

NRC FORM 173 (2-78)		U.S. NUCLEAR REGULATORY COMMISSION		ORDER NUMBER 20-80-232	
STANDARD ORDER FOR DOE WORK				DATE 7/1/80	
				ISSUED TO (DOE Office) Richland Operations Office	
PERFORMING ORGANIZATION AND LOCATION Pacific Northwest Laboratory Richland, Washington				ACCOUNTING CITATION APPROPRIATION SYMBOL 31X0200.200	
FIN TITLE State-of-the-Art Review and Evaluation of Systems Interaction Methods				B&R NUMBER 20-19-10-09	
				FIN NUMBER B2325 - 0	
OBLIGATION AVAILABILITY PROVIDED BY:				WORK PERIOD - THIS ORDER	
				FIXED <input type="checkbox"/> ESTIMATED <input checked="" type="checkbox"/>	
A THIS ORDER				FROM 7/1/80 TO 11/10/80	
B TOTAL OF ORDERS PLACED PRIOR TO THIS DATE WITH THE PERFORMING ORGANIZATION UNDER THE SAME APPROPRIATION SYMBOL AND THE FIRST FOUR DIGITS OF THE B&R NUMBER CITED ABOVE				\$ 40,000*	
C TOTAL ORDERS TO DATE (TOTAL A & B)				\$ 2,543,000	
D AMOUNT INCLUDED IN "C" APPLICABLE TO THE "FIN NUMBER" CITED IN THIS ORDER				\$ 2,583,000	
FINANCIAL FLEXIBILITY				\$ 40,000	
<input checked="" type="checkbox"/> FUNDS WILL NOT BE REPROGRAMMED BETWEEN FINIS. LINE D CONSTITUTES A LIMITATION ON OBLIGATIONS AUTHORIZED <input type="checkbox"/> FUNDS MAY BE REPROGRAMMED NOT TO EXCEED ± 10% OF FIN LEVEL UP TO \$50K. LINE C CONSTITUTES A LIMITATION ON OBLIGATIONS AUTHORIZED					
STANDARD TERMS AND CONDITIONS PROVIDED DOE ARE CONSIDERED PART OF THIS ORDER UNLESS OTHERWISE NOTED.					
ATTACHMENTS THE FOLLOWING ATTACHMENTS ARE HEREBY MADE A PART OF THIS ORDER <input checked="" type="checkbox"/> STATEMENT OF WORK <input type="checkbox"/> ADDITIONAL TERMS AND CONDITIONS <input type="checkbox"/> OTHER			SECURITY <input checked="" type="checkbox"/> WORK ON THIS ORDER IS NOT CLASSIFIED. <input type="checkbox"/> WORK ON THIS ORDER INVOLVES CLASSIFIED INFORMATION. NRC FORM 187 IS ATTACHED.		
REMARKS After signature, please send to the NRC Office of the Controller, ATTN: D. Dandois and provide a copy of this order to the Office of Nuclear Reactor Regulation, ATTN: P. Triplett, NRR, P-428. *This project is to be incrementally funded in FY 1980 after receipt of an acceptable proposal.					
ISSUING AUTHORITY Bernard L. Grenier 7/2/80 Technical Assistance Program Manager			ACCEPTING ORGANIZATION SIGNATURE TITLE DATE		

Enclosure 2

PROPOSAL CONTENT

The minimum items required in all proposals are:

1. Performing organization's name and location.
2. FIN Title, FIN Number, and B&R Number (NRC's) (as on statement of work).
3. Performing organization's key personnel, program manager, or principal investigator, their resumes and FJS phone number.
4. Background (definition of the problem including the objective(s) to be attained).
5. Work to be performed (Provide a concise description of tasks to be performed and expected results for the period of performance. Note technical data requirements, potential problems, and other technical information needed to fully explain the effort. Highlight changes from prior authorized SOW's, if any, identify changes in performance, schedule, or costs).
6. Identify major subcontracts, including consultants.
7. Costs estimated to be incurred by DOE contractors, subcontractors, and consultants. List by fiscal year to completion:
 - a. Manyears of Technical Support (MTS)
 - b. Costs:
 - (1) Direct Salaries (Labor) for MTS
 - (2) Material and Services (excluding ADP)
 - (3) Total ADP Support
 - (4) Subcontracts
 - (5) Capital Equipment
 - (6) Direct Travel Expense (Foreign travel must be shown separately)
 - (7) General and Administrative Expense (Include indirect labor cost)
 - c. Total Estimated Cost:
8. Forecasts:
 - a. Milestone Chart for accomplishing the work.

b. Planned monthly rate of costs by fiscal year. This may be provided with the first report of an authorized program if not known at time of proposal submittal. At the beginning of each subsequent year, reports should include the planned monthly rate of costs for the ensuing year.

9. Conflict of Interest:

In order to assist the Commission in its evaluation, the DOE Contracting Officer shall describe any significant contractual and organizational relationships of the DOE, its contractor, their employees, or expected subcontractors or consultants on this proposal, with industries regulated by the NRC (e.g. utilities, etc.) and suppliers thereof (e.g. architect engineers and reactor manufacturers, etc.) that might give rise to an apparent or actual conflict of interest.

10. Reporting Requirements (as on statement of work).

ENCLOSURE 3

STATEMENT OF WORK

Title: State-of-the-Art Review and Evaluation of Systems Interaction Methods

FIN No: 82325

B&R No: 20-19-10-09

Technical Monitor: F. Coffman (FTS 492-7499)

Cognizant Branch Chief: J. F. Stolz (FTS 492-7391)

Background

The Office of Nuclear Reactor Regulation is developing a systems interaction program which proposes to define and subsequently implement systems interaction regulatory requirements and guidance on light water reactor plants. This is the objective derived from Section II.C.3 of the Action Plan in NUREG-0660.

Since systems interaction evaluations regulatory guidelines and requirements need to be developed for nuclear power plants; and a consensus regarding definition and methodology is lacking, initially it is appropriate to evaluate and define this effort on a broad front using several systems experts for assistance. Accordingly, the objectives and scope of this task are shared in parallel with FY '80 task efforts by several other contractors. The follow-on phase for FY '81 will narrow our direction as noted below in Task 4.

The state-of-the-art effort is the initial phase of defining applicable methodologies that may have potential for relatively near-term use in systems interaction evaluations.

Objective

The objective of this project is to obtain methods that hold the best potential for further development and near-term (in second half FY '81) use by industry and NRC on systems interactions evaluations for future casework or operating plants.

Work Requirements

Estimated Level of Effort: 1.0 man-year.

Projected
Completion Date

Task 1. Describe and assess current systematic methods that have been used, or considered feasible for use, on any complex system comparable to a light water reactor plant. This effort should include an assessment of the SANDIA (SETS) methodology (NUREG/CR-1321) and the methods used for the Diablo Canyon seismic systems interaction evaluation.

9/15/80

Projected
Completion Date

- Task 2. Provide a definition of systems interaction and corresponding safety failure criteria. 9/15/80
- Task 3. Provide an inventory of a range of systems interaction scenarios with emphasis on actual operating experience to: (a) better focus on the definition of systems interaction and (b) have a basis for evaluating the ability of the methodologies described in Task 1 to "predict" these examples.
- Task 4. Recommend a methodology or alternative(s) that have the best potential for further development and near-term (second half of FY '81) use by industry and the NRC staff on future casework or operating plant systems interactions evaluations. This effort should provide the basis for follow-on studies in FY '81. 9/15/80
- Task 5. Peer review meeting among participants & NRC management regarding results of Task 4. 10/15/80
- Task 6. Preparation of Final Report. 11/10/80

Level of Effort and Period of Performance

The level of effort is estimated at 1.0 man-year over a 4.5 month period (July 1, 1980 to November 10, 1980)

Reporting Requirements

1. Prepare and submit a report in accordance with Manual Chapter 3202 (a copy of which is enclosed) containing the findings and conclusions including the bases upon which they were reached to the cognizant branch chief by the dates indicated below:

Draft Report - 09/15/80
Final Report - 11/10/80
2. A monthly business letter report will be submitted by the 15th of the month to the cognizant branch chief with a copy to the Technical Support Branch, ATTN: B. L. Grenier and L. Rubenstein, OSI. These reports will contain the following information related to accomplishment of this program.
 - Summary of the progress and work completed during the period, including milestones reached or, if missed, an explanation provided;

- The amount of funds expended for manpower and computer services during the period and cumulative to date;
- If problems are encountered or anticipated, a description of the plans for their resolution, the schedule of their implementation and their impact on the overall program;
- Plans for the next reporting period.

Meetings and Travel

Provide for 4 one-day meetings at NRC Headquarters, including Task 5, and another of which will take place in the fall 1980 with the ACRS Subcommittee. In addition, the contractor should plan for other travel needed to obtain source material for this study.

NRC Furnished Materials

The NRC will furnish the contractor with a copy of the referenced SANDIA Phase I report NUREG/CR-1321; and the staff's safety evaluation report on the Diablo Canyon Systems Interaction Program when available in August 1980.