Central files

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

April 30, 1979

Mr. James G. Keppler, Director
Office of Inspection & Enforcement
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Sir:

Docket 50-305
Operating License DPR-43
I&E Bulletin 79-06A, Rev. 1

The following is our response to the items of the referenced Bulletin:

1. Review the description of circumstances described in Enclosure 1 of IE Bulletin 79-05 and the preliminary chronology of the TMI-2 3/28/79 accident included in Enclosure 1 to IE Bulletin 79-05A.

   a. This review should be directed toward understanding: (1) the extreme seriousness and consequences of the simultaneous blocking of both auxiliary feedwater trains at the Three Mile Island Unit 2 plant and other actions taken during the early phases of the accident; (2) the apparent operational errors which led to the eventual core damage; (3) that the potential exists, under certain accident or transient conditions, to have a water level in the pressurizer simultaneously with the reactor vessel not full of water; and (4) the necessity to systematically analyze plant conditions and parameters and take appropriate corrective action.

   b. Operational personnel should be instructed to: (1) not override automatic action of engineered safety features unless continued operation of engineered safety features will result in unsafe plant conditions (see Section 7a.); and (2) not make operational decisions based solely on a single plant parameter indication when one or more confirmatory indications are available.

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c. All licensed operators and plant management and supervisors with operational responsibilities shall participate in this review and such participation shall be documented in plant records.

RESPONSE: The Three Mile Island events have been reviewed with the operating crews of the Kewaunee Plant. Particular attention was provided to clarification of specific design requirements and conditions of license which provide assurance of safety by preventing TMI events from occurring. The specific decision process to be followed after initiation of safety injection signal was included in that review. That review provides assurance that equipment started by the automatic SI sequence will only be overridden when a clearly defined criteria is satisfied. In addition to all licensed members of the plant staff, the members of the corporate engineering staff have been provided a briefing on the TMI events.

2. Review the actions required by your operating procedures for coping with transients and accidents, with particular attention to:

a. Recognition of the possibility of forming voids in the primary coolant system large enough to compromise the core cooling capability, especially natural circulation capability.

b. Operation action required to prevent the formation of such voids.

c. Operator action required to enhance core cooling in the event such voids are formed. (e.g., remote venting)

RESPONSE: The emergency procedures for the Kewaunee Plant have been reviewed by a special team, the members of which have participated in the various Westinghouse licensee meeting addressing the TMI events. Minor revisions have been made to some of the procedures to add clarification to decision criteria to aid the operators. Our review of the Kewaunee procedures indicates that the procedures would have provided proper guidance to the Kewaunee Plant operators for the set of conditions which led to the TMI accident.

The design of the engineered safeguards system includes consideration of void formation within the reactor coolant system following any loss of coolant event of sufficient break size to depressurize the RCS below saturation temperature. Since system design has considered voiding post LOCA and has been evaluated to provide adequate core cooling, with voiding, the ability to recognize void formation is not necessary to the assurance of safety.

3. For your facilities that use pressurizer water level coincident with pressurizer pressure for automatic initiation of safety injection into the reactor coolant system, trip the low pressurizer level setpoint bistables such that, when the pressurizer pressure reaches the low setpoint, safety injection would be initiated regardless of the pressurizer level. In

addition, instruct operators to manually initiate safety injection when the pressurizer pressure indication reaches the actuation setpoint whether or not the level indication has dropped to the actuation setpoint.

RESPONSE: On April 18, 1979, the NRC was informed of the desire by Wisconsin Public Service Corporation to modify the Safety Injection actuation logic associated with the pressurizer level and pressure. The modification removed the level signals from the actuation circuitry and changed the logic to a two of three low pressurizer pressure SI initiation. On April 20, 1979, an amendment to the Kewaunee Plant License was requested to permit the modification. On April 27, 1979, the NRC issued Amendment No. 29 to the Kewaunee Plant Operating License No. DPR-43 which allowed the proposed logic circuit modification. On April 28 and 29 modification of the circuitry was accomplished. Safety Injection will automatically occur upon two of three low pressurizer pressure signals.

During the period from receipt of Bulletin No. 79-06 until completion of the modification, the design low pressure and low level combination safety injection actuation logic provided adequate protection. WPS did not have access to nor was it aware of any analysis of a two loop Westinghouse designed reactor coolant system which indicated the pressure and level combination was inadequate. While information from the TMI event raises question to the desirability of combining pressurizer level and pressure for SI signal generation, that information along with previous analysis clearly indicates pressurizer pressure does respond to upset conditions when SI is desired.

The proposal of the Bulletin to simply trip the level bistables did not necessarily provide greater safety. Since significant time would be available for operator response to a small break LOCA event when pressurizer level response was postulated to be misleading and detailed instruction had been provided to the operators, the threat of TMI event was compared to the threat of needless plant transients resulting from one of three low pressure logic proposed by the NRC. The needless plant transients which have a much higher probability than a small break LOCA in pressurizer steam space in our view posed the greater risk. We, therefore, proposed the logic change rather than simply tripping the level bistables as suggested by the bulletin. After discussions 4/27 these bistables were tripped.

4. Review the containment isolation initiation design and procedures, and prepare and implement all changes necessary to permit containment isolation whether manual or automatic, of all lines whose isolation does not degrade needed safety features or cooling capability, upon automatic initiation of safety injection.

RESPONSE: The containment isolation system design for the Kewaunee Plant has been reviewed. That review confirmed that all penetrations not required for emergency system operation during and post LOCA receive a closure signal upon actuation of Safety Injection. No changes to the Kewaunee Plant design or procedures in regards to containment isolation are warranted considering the TMI events.

5. For facilities for which the auxiliary feedwater system is not automatically initiated, prepare and implement immediately procedures which require the stationing of an individual (with no other assigned concurrent duties and in direct and continuous communication with the control room) to promptly initiate adequate auxiliary feedwater to the steam generator(s) for those transients or accidents the consequences of which can be limited by such action.

RESPONSE: The Kewaunee Plant has installed two motor driven auxiliary feedwater pumps and one turbine driven auxiliary feedwater pump. The motor driven auxiliary feedwater pumps receive an automatic start signal upon a Safety Injection signal, a station blackout signal, two of three low-low steam generator level in either generator and a trip of both main feedwater pumps. The turbine driven pump receives a start signal upon a loss of voltage to both 4KV safeguard buses or low-low level conditions in both steam generators.

The auxiliary feedwater actuation circuitry assures activation of auxiliary feedwater for any condition indicative of a loss of secondary system heat sink.

6. For your facilities, prepare and implement immediately procedures which:

a. Identify those plant indications (such as valve discharge piping temperature, valve position indication, or valve discharge relief tank temperature or pressure indication) which plant operators may utilize to determine that pressurizer power operated relief valve(s) are open, and

b. Direct the plant operators to manually close the power operated relief block valve(s) when reactor coolant system pressure is reduced to below the set point for normal automatic closure of the power operated relief valve(s) and the valve(s) remain stuck open.

RESPONSE: The Kewaunee Plant includes instrumentation which clearly indicates that a pressurizer power operated relief valve or safety valve has opened. Temperature indication exists downstream of the valves. The pressurizer relief tank design includes level and pressure indication within the control room. In addition the pressurizer power operated relief valves at Kewaunee have steam position indication switches which indicate if the valve is closed, open or mid-stroke.

As part of the review with the licensed operators the proper actions following indication of a stuck open pressurizer power operated relief valve were discussed. The operators are aware of the ability to isolate the relief valves by use of the motor operated isolation valve.

Power operated valve failure in an open position was considered in the items which were included in the procedure evaluations.

7. Review the action directed by the operating procedures and training instructions to ensure that:

   a. Operators do not override automatic actions of engineered safety features, unless continued operation of engineered safety features will result in unsafe plant conditions. For example, if continued operation of engineered safety features would threaten reactor vessel integrity then the HPI should be secured (as noted in b(2) below).

   b. Operating procedures currently, or are revised to, specify that if the high pressure injection (HPI) system has been automatically actuated because of low pressure condition, it must remain in operation until either:

      (1) Both low pressure injection (LPI) pumps are in operation and flowing for 20 minutes or longer; at a rate which would assure stable plant behavior; or

      (2) The HPI system has been in operation for 20 minutes, and all hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated. The degree of subcooling beyond 50 degrees F and the length of time HPI is in operation shall be limited by the pressure/temperature considerations for the vessel integrity.

   c. Operating procedures currently, or are revised to, specify that in the event of HPI initiation with reactor coolant pumps (RCP) operating, at least one RCP shall remain operating for two loop plants and at least two RCPs shall remain operating for 3 or 4 loop plants as long as the pump(s) is providing forced flow.

   d. Operators are provided additional information and instructions to not rely upon pressurizer level indication alone, but to also examine pressurizer pressure and other plant parameter indications in evaluating plant conditions, e.g., water, inventory in the reactor primary system.

      RESPONSE: Our review of emergency procedures has considered Appendix G limits for the reactor vessel, the reactor coolant pump operating condition requirements, the

indications available to the operator, and the need for a heat sink for the decay heat. As a result of this review, no major changes were determined necessary to the Kewaunee procedures.

We are very concerned that the Bulletin includes specific instructions which without proper qualification could result in improper and unsafe instructions provided to plant operators, for example; it appears that the criteria for termination of HPI did not consider a Steam Generator tube rupture. It also appears that the design requirements for the code safety valves on the reactor coolant system were disregarded in terms of providing assurance that reactor vessel integrity will be maintained regardless of high head safety injection pump output. We recommend that your office reconsider the guidance provided and assure that improper modifications were not made to procedures or instructions to operators of other facilities.

8. Review all safety-related valve positions, positioning requirements and positive controls to assure that valves remain positioned (open or closed) in a manner to ensure the proper operation of engineered safety features. Also review related procedures, such as those for maintenance, testing, plant and system startup, and supervisory periodic (e.g., daily/shift checks) surveillance to ensure that such valves are returned to their correct positions following necessary manipulations and are maintained in their proper positions during all operational modes.

   RESPONSE: All safety related systems have been reviewed to assure that proper valve line-up exists during operation of the Kewaunee Plant. A physical check of valve position was performed following that review. That check and the system review indicated that all safety related valves in the Kewaunee Plant are properly positioned to assure safety system operation in the event of any upset condition. The review and physical check were performed prior to the receipt of the subject Bulletin.

9. Review your operating modes and procedures for all systems designed to transfer potentially radioactive gases and liquids out of the primary containment to assure that undesired pumping, venting or other release of radioactive liquids and gases will not occur inadvertently.

   In particular, ensure that such an occurrence would not be caused by the resetting of engineered safety features instrumentation. List all such systems and indicate:

   a. Whether interlocks exist to prevent transfer when high radiation indication exists, and

b. Whether such systems are isolated by the containment isolation signal.

c. The basis on which continued operability of the above features is assured.

RESPONSE: The review of item 4 above assures that all non-safety systems penetrating the containment boundary are isolated upon generation of a safety injection signal. In addition the control circuitry was evaluated to assure that a reset of the containment isolation signal would not result in an automatic reopening of paths through the containment boundary without additional operator action. For all non-safeguards flow paths through containment the isolation valves can only be opened by a containment isolation signal reset plus an open signal from the control room switch. All systems which are associated with containment penetrations are discussed in Section 5 of the Kewaunee FSAR.

10. Review and modify as necessary your maintenance and test procedures to ensure that they require:

a. Verification, by test or inspection, of the operability of redundant safety-related systems prior to the removal of any safety-related system from service.

b. Verification of the operability of all safety-related systems when they are returned to service following maintenance or testing.

c. Explicit notification of involved reactor operational personnel whenever a safety-related system is removed from and returned to service.

RESPONSE: The Kewaunee Plant Technical Specifications require that prior to removal of a redundant safety related system or component from service the parallel system or component be demonstrated to be operable. The existing procedures for maintenance on safety systems requires a demonstration of operability following completion of the maintenance activity.

All maintenance or testing activities performed within the Kewaunee Plant require approval of the Shift Supervisor prior to the start of the activity and notification of the Shift Supervisor upon completion. The review of this matter indicates that changes to the existing practices at the Kewaunee Plant are not necessary.

11. Review your prompt reporting procedures for NRC notification to assure that NRC is notified within one hour of the time the reactor is not in a controlled or expected condition of operation. Further, at that time an open continuous communication channel shall be established and maintained with NRC.

RESPONSE: The reporting requirements of the Kewaunee License are specified in Section 6.9.2.a of the Technical Specifications and Section D of the Kewaunee Plant Emergency Plan. WPS has and will comply with the specific notification requirements and commitment made in the forementioned documents.

12. Review operating modes and procedures to deal with significant amounts of hydrogen gas that may be generated during a transient or other accident that would either remain inside the primary system or be released to the containment.

RESPONSE: The Kewaunee Plant design considered hydrogen generation post LOCA during operating license review. That evaluation provided assurance that the hydrogen gas concentration can be maintained below the explosive concentration even in the event of a worst break LOCA. In addition the design of the Kewaunee Plant is being reviewed to determine the practicability of modification to permit installation of hydrogen recombiners.

A review of the accident analysis of the Kewaunee Plant and the analysis performed in regards to hydrogen generation indicated the existing plan for minor venting to the shield building will assure maintenance of a sufficiently low hydrogen concentration post LOCA to preclude development of explosive mixtures.

Very truly yours,

E R Mathews

E. R. Mathews, Vice President
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