

STATE-OF-THE-ART REACTOR CONSEQUENCE ANALYSES (SOAR CA)

Project Objectives:

Perform a realistic evaluation of severe accident progression, the radiological releases, and the resulting offsite consequences.

Provide a more accurate assessment of potential offsite consequences and update previous analyses such as NUREG/CR-2239.

Project Method:

Use a spectrum of scenarios (accidents) most likely to contribute to release and subsequent offsite consequences. Use a risk-informed approach (i.e. PRA)

Use realistic, detailed integral modeling of plant systems, radionuclide transport and deposition, and release pathways (i.e., MELCOR, MACCS)

Use updated emergency preparedness modeling assumptions

Account for plant improvements, including insights from newer, more realistic NRC evaluations

Account for use of mitigative strategies for the delay or prevention of core damage, and further reduction in offsite releases

Project Schedule:

Perform the SOARCA on an initial scope of not more than eight (8) plants that represent the spectrum of plant vendors and technologies.

Complete a PWR (Surry) and a BWR (Peach Bottom) analysis by September 2007. Resolve issues and details associated with the integration of methods and simulation of plant systems and procedures. Peach Bottom and Surry have the most advanced MELCOR and MACCS models.

- Obtain preliminary information for model refinement May
- Provide detailed information needs
Surry ~ May 25, 2007
- Site visit
Surry ~ June 5-7, 2007
- Complete up to six more plants (TBD) September 2008
- Provide recommendations to the Commission on how to proceed with the remaining plants. September 2008

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Peach Bottom Initial Information Needs

MELCOR Related Information

A "Description of containment failure criteria (Please confirm whether the discussion in Section 4.4 of the Peach Bottom IPE is still considered valid and a best-estimate characterization.)"

A current "MAAP model" (or similar thermal-hydraulic model of reactor and containment) with associated documentation.

MACCS2 Related Information

Reg Guide 1.23, "Onsite Meteorological Programs," data that includes 8760 consecutive hours of meteorological data provided in electronic format, if available. In addition, if the licensee records precipitation (not required by the Guide), the precipitation data for the same 8760 hours of Reg Guide 1.23 data is needed.

Emergency Preparedness Related Information

The complete Evacuation Time Estimate (ETE) report. The full size, color (if available) EPZ map with evacuation routes.

Structural Related Information

Provide the number, material, dimensions, and mechanical properties for the drywell top flange assembly gasket(s), Torque value(s) for drywell top flange bolts (2-1/2"), and detailed drawings of containment bellows and related design basis analyses.

Surry Initial Information Needs

MELCOR Related Information

Steam generator 100 % operating conditions including steam generator secondary mass, pressure, and flow rates inside steam generator. Identify the number of tubes and number plugged tubes by steam generator. Identify active heat transfer area and inactive heat transfer area, if readily available.

A current "MAAP model" (or similar thermal-hydraulic model of reactor and containment) with associated documentation.

MACCS2 Related Information

Reg Guide 1.23, "Onsite Meteorological Programs," data that includes 8760 consecutive hours of meteorological data provided in electronic format, if available. In addition, if the licensee records precipitation (not required by the Guide), the precipitation data for the same 8760 hours of Reg Guide 1.23 data is needed.

Emergency Preparedness Related Information

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Fuel Related Information

Provide both axial and radial fuel geometry.

Provide complete fuel material specification relating to fuel enrichment, any burnable absorbers, and cladding material.

Provide reactor design information including the number and type of assemblies, reactor power, assembly layout, the typical boron letdown curve, and the typical cycle burnup.