DAIRYLAND Power COOPERATIVE · P.O. BOX 817 · 2615 EAST AV. SOUTH · LA CROSSE, WISCONSIN 54601
(608) 788-4000

February 20, 1981

In reply, please refer to LAC-7379

DOCKET NO. 50-409

Director of Nuclear Reactor Regulation
ATTN: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
BYPASS AND RESET OF ENGINEERED SAFETY FEATURES

Reference: (1) NRC Letter, Crutchfield to Linder, dated September 22, 1980.

Gentlemen:

The response to your request for additional information (Reference 1) on the bypass and reset of engineered safety features is attached to this letter.

If you have any questions regarding this submittal, please let us know.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

Frank Linder, General Manager

FL:JDP:af

Attachment

cc: J. Keppler, Reg. Dir., NRC-DRO III
NRC Resident Inspectors

8103060469
P

NRC REQUEST FOR ADDITIONAL INFORMATION

BYPASS AND RESET OF ENGINEERED SAFETY FEATURES

ITEM 1

The information presented in your SAR and your letters of February 1, 1979 and January 14, 1980, is not sufficient to determine if the following requirements are met for the safety signals to all Engineered Safety Features (ESF) equipment. Therefore, identify and justify all exceptions to the following:

Criterion 1 - In keeping with the requirements of General Design Criteria 55 and 56, the overriding of one type of safety actuation signal, e.g., radiation, should not cause the blocking of any other type of safety actuation signal, e.g., pressure, for those valves that have no function besides containment isolation.

Criterion 2 - Sufficient physical features e.g., key lock switches, are to be provided to facilitate adequate administrative controls.

Criterion 3 - A system level annunciation of the overridden status should be provided for every safety system impacted when any override is active. (See R.G. 1.47).

Criterion 4 - Diverse signals should be provided to initiate isolation of the containment ventilation system. Specifically, containment high radiation, safety injection actuation, and containment high pressure (where containment high pressure is not a portion of safety injection actuation) should automatically initiate containment ventilation isolation.

Criterion 5 - the instrumentation and control systems provided to initiate the ESF should be designed and qualified as safety grade equipment.

Criterion 6 - The overriding or resetting of the ESF actuation signal should not cause any valve or damper to change position.

DPC RESPONSE:

Criterion 1 - We comply.

Criterion 2 - We will initiate a Facility Change to place a locked cover over the reset switches ROGH, ROGG, VDX1 and VDX. We will investigate future replacements with key lock switches.

Criterion 3 - The reset switches do not override safety system functions and this does not apply.

ITEM 1 - (Cont'd)

Criterion 4 - We comply.

Criterion 5 - The instrumentation systems are presently under review by NRC Environmental Qualifications Group.

Criterion 6 - The overriding or resetting of a containment actuation signal does not cause any valve or damper to change position.

ITEM 2

The NRC requires that all override and reset switches have physical provisions to aid in the administrative control of the override or reset function. Discuss the physical provisions supplied with your manual radiation channel pushbutton reset switches and the manual auxiliary relay pushbutton reset switches (ROH, RCGG, VDX1 and VDX). If no such provisions are presently provided, how do you intend to comply with this requirement?

DPC RESPONSE:

Reset pushbutton switches for the manual radiation channels located on the unit chassis will only reset the radiation signal if the level is within limits. The reset action on the chassis will not automatically reset the Containment Building damper circuit. In resetting of the Containment Building dampers from high radiation, it would take a combination of resetting the radiation monitor chassis pushbutton and resetting the VDX or VDX1 reset pushbutton on the Control Room bench board. Our response to Question 1, Criterion 2, addresses these administrative controls.

Item 3

The NRC requires that, as a minimum, containment ventilation isolation be accomplished on any of the following:

a. Containment pressure high
b. Safety injection
c. Containment radiation high.

Your 20-inch isolation dampers do not isolate on safety injection. (Your 4-inch vent header valves do not isolate on safety injection or on high radiation.) How do you intend to meet this requirement?

DPC RESPONSE:

The LACBWR 20-inch containment ventilation dampers isolate on high radiation, low reactor water level, high primary system pressure and high reactor Containment Building pressure. As safety injection (high pressure core spray) is initiated by either high containment

ITEM 3 - (Cont'd)

pressure or low reactor vessel water level. The use of these signals to isolate the 20-inch containment ventilation dampers meets this requirement.

The LACBWR 4-inch vent header valve isolates on high Containment Building pressure, low reactor vessel water level, and high reactor vessel pressure. As safety injection (high pressure core spray) is initiated by either high containment pressure or low reactor vessel water level, the use of these signals to isolate the 4-inch vent header valve meets this requirement. During operation, the 20-inch ventilation dampers are open and the 4-inch header is closed. The ventilation line from the reactor cavities and Fuel Element Storage pool, which can be routed to the 4-inch vent header is routed instead (via a 3-way valve) to the main ventilation system and would therefore be isolated on a high radiation signal by the 20-inch ventilation dampers. This in effect meets the requirement.

ITEM 4

The NRC requires signals that initiate containment isolation be derived from safety-grade (class IE) equipment. Discuss the qualifications of the equipment used presently and the equipment that is needed to meet requirement 3 above. If any is not of safety-grade, how do you intend to upgrade them to safety-grade?

DPC RESPONSE:

The following signals will initiate automatic containment isolation:

a) Reactor Vessel Low Water Level Channels 1 and 2
b) Reactor Vessel Pressure High Channels 1 and 2
c) Containment Building Pressure High Switches 1 and 2
d) Containment Radiation Monitor High

1) Gaseous Activity
2) Immediate Particulate
3) Delayed Particulate

Reactor Water Level Channels

The majority of the Reactor Water Level instrumentation is located in the Control Room and exposed to normal ambient conditions. The Reactor Water Level Transmitters are located in the containment. The transmitters are contained in waterproof housing and have mineral insulated cabling with no other terminations inside the containment. The water level channels will perform their CCCS system function prior to significant exposure to radiation, temperature, or pressure.

ITEM 4 - (Cont'd)

Reactor Vessel Pressure Channels 1 and 2

The Reactor Vessel Pressure Channels are primarily located in the Control Room and subject to normal ambient conditions. The pressure transmitters are located in the Containment Building and would function prior to a breach of the primary system. If a major break occurred in the primary system, the pressure transmitters would not be expected to isolate the containment. For a rapid loss of inventory, the Reactor Water Level, Radiation Monitor or Building Pressure Switches would initiate the automatic isolation function.

Containment Building Pressure Switches 1 and 2

The Containment Building pressure switches are located in the Electrical Penetration Room which is not subject to a harsh environment.

Containment Building Radiation Monitor

The existing Containment Building radiation monitors consist of Tracerlab Model MAP-1A Continuous Airborne Particulate Monitor and Tracerlab Model MGP-2 Geiger-Mueller Gas Monitor. Due to the age of the equipment, replacement of these monitors is scheduled for 1981. Specifically, an Eberline Sping 3 Gaseous and Particulate Monitor has been ordered.

ITEM 5

Reference (b) indicates that both redundant 20-inch dampers are located inside containment (for both inlet and exhaust). General Design Criteria (GDC) 56 does not permit this. Discuss the acceptability of the design on some other defined basis.

DPC RESPONSE:

The LACBWR plant was constructed by Allis Chalmers Corporation in the mid-1960's under contract to the Atomic Energy Commission. Therefore, the current requirements of Criterion 56 of the General Design Basis were not applicable at the time the plant was built.

However, the containment ventilation-isolation system design was extensively reviewed for safety and operational adequacy by appropriate AEC safety review committees. The system design was found to be fully acceptable (References: LACBWR Safeguards Report ACNP-65544 dated August 1967 and referenced ACNP's therein).

ITEM 5 - (Cont'd)

Recently, an extensive testing program was instituted to further demonstrate the ability of the 20" containment isolation valves to perform their safety function; i.e., to isolate the Containment Building during a worst case DBA. Valve operability tests were conducted in a cooperative program by DPC and A-C at National Aeronautics and Space Administration Research Laboratory. Test valves were subjected to conservatively dynamic high fluid flow conditions and supply pressures and tested for operation. An evaluation of the results of these unique tests conclusively demonstrated that the valve would close as designed during any postulated worst case LOCA condition. The valves are also in the process of being further upgraded by the addition of environmentally qualified valve seals and solenoid valves (Reference: DPC Letter, F. Linder to Director of Nuclear Reactor Regulation, LAC-6982, Containment Purging and Venting During Normal Operation", dated June 12, 1980.)

The relative location of the isolation valves, whether inside or outside containment will have no significant affect on the ability of the valves to close during a DBA. The valves are not required to operate after a LOCA event and will remain in a de-energized condition. The location of the valves inside containment has the added advantage of their being located in a high-security, readily accessible area which permits frequent surveillance, inspection and testing.

Since the valves are specifically designed and constructed to close in a LOCA environment, the location of the valves inside containment is considered to be acceptable.

ITEM 6

Reference (c) indicates that CS contacts to both strings of valve control are common to the same switch in the control room. Discuss how this design complies with GDC 21 ("no single failure results in the loss of a protection function").

DPC RESPONSE:

The containment ventilation inlet, recirculation and outlet dampers strings are controlled with a single switch. The safety function requires de-energization of the damper solenoids to isolate the containment ventilation system. Relays and solenoids associated with the protective function are redundant and independent. A failure of the switch contacts in the closed position will not prohibit the safety actuation function. The normal operating condition would be to have the CS switch contacts closed, otherwise the dampers would be shut. After an automatic closure signal, the

ITEM 6 - (Cont'd)

operation would not reset or reopen these dampers until it was determined no actual automatic closure condition exists. The safety function is to close the dampers not to open them. In addition, only one of two solenoids is required to shut the dampers, but both solenoids must energize to open the dampers. A switch failure will not disable the protective function.