

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-409/79-13

Docket No. 50-409

License No. DPR-45

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

Facility Name: La Crosse Boiling Water Reactor

Inspection At: La Crosse Boiling Water Reactor Site, Genoa, WI

Inspection Conducted: June 4-7, 1979

Inspector: L. R. Greger

LR Greger

6/27/79

Approved By: ^{for} W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

LR Greger

6/27/79

Inspection Summary

Inspection on June 4-7, 1979 (Report No. 50-409/79-13)

Areas Inspected: Routine, unannounced inspection of radioactive waste systems and radiation protection activities during refueling, including: effluent releases; records and reports of effluents; effluent control instrumentation; procedures for controlling releases; containment air-cleaning systems; reactor coolant water quality; solid radioactive waste; radiation protection procedures; outage planning and preparation; exposure control; surveys; actions regarding NRC Circulars, Bulletins, and Information Notices; and licensee action on previous inspection findings. The inspection involved 36 inspector-hours onsite by one NRC inspector.

Results: Of the thirteen areas inspected, no items of noncompliance or deviations were found in twelve areas. One apparent item of noncompliance was found in the remaining area (deficiency - insufficient records for Type B shipments - Paragraph 11).

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DETAILS

1. Persons Contacted

G. Boyd, Operations Supervisor
*L. Krajewski, Health and Safety Supervisor
*R. Prince, Radiation Protection Engineer
*R. Shimshak, Plant Superintendent
P. Wiley, Assistant to Operations Engineer

The inspector also contacted several other licensee employees, including members of the technical and engineering staffs.

*Denotes those attending the exit interview.

2. General

This inspection, which began at 1:00 p.m. on June 4, 1979, was conducted to examine the licensee's radioactive waste program and review selected radiation protection activities associated with the recently completed refueling outage. The inspection included the review of licensee records and reports, discussions with licensee personnel, and observation of plant activities by the inspector.

3. Licensee Action on Previous Inspection Findings

(Open) Unresolved Item (50-409/77-11, 50-409/77-16): Adequacy of sampling arrangement for quantification of plant stack iodine and particulate releases. The licensee plans to install an isokinetic flow splitter in the sample lines. The modification should be completed by September 1, 1979.

4. Radioactive Liquid Effluent Releases

The inspector selectively reviewed the licensee's Liquid Effluent Gross Activity Records (L39) and the Liquid Waste Batch Forms (L81) for the period from June 1978 through May 1979. No liquid releases exceeding NRC limits were identified. Form L39 includes a record of cumulative discharges for the previous 365 days and the maximum allowable discharge based on this history. The allowable discharge data are not entirely accurate, due to differences in effluent MPC's. This discrepancy has not caused a problem to date, since liquid releases have not approached the regulatory limits. Liquid releases averaged less than one percent of the regulatory limit during 1978. Of the approximately nine curies (not including tritium) released during calendar year 1978, about 20% was cobalt-58, thereby continuing the trend for reduced cobalt-58 releases following replacement of the reactor feedwater heat exchangers in 1976.

The licensee's liquid radwaste treatment and effluent quantification methods are essentially unchanged from the previous inspection report. The radwaste demineralizer is used only sparingly, as needed to limit diluted effluent concentrations below NRC release limits. No other treatment for radioactivity removal is currently utilized. The concentrated waste tank associated with the one-gpm liquid waste evaporator was removed during 1976 to make room for the secondary offgas filters.

The licensee is considering the use of dry cleaners to replace the washing machines. The laundry discharges, which presently account for about one third of the liquid radwaste, are difficult to treat by demineralization because of rapid resin depletion caused by the detergents.

No discrepancies from the technical specification liquid radwaste surveillance requirements were identified. Liquid effluent quantification consists of prerelease gamma isotopic analysis and analysis of monthly composite samples for strontium, tritium, and gross alpha.

No items of noncompliance or deviations were identified.

5. Radioactive Airborne Effluent Releases

The inspector selectively reviewed the airborne gaseous, particulate, and iodine effluent records for the period from June 1978 through May 1979. Form L29 includes a record of cumulative gaseous releases for the previous 365 days and the maximum allowable release based on this history. The allowable release data is not entirely accurate, due to differences in stack flow rates which are not factored into the calculations. This slight discrepancy has not caused a problem to date, since airborne releases have not approached the annual average technical specification limit. No releases exceeding the technical specification limits were identified.

Gaseous releases continue to be quantified from hourly readings of the air ejector or vault monitors, depending on the offgas flowpath. As noted in a previous inspection report, use of the air ejector or vault monitors to quantify gaseous releases does not account for ventilation, mechanical vacuum pump, and gland seal exhaust releases, since they enter the stack downstream of the monitors.^{1/} The installed stack gas monitor has not been used for release quantification, because its sensitivity is reduced through dilution airflow provided by two 35,000 cfm stack blowers. Preliminary results from a stack grab sampling effort has indicated that gaseous releases have not

^{1/} IE Inspection Report No. 50-409/78-06.

been significantly underestimated in the past. According to licensee personnel, efforts will continue to evaluate gaseous releases and the possible use of the stack gas monitor for quantification of these releases.

The offgas recombiner and flow-through holdup tanks continue to be used during normal operation. Noble gas releases averaged about 300 to 500 uCi/sec before the recent (April-May) refueling outage and were reduced to 100 to 200 uCi/sec following the refueling outage. The offgas release rate increased to about 3000 uCi/sec during a three week period in February 1979, when freezing of moisture in the offgas line prevented use of the flow-through storage tanks. Airborne releases for 1978 averaged less than five percent of the technical specification limit. No surveillance discrepancies were identified.

The licensee currently uses a 90% iodine collection efficiency for charcoal filters. According to licensee personnel, a program has been initiated to verify the actual collection efficiency of the stack sampler. This item will be reviewed further during a future inspection.

No items of noncompliance or deviations were identified.

6. Effluent Reports

The inspector reviewed the licensee's semiannual radioactive effluent reports for 1978. Selective comparison of the reported radioactive effluents with the licensee's analysis records did not reveal any discrepancies. All significant isotopes identified in the liquid effluents were included in the 1978 reports.

No items of noncompliance or deviations were identified.

7. Effluent Control Instrumentation

Gaseous and liquid effluent/process monitor surveillance records for the period June 1978 through May 1979 were reviewed for compliance with the technical specification requirements for operability, trip setpoints, calibrations, and testing. The liquid monitors and the gaseous monitors, except for the vault offgas monitor and the "new" offgas monitor, are equipped with NaI detectors. The vault monitor uses a GM detector and the "new" offgas monitor uses an ionization chamber detector. The "new" offgas monitor is still under evaluation and is not presently used for release quantification. Particulate monitors use beta scintillators.

According to the licensee's records, the monitors were last calibrated during the first six months of 1979 in conjunction with the recent refueling outage. The three liquid monitors were calibrated

at three points over about 1 1/2 decades of monitor response, using liquid sources of similar isotopic composition. The radwaste and component cooling water monitors did not exhibit a well defined voltage plateau at the last several calibrations. This matter was discussed at the exit interview. The gaseous monitors were calibrated at essentially one point. (In some cases more than one concentration was correlated to monitor response; but in these cases, different isotopic compositions were utilized, thereby affecting monitor response). Linearity responses were not performed on the monitors. Instead, response curves were generated either by assuming a linear response with slope equal to one or by fitting a linear response to the calibration points generated from the correlations with varying isotopic compositions. Both methods are inherently erroneous. This matter, which was discussed with the licensee during a previous inspection, was discussed at the exit interview.^{2/}

Trip setpoints for the monitors, including the stack particulate monitors, were verified to comply with the technical specification requirements. Setpoint adjustments for flowrate changes were available.

Results of biweekly and daily operability tests for the period from June 1978 through May 1979 were selectively reviewed. No discrepancies were identified. Initiating functions associated with the offgas monitors (redirect offgas flow), containment monitors (redirect containment ventilation flow), and stack monitors (redirect 4-inch vent header flow) were verified during the biweekly tests reviewed. Procedure HSP 2.4, Rev. 1 (dated August 15, 1978) corrected a discrepancy regarding verification of the offgas trip function that was noted during a previous inspection.^{3/}

No items of noncompliance or deviations were identified.

8. Procedures for Controlling Releases

The inspector reviewed the revisions to radwaste related procedures which had been implemented since the previous radwaste inspection. The changes did not appear to diminish the effectiveness of the licensee's radwaste program.

As noted in Section 7 of this report, procedure HSP 2.4 was revised since the previous inspection to include observation and documentation of the offgas monitor isolation function as committed to during a

^{2/} Ibid.

^{3/} Ibid.

previous inspection.^{4/} The liquid monitor calibration procedure was also revised in response to concerns raised during the same inspection. The gas monitor calibration methods, however, had not been revised.

Several minor errors were noted in Procedure HSP 6.16, Rev. 0, dated February 24, 1977. This item was discussed at the exit interview.

9. Containment Air Cleaning Systems

The containment structure is equipped with a recirculating air conditioning system, a ventilation system to the plant stack, and a building spray system. The air conditioning system, which utilizes two 30-ton air conditioning units, has no associated radiation monitors or charcoal or HEPA filters. The containment ventilation system has six installed HEPA filters. Gaseous and particulate radiation monitors initiate isolation of containment ventilation releases to the plant stack. Proper operation of the isolation function is verified during the biweekly tests of the containment radiation monitors as noted in Section 7 of this report, thereby satisfying the annual technical specification surveillance requirement. The containment HEPA filters were changed out during the recent refueling outage. There are no technical specification requirements regarding the filters.

HEPA filters are also installed in the offgas system (two sets), the waste treatment building ventilation system, and the laboratory hood exhaust. Charcoal filters are located in the offgas system (two sets). No filter testing has been conducted during the past year.

No items of noncompliance or deviations were identified.

10. Reactor Coolant Water Quality

The inspector reviewed selected licensee records to determine compliance with technical specification requirements for reactor coolant activity and radiochemistry surveillance for the period from June 1978 through May 1979.

Typical reactor coolant activities have been: (1) less than 5% of the gross beta-gamma technical specification limit; (2) 10% to 25% of the dose equivalent I-131 technical specification limit; and (3) less than the gross alpha technical specification limit. The gross alpha technical specification limit of 5 E-6 uCi/gm was exceeded on one occasion in May 1979 according to the licensee's records. Licensee personnel stated that a 30-day written report describing the event would be submitted in accordance with Technical Specification 3.9.2.b. This item will be reviewed during a future inspection.

^{4/} Ibid.

No items of noncompliance or deviations were identified.

11. Solid Radioactive Waste

As reported in the previous radwaste inspection report, the licensee does not have installed equipment for solidification of radwaste. Spent resins are shipped dewatered and tank sludges are allowed to dry by evaporation before being shipped offsite. Two dewatered resin shipments and one combination dewatered resin and sludge shipment were made during the period from June 1978 through May 1979. These Type B shipments, totaling approximately 150 curies, were made in approved containers. The licensee met NRC requirements for the shipments, except for the record requirements of 10 CFR 71.62 for determining that: (1) the containers were not significantly damaged, (2) the container closure devices and sealing gaskets were present and free from defects, and (3) the containers were loaded and closed in accordance with written procedures. Records ascertaining these items for the three Type B shipments of radioactive material made over the last twelve months were not available. This noncompliance was discussed at the exit interview.

Typical solid radwaste volume per year includes two to three resin shipments, and one compacted DAW shipment (including spent filters). The spent filters are packed in 30-gallon drums, which are then packed in concrete lined 55-gallon drums for shipment. Approximately five manrem per year is attributable to handling of solid radwaste.

12. Refueling Outage Planning/Preparation

The recent refueling outage occurred from late March to late May. Radiologically significant jobs, in addition to the actual refueling, included fuel shipment, inservice inspections, forced circulating water pump seal replacements, CRD maintenance, and replacement of the reactor vessel peripheral shroud.

Preplanning for these jobs was evident from discussions with licensee personnel. A reusable shielded work platform was built for the peripheral shroud replacement; extensive familiarization and testing of special tools occurred; and a dry run of the fuel shipment was made with a dummy cask.

No items of noncompliance or deviations were identified.

13. Radiation Protection Procedures

The inspector reviewed selected maintenance and refueling procedures for incorporation of radiation protection precautions. No problems were identified.

No items of noncompliance or deviations were identified.

14. Exposure Control

Although the final number had not been determined, less than 100 man-rem was accumulated during the two-month refueling outage. The major contributors to this dose are listed in Section 12 of this report. A maximum personal exposure of 2700 mrem was identified through review of the licensee's dosimeter log for the refueling outage. No exposures exceeding regulatory limits were identified. Only a limited number (<20) of non-station personnel were involved in the outage. Radiation protection coverage was provided by the plant's radiation protection staff. Outside radiation protection personnel are not utilized.

Although the licensee's respiratory protection program does not satisfy the program recommended in Regulatory Guide 8.15, certain respiratory equipment is used on a precautionary basis. Protection factors are not utilized and personal exposures to airborne radioactive material are controlled by utilizing airborne survey information to limit stay times. The inspector reviewed the licensee's airborne exposure records for the outage and did not identify any exposures in excess of 10 MPC-hours cumulative for the outage. Although the licensee performs whole body counting semiannually, the next counts are not due until August. A small number of individuals had been counted during or immediately after the outage. The inspector discussed the desirability of coordinating the routine whole body counting to coincide with major outages.

No items of noncompliance or deviations were identified.

15. Surveys

The inspector reviewed selected direct radiation, contamination, and airborne survey records for the refueling outage. Spent fuel was shipped offsite immediately after shutdown; the reactor vessel head was not removed for over a week after shutdown. As a result, iodine-131 had decayed for slightly more than one half-life before head removal. The airborne survey records did not show any airborne iodine concentrations greater than one MPC. The highest airborne concentration entered by workers was six MPC's according to the licensee's records.

No items of noncompliance or deviations were identified.

16. IE Circulars

The inspector reviewed the licensee's actions regarding IEC 77-14, "Separation of Contaminated Water Systems from Noncontaminated Plant

Systems." The licensee had completed the specified actions. No interconnections or needed procedural changes were identified.

17. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 7, 1979. The inspector summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee:

- a. Acknowledged the inspector's comments regarding potentially misleading data regarding allowable liquid and gaseous effluents in the L39 and L29 records. (Paragraphs 4 and 5)
- b. Stated that a schedule would be established for collecting stack grab gas samples for comparison with calculated release rates from the offgas monitors. (Paragraph 5)
- c. Stated that the stack particulate and iodine sampling arrangements would be modified to enhance sample representativeness. (Paragraph 5)
- d. Stated that the use of collection efficiencies with charcoal filters would be reviewed. (Paragraph 5)
- e. Stated that gaseous monitor calibration procedures would be reviewed and revised as necessary. (Paragraphs 7 and 8)
- f. Stated that the lack of a well defined voltage plateau for two liquid radiation monitors would be investigated. (Paragraph 7)
- g. Stated that the respiratory protection program was expected to be implemented within the next three to six months and reaffirmed that the NRC-RIII office would be notified 30 days in advance of implementation of the program. (Paragraph 14)
- h. Acknowledged the inspector's comments that whole body counting schedules should preferably be coordinated with the conduct of significant potential exposure situations, such as major outages. (Paragraph 14)