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NOTE TO: Roger J. Mattson, Director
TMI-2 Lessons Learned Task Force

FROM: Jim Martin, Accident Analysis Branch
Division of Site Safety and Environmental Analysis, NRR

SUBJECT: CLASSIFICATION OF TMI-2 ACCIDENT

REFERENCE: Your August 16, 1979 note to Guy H. Cunningham, Re: Board (Salem) question concerning class 9 accidents

There are at least ten classes of accidents: classes 1 through 8, class 9 and the set of conservatively analyzed accidents postulated pursuant to 10 CFR Parts 50 and 100. The double ended pipe break postulate is part of the design bases for the ECCS. The scenarios postulated in Reg. Guides 1.3 and 1.4 are part of the design bases for the containment for the site. The titles on Reg. Guides 1.3 and 1.4 are misnomers, causing part of the widespread confusion - the titles say "LOCA", but the Regulatory Positions are silent with respect to mechanisms or initiating events. (Nevertheless, it has always been clear that severe cladding failure and primary pressure boundary leaks would be necessary in order to obtain the source terms specified in the scenarios in Reg. Guides 1.3 and 1.4.)

In the decade since the accident classification scheme for environmental reports was established (Proposed Appendix D to Part 50), the term "class 9 accident" has developed as a colloquial expression related to the resulting broad cast and adverse radiological exposures of accidents, rather than any specific (or even general) initiating event. (Although common attention is paid to the core and containment, there is sufficient inventory in the spent fuel storage pool to cause such exposures.)

The upshot of these musings is four-fold:

1. I don't agree that "the accident at Three Mile Island Unit 2 involved a sequence . . . of successive failures . . . more severe than those postulated for the design of the plant" (emphasis added). Although there was a series of failures, the combination of engineered safety features that worked, or partially worked, was sufficient to prevent broad cast and adverse radiological exposures.

2. I would say the event was close enough to a conservatively analyzed design basis scenario for the containment and it's engineered safety features, to be called that. In short, it was a design basis accident.

dupe of 7910240703

3. The classification is moot. The major environmental consequence of TMI-2 was that we scared h--l out of 1.5 million people, or so. Such a broad cast and adverse consequence is not covered by our regulations, guides, or the Atomic Energy Act.

4. We need a much better consequence oriented classification scheme.

Health effects and property damage should be considered quantitatively. The attached table is illustrative of a starting point. I doubt that we know how to handle the matter of psychological stress. We certainly can't avoid such stress given an appropriate and actual initiating event. (The way things are going, I'm not sure that we can avoid it in the absence of an initiating event!)

Jim Martin
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Office of Nuclear Reactor Regulation

Attachment: As stated

cc: L. Soffer
R. Houston
W. Kreger
D. Muller

CLASSIFICATION OF EMERGENCIES BY SEVERITY OF PROJECTED INSULT

CLASS[1]	PROJECTED WHOLE BODY DOSE (WBD) (REMS)[2]	DEFINITION
I	WBD $\geq$ 500	Incidents which pose a clear and imminent threat to the lives of individuals.
II	50 $\leq$ WBD $\leq$ 500	Incidents which pose a clear and imminent threat to the health of individuals.
III	5 $\leq$ WBD $\leq$ 50	Incidents which on a statistically significant basis pose a threat to the health of individuals in a population group in the long term.
IV	0.5 $\leq$ WBD $\leq$ 5	Incidents which on a statistical basis pose a threat to the general health of a population group in the long term, but for which specific individuals in the group[3] cannot be positively identified in the short term.
	0.05 $\leq$ WBD $\leq$ 0.5	Incidents not to be classified as emergencies, but for which assessment, protective or corrective actions may be deemed advisable or desirable.

NOTES:

1. All, none, or some of these classes may coexist in time and space. Doses at larger distances would occur after a delay due to travel time.

2. Whole body doses include bone doses. Ranges for other organs can be established using ratios of whole body dose to organ dose (e.g., WBD is about 1% of thyroid dose), unless other evidence suggests the use of a higher ratio.

3. On a statistically significant basis; pregnant women in their first trimester could be identified as a sub-group in this class.