

RIC 2006
SESSION T2BC
SEVERE ACCIDENT RESEARCH

SEVERE ACCIDENTS

UTILITY ISSUES

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March 7, 2006



UTILITIES

- **OPERATE UNITS**
 - **NOT DESIGNED FOR SEVERE ACCIDENTS**
 - **LIMITED FLEXIBILITY FOR MODIFICATIONS**
 - **SIGNIFICANT DESIGN MARGINS (CONTAINMENT)**
- **CONSIDER BUILDING NEW PLANTS**
 - **S. A. CREDITED IN PLANT DESIGN**
- **ULTIMATE RESPONSIBILITY FOR PLANT SAFETY**
 - **ADEQUATE PROTECTION OF THE PUBLIC/ENVIRONMENT**

OBJECTIVES

- **SHOW PUBLIC/ENVIRONMENT PROTECTION ADEQUATE**
 - **EVALUATE SEVERE ACCIDENT CHALLENGES**
 - **ADDRESS POTENTIAL VULNERABILITIES**

- **IF IMPROVEMENTS NEEDED**
 - **FACTOR PLANT SPECIFICS**
 - **IMPLEMENT OPTIMUM SOLUTION**
 - **NOT NECESSARILY FUTURE PLANT SOLUTIONS**

NEED FOR INTEGRATED APPROACH

- **OBJECTIVES FOR PUBLIC PROTECTION**
- **DEFINE SAM GUIDELINES**
 - **ACCIDENT PROGRESSION, POTENTIAL CHALLENGES**
 - **CRITICAL ACTIONS**
 - **CORE COOLING**
 - **CONTAINMENT INTEGRITY**
 - **EVALUATE PROS AND CONS**
- **ADDRESS POTENTIAL VULNERABILITIES**
 - **DRAWBACKS FOR MORE PROBABLE PLANT STATES**
 - **CREDIT PLANT SPECIFICS**
 - **MITIGATIVE DEVICES IF NEEDED**

SEVERE ACCIDENT R&D

- **QUANTITATIVE INFORMATION NEEDED**
 - **R&D PROGRAMS**
- **MANY PROGRAMS IN THE LAST 25-30 YEARS**
 - **NATIONAL OR MULTINATIONAL**
 - **SOMETIMES OVERLAPPING**
 - **ADDRESS ALL RELEVANT PHENOMENA**
 - **MANY DATA ALREADY AVAILABLE**
 - **RESULTS SHOW**
 - **UNCERTAINTIES CAN BE LARGE**
 - **DECREASING UNCERTAINTIES QUESTIONABLE IN SOME CASES**

SEVERE ACCIDENT R&D

- **IS DATA CONSOLIDATION ADEQUATE?**
 - **YES FOR COMPUTER CODES**
 - REPOSITORY OF CURRENT KNOWLEDGE (e.g. MELCOR, ASTEC)
 - **MORE COULD BE DONE**
 - PERIODIC UPDATE OF STATE OF THE ART REPORTS
 - PERSPECTIVE FOR PRACTICAL USE
 - RESULTS DON'T ALWAYS GIVE ADEQUATE PERSPECTIVE ON RISK (E.G. CONDITIONAL PHENOMENA)

SEVERE ACCIDENT R&D

- **DO WE NEED MORE?**

- **FORMAL STANDPOINT**

- MANY NEXT GENERATION DESIGNS HAVE BEEN LICENSED
 - NO RESTRICTIONS ON CURRENT PLANTS
 - → RISKS DEEMED ADEQUATELY LOW

- **BUT BETTER CLOSURE WELCOME FOR SOME CHALLENGES**

- IN-VESSEL RETENTION CAPABILITY (CURRENT PLANTS)
 - EX-VESSEL CORIUM COOLABILITY (CURRENT PLANTS)
 - LOW VOLATILE F.P. RELEASE

OTHER CONSIDERATIONS

- **KNOWLEDGE TRANSFER TO YOUNG GENERATIONS**
- **MAINTAIN AWARENESS**
 - **COMPLACENCY COULD BE AN ISSUE**
- **RISK AVERSION COULD INCREASE**
- **R&D CAPABILITY WILL DISAPPEAR BELOW MINIMUM LEVEL OF RESOURCES**
 - **➔ DIFFICULT TO RE-CREATE (COSTS, HUMAN RESOURCES)**

POSSIBLE APPROACH

- **COMMUNICATION BETWEEN STAKEHOLDERS**
 - **COSTS WILL BE AN ISSUE**
 - **NEED FOR COMMON UNDERSTANDING**
 - **NEEDS, PRIORITIES**
- **EMPHASIZE INTERNATIONAL COOPERATION**
 - **FACILITIES/PROGRAMS AT RISK**
 - **COOPERATIVE PROGRAMS**
 - **COMMON POSITION PAPERS**
 - **UPDATE SOARS**
 - **LECTURES REFLECTING INTERNATIONAL VIEWS**
 - **e.g. OECD THICKET**