

JUN 29 2000

MODIFICATION NO. 6 TO COOPERATIVE AGREEMENT NO. NRC-04-98-051

BETWEEN

UNIVERSITY OF CALIFORNIA AT SANTA BARBARA

AND THE

U.S. NUCLEAR REGULATORY COMMISSION

The purpose of this modification is to provide two new tasks as described in the attached page as agreed upon by NRC and the Cooperator. Accordingly, the following change is hereby made:

1. Block No. 9, Project Will Be Conducted Per Government's Proposal, is modified by adding the following statement to the existing statement:

"Project will be conducted per the Government's proposals dated 12/16/97 and 03/30/00 (attached) and Appendix A - Project Cooperative Agreement Provisions"

2. In Block No. 13, Accounting & Appropriation Data, the following is added to the information previously found there:

APPN. NO: 31X0200.060  
B&R NO: 06015110110  
Job Code: K6987  
BOC NO: 4110  
Amount Obligated: \$ 50,000  
RES ID NO: RES-C00-438

APPN. NO: 31X0200.060  
B&R NO: 06060401710  
Job Code: F6293  
BOC NO: 4110  
Amount Obligated: \$130,000  
RES ID NO: RES-C00-439

APPN. NO: 31X0200.060  
B&R NO: 06060401710  
Job Code: F6294  
BOC NO: 4110  
Amount Obligated: \$ 20,000  
RES ID NO: RES-C00-440"

3. Block No. 15, NRC Obligation of Funds, is deleted in its entirety and replaced with the following:

This Cooperative Agreement Action	\$ <u>200,000.00</u>
Previous Obligation	\$ <u>619,800.00</u>
Total	\$ <u>819,800.00</u>

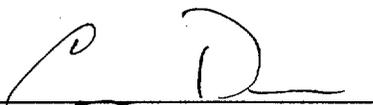
4. Block No. 16, Total Funding Agreement, is deleted in its entirety and replaced with the following:

NRC:	\$ <u>819,800.00</u>
Cooperator:	\$ <u>- 0 -</u>
Total:	\$ <u>819,800.00</u>

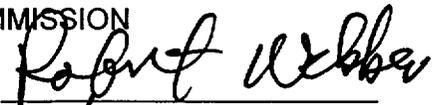
All other terms and conditions remain the same.

EXECUTED:

UNIVERSITY OF CALIFORNIA @  
SANTA BARBARA

BY:   
NAME: David J. Mayo  
Assoc. Director, Sponsored Projects  
TITLE: \_\_\_\_\_  
DATE: 6/29/00

UNITED STATES OF AMERICA  
U.S. NUCLEAR REGULATORY  
COMMISSION

BY:   
NAME: Mary H. Mace  
TITLE: Contracting Officer  
DATE: 6/19/00

## **SEVERE ACCIDENT RESEARCH INSIGHT REPORT**

### **Objective**

The objective is to produce an insight report that summarizes and distills what we know about severe accidents, and how we can make use of what we know to "manage" severe accidents.

### **Framework of the Report**

The report will be written from a risk perspective, i.e., phenomena and processes that are risk- significant would be included and considered. To be clear, the "risk" at a severe accident stage refers primarily to outside consequences. Physical fidelity of these important processes and phenomena will be a principal consideration in such a document. Accordingly, and to the extent possible, emphasis will be on basic understanding as compared to empirical treatments.

The report will be comprehensive in its treatment of severe accident phenomena so that a complete "risk" picture can be obtained. Both PWRs and BWRs should be considered. There are sufficient differences between these two types of reactors so it may justify the development of report in two separate volumes, each dedicated to a corresponding reactor type.

The proposed report will also make efforts to produce short-cut methods that would allow quick scoping of severe accident scenarios, without having to run big computer codes and analyze results. To the extent possible, development and use of charts, tables, and simple analytical tools are encouraged for carrying out calculations useful in one's assessment task during a hypothetical accident. The basic report should be usable as a starting point for more detailed technical discussions of phenomena and processes. Such discussions would be supplementary to the basic report and could be made available as a reference document. This latter document will be useful for those who really need to know the technical basis for the basic report that will be produced under this task.

One class of intended users of the proposed severe accident insight report would be reactor operators and the NRC staff dealing with the issue of severe accident and its management. As such, the report will be written in a way so as to be completely self-contained. Another important use of the report will be in serving as the "primer" on severe accidents for newcomers to the field. A third use may be to educate students in college, or professionals in a short course setting.

## **Task Description**

1. The contractor shall produce an outline of the report first. The outline will be reviewed by NRC.
2. Upon approval of the outline, the contractor shall produce a draft version of the report. The draft version will be reviewed by NRC and comments will be provided to the contractor.
3. The contractor shall incorporate the comments and produce a final reproducible copy of the report consistent with NRC's publication guidelines.

## **Estimated Cost**

The estimated cost for this task is \$150K.

## **Period of Performance**

The period of performance is from 06/23/00 through 03/25/01.

## **NRC Furnished Materials**

Upon requests from the contractor, NRC will furnish published reports (NUREG, NUREG/CR, international, and/or topical) on severe accident research.

## **REGULATORY APPROACHES FOR MANAGING NUCLEAR MATERIALS RISK**

### **Objectives**

1. To examine from a top level perspectives the risks that arise in the preparation, generation, handling, storage, transportation, and ultimate disposition of nuclear (radioactive) materials.
2. To identify the key features of such risks and on this basis create broad classes for consideration of risk management issues and regulatory implementation.
3. To critically examine the state of the art in the subject matter as developed in the above, and to create a clear, comprehensive and consistent framework for the assessment, management, and regulation of nuclear material risks.

### **Technical Approach**

The work will be carried out by E.D. Jones and T.G. Theofanous in the course of a year during which they will be concurrently writing a textbook on the Fundamentals of Risk Analysis. Most of the effort will be in gathering pertinent information, nationally and internationally, analyzing it, and using the understanding so derived to create a framework of options appropriate for regulatory use, including the definition of any research needs where appropriate. Scoping calculations, aided by CRSS staff, will be performed as feasible.

### **Cost Estimate**

The estimated cost for this task is ~\$50K.

### **Period of Performance**

The period of performance for this task is from 06/23/00 through 03/25/01.

### **NRC Furnished Material**

None identified at this point.