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US NRC

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To: R. Dudley for
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U.S.N.R.C.

D. Meyer original

Subj. Comments on "Draft Final Technical Study of SFP Accident Risk at Decommissioned NPP's."

These informal and incomplete comments are provided to NRC for NRC's review and consideration. The 2/22/00 release date to the 4/2/00 due date for comments (the period of time) is suggested to be insufficient time for complete comments, especially when I am unable to devote a full time effort to the review.

Accordingly, I respectfully seek another three (3) months from this date to more formally and completely respond.

However, I provide my comments without access to any of the references in the study. The additional time (requested) permits me the opportunity to obtain and/or review the references.

My involvement during the 1970's (as an NRC employee) with the Maine Yankee NPP and more recently with the allegation review process and followup investigations by the OIG has required me to stay

with Maine Yankee during the decommissioning process both for personal reasons and at the request of stakeholders. I attended most of the meetings. These are my first written comments. However much of what I have said was transcribed from the meetings.

Among the many issues that I talked about were seismic concerns, criticality concerns & aging questions. Although earthquake and fuel reactivity issues are addressed from an engineering investigative perspective, aging has not been.

Comments on Policy.

1. It is suggested that references used in a study seeking public comment be made available to those interested members of the public at no cost. Some members of the public wanting to comment do not have these references readily available, especially when they are out of state.
2. Possible Conflict of Interests by the NRC should be identified and addressed. For example, when nuclear P.P. owners sue DOE on fuel storage matters, NRC (being part of the same govt. as DOE) might appear to have a motivation to rule in a manner to minimize the lawsuits' impact (SFP matters)

at the expense of public safety.

3. The NRC should identify differing professional opinions expressed and their resolution as it affects this study. For instance, ON 5/4/75, Dr. S. H. Hanauer in a memo to G. Arlotto is quoted to say "you can make probabilistic numbers prove anything, by which I mean that probabilistic numbers 'prove' nothing."

4. The basis for the heavy reliance upon a risk-informed approach to this study fails to account for realistic probabilistic numbers. The probability of the happening of accidents as the event occurred should be calculated so that a more realistic probabilistic perspective is determined. For example, what is the probability that the TMI-2 & Chernobyl accidents would have occurred. This number properly calculated could form a more realistic figure from which to apply "highly unlikely" & "not credible" terminology. At this time the RG 1.174 criteria of 1×10^{-5}/yr frequency used for a zirc fire has no documented experimental basis or actual happening to support its use for zirc fires. R.G. 1.174 was not in fact written for decommissioned

nuclear power plants. Its application is for operating reactors, which have a more conservative defense in depth strategy than the design of SFPs.

5. The NRC should perform a rigorous engineering analysis of the effects of aging* upon the spent fuel pool and its associated structures and equipment. Most SFPs were never designed to be quasi-permanent fuel storage facilities. Because there is as yet no permanent place to store used fuel, SFPs have had to accept more fuel than they were originally designed to hold. To allow SFPs to continue to store spent fuel for as yet an undetermined period of time requires, I suggest, a comprehensive look at aging.

Comments on Seismic Designs.

1. A significant seismic event which damages & drains the SFP is also likely to wreak havoc upon the local infrastructure. How has NRC considered the availability of local resources as identified by IDC #2, #3 & #4, if should the local infrastructure be destroyed?

* aging could include degradation, failure, etc, of structures & equipment.

2. To my knowledge, not every spent fuel pool was designed to the seismic criteria in use today. The use of words like "robust" does not necessarily address seismic qualification. The NRC should identify all spent fuel pools that were not initially designed to seismic criteria and explain their level of qualification, including the SF racks.

3. Not all AVR buildings housing spent fuel are seismically qualified. The NRC should perform a worst case analysis of the result of a seismic event which collapses the spent fuel pool building, and/or drains the pool and damages the spent fuel. Both criticality & zirc fires are of concern. The nine initiating events listed at p. 11 which could occur concurrent with the earthquake should also be considered if the events contribute to the worst case scenario.

4. The NEI seismic checklist requires a seismic engineer to review drawings in addition to conducting a walkdown of the SFP. It has been my experience that many electrical drawings of NPP's do not reflect the existing plant electrical installation.

How is the seismic engineer going to verify drawings to the existing SFP building & pool if much of the pool is inaccessible? For instance, how does he verify concrete degradation under the steel liner? The NRC should require that specific areas be inspected and that these areas be accessible. If these areas are not accessible, then the checklist is not complete and susceptibility to seismic activity remains a concern.

5. The NRC should specify why it is not cost effective to perform a plant-specific seismic evaluation for each spent fuel pool and what impact this has on safety. Because there are so many differently designed spent fuel pools, it is difficult to perceive how a generic approach could be acceptable without assembling a list of similar & identical designs and performing a seismic evaluation of the various groups which are assembled. Specific seismic evaluations for each plant or groups of similar/identical plants should be considered.

Comments on Spent Fuel Pools (SFP).

1. The NRC should identify all spent fuel pools that leak. Degradation of the liner and concrete should be investigated. The leaks should be sealed.
2. The NRC should determine the qualification and degradation of spent fuel racks.
3. The proper methods of extinguishing a possible zirconium fire need to be addressed.

Comments on Failure Rates.

It is possible to obtain reliable failure rates for safety related equipment. However non-safety related equipment failure rate information is not as simple for NRC to obtain. Standards for manufacture, quality assurance, etc. may not be known. Requirements to report non-safety related failures of equipment may not be properly documented. Hence, non-safety-related equipment failure rates may not be accurate. Inputs of failure rates of non-safety related equipment to a risk-informed PRA could adversely affect.

accuracy. NRC should determine which failure rates used in the risk informed process are reliable and which are not, and the results should be included in the study. I am not aware of any older NPP's that have safety related equipment ~~that~~ in the SFP cooling, instrumentation or other areas. Reliable failure rates are questionable.

My recollection of the 7/16/99 work/study group meeting between the NRC and industry is that industry verbally agreed through Mr. Meisner of Maine Yankee to install a single failure proof crane system using safety grade electrical equipment. What happened to this commitment?

Comments on Terrorism.

This draft report omitted terrorist acts of sabotage and vandalism. A successful terrorist event could endanger public health and safety. Emergency evacuation plans should be prepared with this consideration of terrorism

Comments on Criticality.

1. NRC should identify the scenario where a steam explosion is possible because of a severe criticality event and the basis upon which the probability was determined to be "highly unlikely."

2. A recent telephone conference call on criticality has been the basis of a request for access to various reference documents. In conjunction with policy comment #1, NRC should permit free and easy access to references. I do not anticipate a flood of requests for technical references. The subject matter should be of interest to technically educated people.

3 The NRC should ~~state the name~~ identify all radioactivity in the spent fuel pool & that capable of being dispersed in an accident (beyond that on p. A3-11 to A3-13).

Comments on Operator Action.

1. Because spent fuel pool accidents require operator manual action, the NRC should identify the number of operators assigned to each shift and how these operators are protected so that their availability

is "guaranteed" in the event of an accident.

2. Standing watch over a SFP "graveyard" cannot be the most exciting job available. What measures are taken to minimize boredom and maintain alertness?

3. Accidents in operating reactors are designed to be mitigated by automatic safety systems. Operator error has aggravated many of these accidents. What measures are in place to minimize operator error in a postulated spent fuel pool accident?

General comments.

1. Spent fuel pools in PWR's do not have a containment. Yet the worst case accident scenario parallels that of an operating reactor with respect to both people and property damage. The NRC should review the justification for containments in operating reactors and explain why a containment would or would not be advisable over a SFP.

2. To the extent possible, experimental validation of risk informed results should be addressed.

3. Because terrorist acts are not specifically addressed, it is suggested that any approach towards safety that NRC adopts should err on the side of safety wherever there is a choice.

4. It is suggested that these interim regulations be time limited, to be reviewed again at some future date.

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