

Contract Program or Project Title: Advanced Reactor Safety Analysis
Technical Assistance, Reactor Projects

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INTERIM REPORT

NRC Research and Technical
Assistance Report

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MONTHLY HIGHLIGHTS

for

May 1979*

PROGRAM: Advanced Reactor Safety Analysis
Technical Assistance, Reactor Projects
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NRC Research and Technical
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MONTHLY HIGHLIGHTS

TASK I. SPECIAL SERVICES (R. A. Bari)

NRC/OSP Meeting (W. T. Pratt)

A meeting between Offshore Power Systems and NRC and its consultants on the proposed sacrificial bed design for a floating nuclear power plant was attended. At the request of A. R. Marchese, a written evaluation of the meeting was provided to DPM/NRC.

TASK II. POST-ACCIDENT CONTAINMENT ANALYSIS (W. T. Pratt)

Sodium Spill and Fire Analysis (S. S. Tsai)

A report that describes the NACOM computer program and provides a User's Guide is currently being prepared.

FMO Sacrificial Bed Analysis (R. D. Gasser and W. T. Pratt)

A preliminary version of the MELT code is nearing completion. The code is designed to calculate the melt-front propagation of a molten UO_2 pool through a sacrificial layer of MgO . It features a transient solidified crust at the surface of the pool, radiation from the pool surface to the walls and structures above the pool, and temperature feedback as these structures are heated up.

LMFBR Containment Analysis (R. D. Gasser)

Operation of the CONAN code has revealed that with current modeling a high degree of supersaturation can occur in the reactor cavity. Review of cloud chamber data indicates that the partial pressure of vapor may exceed the saturation pressure by a factor of 50 or more before homogeneous nucleation occurs. A correlation for the onset of "rainout" is being sought in order to limit the supersaturation to experimentally observed levels and provide for reflux through the "rainout" phenomenon.

TASK III. PLANT DYNAMICS AND RELIABILITY ANALYSIS (R. A. Bari)

Evaluation of Boiling at Low Power (K. R. Perkins)

A memo summarizing the results of the SAS-3D boiling calculations has been completed. The results for constant power low inlet subcooling are in substantial agreement with the analysis for in-vessel natural circulation (reported below).

FFTF In-Vessel Natural Circulation (K. R. Perkins)

A draft informal report on the "Evaluation of In-Vessel Natural Circulation During a Hypothetical Loss-of-Heat-Sink Accident in FFTF" has been completed and transmitted to the NRC.

Reliability Analysis (Y. H. Sun)

The Boolean Algebra process was carried out for the fault tree constructed for the shutdown heat removal system of the NASAP HWR. The obtained cut sets provide a basis for system interactions evaluations.

TASK IV. REACTOR PHYSICS (H. Ludewig)

HWR Reactor Physics (A. Mallen)

The study of coolant void coefficients and fuel temperature coefficients has been completed using WIMS. These are now being repeated using LATREP.

HWR Xenon Oscillations (H. Takahashi)

A memorandum is being prepared which outlines the initial conclusions reached in this study.

LMFBR NASAP Studies (H. Ludewig)

The NASAP PSEID has been studied as well as the more detailed supporting document from Westinghouse. Safety-related parameters summarized in the PSEID (Doppler coefficients, sodium void) tend to follow expected trends (i.e., sodium void worth drops for heterogeneous cores and for cores with thorium in blankets.)

Distribution

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