

MAR 24 1983

50-254

MEMORANDUM FOR: D. G. Eisenhut, Director, Division of Licensing, NRR

FROM: C. E. Norelius, Director, Division of Project and Resident Programs

SUBJECT: SAFETY EVALUATION OF NUREG-0737, ITEM II.B.2.2.
DESIGN REVIEW OF PLANT SHIELDING-ACCESS TO VITAL AREAS
QUAD-CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
TAC NOS. 47969 AND 47970

Per your request, we have completed the review of the subject TMI Action Item. The Safety Evaluation documenting this review is attached.

Forty staff hours were used in this evaluation.

Any questions on this subject should be directed to K. R. Ridgway (FTS 384-2544)

C. E. Norelius, Director
Division of Project and
Reactor Programs

Enclosure: SE

cc w/encl:
G. Lainas, AD/OR
E. Tourigny, LORPM
R. Bevan, ORPM
D. Vassallo, ORB-2

cc w/o encl:
J. Thoma, NRR

RIII
[Signature]
Hueter/jp
3/18/83

RIII
[Signature]
Greger
3/21

RIII
[Signature]
Ridgway
3/22

RIII
[Signature]
Tambling
3/22

RIII
[Signature]
Norelius
3/23/83



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

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J. Thoma, NRR

SAFETY EVALUATION OF NUREG-0737, ITEM II.B.2.2. - DESIGN REVIEW OF
PLANT SHIELDING-ACCESS TO VITAL AREAS

Commonwealth Edison Company
Quad-Cities Nuclear Power Station, Units 1 and 2
DOCKET NOS. 50-254; 50-265

INTRODUCTION

Following the accident at TMI-2, the NRC staff developed Action Plan NUREG-0660, and "Clarification of TMI Action Plan Requirements" NUREG-0737, to provide for improved safety at nuclear power plants.

NUREG-0737, Item II.B.2, directed all licensees to perform a radiation and shielding design review of the spaces around systems that may, as a result of an accident, contain highly radioactive materials, and to provide for adequate access to vital areas by design changes, increased shielding, or procedural controls. The licensee has not requested technical deviations from the criteria of ITEM II.B.2.

The following evaluation contains the results of the post implementation review regarding Item II.B.2.2 entitled Plant Shielding Modifications for Vital Area Access.

EVALUATION

The inspector examined the conclusions resulting from the licensee's shielding design review. The shielding design review dated December 31, 1979, for the Quad-Cities Nuclear Power Station (conducted by Sargent and Lundy Engineers), was reviewed by the licensee to identify any changes needed to incorporate the shielding design review findings with the Quad-Cities Nuclear Power Station post-accident access requirements. Final conclusions were forwarded to the Quad-Cities Nuclear Power Station by memorandum dated June 29, 1982, from J. L. Woldridge (SNED) to N. J. Kalivianakis.

The licensee concluded that plant areas vital for the purposes of personnel access during post-accident operation were the main control room, the Technical Support Center (TSC), and the reactor and containment sample systems. This determination was based on the fact that no operator action other than those that take place in the control room are critical to bringing the plant to and maintaining a cold shutdown condition. Modifications were undertaken to prevent the sump and drain systems from causing uncontrolled releases from the reactor building.

The shielding evaluation concluded that the control room is adequately shielded to limit the integrated dose to each individual in the control room during the course of the accident to less than five rem. The TSC has been relocated in new separate facilities designed for that purpose, adjoining existing plant buildings. The shielding evaluation concluded that the new TSC is adequately shielded. New High Radiation Sampling Systems (HRSS) have been constructed

in shielded sampling buildings near the reactor buildings to allow collection of post-accident reactor and containment atmosphere samples. The shielding evaluation concluded that each HRSS is shielded as required to limit the integrated dose to individuals collecting samples.

To prevent the sump and drain systems from causing uncontrolled releases from the reactor building, modifications were completed to ensure that the reactor building floor drain sump, the reactor building equipment drain tank, and the HPCI sumps would not be transferred to the radwaste storage and processing area when a group II isolation signal occurs. These modifications, and testing of the completed modifications, were conducted by the licensee under Modification Test M-4-1(2)-80-13. On February 24, 1982, the inspector reviewed the modification test package records, which showed that the modifications of the reactor building equipment drain tank and the reactor building floor drain sump pumps were completed and satisfactorily tested on February 21, 1981, and the HPCI sump pump discharge reroute from the radwaste facility to the reactor building floor drain sump was completed and satisfactorily tested on December 31, 1981. On October 29, 1982, the inspector verified by direct observation that the control room reset buttons (Units 1 and 2) were installed. He also verified that the piping modification for the HPCI sump (Unit 1) included a locked closed valve leading to the radwaste facility and new piping with a locked open valve leading to the reactor building floor drain sump. In conjunction with the above verifications, the inspector reviewed procedure QCP 2040-11, Revision 3, Post-Accident Sump Pumping Operations. No problems were identified.

The inspector selected for review and discussion with licensee personnel, procedure QCP 960-1, "Reactor Water Recirculation Diluted Liquid Sample," which is associated with post-accident sampling, to verify that the sampling and analysis could be accomplished without exceeding the criteria of GDC 19. The inspector traced the planned path from the portable radioanalytical facility in the TSC to the post-accident sample station in order to evaluate the potential post-accident sources of radiation and stay times for personnel involved in implementing the procedures. During this walkdown the inspector discussed potential post-accident sources of radiation with the licensee representative. The inspector did not observe any potential sources of radiation that were not included in the licensee's evaluation. Based on the inspector's reviews and discussions, it appears the licensee can implement procedure QCP 960-1 to obtain and analyze post-accident reactor coolant samples without radiation exposures to any individual exceeding the criteria of GDC 19 (five rems whole body and 75 rems to the extremities).

SUMMARY

The inspector verified by actual observation that selected plant modifications recommended by the shielding design review report were complete. In addition, the inspector verified by selective review and walkdown of procedures that post-accident procedural controls for ensuring adequate access to vital areas were implemented. The inspector observed no potential sources of radiation that were not included in the licensee's evaluation. These verifications were performed on February 24 and October 29, 1982.

CONCLUSION

The licensee has completed the modifications resulting from the plant shielding review for post-accident access to vital areas as outlined in NUREG-0737, Item II.B.2.2.

The following NRC personnel have contributed to this Safety Evaluation.

Loren J. Hueter