SPSB Comments

The conclusions and important findings in the Technical Study are undermined by Appendix 1.

Line 479 - "The staff has concluded that it is not possible to perform a generically applicable analysis to determine heatup times or critical decay times." without fuel

Line 483 - "The staff...has a poor understanding of the accident progression and source term from a spent fuel pool fire."
bundles

Line 139 - "...it is the opinion of the staff that [studies in support of GSI 82] do not provide an adequate basis for exemptions."

Line 140 - "...[The GSI 82 studies] lack sufficient information for *all* the parameters that could affect the decay time."

July 19, 2000

DRAFT

Q/212

AREAS NO LONGER TRUE IN EXECUTIVE SUMMARY

1. THERMAL HYDRAULICS NO LONGER SUPPORTS DECAY TIME OF 5 YEARS OR LESS. Maybe o'k for full draindown Partial unknown

2. CAN NO LONGER SAY THAT "CONSEQUENCES ARE SIMILAR TO A LARGE EARLY RELEASE, BUT THE TIME OF RELEASE OCCURS MUCH LATER (i.e. 10 hours or more) FOLLOWING INITIATION OF THE ACCIDENT."

   Consequences same, but no longer >10 hrs

3. CAN NO LONGER SAY "THE RISK ASSESSMENT SHOWS LOW NUMERICAL RISK RESULTS IN COMBINATION WITH SATISFACTION OF SAFETY PRINCIPLES (e.g., margins, defense-in-depth) AS DESCRIBED IN R.G. 1.174. " Don't understand

4. CAN NO LONGER SAY THAT "AFTER ONE YEAR FOLLOWING FINAL SHUTDOWN, THE LOW LIKELIHOOD THAT A ZIRCONIUM FIRE WOULD OCCUR, IN COMBINATION WITH THE LONG TIME FRAMES (i.e., > 10 hours) AVAILABLE FOR TAKING OFF-SITE PROTECTIVE ACTIONS, PROVIDES A BASIS FOR RELAXATION OF EP REQUIREMENTS." Full may be o'k but partial unknown

DRAFT

OPTIONS

A. PERFORM EXTENSIVE EXPERIMENTAL PROGRAM (MULTI-YEAR) BEFORE CAN MAKE TECHNICALLY SOUND RECOMMENDATIONS

B. ABANDON RULEMAKING. DISCOURAGE EP EXEMPTION REQUESTS. REVISIT PAST EP, SECURITY, AND INDEMNIFICATION EXEMPTIONS FOR DECOMMISSIONING PLANTS DUE TO HIGH UNCERTAINTY.

C. CONVENE PANEL OF EXPERTS. ATTEMPT TO ADDRESS THERMAL HYDRAULIC UNCERTAINTIES THROUGH EXPERT ELICITATION PROCESS. SEE IF ORIGINAL THERMAL HYDRAULIC ASSUMPTIONS WERE REASONABLE AND CAN BE RE-ESTABLISHED.

D. ABANDON LINKING OF LOW FREQUENCY OF ZIRCONIUM FIRE WITH LONG TIMES AVAILABLE FOR LOCAL EVACUATIONS. JUSTIFY EXEMPTION OF EP SOLELY ON FREQUENCY OF RISK.[1] [2]

E. REDO T/H ANALYSIS USING RES GUIDANCE ON BREAKAWAY OXIDATION AND CLADDING TEMPERATURE CRITERIA FOR RAPID OXIDATION. USE OTHER BASES AND ARGUMENTS TO JUSTIFY SPECIFIC T/H ASSUMPTIONS.

DRAFT

[1] In the past the EP people have indicated this approach was unacceptable.

[2] The frequency of the dominant sequence (seismic) at about 4.5×10^{-6} per year for large releases is in the area of increased management attention, based on Regulatory Guide 1.174 guidance. In comparison, this frequency is above frequencies of events the staff has categorized as not credible, such as vessel rupture. This level of risk clearly is not below regulatory concern.

THE FOLLOWING MUST BE ADDRESSED/ASSUMED:

1. NO BREAKAWAY OXIDATION WILL OCCUR WITHOUT IMPACT FORCE.
w/3 below not concern

2. ADDRESS WHETHER CAN EXCLUDE SEISMIC AND HEAVY LOAD DROP AS POTENTIAL IMPACT SOURCES.

3. SET CLADDING TEMPERATURE LIMIT TO 800 °C FOR ONSET OF RAPID OXIDATION. Will be done

4. ADDRESS PARTIAL DRAINDOWN EVENTS AND PROVIDE JUSTIFICATION FOR EXCLUSION, IF WARRANTED. IF EXCLUSION IS WARRANTED, MAKE IT AN SDA.

5. ADDRESS EFFECT OF FUEL BURNUP ON RES ASSUMPTIONS.

6. ADDRESS CODE LIMITATIONS DISCUSSED IN APPENDIX 1 (E.G., MODELING OF MIXING, AIR FLOW RATE, FLOW BLOCKAGES, LACK OF BENCHMARKING IN A MANNER THAT BOUNDS OR PROVIDES A BEST ESTIMATE. MUST EXPLAIN THE POTENTIAL EFFECT OF CODE LIMITATIONS ON TIME TO ZIRCONIUM FIRE.

7. ADDRESS EFFECT OF FUEL RACK DAMAGE OR RUBBLE FORMATION ON PROPAGATION OF ZIRCONIUM FIRE. At most can be done qualitatively other probably impossible

8. REWRITE APPENDIX 1 AND MAIN REPORT.

9. ENDORSE RECOMMENDATION THAT CONFIRMATORY RESEARCH BE PERFORMED FOR HIGH BURNUP FUEL.

10. ESTABLISH ADDITIONAL STAFF DECOMMISSIONING ASSUMPTIONS (SDAS) AFFECTING T/H ASSUMPTIONS SUCH AS, THE NATURAL CIRCULATION BUILDING FLOW EQUALS X -TIMES NORMAL VENTILATION FLOW, OR BUILDING INTEGRITY WILL BE MAINTAINED UP TO 1.2G SPECTRAL ACCELERATION.