

INTERIM REPORT

Accession No. _____

Contract Program or Project Title:

Analysis of Hypothetical Accidents Resulting in Core Meltdown

Subject of this Document:

Analysis of Hypothetical Accidents Resulting in Core Meltdown

Type of Document:

Monthly Progress Report for June, 1979

Author(s):

R. S. Dennis, P. Cybulskis and P. Baybutt

Date of Document:

July 16, 1979

Responsible NRC Individual and NRC Office or Division:

M. A. Cunningham
Office of Nuclear Regulatory Research

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.

NRC Research and Technical
Assistance Report

BATTELLE
Columbus Laboratories
505 West King Avenue
Columbus, Ohio 43201

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

INTERIM REPORT

695304

7908160/88

PROGRAM: REACTOR SAFETY STUDY FOLLOW-ON PROGRAM SUBTASK FILE: A4067

CONTRACTOR: Battelle Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/78-9/79

PAS PROGRAM MANAGER: M. A. Cunningham

BUDGET AMOUNT: (Thousands) 180.2*

CONTRACTOR PROGRAM MANAGER: R. S. Denning

PHONE: FTS 976-7510

PRINCIPAL INVESTIGATOR(S): P. Cybulskis

PHONE: FTS 976-7509

PROGRAM OBJECTIVES:

Investigate the effects of LWR plant design variations on the risks associated with reactor meltdown accidents. Specifically, determine the effects of plant design variations on the probability and nature of the radionuclide source term released during key meltdown accident sequences.

ACTIVITIES DURING JUNE, 1979

Status of the program was reviewed with NRC, Sandia, and BCL during the June 21 meeting in Bethesda.

A list of significant sequences for the GE Mark III design was received from Sandia.

NRC Research and Technical Assistance Report

MAJOR MILESTONES:

MILESTONE DESCRIPTION	SCHEDULED/ACTUAL START	SCHEDULED COMPLETION	ACTUAL/PROJECTED COMPLETION
1. RSS PWR BASELINE ANALYSES	4/78-4/78	6/78	6/78
2. B&W PWR ANALYSES	4/78-4/78	6/78	11/78
3. CE PWR ANALYSES	7/78-8/78	9/78	**
4. RSS BWR BASELINE ANALYSES	6/78-6/78	9/78	11/78
5. GE MARK III BWP ANALYSES	9/78-9/78	12/78	**

MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

695305

Schedules are being reevaluated based on the delay in FY79 authorizations.

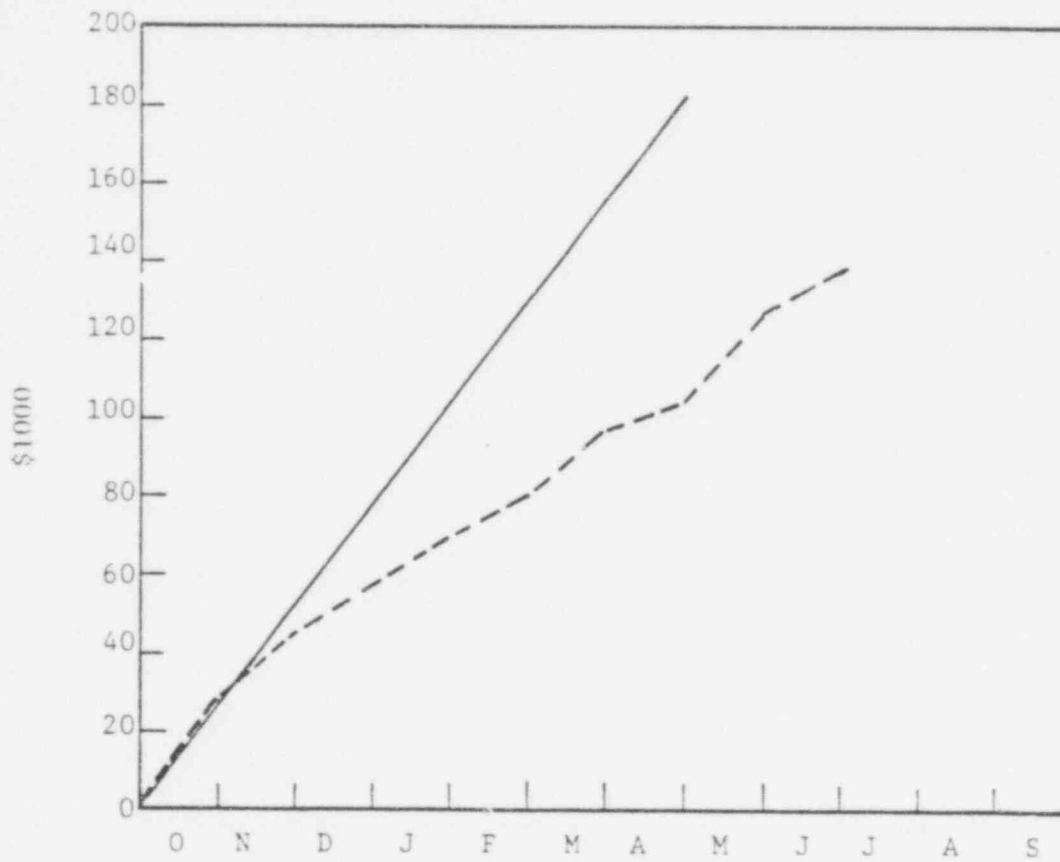
Definition of the shutdown power transient to be used for the reactor protection system failure sequences for the CE plant is still required. Reanalysis of the plants previously considered may be required in order to have a consistent treatment of these sequences.

* Includes \$30,250 carryover from FY78.

** Milestones are under review as a result of the delay in FY79 authorization.

EXPENDITURES

PROGRAM: REACTOR SAFETY STUDY FOLLOW-ON PROGRAM



RESOURCES EXPENDED:

	JUNE, 1979	CUMULATIVE
DOLLARS	11.7K	137.5K (76%)
MAN-MONTHS	1.6	17.3

635306

PROGRAM: PROBABILISTIC UNCERTAINTY ANALYSIS SUBTASK FIN#: A4067

CONTRACTOR: Battelle Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/78-9/79

PAS PROGRAM MANAGER: M. A. Cunningham

BUDGET AMOUNT: (Thousands) 228.1K*

CONTRACTOR PROGRAM MANAGER: R. S. Denning

PHONE: FTS 976-7510

PRINCIPAL INVESTIGATOR(S): P. Baybutt

PHONE: FTS 976-7499

PROGRAM OBJECTIVES:

- Perform probabilistic uncertainty analyses for PWR and BWR accident sequences
- Evaluate the uncertainty analysis methodology and develop decision criteria
- Assess the feasibility of developing response surfaces for the MARCH and CORRAL codes.

ACTIVITIES DURING JUNE, 1979

Effort continued in documenting the research which has been performed to date. Two reports are in preparation. The work plan for FY 79 activities was completed. Research continued on the evaluation of bias in the statistical designs used for response surface generation.

MAJOR MILESTONES:

MILESTONE DESCRIPTION	SCHEDULED/ACTUAL START	SCHEDULED COMPLETION	ACTUAL/PROJECTED COMPLETION
1.	Project milestones have been defined for FY79. NRC approval is still required.		
2.			
3.			

MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

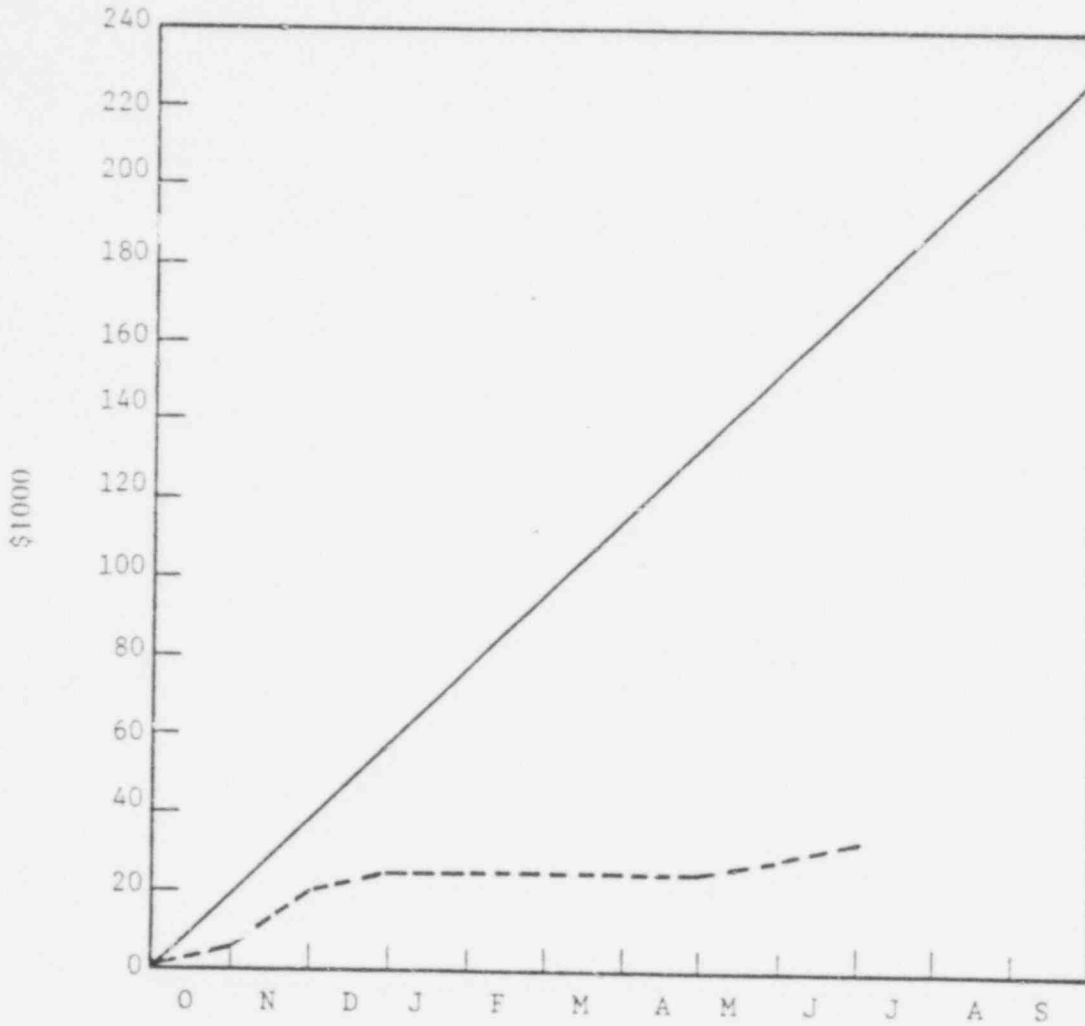
The delay in funding authorization will require rescheduling of the FY79 effort.

* Includes \$18.1K carryover from FY78.

695307

EXPENDITURES

PROGRAM: PROBABILISTIC UNCERTAINTY ANALYSIS



RESOURCES EXPENDED:

	JUNE, 1970	CUMULATIVE
DOLLARS	3.8K	32.8K (14%)
MAN-MONTHS	0.4	4.0

695308

PROGRAM: ANALYSIS OF THERMAL-HYDRAULIC BEHAVIOR

FIN#: A4067

CONTRACTOR: Battelle-Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/78-9/79

PAS PROGRAM MANAGER: M. A. Cunningham

BUDGET AMOUNT: (Thousands) \$90

CONTRACTOR PROGRAM MANAGER: R. S. Denning

PHONE: FTS 976-7510

PRINCIPAL INVESTIGATOR(S): P. Cybulskis

PHONE: FTS 976-7509

PROGRAM OBJECTIVES:

1. Test each of the modules in the MARCH code
2. Standardize programming and units
3. Document the MARCH code
4. Verify against available data and compare with similar codes

ACTIVITIES DURING JUNE, 1979

The principal effort on the MARCH code this month was devoted to the HOTDROP sub-routine with the investigation of the sensitivity of hydrogen production to geometric assumptions and chemical reaction variables. Discussions were held with R. Bisantz of IKE-Stuttgart on core meltdown modeling activities in the FRG and comparison with the BCL work.

MAJOR MILESTONES:

MILESTONE DESCRIPTION	SCHEDULED/ACTUAL START	SCHEDULED COMPLETION	ACTUAL/PROJECTED COMPLETION
1. MARCH Testing/ Documentation	4/79-5/79	12/79	
2. MARCH Verification	10/79	9/80	
3.			

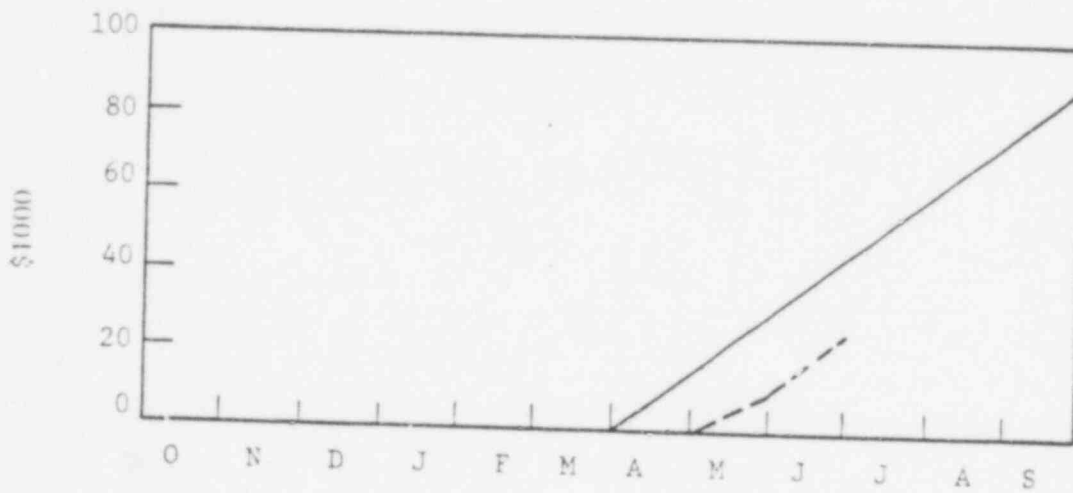
MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

Delay in FY79 funding authorization will have a smaller effect on this task than the other two tasks.

695309

EXPENDITURES

PROGRAM: ANALYSIS OF THERMAL-HYDRAULIC BEHAVIOR



RESOURCES EXPENDED:

	JUNE, 1979	CUMULATIVE
DOLLARS	15.2K	25.1K (28%)
MAN-MONTHS	2.0	3.2

685310