



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

ENCL. 3

August 24, 1979

NOTE TO: Roger J. Mattson, Director, TMI-2 Lessons Learned Task Force  
FROM: Fredric D. Anderson, Site Designation Standards Branch  
Division of Siting, Health & Safeguards Standards  
SUBJECT: COMMENTS ON RESPONSE TO BOARD QUESTION CONCERNING CLASS 9  
ACCIDENTS (NOTE: MATTSON TO CUNNINGHAM, 8/16/79)

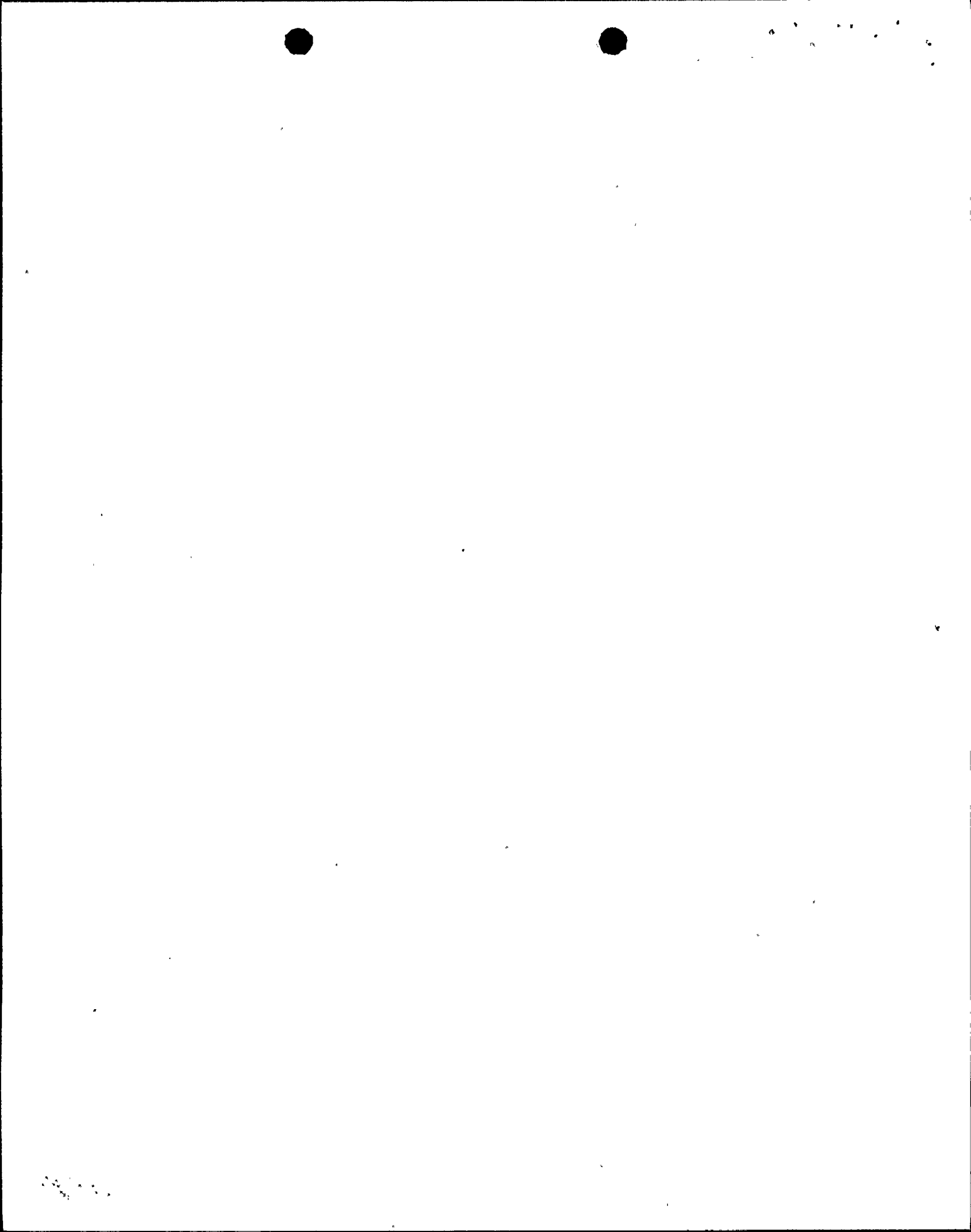
I reviewed your response to the Salem spent fuel board question on Class 9 accidents and the TMI-2 accident. I disagree with the position taken by the Task Force regarding the TMI-2 accident being classified as a Class 9 accident as defined in the proposed Annex to Appendix D of 10 CFR Part 50 (stated in Appendix I to R.G. 4.2, Revision 2, July 1976). I have reviewed this position as a concerned NRC staff member and one of the staff listed in the cc list for your reply.

In truth, the definitions for accident classes as given in the Annex for environmental reports are not applicable to the determination of an actual accident. Actual accident scenarios should not be forced to match the perceived analytical models for accidents used to postulate potential consequences. Because of the many differences expected in accident scenarios depending upon the purpose for the evaluation, the NRC staff uses different accident scenarios (classes) for analyzing system failures as given in SRP and R.G. 1.70, for analyzing consequences from design basis accidents as given in SRP, R.G. 1.70 and specific guides such as R.G. 1.3, 1.4, 1.24, 1.25 etc., and for analyzing environmental impact from accidents as given in R.G. 4.2. Therefore, the correct answer to the Board question would be that the Class 9 accident nomenclature was not applicable to assess any real accident scenario.

If NRC feels compelled to respond to the Class 9 accident question for TMI-2 in a manner consistent with the conceived public understanding of a Class 9 accident, the answer should be that the TMI-2 accident was not a Class 9 accident. The reason is that the commonly held definition for a Class 9 accident is an accident resulting in fuel melt with failure of engineered safety features designed to mitigate the consequences of the accident -- the extreme case is containment failure. Since TMI-2 did not experience fuel melt or ESF failure of a mitigative system, the accident cannot be classified as a Class 9 accident by common definition.

If NRC feels that the staff should force-fit the TMI-2 accident scenario with operator error and bad judgments into the R.G. 4.2 class accident scenario

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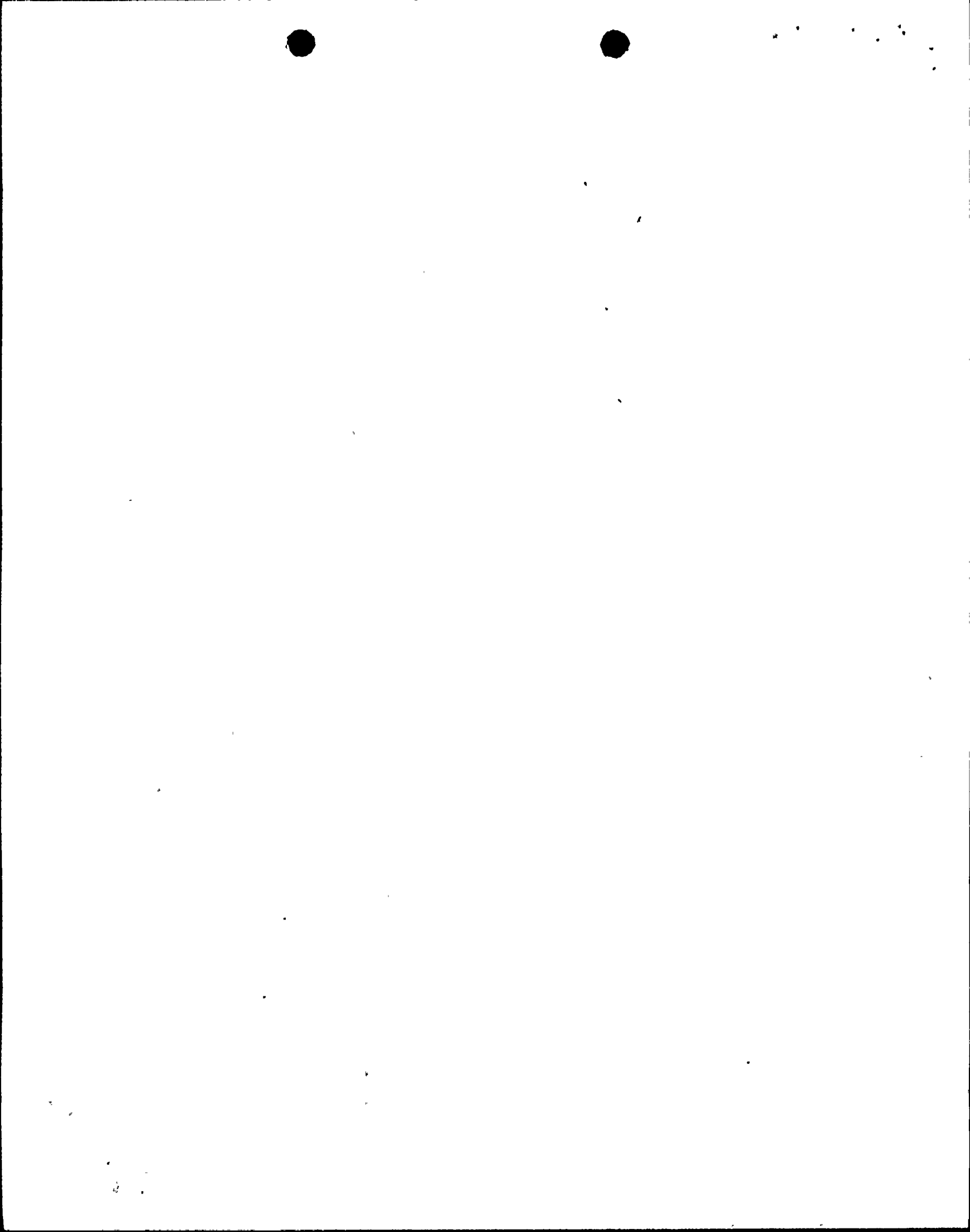


which evaluates how radioactive material could be released to the environment and the consequences, the TMI-2 accident could not be deemed a Class 9 accident since the releases did occur by evaluated pathways. Rather than defining whether conditions of the TMI-2 accident corresponded to the defined classes given in R.G. 4.2, I would rather describe what accident classes did not occur at TMI-2.

1. Class 9 accidents involve sequences of postulated successive failures more severe than those postulated for establishing protective systems and engineered safety features. The TMI-2 accident conditions were not more severe than postulated for any of the engineered safety features though the protective systems did take some severe conditions. The consequences were not severe as defined for Class 9 accidents -- they were rather trivial.
2. All Class 8 accidents are defined as events initiated by pipe breaks and reactivity additions and are relatable to design basis accidents used in the safety analysis report. The TMI-2 accident was not initiated by either a pipe break or a reactivity addition and was not relatable to such accidents evaluated in the SAR.
3. All Class 6 and 7 accidents involve fuel handling conditions. TMI-2 accident did not involve fuel handling.
4. Class 4 accidents are defined for BWR facilities. TMI-2 is a PWR facility.
5. Class 1 accidents are defined as trivial incidents and TMI-2 accident was not a trivial incident.

The accident classes that remain as contributors to the TMI-2 accident are: Class 2, small release outside containment; Class 3, radwaste system failure; and Class 5, fission products to primary and secondary system (PWR). The reported consequences from the TMI-2 accident are consistent with the predicted consequences from such class accidents as the Class 2, Class 3 and Class 5 defined accidents. If the NRC wishes to discuss the TMI-2 accident in respect to system analysis categories as given in R.G. 1.70, then a further review of the TMI-2 scenario would be required.

In conclusion, the TMI-2 accident was not a Class 9 accident by any rational analysis and comparison of the definition for a Class 9 accident with the TMI-2 accident scenario. I would recommend that the NRC staff (maybe your Task Force) prepare an analysis and evaluation of the TMI-2 accident to show the accident development scenario in terms of the response of various systems especially in respect to fission product releases from the fuel; where, what and how much of the fission product inventory was inside containment, inside auxiliary building and released to the environment; and



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what the effect of the hydrogen exploding inside the reactor vessel (regardless of the impossibility) would have been. There are probably other unresolved questions in addition to the above that need investigation for comparison with measured or predicted results from the TMI-2 accident.

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