ATTACHMENT

LAWRENCE LIVERMORE LABORATORY

Selected Operating Reactor Issues Program II

Reactor Coolant System Vents (NUREG-00737, Item II.B.1.)
NRC FIN A0250 - Project 9

FINAL TECHNICAL EVALUATION REPORT FOR DRESDEN 2 AND 3

Docket Numbers 50-237 and 50-249
NRC TAC Numbers 44368 and 44369

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TECHNICAL EVALUATION REPORT ON REACTOR COOLANT SYSTEM VENTS FOR DRESDEN 2 AND 3

INTRODUCTION

The requirements for reactor coolant system high point vents are stated in paragraph (cX3Xiii) of 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors," and are further described in Standard Review Plan (SRP) Section 5.4.12, "Reactor Coolant System High Point Vents," and Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements." In response to these and previous requirements, Commonwealth Edison has submitted information in References 1 through 5 in support of the vent system at Units 2 and 3 of the Dresden Nuclear Power Station.

EVALUATION

The function of the reactor coolant system (RCS) vent system is to vent noncondensible gases from the high points of the RCS to assure that core cooling during natural circulation will not be inhibited. The Boiling Water Reactor (BWR) Owners' Group has submitted documentation (References 6 through 9) on how the RCS venting requirements are met in General Electric (GE) BWRs. The BWR Owners' Group position has been endorsed by the licensee.

In accordance with the BWR Owners' Group position, the primary means of venting noncondensible gases from the reactor pressure vessel at Dresden 2 and 3 are four safety-grade Electromatic relief valves and one safety-grade Target Rock safety/relief valve that are part of the automatic depressurization system (ADS) and which alone provide adequate venting.

We have reviewed design information on the valves associated with the above system that will serve as RCS vents and confirmed that they are operable from the main control room. We have also determined that the valves are provided with emergency power and

that a degree of redundancy in the RCS vent system is provided by powering different vent paths from different emergency buses. Positive valve position indication is provided in the main control room by two acoustic flow monitors for each relief and safety/relief valve. Additional RCS venting occurs at the high pressure coolant injection (HPCI) system turbine exhaust.

The accumulation of a large amount of noncondensible gas within the tube side of the isolation condenser could, however, cause the loss of function of the isolation condenser which provides diversity in core cooling methods. Thus, based on the requirements of NUREG-0737 Item II.B.1 Clarification B.(2) and paragraph (c)(3)(iii) of 10 CFR 50.44, and as stated in Reference 10, the licensee will be required to provide remote venting of the isolation condenser inside containment. This is an open item.

In addition, the licensee has failed to verify that no other protection systems that are necessary to maintain adequate core cooling following an accident are susceptible to the buildup of a large amount of noncondensible gas that could cause a loss of function of these systems and would therefore require remote venting. This also is an open item.

CONCLUSION

We conclude, based on the applicability of the BWR Owners' Group position to Dresden 2 and 3 and our specific review of the Dresden 2 and 3 design, that the existing systems at Dresden 2 and 3 are sufficient to effectively vent noncondensible gases from the RCS and meet the requirements of NUREG-0737 Item II.B.1 and paragraph (c)(3)(iii) of 10 CFR 50.44, with two exceptions concerning the venting provisions for the isolation condenser and whether other systems require venting. The provision of acceptable remote venting capability for the isolation condenser as addressed in Reference 10, and the verification that no other protection systems necessary to maintain adequate core cooling are susceptible to the buildup of a large amount of noncondensible gas that could cause a loss of function of these systems, are open items. We therefore recommend following resolution of these open items that the Dresden 2 and 3 RCS venting capability be found acceptable by NRC. It should be noted, however, that the following items were excluded from the scope of our review: seismic and environmental qualification, operating guidelines and procedures, and required modifications to the plant technical specifications for use of existing systems as RCS vents.

REFERENCES

1. Letter, C. Reed (Commonwealth Edison) to D.G. Eisenhut (NRC), "Commitments to Meet Near Term Requirements of the Lessons Learned and Emergency Preparedness Task Force," dated October 18, 1979.

2. Letter, R.F. Janecek (Commonwealth Edison) to Director of Nuclear Reactor Regulation (NRC), "Proposed Amendments to Technical Specifications, Appendix A to Operating Licenses DPR-19, 25,29, and 30," dated September 18, 1980.

3. Letter, L.O. DelGeorge (Commonwealth Edison) to D.G. Eisenhut (NRC), "Responses to NUREG-0737 Items Requiring July 1, 1981 Submittal," dated July 1, 1981.

4. Letter, E.D. Swartz (Commonwealth Edison) to D.G. Eisenhut (NRC), "NUREG 0737 Items Requiring a January 1, 1982, Submittal," dated January 8, 1982.

5. Letter, E.D. Swartz (Commonwealth Edison) to D.G. Eisenhut (NRC), "NUREG 0737 Item II.B.1, Additional Information," dated April 20, 1982.

6. Letter, T.D. Keenan (BWR Owners' Group) to D.G. Eisenhut (NRC), "BWR Owners' Group Positions on NUREG-0578," dated October 17, 1979.

7. Letter, D.B. Waters (BWR Owners' Group) to NRC (Attn: D.G. Eisenhut), "Preliminary Clarification of TMI Action Plan Requirements - BWR Owners' Group Comments," dated October 8, 1980.

8. General Electric Report NEDO-24708A, Revision 1, "Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors," dated December 1980.

9. Letter, D.B. Waters (BWR Owners' Group) to NRC (Attn: D.G. Eisenhut), "NUREG-0660/0737 Requirement II.B.1: Reactor Coolant System Vents," dated April 24, 1981.

10. Letter, D.B. Vassallo (NRC) to L. DelGeorge (Commonwealth Edison), "TMI Item II.B.1 - Reactor Coolant System Vents," dated August 6, 1982.