

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 October, 1981

Author(s):

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Date of Document:

November 13, 1981

Responsible NRC Individual and NRC Office or Division:

M. A. Cunningham
Office of Nuclear Regulatory Research



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*NRC Research and/or Technical
Assistance Report*

BATTELLE
Columbus Laboratories
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Columbus, Ohio 43201

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

INTERIM REPORT

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c. PATENT COUNSEL'S SIGNATURE		d. SIGNATURE (NRC responsible staff member.) <i>Frank G. Euly</i>	
d. DATE:		e. DATE: November 13, 1981	



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November 13, 1981

Mr. Mark Cunningham
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Cunningham:

Enclosed is a copy of the monthly report for October, 1981, on the program "Analysis of Hypothetical Accidents Resulting in Core Meltdown", which is Task 8 of Contract NRC-04-76-293. The report describes the efforts for: Subtask 1, Reactor Safety Study Follow-on Program; Subtask 3, Analysis of Thermal-Hydraulic Behavior; and Subtask 4, Analysis of Radionuclide Transport.

Costs for efforts in writing the in-plant consequence sections of the PRA Guide were \$3,717, for a total of \$49,423. The contract with Sandia is now in place to cover all costs except those incurred prior to April.

Sincerely,

Richard S. Denning
Senior Research Leader
Nuclear Technology and
Physical Sciences Dept.

RSD:erc

xc: J. Curry	F. Schroeder
T. Speis	JA Murphy
D. Ross	C. Johnson
J. Meyer	NRC Public Document
R. DiSalvo	Room (2)
MA Taylor	

PROGRAM: ANALYSIS OF THERMAL-HYDRAULIC BEHAVIOR

FIN#: A4067

CONTRACTOR: Battelle's Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/81-9/82

PAS PROGRAM MANAGER: M. A. Cunningham

BUDGET AMOUNT: (Thousands) 145.4*

CONTRACTOR PROGRAM MANAGER: R. S. Denning

PHONE: FTS 976-7510

PRINCIPAL INVESTIGATOR(S): P. Cybulskis

PHONE: FTS 976-7509

PROGRAM OBJECTIVES:

- (1) Perform MARCH calculations for complete meltdown accident sequence for purposes of comparison with the results of the KESS code.
- (2) Develop improved primary system model for inclusion into the MARCH code.

ACTIVITIES DURING: October, 1981

The direction of possible further development of the MARCH code has been reviewed with the NRC. A number of inquiries have been received regarding the IBM version of MARCH. While we have received a version of MARCH that has been converted to IBM by TVA, present guidance from NRC does not include further distribution or assistance with this version of MARCH.

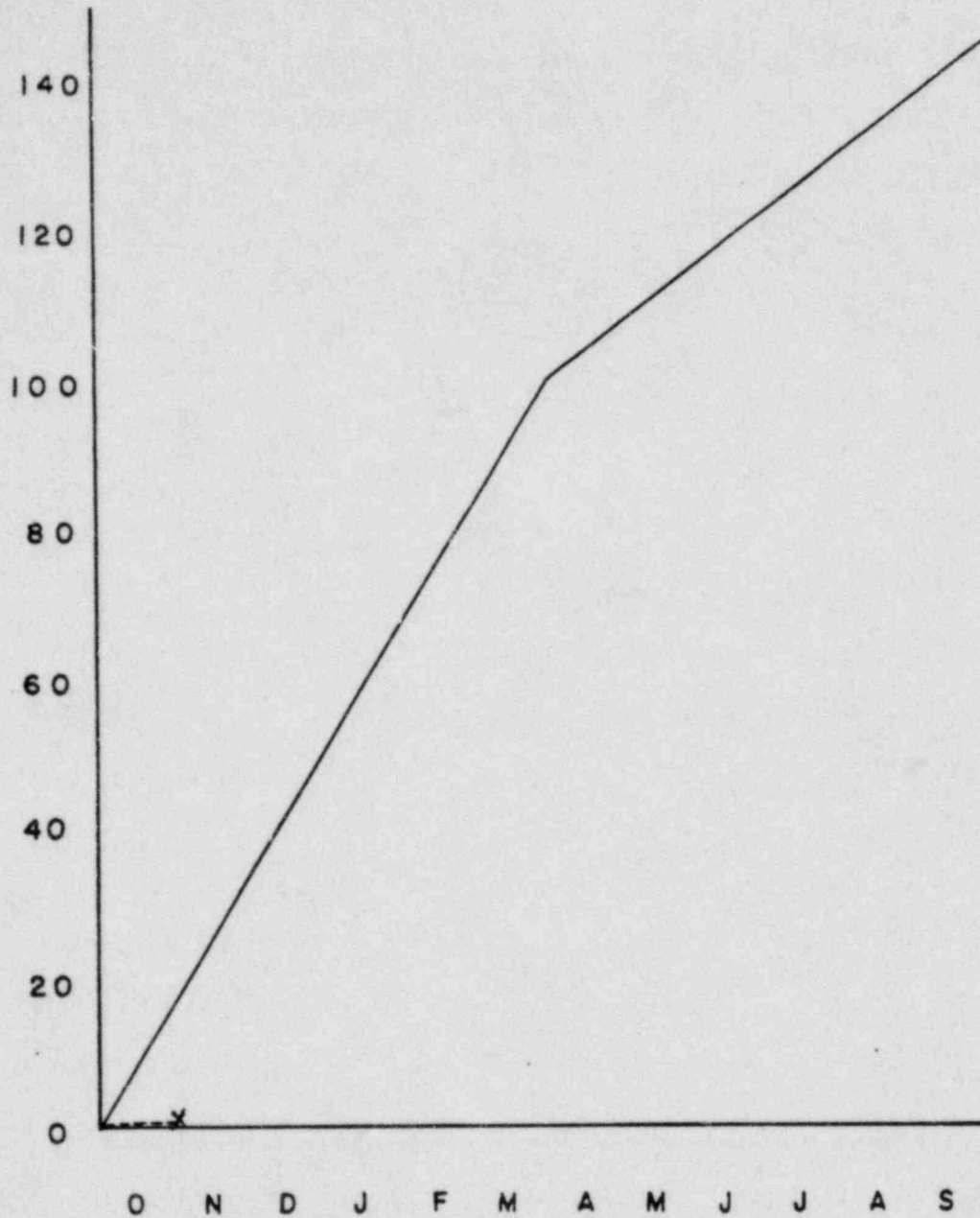
MAJOR MILESTONES:

	MILESTONE DESCRIPTION	SCHEDULED/ACTUAL START	SCHEDULED COMPLETION	ACTUAL/PROJECTED COMPLETION
1.	MARCH/KESS Comparison	6-81/6-81	12-81	3-82
2.	MARCH Primary System Model	9-81	9-82	
3.				

MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

* Includes \$150 K not yet officially received.

EXPENDITURES
ANALYSIS OF THERMAL-HYDRAULIC BEHAVIOR



RESOURCES EXPENDED:	October, 1981	CUMULATIVE
DOLLARS	0.9 K	0.9 K (0%)
MAN-MONTHS	0.0	0.0

PROGRAM: REACTOR SAFETY STUDY FOLLOW-ON PROGRAM

FIN#: A4067

CONTRACTOR: Battelle's Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/81-9/82

PAS PROGRAM MANAGER: M. A. Cunningham/
J. Murphy

BUDGET AMOUNT: (Thousands) 68.2*

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 risk 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: October, 1981

The analyses to be performed in support of the NRC interim hydrogen rule were reviewed with NRC on October 14. A series of MARCH calculations on key PWR and BWR accident sequences were undertaken.

MAJOR MILESTONES:

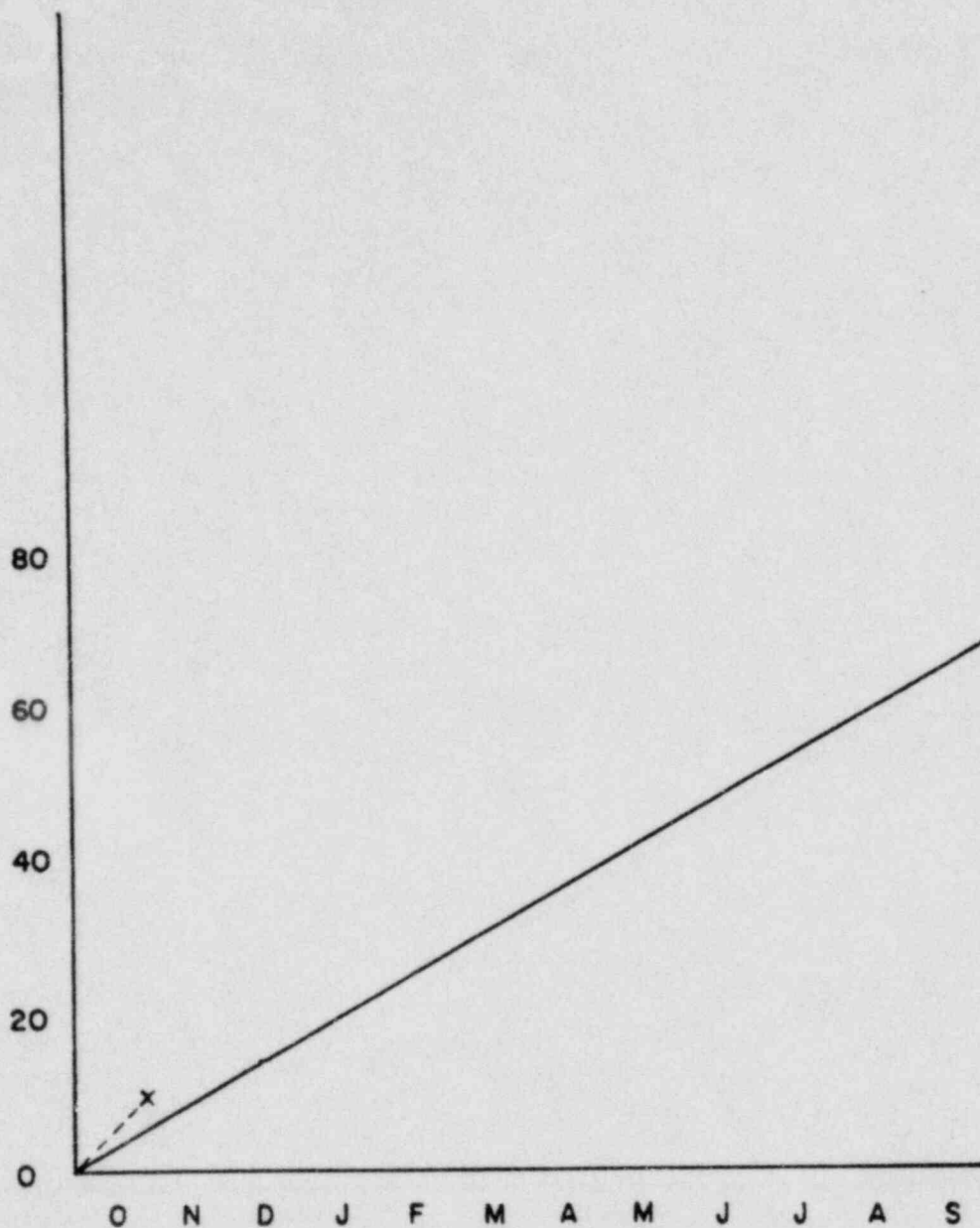
	1. MILESTONE DESCRIPTION	2. SCHEDULED/ACTUAL START	3. SCHEDULED COMPLETION	4. ACTUAL/PROJECTED COMPLETION
1.	MARCH/CORRAL Analyses for Mark II BWR	9-81		
2.	Interim Hydrogen Rule Support	9-81/9-81	1-82	1-82
3.				

MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

The initiation of the MARK II BWR analyses is awaiting NRC guidance regarding plant design and accident sequences to be utilized.

* Carryover from FY'81.

EXPENDITURES
REACTOR SAFETY STUDY FOLLOW-ON PROGRAM



RESOURCES EXPENDED:

	October, 1981	CUMULATIVE
DOLLARS	9.4 K	9.4 K (14%)
MAN-MONTHS	1.2	1.2

PROGRAM: ANALYSIS OF RADIONUCLIDE TRANSPORT

FIN#: A4067

CONTRACTOR: Battelle's Columbus Laboratories

BUDGET PERIOD: (mm/yy-mm/yy) 10/81-9/82

PAS PROGRAM MANAGER: M. A. Cunningham

BUDGET AMOUNT: (Thousands) 21K*

CONTRACTOR PROGRAM MANAGER: R. S. Denning

PHONE: FTS 976-7510

PRINCIPAL INVESTIGATOR(S): P. Baybutt

PHONE: FTS 976-7499

PROGRAM OBJECTIVES:

- To revise the CORRAL code.
- To verify the revised code.
- To provide for the coupling of CORRAL with other codes.

ACTIVITIES DURING: October, 1981

Two reports on the MATADOR computer code that were written to replace CORRAL-2 were prepared and will be submitted to the NRC in early November. One is a detailed technical description of the models in the new containment radionuclide transport and deposition code. It also contains the results of two calculations performed using CORRAL-2 and MATADOR and discusses these results in light of the modeling changes that were made. The other is in the form of a User's Guide to the new code.

MAJOR MILESTONES:

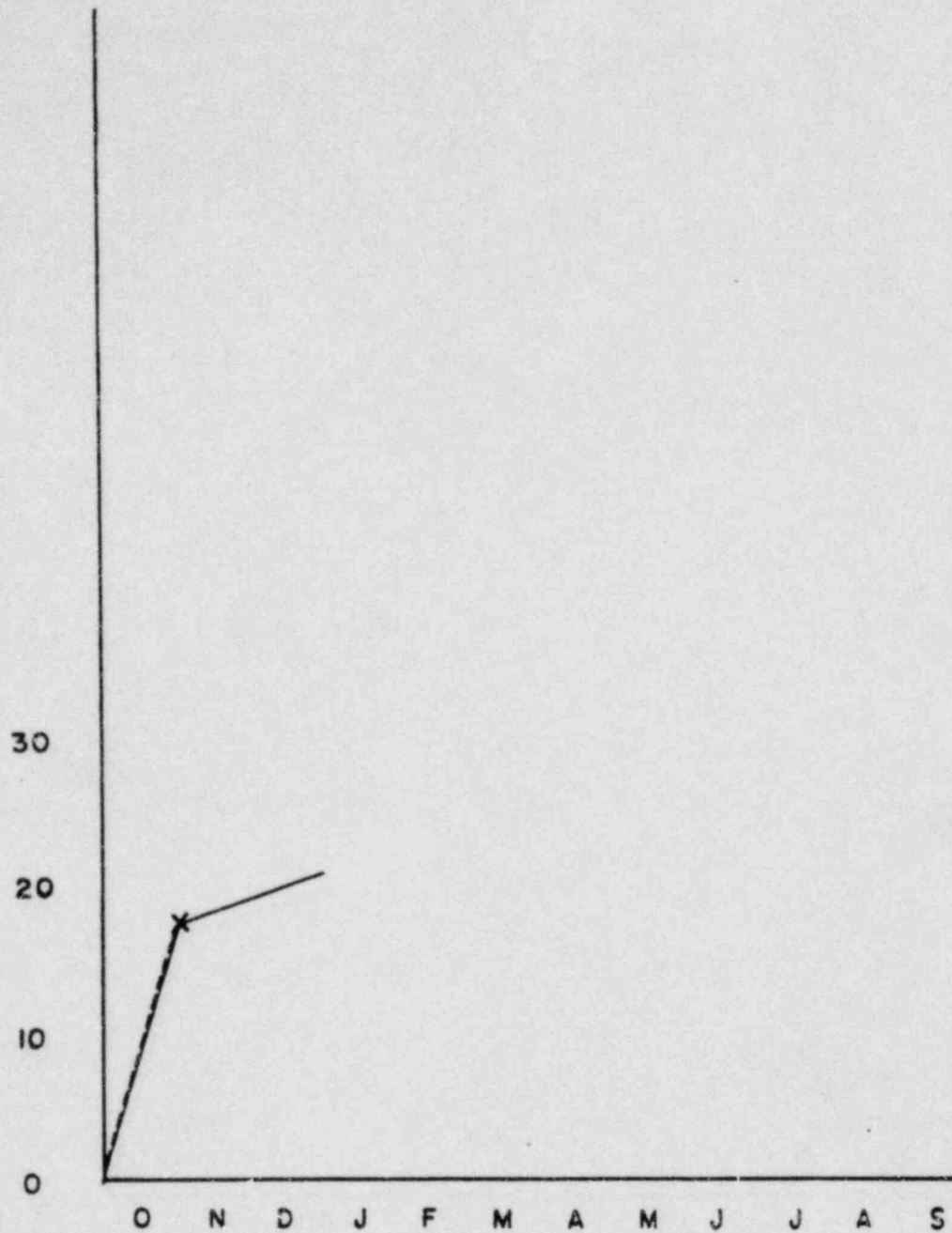
MILESTONE DESCRIPTION	SCHEDULED/ACTUAL START	SCHEDULED COMPLETION	ACTUAL/PROJECTED COMPLETION
1. Completion of Peer Review		12/81	
2.			
3.			

MANAGEMENT AND TECHNICAL ISSUES/POTENTIAL SCHEDULE OR FUNDING PROBLEMS:

* Includes \$25 K not yet officially received.

EXPENDITURES

ANALYSIS OF RADIONUCLIDE TRANSPORT



RESOURCES EXPENDED:

	October, 1981	CUMULATIVE
DOLLARS	17.5 K	17.5 K (83%)
MAN-MONTHS	1.5	1.5