

**Commissioner's Technical Assistants Briefing**

**on**

**ACRS Comments on the Draft Final Technical**

**Study of Spent Fuel Pool Accident Risk**

**at**

**Decommissioning Nuclear Power Plants**

**May 4, 2000**

I-1111

## OVERVIEW

### Issue:

- ACRS comments impact the staff report in four critical areas
  - Frequency of zirconium fires — *Frequency*
  - Acceptance criteria — *Consequences*
  - Timing of zirconium fire
  - Window of vulnerability } *T/H*
- Based on comments from the November 5 ACRS meeting, the staff thought there was a mutually acceptable approach for addressing T/H issues and the principle of using LERF.

### Approach:

- Addressing the ACRS comments will require some additional technical work related to consequence analysis and T-H.
- The text of the report will have to be modified somewhat to address uncertainties and to clarify staff's technical bases.
- The response to ACRS will commit to additional technical work and some modification of the report. However, we will also dispute the relevance of some ACRS comments to the conclusions of the report.
- Staff believes that principal findings of the report remain valid.

## OVERVIEW (Continued)

### Impact:

- In order to address the ACRS issues in the final report, a three-month delay will be needed.
- Should not impact timing or content of the rulemaking.

## FREQUENCY OF ZIRCONIUM FIRES

### Issue:

- The report concluded that the zirconium fire frequency is in the low E-6 per year range and is dominated by seismic.
- ACRS cited undue conservatism in the seismic numbers, and called for a discussion of human reliability uncertainties in the report.

### Approach:

- Staff response to ACRS will commit to more discussion of uncertainties in report.
- Regarding seismic, the staff recognizes that there are conservatisms, but is not in a position to push the state of the art of seismic risk analysis.

### Impact:

- Addressing these comments will not affect the report schedule.

## ACCEPTANCE CRITERIA

### Issue:

- The report assumes that any fuel uncover will lead to a Large Early Release. The report uses the Reg Guide 1.174 guideline of  $1\text{E-}5$  per year as the acceptance criterion for zirconium fire frequency.
- ACRS claims that there are aspects of a zirconium fire which may go beyond LER. These include the effect of Ruthenium on early fatalities and the potential for enhanced land contamination.

### Approach:

- Staff is prepared to include Ruthenium in the report. The effect on early fatalities does not qualitatively change our view of LERF guideline.
- The land contamination issue is a policy question that goes well beyond report scope and is under consideration by the Commission.

### Impact:

- This work can be accomplished within the current schedule for finalizing the report.

## TIMING OF ZIRCONIUM FIRE

### Issue:

- The technical report concludes that fuel heatup to a zirconium fire will take about 10 hours, even for seismic sequences. This has implications for the time available for ad-hoc protective actions.
- ACRS cites the possibility of earlier ignition due to zirconium hydride formation and other phenomena.

### Approach:

- Staff is preparing to present information refuting these arguments, although there may be some reduction of the delay time.

### Impact:

- To address these comments, the staff needs a three-month delay in finalizing the report.

## WINDOW OF VULNERABILITY

### Issue:

- The report concluded that the window of vulnerability for zirconium fire is no greater than five years. Plant specific analyses could demonstrate shorter times.
- ACRS (and other commenters) point out that the report does not address the partial draindown case, in which natural circulation of air is not present.

### Approach:

- Staff proposes to do additional T-H analysis to address this issue. Staff expects the effect on the 5 year finding to be relatively small.

### Impact:

- The staff needs a three-month delay in the schedule for including this additional analysis in the final report.

## SUMMARY

- The ACRS comments, and those of other commenters, are substantive and require significant effort to address.
- The staff believes the report can be modified to address these issues with only minor changes to the conclusions of the study.
- A three-month delay in the schedule for completing the technical report is needed to address the ACRS issues.
- Westinghouse Owners Group and NEI comments have not been received and could affect schedule if substantive.
- There should be no impact on the substance of, or the schedule for, the rulemaking.