

What needs to be said  
9/9/99

AREAS WHERE THEY HAVE BEEN TOLD BEFORE THAT RESOLUTION TO AN ISSUE EXISTS

1. NEI asked for NRC to release the preliminary "Draft Technical Study of Spent Fuel Pool Accidents for Decommissioning Plants" (draft report) even though it was made clear that this was preliminary and the staff intended to subject the draft to technical review by independent reviewers. NEI was told the final report would be part of the technical basis for deciding how to provide guidance on exemption requests and reviews for decommissioning plants in the areas of emergency preparedness, safeguards, and insurance. The final report probably would provide the technical bases for rule making on this issue also. The staff stated various times that the draft report was a preliminary risk assessment (two months in preparation) that would not be used to make regulatory decisions.
2. NEI was told that the draft report was provided to them at a preliminary stage at NEI's insistence. The draft report attempted to provide a risk perspective for a full range of initiating events for decommissioning plants, unlike NRC's previous analyses that were either limited in scope, highly focused, or applicable to operating reactors only. ✓
3. NEI was told that the primary purpose of the draft report was to explore the risk associated with operation of spent fuel pools at decommissioning plants on as realistic a basis as possible. The analysis was not performed to determine the applicability of backfits. NEI was told the staff originally expected the analysis would demonstrate that exemptions could be easily justified. Such was not the case.
4. NEI was told that when the staff analyzes rules, it does not approve or endorse them on the basis of a majority of the covered plants being safe, but on the basis of all the plants being safe. We clearly would reject a rule change that left only 50% of the plants in a safe condition. ✓
5. The staff told NEI that <sup>the</sup> its risk assessment was performed in parallel with the deterministic analyses due to the short period scheduled for completion of the decommissioning analysis. The staff acknowledged that the risk assessment was performed in a rapid manner utilizing the services of several senior risk analysts at the NRC. It was assumed that the bounding deterministic evaluations would possibly show that there was no chance of significant offsite consequences (i.e., no zirconium clad fire) for all or most cases. That did not turn out to be the case. The bounding cases were chosen also to assure that they were applicable to all current and future plants as well as potential fuel configurations. The staff told NEI that plant-specific analyses might demonstrate significant margin to ~~safety improvements~~ compared to the staff's deterministic calculations in the draft report. ✓
6. The staff stated that all responses to loss of cooling events at decommissioning plants had to be made by certified fuel handlers, as there were no automatic actions at current decommissioning plants.

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7. The staff directly discussed the time window between the spent fuel pool being drained to within three feet of the top of fuel and the beginning of a zirconium fire. NEI was told that it was assumed that the scenerio was unrecoverable once such a water level was reached. This was based on the anticipated radiation fields (perhaps at the 100,000 Rad per hour level at the lip of the pool) once the fuel was uncovered and the probable temperature/humidity in the spent fuel pool building at that time (probably in the 200°F/100% range.) Because of these assumptions, the staff gave no credit for mitigation of the event once it had progressed to this point. In addition the staff did not believe it would be acceptable to have firefighters or plant personnel performing very heroic measures under these conditions to attempt to prevent a zirconium fire.

8. We told NEI there are only two end states for these events: there is a zirconium fire or there is not. Without a fire, there is not enough energy to transport fission products offsite to cause a serious accident (in severe accident space). We made it clear that it would take days (with the exception of seismic and heavy load drop events) to empty the pool to three feet above the fuel. The staff stated the additional hours it would take the spent fuel pool level to drop from three feet above the fuel until the beginning of runaway clad oxidation were insignificant and would have minimal, if any, effect on human reliability analysis results. It certainly would have little effect on insights.

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9. The staff repeatedly told NEI that NUREG-1353 does not apply to decommissioning plants ~~as~~ the NUREG examines operating plants that have a full complement of emergency diesel generators, a full complement of offsite power sources, decay heat removal systems capable of aiding the normal spent fuel pool cooling systems, seismically capable makeup systems, multiple makeup sources to the spent fuel pool, multiple makeup systems (several of which have high volume makeup capability), and 24-hour staffing by maintenance personnel. Decommissioning plants often have no emergency diesel generators, only one offsite power line, no large capacity decay heat removal system to assist the skid-mounted replacement spent fuel pool cooling system, limited low volume makeup capability, limited makeup water sources, and only day-shift (4 days a week, ~~not~~ on weekends) maintenance help.

*none*

AREAS WHERE WE AGREE WITH NEI AND THE AREA MAY CHANGE THE PERCEPTION OF RISK

- with the draft report*
1. The typical plant configurations for BWRs and PWRs were modeled essentially the same as described in "A Review of Draft NRC Staff Report: 'DRAFT Technical Study of Spent Fuel Pool Accidents for Decommissioning Plants'" (NEI report)
  2. The differences between operating plants and decommissioning plants can prove to be important because of the substantially different configuration of the plant and the SFP or because of the reduced complement of electrical power sources in a decommissioning plant.
  3. The draft report is unique in identifying the majority of accident types as worthy of additional consideration (NEI characterized them as "risk significant.") We found that previous analyses were not applicable to the configurations found at today's decommissioning plants. The draft report was the first to model actual decommissioning
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plant configurations. We also found other limitations in earlier analyses that tend to reduce the value of their conclusions on the risk associated with different initiators at decommissioning plants.

4. We agree that the staff has not developed safety goals applicable to operation of spent fuel pools at decommissioning plants. We agree that it is very difficult to try and compare operating reactor safety goals to spent fuel pool accidents (there are several technical reasons for this.)
5. The staff agrees that the duration over which there is a risk of zirconium fires at decommissioning plants is plant-specific and should be five years or less.

#### AREAS WHERE WE DO NOT AGREE WITH NEI'S ASSESSMENT

1. The staff does not agree that NUREG-1353 applies to decommissioning plants. We do believe that it provides a reasonable representation of the risk associated with most initiating events for spent fuel pools at operating plants.
2. The staff does not agree that its draft report called for backfits at decommissioning plants.
3. The NEI report incorrectly states that the draft report does not consider mitigation on-site and does not consider the time between initial fuel uncovering and complete uncovering.
4. The NEI report appears to misunderstand the difference between the 800°C and 1600°C temperatures regarding when a zirconium fire will occur. The 800 degree C value is the temperature at which runaway oxidation will occur. In a short period (perhaps 20 minutes), the exothermic reaction will have heated the cladding to 1600 degrees C, the temperature at which ignition of the fuel in air is expected.
5. The NEI report mischaracterizes the staff's position on the meaning of the deterministic results. The staff found that because the deterministic analyses could not rule out the possibility of a zirconium fire, then it was prudent to perform a risk assessment of the likelihood and consequences of such events.