

December 10, 1985

Docket No. 50-344

Mr. Bart D. Withers
Vice President Nuclear
Portland General Electric Company
121 S.W. Salmon Street
Portland, Oregon 97204

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Dear Mr. Withers:

SUBJECT: NUREG-0737, ITEM II.F.2, INADEQUATE CORE COOLING
INSTRUMENTATION (ICCI)

By letter dated February 2, 1984, we forwarded our Safety Evaluation (SE) on the above subject. Our SE concluded that your proposed use of the Westinghouse Reactor Vessel Level Instrumentation System (RVLIS) was acceptable. However, our implementation review was incomplete, and we also forwarded (1) a request for additional information relative to conformance of some components of the ICCI system to NUREG-0737 design requirements and (2) a request to provide an implementation letter report in order for us to complete our implementation review. By letter dated March 12, 1984, you stated that the requested information for the core exit thermocouples (CET) and subcooling margin monitor (SMM) would be provided by December 31, 1984, and the implementation letter report for the RVLIS would be provided within 60 days of final acceptance of the system, but no later than September 1, 1985.

By letter dated January 4, 1985, you provided your responses to our February 2, 1984, request for additional information. We reviewed your January 4, 1985 responses and determined that additional information was needed. The request for additional information was forwarded to you on June 13, 1985. By letter dated July 19, 1985 you provided your responses to our June 13, 1985 request for additional information. In addition, by letter dated August 7, 1985, you submitted proposed Technical Specifications for the ICCI system and by letter dated September 3, 1985, you provided an implementation letter report. As you know, we conducted an onsite evaluation of the ICCI system on September 10, 1985, and you provided additional information by letter dated November 5, 1985.

Based upon the above referenced letters, we have completed our review of the ICCI system for the Trojan Nuclear Plant. We have concluded that (1) the currently installed RVLIS for the Trojan Nuclear Plant is acceptable; (2) the commitments to upgrade the SMM and CET are acceptable, and (3) the proposed Technical Specification changes to include the CET and RVLIS in

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Mr. Bart D. Withers

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the Trojan Accident Monitoring Instrumentation TS's will be the subject of a future license amendment.

Therefore, we conclude the PGE's proposed final ICCI system is acceptable and is in compliance with NUREG-0737, Item II.F.2 requirements upon:

(1) The implementation of the revised ICC procedures by December 31, 1985 as required by the October 15, 1984 letter granting extension to the June 14, 1984 NRC Order, (2) The completion of the SMM and CET upgrade by the end of the 1987 refueling outage as committed to by letters dated January 4, 1985 and July 19, 1985, and (3) The publication of the Technical Specification changes for the CET and RVLIS which are currently under review.

Our Safety Evaluation is enclosed.

Sincerely,

/s/SVarga

Steven A. Varga, Director
PWR Project Directorate #3
Division of PWR Licensing-A

Enclosure:
As stated

cc w/enclosure:
See next page

*SEE PREVIOUS WHITE FOR CONCURRENCES

PWR#3-A*
CParrish
12/4/85

PWR#3-A *Nel*
KJohnston;ps
12/10/85

PWR#3-B*
ETourigny
12/4/85

D/PWR#3-A
SVarga
12/10/85

Mr. Bart D. Withers

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the Trojan Accident Monitoring Instrumentation TS's will be the subject of a future license amendment.

Therefore, we conclude the PGE's proposed final ICCI system is in compliance with NUREG-0737, Item II.F.2 requirements and is acceptable upon completion of the SMM and CET upgrade and, implementation of the revised ICC procedures.

Our Safety Evaluation is enclosed.

Sincerely,

Steven A. Varga, Director
PWR Project Directorate #3
Division of PWR Licensing-A

Enclosure:
As stated

cc w/enclosure:
See next page

PWR#3-A
CParrish
12/4/85

PWR#3-A
KJohnston:ps
12/4/85

PWR#8-B
ETourigny
12/4/85

D/PWR#3-A
SVarga
12/ /85

Mr. Bart D. Withers
Portland General Electric Company

Trojan Nuclear Plant

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO IMPLEMENTATION OF THE INADEQUATE CORE COOLING
INSTRUMENTATION SYSTEM FOR THE
PORTLAND GENERAL ELECTRIC COMPANY
TROJAN NUCLEAR PLANT

The Inadequate Core Cooling Instrumentation (ICCI) system at the Trojan Nuclear Plant consists of subcooling margin monitors (SMM), core exit thermocouples (CET), and a reactor vessel level instrumentation system (RVLIS). All of the equipment is installed and operational. The staff evaluation of the Portland General Electric Company (PGE) response² to NRC Generic Letter No. 82-28 (GL 82-28) concluded that additional information^{1,4} with respect to the ICCI system upgrade and the implementation letter report were needed in order for the staff to conclude that the design of the ICCI system conforms to NUREG-0737 design requirements. In response to staff's request^{1,4} for additional information and for the implementation letter report, the licensee has transmitted letters^{3,5,6,7,8} from B. D. Withers (PGE) to D. G. Eisenhower, et.al., (NRC) to address those concerns as stated below. Some related proposed Technical Specifications are discussed also but these will be the subject of a future license amendment and Safety Evaluation.

A. Response to the ICCI design:

1. PGE has determined that the reference junction boxes in the final CET system will be located inside the control room. Seismically

qualified, Class 1E platinum resistance temperature detectors will be used to measure the reference junction temperature for the backup displays.

2. The CET upgrade will include the installation of signal isolators to electrically isolate the CET input to the SMM from the primary display. The SMMs, which are also used as the CET backup display, will be seismically qualified in accordance with IEEE 344-1975. The two SMM channels are redundant and are powered from separate trains of Class 1E power.
 3. A RVLIS modification was completed during the 1985 refueling outage to replace many of the system's mechanical joints with welded joints and to weld the caps on the three-way valves in the system. The Westinghouse field change notice involving modifications to ensure seismic qualification as well as two modifications of lesser importance will be installed by December 31, 1985.
 4. Operators at Trojan are taught to confirm equipment status indications by comparison with other instrument indications whenever practicable. Reactor coolant pump status would be verified by observing flow indication for the appropriate loop(s). It is fully expected that an incorrect reactor pump status indication on the RVLIS would not go unrecognized.
- B. Response to the implementation letter report:
1. The RVLIS installation, functional testing, and calibration are complete. The test results are available for inspection at Trojan Nuclear Plant.

2. Based on test results, the RVLIS's performance is in accordance with design expectations and error tolerances.
3. A dedicated differential pressure transmitter was installed outside containment for each channel to achieve the anticipated $\pm 6\%$ uncertainty of level measurement under the worst case environmental conditions in containment.
4. License Change Application 125 requested changes to the Trojan Technical Specifications to incorporate the RVLIS and core exit thermocouples. The subcooling margin monitors are already contained in the Trojan Technical Specifications.
5. The revised Emergency Operating Procedures (EOPs) used for Operator Training will conform to the NRC-approved Westinghouse Owners Group Emergency Response Guidelines (ERGs). Operator training on the RVLIS is currently in progress and will be completed in November 1985.

Evaluation

The staff has reviewed the PGE responses^{2,3,5,6,7,8} to NRC's concerns with respect to conformance with the requirements of NUREG-0737, Item II.F.2.

Based on this review in conjunction with our implementation review of the ICCI system installation conducted at the Trojan site on September 10, 1985, the staff's conclusions follow:

1. The RVLIS system, which has been installed, calibrated, and demonstrated to be functional, is acceptable.
2. The commitments to upgrade the SMM and CET system by the end of 1987 refueling outage and to implement the revised EOPs by December 31, 1985 are acceptable.

3. PGE's request in its License Change⁵ Application 125 to include the CET and RVLIS in the Accident Monitoring Instrumentation Technical Specifications is still under review and will be the subject of a future license amendment.

Regarding the Trojan Nuclear Plant procedures and displays, review of the Procedures Generation Package (PGP) and review for acceptance of the licensee's Detailed Control Room Design Review (DCRDR) (required by Generic Letter No. 82-33), which will include procedures and displays for inadequate core cooling, are in progress and may require further changes to Trojan Nuclear Plant EOPs and displays. Additional changes to Trojan Nuclear Plant EOPs and displays resulting from the staff review of PGP and DCRDR should be addressed by PGE in a separate submittal corresponding to the schedule committed in response to GL 82-33.

Based on this review and the implementation review of the ICCI system installation conducted at the Trojan Nuclear Plant on September 10, 1985, the staff has concluded that upon completion of the CET, SMM and RVLIS upgrade, implementation of the revised procedures for ICCI, the PGE proposed final ICCI system for Trojan Nuclear Plant, is in compliance with the NUREG-0737, Item II.F.2 requirements and is acceptable.

REFERENCES

- (1) NRC letter, J. R. Miller to B. D. Withers, Safety Evaluation and Request for Additional Information Generic Letter No. 82-28; NUREG-0737, Item II.F.2, Inadequate Core Cooling Instrumentation, February 2, 1984.
- (2) PGE letter, B. D. Withers to D. G. Eisenhut, Response to NRC Generic Letter 82-28 dated December 10, 1982, Inadequate Core Cooling Instrumentation, , March 14, 1983.
- (3) PGE letter, B. D. Withers to D. G. Eisenhut, Response to Request for Additional Information on Inadequate Core Cooling Instrumentation, dated January 4, 1985.
- (4) NRC letter, E. J. Butcher to D. G. Withers, Request for Additional Information for Inadequate Core Cooling Instrumentation, dated June 13, 1985.
- (5) PGE letter, B. D. Withers to E. J. Butcher, License Change Application 125, August 7, 1985.
- (6) PGE letter, B. D. Withers to E. J. Butcher, Implementation Letter Report Reactor Vessel Instrumentation System, September 3, 1985.
- (7) PGE letter, B. D. Withers to E. J. Butcher, Inadequate Core Cooling Instrumentation, November 5, 1985.
- (8) PGE letter, B. D. Withers to E. J. Butcher, Inadequate Core Cooling Instrumentation, July 19, 1985.