



Department of Energy
Oak Ridge Operations
P.O. Box E
Oak Ridge, Tennessee 37830

JUN 28 1983

Mr. G. A. Arlotto, Director
Division of Engineering Technology
Office of Nuclear Reactor Research
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

[Handwritten signature: W. R. Bibb]
[Handwritten signature: E. G. Arndt]

Dear Mr. Arlotto:

ORNL RESEARCH ASSISTANCE TO THE NRC, "CONTAINMENT LEAK RATE SENSITIVITY"
(INTERAGENCY AGREEMENT DOE NO. 40-551-75, FIN NO. B0489-B)

Enclosed for your consideration are six (6) copies of a revised Schedule 189 project proposal, subject as above, which has been prepared by the Oak Ridge National Laboratory. This proposal is being submitted following discussions between T. J. Burns, ORNL, and E. G. Arndt, NRC. This is the second part of FIN No. B0489. The first part was submitted in June 1982.

Technical questions relative to this proposal should be directed to A. L. Lotts, ORNL Program Director, telephone FTS 624-0422. Administrative questions should be addressed to J. E. Carr, ORNL Work for Others Coordinator, telephone FTS 624-6062.

Sincerely,

[Handwritten signature: W. R. Bibb]
William R. Bibb, Director
Energy Programs and Support Division

ER-11:WRB

Enclosure:
Schedule 189 (6)

cc w/encl:
R. W. Barber, EP-34, HQ, GTN
W. P. Snyder, CC-10, ORO
D. Dandois, NRC

cc w/o encl:
H. Postma, ORNL
A. L. Lotts, ORNL
J. E. Carr, ORNL

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NRC FORM 189 Page 1 of 3 (3-81)		 U.S. NUCLEAR REGULATORY COMMISSION PROJECT AND BUDGET PROPOSAL FOR NRC WORK		DATE OF PROPOSAL June 2, 1983 NEW <input checked="" type="checkbox"/> REVISION NO. 1	
PROJECT TITLE: Containment Leak Rate Sensitivity Study				FIN NUMBER B0489-B	
NRC OFFICE Office of Nuclear Regulatory Research Division of Engineering Technology				NRC B & R NUMBER 60 19 01 01	
DOE CONTRACTOR UNION CARBIDE CORPORATION		PATENT STATUS <i>This proposal is being transmitted in advance of patent review for evaluation purposes only. No further dissemination or publication shall be made without prior approval of the Assistant General Counsel for Patents, DOE.</i>		CONTRACTOR/ORNL ACT. 418955139 DIV. 12	
SITE OAK RIDGE NATIONAL LABORATORY OAK RIDGE, TENNESSEE 37830		DOE B & R NUMBER 40 10 01 06			
COGNIZANT PERSONNEL NRC PROJECT MANAGER E. G. Arndt		ORGANIZATION DET/RES		FTS PHONE NUMBER 443-5997	
OTHER NRC TECHNICAL STAFF		PERIOD OF PERFORMANCE STARTING DATE 02-01-83 COMPLETION DATE 09-30-83			
DOE PROJECT MANAGER W. R. Bibb		DOE/ORO 626-0742			
CONTRACTOR/ORNL PROG. DIR.: A. L. Lotts <i>Malinauskas</i> PROG. MGR.: F. J. Homan PROJ. MGR.: T. J. Burns PRIN. INVESTIGATOR(S): T. J. Burns		CMO 624-0422 M&C 624-5169 EPD 624-6101 EPD 624-6101			
STAFF YEARS OF EFFORT (Round to nearest tenth of a year)		FY 19 83		FY 19	
Direct Scientific/Technical		0		FY 19	
Other Direct		0		FY 19	
TOTAL DIRECT STAFF YEARS		0		FY 19	
COST PROPOSAL (OBLIGATIONS)		(\$ in Thousands)		FY 19	
Direct Salaries (Cost Centers)		0		FY 19	
Material and Services (Excluding ADP)		4		FY 19	
ADP Support		34		FY 19	
Subcontracts and Consultants		0		FY 19	
Travel Expenses Foreign		0		FY 19	
Domestic		0		FY 19	
Indirect Labor Costs (Cost Centers)		0		FY 19	
Other (Specify) GSO Change		0		FY 19	
General and Administrative (G&A/GPS)		12		FY 19	
TOTAL OPERATING COST (Obligations)		50		FY 19	
CAPITAL EQUIPMENT		0		FY 19	
FIN CHARGED:		0		FY 19	
TOTAL PROJECT COST (Obligations)		50		FY 19	
FY 83		OCTOBER		NOVEMBER	
MONTHLY FORECAST EXPENSE		APRIL		MAY	
7		JUNE		JULY	
12		AUGUST		SEPTEMBER	
12		12		7	

PROJECT AND BUDGET PROPOSAL FOR NRC WORK

B0489-B

PROJECT TITLE:

Containment Leak Rate Sensitivity Study

ITEM NO.

1. OBJECTIVE OF PROPOSED WORK:

The overall objective of Tasks 1-3 is to determine the importance of the containment leak rate relative to the consequences of specified accident scenarios. In particular, the objective of Task 1 is to determine the sensitivity of the risk of the specified accident scenarios to changes in the containment leak rate. Task 2 addresses the prediction of the containment leak rate between leak tests, and Task 3 is designed to evaluate the potential of additional containment integrity information (such as a simple gross containment monitoring system) in reducing the risk. Additionally Task 3 will assess the adequacy of the current 0.25L_A safety margin and the desirability/limitations of single leak rate criteria applying to the majority of containment systems.

2. SUMMARY OF PRIOR EFFORTS:

Not applicable.

3. WORK TO BE PERFORMED AND EXPECTED RESULTS:

Summary

Tasks for FY-1983 concentrate on three areas of work: first a sensitivity study to determine the relative change in risk to the general public associated with differences in the containment leak rate under postulated accident conditions; second, an initial attempt at developing (and verifying) an appropriate methodology for predicting the actual post-test containment leak rate; and third, a preliminary assessment of the potential value of additional containment integrity information, the adequacy of the current safety margin, and the desirability/limitations inherent in a single containment leak rate criteria for different containment designs.

FY-1983

Task 1 - Containment Leak Rate Sensitivity Analysis. The relative change in the risk to the general public for specified accident scenarios as a function of the containment leak rate will be estimated. In particular, the standard reactor source terms given in NUREG-0773 will be utilized, and the offsite risk in terms of dose will be estimated as a function of the postulated containment leak rate. Scoping calculations will be performed to verify the completeness of the specified source terms for very short time periods/high containment leak rates. The resulting analysis will provide a relative measure of the change in the risk as a function of the leak rate.

Task 2 - Methods Development. The primary concern regarding the containment leak rate is the actual leakage rate which is present during the hypothetical accident scenario. An initial approach towards estimating the changes in leak rate versus the time between tests will be developed. This will entail a preliminary study to determine whether a correlation exists between actual leak rates (as indicated by LERs, as found tests, etc.) and leakage test values and/or leakage test intervals. These data will be employed to test the workability/suitability of the leak rate prediction methodology.

PROJECT AND BUDGET PROPOSAL FOR NRC WORK

B0489-B

PROJECT TITLE:

Containment Leak Rate Sensitivity Study

ITEM NO.

11. OBLIGATION ESTIMATES:

	FY-1983	FY-1984	FY-1985
(1) Cost Est	50	0	0
(2) Goods & Services on order - GSO est	0	0	0
Less Uncosted Balance	0	0	0
GSO Change	0	0	0
Total Obligation Change	50	0	0

12. OTHER:

12(a). QUALITY ASSURANCE AND CONTROL: Work will be performed according to the Engineering Physics Division and ORNL QA programs.

12(b). COST AND MILESTONE CHARTS

A. PROJECT COST SCHEDULE

Prior Costs	Years	1983	1984	1985	1986	1987	Total Estimated Cost
Task 1	0	22	0	0	0	0	22
Task 2	0	22	0	0	0	0	22
Task 3	0	6	0	0	0	0	6

B. 189 SUBTASK/MILESTONE CHARTS