



J. Phillip Bayne
Executive Vice President
Nuclear Generation

July 19, 1984
IPN-84-24

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Inadequate Core Cooling Instrumentation

Dear Sir:

Enclosed as Attachments 1 and 2 to this letter are the Authority's responses to Enclosures 1 and 2 of your May 29, 1984 Safety Evaluation Report regarding the subject item.

Should you or your staff have any additional concerns regarding this matter, please contact Mr. P. Kokolakis of my staff.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'J. P. Bayne'.

J. P. Bayne
Executive Vice President
Nuclear Generation

cc: Resident Inspector's Office
Indian Point Unit 3
U. S. Nuclear Regulatory Commission
P. O. Box 66
Buchanan, New York 10511

8407240310 840719
PDR ADOCK 05000286
P PDR

F002
1/1

The Authority intends to replace or qualify the remainder of the core exit thermocouple system (i.e., cables, connectors, penetrations and compensation junction boxes), as needed, to meet the requirements of Regulatory Guide 1.97 revision 2. Compliance with the R.G. 1.97 requirements will be accomplished by either additional analyses/assessment or plant modifications. The analyses/assessment phase is to be completed by September 1985. Plant modifications, if any, will be completed during the cycle 5/6 refueling outage.

Question

3. Provide an evaluation of the final SMM with respect to NUREG -0737, Appendix B design requirements and identify any deviations. Describe the plan for upgrading the SMM or justify each deviation.

Response

3. The margin of subcooling in the core will be displayed by the CFMS and QSPDS. Information regarding the display features and qualifications of these display systems are provided in the Authority's submittal IPN-83-22 dated 3/15/83. The Authority is committed to install the CFMS and QSPDS by the end of our cycle 4/5 refueling outage.

The Authority intends to replace the wide range RTD's and pressure transmitters, which provide the input signals for calculating the margin of subcooling, to meet the requirements of Regulatory Guide 1.97 revision 2 (NOTE: The RTD's will have a range of 0-700° F instead of 50-750° F as required by R.G. 1.97. Justification for this deviation is contained in our letter IPN-84-20 dated 6/29/84). The cables and penetrations are already environmentally qualified. The Authority intends to replace the field instrumentation by the end of our cycle 4/5 refueling outage. Compliance with the R.G. 1.97 requirements will be accomplished by either additional analyses/assessment or plant modifications. The analyses/assessment phase is to be completed by September 1985. Plant modifications, if any, will be completed during the cycle 5/6 refueling outage.

Question

4. Describe the status of the RVLIS installation and provide the justification for the long delayed schedule for completion during the 1986 refueling outage.

Response

- 4 The Authority has purchased the Westinghouse (W) Reactor Vessel Level Instrumentation System. W has completed their portion of the engineering and has shipped nearly all W deliverables (hardware and software) to the Authority. Engineering is in progress to install the W RVLIS at IP-3. The engineering includes capillary tube routing and supports, cable routing, rack and cabinet locations, power supplies, etc. Also, additional hardware (e.g. instrument racks, conduit and cable, structural steel, etc.) need to be purchased. To date, no hardware has been installed in the field.

The completion schedule for the RVLIS was developed with considerations given to completion of the other NUREG-0737 items, performance of scheduled maintenance and inspections and implementation of internally generated plant modifications and improvements. Challenged by the urgency to implement NUREG-0737 modifications and the limitations of our manpower, technical and financial resources without compromising plant safety and reliability, the Authority has developed an implementation schedule which was submitted to the NRC via letter IPN-81-97 dated 12/29/81. The schedule proposes the implementation of the RVLIS during our 5/6 refueling outage. Furthermore, the Authority is presently evaluating another ICC detection and monitoring system, to determine potential technical and cost advantages. The following discussion provides justification for the delayed completion schedule.

1. Current Plant Instrumentation

Current plant instrumentation is available to determine heat sink availability, to detect the onset of inadequate core cooling (ICC) and to detect the effectiveness of mitigation actions following the onset of ICC conditions. This includes:

- (a) Wide Range Reactor Coolant Pressure - adequate to determine the approach to an ICC condition and general RCS pressure trends during the period of ICC.
- (b) Wide Range Reactor Coolant Temperature (Hot and Cold Legs) - adequate to determine the approach to an ICC condition and general trends of recovery actions.
- (c) Core Exit Thermocouples - adequate to determine the existence of an ICC condition and the trends of recovery actions.
- (d) Subcooling Margin Monitor - adequate to indicate the approach to an ICC condition.
- (e) Auxiliary Feedwater Flow - to assure that sufficient makeup water is supplied to the steam generators during an ICC condition.
- (f) Steamline Pressure - to determine heat sink availability and heat removal capability during ICC mitigation actions.
- (g) Steam Generator Level - to determine the availability of a heat sink for the RCS during an ICC condition.

2. Upgrade of Current Plant Instrumentation

Although the RVLIS is scheduled for completion during the 5/6 refueling outage, the Authority intends to upgrade some of the current plant instrumentation listed above during the 4/5 refueling outage to expand their usage during a condition of inadequate core cooling. The following instrumentation will be upgraded:

- (a) Wide Range Reactor Coolant Pressure - upgraded instrumentation will be used to verify the approach to an ICC condition, to assure accomplishment of mitigation actions, to verify recovery from an ICC condition and for long term surveillance.
- (b) Wide Range Reactor Coolant Temperature (Hot and Cold Legs) upgraded instrumentation will be used to verify the approach to an ICC condition, to verify recovery from an ICC condition and for long term surveillance.
- (c) Subcooling Margin Monitor - upgraded instrumentation will be used to provide indication of the approach to and recovery from an ICC condition.
- (d) Core Exit Thermocouples - the thermocouple displays will be upgraded during the 4/5 refueling outage. The display range of the thermocouples will be expanded to 160° F - 2300° F. The usage of the thermocouple system will be the same as discussed in item 1.(c) above.
- (e) Steam Generator Level - the upgraded instrumentation will be utilized as discussed in item 1.(g) above.

In summary, the Authority maintains the position that the existing plant instrumentation and the upgrade of existing plant instrumentation, during the 4/5 refueling outage, is satisfactory in the interim period and does not compromise plant safety and reliability.

Question

5. Provide justification for the schedule for completion of the final ICCI system and for the adequacy of the CET system during the interim period before upgrading can be completed.

Response

5. The final ICCI system will be completed by the end of our cycle 5/6 refueling outage. However, as stated in the response to question 4, existing plant instrumentation is adequate to determine heat sink availability, detect the onset of inadequate core cooling (ICC) and mitigate the consequences following the onset of ICC conditions. Furthermore, the Authority intends to upgrade the existing plant instrumentation listed in the response to question 4.

With regard to the Core Exit Thermocouple (CET) system, tests have been conducted at the Loss of Fluid Test (LOFT) Facility in the Idaho National Engineering Laboratory to determine any limitations in using core exit TC's to monitor core uncover and cladding thermal excursions. The results show that, although there are some limitations, the CET system may be used to monitor core uncover.

ATTACHMENT 2

RESPONSE TO ENCLOSURE 2 OF SER
DATED 5/29/84 REGARDING MILESTONES FOR
IMPLEMENTATION OF IP-3's ICCI SYSTEM

1. Submit final design description.

The final design description of the ICCI System was provided in the Authority's letters dated 1/4/82 (IPN-82-1) and 3/15/82 (IPN-83-22) as supplemented by information contained in Attachment 1 of this letter.

2. Inventory Tracking System (ITS) installation.

As previously stated, the W RVLIS will be installed by the end of our 5/6 refueling outage.

3. ITS functional testing and calibration.

The functional testing and calibration of the ICCI System will be completed during startup from the 5/6 refueling outage.

4. Revisions to plant operating procedures and emergency procedures based on approved EOP guidelines.

The plant normal operating procedures for the RVLIS were submitted in our 1/4/82 letter. All the emergency operating procedures including ICCI will be implemented by the 4/5 refueling outage as stated in our 4/18/83 response to NUREG-0737, Supplement 1. These procedures will be updated by 5/6 refueling outage to include the RVLIS. The Westinghouse Owners Group (WOG) Emergency Response Guidelines were previously approved, for implementation to plant specific procedures, by the NRC via the 6/1/83 SER transmitted to J. J. Sheppard of CP&L. By letter dated 9/27/83 the WOG submitted responses to specific items identified during the NRC SER review.

5. Implementation letter report to NRC.

This item will be prepared subsequent to the functional testing and calibration of the ICCI System during startup from the 5/6 refueling outage.