JAN 29 1985

Docket Nos. 50-266
and 50-301

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JShea

Mr. C. W. Fay, Vice President
Nuclear Power Department
Wisconsin Electric Power Company
231 West Michigan Street Room 308
Milwaukee, Wisconsin 53201

Dear Mr. Fay:

We have completed our initial review of your responses to Generic Letter 82-28 "Inadequate Core Cooling Instrumentation (ICCI) System" dated December 10, 1982. Our evaluation is enclosed for your review. We have determined that we will need the additional information contained in Enclosure 1 of the draft evaluation to complete our review. We also request that you commit to providing the Implementation Letter Report as described in Enclosure 2 to the draft evaluation upon completion of system implementation.

We request that you provide your schedule for submittal of these items within 30 days receipt of this letter. If you have any questions concerning this request, please contact T. G. Colburn at (301) 492-4709.

The recordkeeping and/or reporting requirements contained in this letter affect fewer than 10 respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by:

James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosure:
Draft Evaluation

cc: See next page

*See previous concurrence page

*ORB#3:DL	*ORB#3:DL	*CPB	ORB#3:DL
PKreutzer	TColburn:dd	LPhillips	JRMiller
1/24/85	1/24/85	1/28/85	1/ /85

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EVALUATION OF WISCONSIN ELECTRIC POWER COMPANY RESPONSE TO U.S. NRC GENERIC LETTER NO. 82-28 "INADEQUATE CORE COOLING INSTRUMENTATION SYSTEM" NUREG-0737 ITEM II.F.2 FOR POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

In response to U.S. NRC Generic Letter No. 82-28, "Inadequate Core Cooling Instrumentation (ICCI) System", dated December 10, 1982, Wisconsin Electric Power Company (WE) has proposed a reactor coolant inventory tracking system (ITS) for detecting and monitoring ICC conditions including a subcooling margin monitor (SMM), core exit thermocouples (CET), and a reactor vessel water level indication system (RVWLIS). The staff in conjunction with its contractor, Oak Ridge National Laboratory (ORNL), has reviewed the WE submittals dated October 20, 1981, July 28, 1982, January 19 and March 21, 1983 and July 9, 1984 describing the proposed system.

Reactor Vessel Level Indication System

The RVWLIS system proposed by WE for installation at the Point Beach Nuclear Plant Units 1 and 2 is a differential pressure system utilizing Foxboro gauge and differential pressure transmitters to measure the differential pressure between the top and bottom of the reactor vessel. It contains a top fluid connection to a spare instrumentation port on the reactor vessel head and a bottom fluid connection to a coupling in an incore detector thimble guide tube. The top and bottom fluid connections are connected via 3/8 inch diameter tubing to four Foxboro differential pressure transmitters. Two of the transmitters are wide range and intended for use primarily when the reactor coolant pumps are running; however, they will provide indication with the pumps off. Two of the transmitters are narrow range and intended for use when the reactor coolant pumps are off. A seal chamber is located at the high point of the system to keep the fluid line to the transmitters full of water. Each pair of wide and narrow range transmitters is to be independently powered by Class 1E instrumentation power. Foxboro spec 200 analog

equipment racks are used to power the differential pressure transmitters and process their outputs to compute the equivalent water level. The racks will provide output signals to indicators on the Auxiliary Safety Instrumentation Panel (ASIP) in the control room and to the computer. The outputs of the in-core thermocouples and the thermocouples mounted on vertical sections of tubing will be processed by the computer multiplexer. The computer multiplexer will output weighted averages of the temperatures to the Foxboro racks.

The staff has reviewed the licensee's proposed RVWLIS and its responses to requested additional information (August 5, 1981 and June 19, 1982) regarding the RVWLIS design conformance to the NUREG-0737 Item II.F.2 design requirements, including the system accuracy. Based on our review we have found that the WE design of its installed differential pressure RVWLIS system is acceptable. However, we request that WE provide the implementation letter report described in Enclosure 2 in order that we can complete our review for approval of the RVWLIS implementation.

Core Exit Thermocouples (CET)

The present core exit thermocouple system consists of 39 thermocouples which are somewhat evenly divided between two reference junction boxes in the containment. Chromel-Alumel cable is routed from stalks on the reactor vessel head through a single cable tray to a pull box and then through conduit to cold junction boxes. The connectors at the vessel head, the cable and cold junction boxes are to be upgraded to provide a fully qualified system. The primary operator display is the computer-driven CRT screens ranging from 32°F to 2290°F. The backup operator display is the multiplexer-driven display ranging from 32°F to 2290°F. A new computer system will provide three means of displaying ICC instrumentation information; Safety Assessment System (SAS) displays, process computer displays, and multiplexer-driven displays. The SAS displays include a high-level display on which the values for subcooling, vessel level and core exit temperature will be shown. The SAS display selection also includes trend plots for the last thirty minutes of data from the ICC instrumentation. The SAS programs also monitor critical safety function

parameters, which include subcooling, vessel level and core exit temperature, and display the results on status trees. The process computer displays include all of the SAS displays plus a core map display showing the location of each core exit thermocouple and its present value. Additional multiplexer-driven displays are presented on a 40 character-per-line by 12 line plasma display panel. A summary display presents two sets of core exit thermocouple quadrant tilts, the five highest readings and their locations and the average exit temperature. Two other displays present the individual thermocouple values and locations. One display has twenty thermocouples and the other has nineteen thermocouples. The operator can also select up to twenty of the individual thermocouples for display. The multiplexer processors have programs that calculate subcooling and reactor vessel water level for display on the plasma panels.

The core exit thermocouples are those originally installed in the reactor vessel and will not be replaced. The connectors, cables and containment penetrations are being replaced with environmentally qualified Class 1E hardware. The computer multiplexers which contain the isolation devices will be seismically qualified. The RVWLIS, SMM, and CET systems will be powered from Class 1E sources. The analog indicators for subcooling, vessel level and the computer-generated displays for the core exit thermocouples that are on the Auxiliary Safety Instrumentation Panels will be powered from Class 1E sources and seismically qualified.

Based on our review, we have found that additional information is required with respect to the recording capability for the CET backup display and the qualification of the reference junction box. The additional information requested is contained in Enclosure 1.

Subcooling Margin Monitor (SMM)

The SMM consists of two redundant monitors for each unit utilizing qualified Foxboro Spec 200 analog instrumentation. A function generator is used to

derive the saturation temperature from the reactor coolart loop wide range pressure signal. The computed saturation temperature is subtracted from either the average CET temperature or the temperature indicated by a hot leg RTD. This difference in temperature is sent to the computer and also displayed on an indicator located on the Auxiliary Safety Instrumentation Panel in the control room. The output is scaled from 200°F subcooling to 50°F superheat.

The final subcooling indication system which will meet all of the NUREG-0737 Appendix B requirements has been designed as part of the qualified instrumentation system being added to the plant. Subcooling display meters will be located on the Auxiliary Safety Instrumentation Panels in the control room.

Currently, one of two subcooling monitor channels from each unit is connected to a subcooling display temporarily located in an auxiliary rack in the computer room. The second channel from each unit is connected to the backup computer with continuous CRT display available in the control room. Additionally, the licensee has decided to purchase the equipment necessary to make the subcooling indication system fully operational without the new computer. The system is scheduled to be fully operational in late 1984.

Based on our review, we have found that additional information is required with respect to the qualification of the SMM. This additional information is contained in Enclosure 1.

Conclusion

Based on our review of the Wisconsin Electric Power Company response to Generic Letter No. 82-28, we have concluded that the proposed approach to a reactor coolant inventory tracking system is acceptable. However, additional information described in Enclosure 1 should be provided before we can conclude that the design of the ICCI fully conforms to NUREG-0737 design requirements.

With regard to the implementation of RVWLIS, WE should provide the implementation letter report described in Enclosure 2 in order that we can complete our review for approval of the RVWLIS implementation.

Enclosure 1:
Request for Additional
Information

Enclosure 2:
Milestones for Implementation
of Inadequate Core Cooling
Instrumentation

ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION

WISCONSIN ELECTRIC POWER COMPANY'S PROPOSED

INADEQUATE CORE COOLING INSTRUMENTATION SYSTEM FOR

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

1. Describe the operational status of the final ICCI system, including an updated schedule for system operation, and identify any as-built deviations of the system from your previous design descriptions.

2. Describe the upgraded CET system with respect to reference junction boxes status. Are they environmentally qualified.

3. Describe the upgraded CET system with respect to backup display capability. NUREG-0737, II.F.2 Attachment 1 item (3) requires that a backup display should be provided with the capability for selective reading of a minimum of 16 operable thermocouples, 4 from each core quadrant. The range should extend from 200°F to 2300°F.

4. Describe the function generator which is used to derive the saturation temperature from the pressure signal. Is this equipment fully qualified? Is this equipment capable for trending data?

5. Describe the separation criteria for fiber optic cables between displays and the multiplexer. Describe the interface between Units 1 and 2 ICC instruments and the procedures to operate these ICC instruments for both units.

ENCLOSURE 2

MILESTONES FOR IMPLEMENTATION OF

INADEQUATE CORE COOLING INSTRUMENTATION

1. Submit final design description (by licensee) (complete the documentation requirements of NUREG-0737, Item II.F.2, including all plant-specific information items identified in applicable NRC evaluation reports for generic approved systems).
2. Approval of emergency operating procedure (EOP) technical guidelines - (by NRC).

   Note: This EOP technical guideline which incorporates the selected system must be based on the intended uses of that system as described in approved generic EOP technical guidelines relevant to the selected system.
3. Inventory Tracking Systems (ITS) installation complete (by licensee).
4. ITS functional testing and calibration complete (by licensee).
5. Prepare revisions to plant operating procedures and emergency procedures based on approved EOP guidelines (by licensee).
6. Implementation letter* report to NRC (by licensee).
7. Perform procedure walk-through to complete task analysis portion of ICC system design (by licensee).
8. Turn on system for operator training and familiarization.
9. Approval of plant-specific installation (by NRC).
10. Implement modified operating procedures and emergency procedures (by licensee).

- System Fully Operational -

*Implementation Letter Report Content

(1) Notification that the system installation, functional testing, and calibration is complete and test results are available for inspection.

(2) Summary of licensee conclusions based on test results, e.g.:

   (a) the system performs in accordance with design expectations and within design error tolerances; or

   (b) description of deviations from design performance specifications and basis for concluding that the deviations are acceptable.

(3) Description of any deviations of the as-built system from previous design descriptions with any appropriate explanation.

(4) Request for modification of Technical Specifications to include all ICC instrumentation for accident monitoring.

(5) Request for NRC approval of the plant-specific installation.

(6) Confirm that the EOPs used for operator training will conform to the technical content of NRC approved EOP guidelines (generic or plant specific).

The RVWLIS system proposed by WE for installation at the Point Beach Nuclear Plant Units 1 and 2 is a differential pressure system utilizing Foxboro gauge and differential pressure transmitters to measure the differential pressure between the top and bottom of the reactor vessel. It contains a top fluid connection to a spare instrumentation port on the reactor vessel head and a bottom fluid connection to a coupling in an incore detector thimble guide tube. The top and bottom fluid connections are connected via 3/8 inch diameter tubing to four Foxboro differential pressure transmitters. Two of the transmitters are wide range and intended for use primarily when the reactor coolant pumps are running; however, they will provide indication with the pumps off. Two of the transmitters are narrow range and intended for use when the reactor coolant pumps are off. A seal chamber is located at the high point of the system to keep the fluid line to the transmitters full of water. Each pair of wide and narrow range transmitters is to be independently powered by Class 1E instrumentation power. Foxboro spec 200 analog equipment racks are used to power the differential pressure transmitters and process their outputs to compute the equivalent water level. The racks will provide output signals to indicators on the Auxiliary Safety Instrumentation Panel (ASIP) in the control room and to the computer. The outputs of the incore thermocouples and the thermocouples mounted on vertical sections of tubing will be processed by the computer multiplexer. The computer multiplexer will output weighted averages of the temperatures to the Foxboro racks.

The staff has reviewed the licensee's proposed RVWLIS and its responses to requested additional information (August 5, 1981 and June 19, 1982) regarding the RVWLIS design conformance to the NUREG-0737 Item II.F.2 design requirements, including the system accuracy. Based on our review we have found that the WE design of its installed differential pressure RVWLIS system is acceptable. However, we request that WE provide the implementation letter report described in Enclosure 2 in order that we can complete our review for approval of the RVWLIS implementation.