calibrated.

A review of the liquid release records indicated that liquids are released in batches and samples from those batches are analyzed in the licensee's on-site laboratory. LACBWR has no real-time monitors on their liquid release lines.

IV.9 Solid Radioactive Waste (86750)

a. Inspection Scope

The inspectors toured the restricted areas to determine if the licensee was in compliance with their program for identifying and storing radioactive waste.

b. Observations and Findings

During the tour the inspectors noted that containers marked as containing radioactive waste were located throughout the restricted areas. The containers appeared to be appropriately placed and were clearly marked as containing radioactive waste.

The inspectors also noted that contaminated materials from the limited dismantlement of contaminated systems had been placed in a sea-van container. The sea-van container was also properly marked and labeled as containing contaminated materials.

The inspectors toured the licensee's low level waste processing facility. The facility was located within the restricted area and had been used primarily for processing spent resins. The facility, however, had seen little use since decommissioning began in 1986. Personal monitoring devices and portable particulate air monitors were available if needed.

IV.10 Transportation of Radioactive Materials (86750)

a. Inspection Scope

The inspectors reviewed the shipping papers generated for radioactive shipments made by LACBWR in 1996 and 1997. The inspectors also interviewed the individual responsible for ensuring that the shipments were made in compliance with NRC and DOT requirements.

b. Observations and Findings

From January 1996 to December 1997, the licensee made ten shipments of radioactive materials from the LACBWR facility. Three shipments contained radioactive filter and water samples and one shipment contained activated neutron absorber coupons. The remaining six shipments involved solid low-level radioactive waste packaged in sea van containers. The shipping documents indicated that the filters, samples and coupons had been sent to an off site laboratory for analyses and the waste had been shipped to a

vendor (American Ecology) for processing and eventual disposal. For each of the shipments, LACBWR was the shipper of record.

The records maintained by the licensee for those shipments were excellent and the shipping documents demonstrated that the shipments had been made in full compliance with the applicable NRC and Department of Transportation (DOT) requirements.

The inspectors interviewed the Health and Safety Supervisor who had been responsible for the shipments. The supervisor indicated that he had been trained in the handling and processing of hazardous materials. However, he indicated that the training records did not identify the specific NRC and DOT shipping regulations that had been addressed during the training. This was identified as a concern because the DOT requires that shippers and packagers of hazardous materials be trained in their specific areas of responsibility and the specific training should be documented.

Even though the shipping records indicated that the Health and Safety Supervisor had been properly trained, the licensee agreed to provide those individuals involved in future radioactive shipments with formal NRC and DOT hazardous materials shipping training. The licensee also indicated that the specific areas addressed during training would be documented in the training records.

IV.11 Tours (83750)

a. Inspection Scope

The inspectors toured the reactor building, the radioactive waste processing building, the pump house and containment.

b. Observations and Findings

All areas appeared to be generally clean and well maintained and all areas were adequately posted and controlled.

IV.12 Radiological Safety Conclusions

The radiological safety program appeared to be effective in implementing the requirements for the Decommissioning Plan and the License.

One concern about the documentation of training provided for the shipping of hazardous (radioactive) materials was identified.

V. **Management Meeting**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on December 11, 1997 and during a telephone call on January 7, 1998. The licensee acknowledged the findings presented. The licensee did not identify any of the documents or process reviewed by the inspectors as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

- *M. Wilchinski, Shift Supervisor
- *J. Jiracek, Plant Maintenance
- *A. Hanson, Health Physics Foreman
- +R. Christians, Plant Manager
- *R. Cota, Training/Security Supervisor
- *D. Egge, Quality Assurance
- +*L. Nelson, Health and Safety Supervisor
- +*M. Johnson, Tech Support Engineer
- *R. Lewton, Plant Electrician
- *M. Moe, Burns Security
- *J. Henkelman, Quality Assurance/Control Technician

*Denotes those attending the exit meeting on December 11, 1997.

+Denotes those present during the telephone call on January 7, 1998.

The inspectors also interviewed other licensee personnel in various departments in the course of the inspection.

DOCUMENTS REVIEWED

ACP-04.1, "Design and Facility Change Control," Revision 23, Dated 10/17/97

OM, Volume I, 4.1, "Loss of Heat to the Containment Building with Outside Temperature < 32 F," Revised 9/1/95

OP-58-05, "Annual Visual Inspection of FESW Return Line and Return Line Check Valves 58-26-007 & 58-26-008," Issue 0, Dated 3/13/97

OP-75-02, "Zebra Mussel Treatment at LACBWR," Issue 1, Dated 10/2/96

Annual ALARA Review, dated March 1997

Quality Assurance Audit Report of Health Physics, dated 11/25/97

Shipping Documents: 11/20/96, 5/6/96, 5/6/96, 11/19/97, 10/17/97, 7/2/97, 7/16/97, 4/8/97, 4/8/97, 1/22/97 and 1/3/97

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ccw	component cooling water
cpm	counts per minute
FESW	fuel element storage well
IFI	inspector followup item
IP	Inspection Procedure
IR	Inspection Report
mrem	milliREM
NRC	Nuclear Regulatory Commission
ORC	Operations Review Committee
QA	Quality Assurance
RP	radiation protection
SAFSTOR	safe storage
SFP	Spent Fuel Pool
TS	Technical Specification