

Accession No.

7210180001

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

Subject of this Document: Monthly Highlights for August, 1979

Type of Document: Monthly Highlights

Author(s): Robert A. Bari

Date of Document: August 10, 1979

Responsible NRC Individual
and NRC Office or Division: Dr. Themis P. Speis, Chief
Advanced Reactors Branch
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

Brookhaven National Laboratory
Upton, NY 11973
Associated Universities, Inc.
for the
U.S. Department of Energy

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555
Under Interagency Agreement EY-76-C-02-0016
NRC FIN No. A-3000

INTERIM REPORT

1167 209

NRC Research and Technical
Assistance Report

MONTHLY HIGHLIGHTS

for

August 1979*

PROGRAM: Advanced Reactor Safety Analysis
Technical Assistance, Reactor Projects
20-19-02-01
Fin No. A-3000

Robert A. Bari, Group Leader

Engineering and Advanced Reactor Safety Division
Department of Nuclear Energy
BROOKHAVEN NATIONAL LABORATORY
Upton, New York 11973

NRC Research and Technical
Assistance Report

*Work carried out under the auspices of the United States Nuclear
Regulatory Commission.

1167 210

MONTHLY HIGHLIGHTS

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

Arrangements have been made with Battelle Columbus Laboratories to obtain the MARCH Code for LWR core meltdown analysis. Preparations to transfer the code to BNL will commence during September.

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

Floating Nuclear Plant Sacrificial Bed Analysis (R. D. Gasser and W. T. Pratt)

Work continues on the MELSAC code to incorporate the reactor cavity design changes proposed by Offshore Power Systems (OPS). A number of heat transfer correlations have been incorporated in MELSAC in order to scope the range of expected heat distributions from the molten pool. A model for reactor vessel heat-up and melting under the influence of thermal radiation from the molten pool has been developed and will be incorporated into MELSAC. The GROWS 2 computer code has been made operational at BNL and the sample problem has been reproduced.

A meeting between OPS and NRC, related to questions raised by the ACRS on the proposed sacrificial bed design for a Floating Nuclear Plant, was attended. Recent design changes, made by OPS to their sacrificial bed design to address ACRS concerns, were noted and will be incorporated into the mathematical model used in the MELSAC code.

Hydrogen Flammability Studies (S. S. Tsai)

The possibility of modifying the CONTEMPT 4/MOD 2 code or other containment codes to accommodate hydrogen combustion in the PWR containment is being investigated.

A preliminary estimate of hydrogen stratification, accounting for buoyancy and diffusion, has been made.

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

FFTF Natural Circulation Test Program (K. R. Perkins and L. C. Chen)

A trip was made to the FFTF site to aid in understanding the facility and the test program and to establish modeling differences that had led to discrepancies between the HEDL test predictions and our current predictions with IANUS. The revised model using nominal pressure drops in the secondary loop (88% of design based on isothermal test data) and nominal stopped rotor resistance (based on LMEC pump data) is now in good agreement with the secondary loop flow versus loop temperature drop data. With the required nominal modeling established, the transient tests will be evaluated.

NASAP HWR Reliability (Y. H. Sun)

A report on fault tree analysis for the shutdown heat removal system of the NASAP HWR has been prepared and will be transmitted to DPM/NRC shortly.

LWR System Transient Reliability Studies (A. J. Buslik and Y. H. Sun)

Work has been initiated on assessing the risk associated with various accident sequences related to feedwater transients and small breaks in the primary coolant circuit of PWRs. During the past month, some of the available literature has been reviewed.

A review of LWR system codes has been initiated.

TASK IV. Reactor Physics (H. Ludewig)

Heavy Water Reactor and LMFBR NASAP Studies (A. Mallen, H. Takahashi and H. Ludewig)

Draft milestone reports on the HWR and LMFBR NASAP designs have been completed and forwarded to the DPM/NRC. The HWR report contains an analysis of the reactivity feedback coefficient and a review of Xenon stability. The LMFBR report contains a review of several alternative core designs and an assessment of related safety implications.

1167 212

Distribution

BNL RSP Division Heads
BNL RSP Group Leaders
BNL SEG Personnel

J. F. Meyer (15)
T. P. Speis
U.S. NRC Division of Technical
Information and Control

1167 213