

August 6, 1982

In reply, please
refer to LAC-8470

DOCKET NO. 50-409

Mr. James G. Keppler, Regional Administrator
U. S. Nuclear Regulatory Commission
Directorate of Regulatory Operations
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
REPORTABLE OCCURRENCE NO. 81-15

- REFERENCES: (1) DPC Letter, LAC-7993, Linder to Keppler,
dated December 28, 1981.
(2) DPC Letter, LAC-8007, Linder to Keppler,
dated January 6, 1982.
(3) LACBWR Technical Specifications,
Section 4.2.2.4.a.

Dear Mr. Keppler:

This letter constitutes a final follow-up report to the event reported to you in References 1 and 2. Our letters discussed an occurrence on December 24, 1981, in which the temperature of the 1B Forced Circulation (FC) Loop decreased below 130°F, while primary pressure was greater than 280 psig.

Following a reactor scram, which occurred at 2115 December 23, 1981, the temperature of the piping in the 1B Forced Circulation (FC) Loop decreased to a minimum of 86°F as measured by the 1B FC Pump Suction thermocouple. The temperature of the 1B FC Loop was below 130°F from 0017 to 0433 on December 24, 1981. Reactor pressure varied during this period between a maximum of 1145 psig and a minimum of 680 psig (Refer to attached table). The temperature in the 1A FC Loop remained above 130°F.

Reference 3 states the Main Coolant System chrom piping RT_{NDT} is fixed at 70°F. The 1B FC Loop temperature did not decrease below the RT_{NDT} at anytime during this incident.

An independent analysis of this incident was performed by Nuclear Energy Services. The NES analysis also concluded the 1B FC Loop temperature did not decrease below the NDT. The report covering this independent analysis is attached.

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The cause of this occurrence was the inability to start the Forced Circulation Pumps, combined with discontinuation of the Forced Circulation loop temperature readings and the post-scrum corrective actions taken by the operators, who were unaware of the magnitude of the temperature decrease in the 1B FC loop. Three factors combined to cause the temperature in the 1B FC loop to decrease more rapidly than the bulk of the primary coolant. The first was the tripping of the 1B FC pump and isolation of the loop with closure of the 1B FC Pump Discharge Valve on greater than 10°F temperature differential between the 1A and 1B FC loops. The 1B FC Pump Discharge Bypass Valve did open, so the loop was not totally isolated. The closure of the 1B Forced Circulation Pump Discharge Valve on differential temperature, which was designed to prevent inadvertent addition of positive reactivity upon startup of a cold loop, was manually overridden at 0215 on December 24 to help heat up the 1B loop. The valve was returned to auto prior to restarting the pump.

The second factor was continued operation of the Primary Purification System which discharges purified, cooled primary water into the 1B FC loop. The Primary Purification Pump was secured at 2310 on December 23, restarted at 2325 and finally secured at 0055 on December 24, after discovery of the low temperature in the 1B FC loop. The third factor which helped decrease the temperature in the 1B FC loop was the increase in seal injection flow into the loop which occurred during the effort to restart the 1B Forced Circulation Pump. An explanation of the reasons for the inability to restart the Forced Circulation Pumps is attached.

An extensive review of the incident was undertaken and interviews were conducted with the control room operators and supervisors involved. In addition to the normal operating crew, the Operations Supervisor and Plant Superintendent were present for much of the troubleshooting following the scram and provided continuity between the two crews handling the event. The NRC Resident Inspector expressed concern that the operating crews may have been intimidated by the presence of the Operations Supervisor and the Plant Superintendent and that control of the incident may have been assumed by one of them. The operators and shift supervisors were questioned on this point. Neither Duty Shift Supervisor felt they were supplanted. The Operations Supervisor manipulated controls with the knowledge of the operating crew.

Procedures were examined for their adequacy to handle the event. The alarm response procedure for Annunciator E2-2 "FC Pump 1B Tripped" does state, "Ensure temperature in the shutdown loop remains greater than 200°F by reducing seal inject flow into the shutdown pump to minimum allowable D/P." There were a considerable number of alarms present, however, for two of which the procedure response was to increase seal injection flow. A method of prioritizing alarms is being developed to highlight those of safety consequence to help the operators channel their effort when numerous alarms annunciate. Several procedures were changed to provide more detail to improve response in the event of a similar reoccurrence.

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Training was provided to all operations personnel on the lessons learned during this incident. Specific attention was focused on the explanation of the Forced Circulation Pumps behavior and what errors had been made. The Forced Circulation Pumps are not needed for safe recovery from a scram.

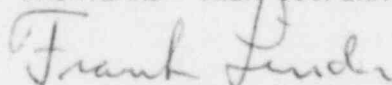
Additional corrective actions taken included modification of the operator log sheets. The logs now specify during what conditions specific readings need to be taken. This action should help prevent operators from missing changes in a parameter which could be important. Memos were sent to Operations Department Personnel concerning time marking of charts and keeping of the Control Room log book to improve both, to facilitate review of an incident.

An updated Licensee Event Report (Reference: Regulatory Guide 1.16, Revision 4) is enclosed.

If there are any questions, please contact us.

Very truly yours,

DAIRYLAND POWER COOPERATIVE



Frank Linder, General Manager

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Enclosures

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