

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>		BPANO.	1. CONTRACT ID CODE	PAGE 1	OF 2
2. AMENDMENT/MODIFICATION NO. M001		3. EFFECTIVE DATE See Blk 16c below	4. REQUISITION/PURCHASE REQ. NO. NMS-13-002 & NMS-13-021	5. PROJECT NO. (if applicable)	
6. ISSUED BY U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Valerie Whipple Mail Stop: TWB-01-B10M Washington, DC 20555		CODE 3100	7. ADMINISTERED BY (if other than item 6) U.S. Nuclear Regulatory Commission Div. of Contracts Mail Stop: TWB-01-B10M Washington, DC 20555		CODE 3100
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  SOUTHWEST RESEARCH INSTITUTE  6220 CULEBRA RD  SAN ANTONIO TX 782385166			9A. AMENDMENT OF SOLICITATION NO.  9B. DATED (SEE ITEM 11)  10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-HQ-12-C-02-0089 NRCT001  10B. DATED (SEE ITEM 13) 09-27-2012		
CODE		FACILITY CODE			

### 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

- ☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
- (a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) RPPA: NMS-13-003; FAIMIS: 131143  
B&R: 13-50-387-183; JC: J5664; BOC: 252A  
Approp. No.: X0200; \$26,000

### 13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Mutual Agreement of Both Parties
	D. OTHER (Specify type of modification and authority)

**E. IMPORTANT:** Contractor ☐ is not, ☒ is required to sign this document and return 1 copies to the Issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

See Page 2.

See revised Statement of Work for increased level of effort.

Task Order Funding: \$385,000 (CHANGED)  
Task Order Ceiling: \$385,011 (INCREASED)

Period of Performance: October 01, 2012 - September 28, 2013 (UNCHANGED)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) B. B. Kalmbach Executive Director, Contracts		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Valerie Whipple Contracting Officer, MSA	
15B. CONTRACTOR/OFFEROR <i>A. C. Frazier</i> (Signature of person authorized to sign)	15C. DATE SIGNED 02/14/2013	16B. UNITED STATES OF AMERICA BY <i>Valerie Whipple</i> (Signature of Contracting Officer)	16C. DATE SIGNED 2/15/13

NSN 7540-01-152-8070  
PREVIOUS EDITION NOT USABLE

STANDARD FORM 30 (REV. 10-83)  
Prescribed by GSA - FAR (48 CFR) 53.243

**SUNSI REVIEW COMPLETE**

MAR 19 2013

**TEMPLATE - ADM001**

**ADM002**

The purpose of this modification is to (1) revise the Statement of Work, (2) increase the level of effort from 2,263 hours to 2,314 hours, (3) increase the task order ceiling from \$371,195 to \$385,011, (4) to increase funding by \$26,000, from \$359,000 to \$385,000, and (5) correct Section A7 to designate Yawar Faraz as the TO COR and Deborah DeMarco as the Alternate TO COR.

Therefore, the following sections are revised.

1. Section A.2 CONSIDERATION AND OBLIGATION—COST-PLUS-AWARD-FEE (AUG 2011) is deleted in its entirety and replaced with the following:

**A.2 CONSIDERATION AND OBLIGATION--COST-PLUS-AWARD-FEE (AUG 2011)**

(a) The total estimated cost to the Government for full performance of this task order is **\$385,011**, of which the sum of [REDACTED] represents the estimated reimbursable costs, and of which [REDACTED] represents the base fee.

(b) An award fee pool of [REDACTED] is hereby established for this task order. Evaluation of award fee earned will be accomplished in accordance with the attached Award Fee Plan (AFP) attached as Attachment 8 to the Contract. The Government reserves the right to unilaterally change the content of the AFP at any time during the life of this contract. Any changes to the plan will be furnished to the Contractor prior to the date they become effective. The amount of award fee available for each period of evaluation and the amount of time for each period will be set forth in the AFP. The final evaluation and determination as to the amount of award fee earned during an evaluation period shall be made unilaterally by the Fee Determination Official (FDO). The Contractor shall be advised of the award fee decision by letter which shall include the rationale for reaching the decision.

(c) The amount obligated by the Government with respect to this task order is **\$385,000**.

(d) This is a fully-funded contract and FAR 52.232-20 - "Limitation of Cost" applies.

3. Section A.7, 2052.215-71 CONTRACTING OFFICER'S REPRESENTATIVE AUTHORITY (NOVEMBER 2006), paragraph (a) is deleted in its entirety and replaced with the following:

(a) The contracting officer's authorized representative (hereinafter referred to as the COR) for this contract is:

TO COR:       Yawar Faraz  
                  Mail Stop EBB/E2C40M  
                  Washington, DC 20555  
                  301-492-3207

Alternate COR: Deborah DeMarco  
                  Mail Stop EBB/E2 B2  
                  Washington, DC 20555  
                  301-492-3143

4. The original Statement of Work is deleted in its entirety and replace with the revised, attached Statement of Work dated October 15, 2012.

## STATEMENT OF WORK TASK ORDER ONE DATED 10/15/2012

**PROJECT TITLE:** OPERATION OF THE CENTER FOR NUCLEAR WASTE ANALYSES AS THE NRC'S FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC) – FIFTH RENEWAL

**TASK TITLE:** COMPLETION OF AQUEOUS REPROCESSING REFERENCE FACILITY DESCRIPTION AND CONSEQUENCE ASSESSMENTS, AND APPLICATION OF PROBABLISTIC RISK ANALYSIS, TECHNICAL SPECIFICATIONS AND GENERAL DESIGN CRITERIA TO TWO AQUEOUS REFERENCE FACILITY SUB-PROCESSES

**TASK ORDER NUMBER:** 001  
**JOB CODE:** J5664  
**B&R NUMBER:**  
**ISSUING OFFICE:** NMSS  
**CONTRACTING OFFICER'S REPRESENTATIVE (COR):** Yawar Faraz (301) 492-3207  
**ALTERNATE CONTRACTING OFFICER REPRESENTATIVE:** Deborah DeMarco (301) 492-3143  
**FEE RECOVERABLE:**  
**TAC NUMBER:** TAC  
**DOCKET NUMBER:**

### 1.0 BACKGROUND

To prepare the Nuclear Regulatory Commission (NRC) for licensing a potential spent fuel reprocessing facility, NRC staff identified the high and medium priority regulatory gaps in May 2009. On November 2011 (SECY-11-0163), the staff issued a draft regulatory basis document that identified regulatory gaps requiring additional work. The Commission also has an Interagency Agreement (IA) with the Department of Energy for NRC to provide regulatory insights to its advanced fuel cycle research and development program. Hazards evaluations are integral to both the NRC and DOE programs.

The technical assistance tasks to be authorized under the Program Element Plan (PEP) of Job Code J5664 request that CNWRA help NRC determine whether a PRA-based or qualitative risk assessment methodology is appropriate for aqueous reprocessing. The task will assist NRC in providing DOE regulatory insights for its Advanced Fuel Cycle Research and Development Program. This program is also expected to provide insights needed to further develop resolution to Gap 5 (Safety and Risk Assessment Methodologies and Considerations).

### 2.0 OBJECTIVE

The objective of Task A is to estimate the worst-case consequences from potential accidents at a reference aqueous reprocessing facility and assess the feasibility of applying PRA methods to aqueous reprocessing facility sub-processes. The feasibility of applying the PRA method to reprocessing will be assessed by independently exercising the method on two selected representative sub-processes of the reference facility which involve accidents that could potentially result in consequences that are significantly greater than the High Consequence thresholds contained in 10 CFR 70.61.

The objective of Task B is to illustrate the application of technical specifications and general design criteria to aqueous reprocessing facilities. This can be accomplished by developing example technical specifications and general design criteria for the two representative sub-processes.

### **3.0 STAFFING**

The contractor shall ensure that the technical staff performing under this task order possess the necessary experience and expertise in the technical areas assigned to them. The NRC reserves the right to approve the Project Manager and the individual technical staff assigned to each task from the necessary technical disciplines. The contractor's Project Manager shall have extensive experience in the technical and regulatory aspects necessary for evaluating radiological and chemical safety aspects of a large fuel cycle facility. The contractor's technical staff shall have expert experience to include greater than 5 years experience in conducting reviews in the specific technical areas assigned and shall have an appropriate combination of education, training, and experience in areas required to identify and assess radiological and chemical safety hazards associated with operations conducted at a large reprocessing facility site. The contractor's technical staff shall have experience in conducting worst-case accident consequence assessments and PRAs for nuclear or chemical facilities. The contractor's technical staff shall also have experience in presenting technical information to the public and technical advisory groups such as the Advisory Committee for Reactor Safety. The NRC considers the following technical staff to be essential for this effort:

1. Project Manager
2. Task Manager
3. Fire and Explosion Safety Analyst
4. Nuclear Physicist/Engineer/Criticality Safety Analyst
5. Instrumentation and Control Expert
6. General Engineer/Chemical Engineer
7. Cost-Benefit Analyst Expert
8. Transportation Impact Assessment Expert
9. PRA Analyst
10. Nuclear Fuel Facility, and/or Spent Fuel Facility Expert
11. Reprocessing Facility Technology, Design and Operation
12. Worst-case Accident Consequence Assessment Modeling

### **4.0 SCOPE OF WORK AND DELIVERABLES**

CNWRA will support the NRC staff by (1) completing the consequence assessments for the worst-case aqueous reprocessing accidents, (2) determine the feasibility of applying PRA to aqueous reprocessing by exercising the method on two selected representative sub-processes, and (3) illustrate the application of technical specifications and general design criteria for the two representative sub-processes.

#### **Task A: Finalize Consequence Assessments and Reference Facility Description, and Exercise PRA for Aqueous Reprocessing**

The objective of Task A is to finalize the consequence assessments for the worst-case aqueous reprocessing accidents and the reference facility description of an aqueous reprocessing facility (Subtask A1), and to exercise PRA for two sub-processes of the

reference facility (Subtask A2).

**Subtask A1 Consequence Assessments for Worst-Case Accidents and Reference Facility Description (0.25 FTE)**

CNWRA will complete the reference facility description which includes finalizing the process flow sheets and mass balances for the aqueous reprocessing facility. CNWRA will finalize its draft consequence assessments identifying accident categories which could potentially result in consequences much above the High Consequence thresholds contained in 10 CFR 70.61, particularly for a member of the public. The consequence assessment document should include a hypothesis of several generic accident sequences within each category, using NUREG-1821 and existing ISA-related documents as guidance; at a minimum, these will include hydrogen explosions (dissolver tank/area, accountability tanks, storage tanks, and waste tanks), large tank spills, boiling releases, sintering furnace events, red oil explosions, solvent fires, and vitrification accidents. Parametric analyses will include the unmitigated case, at least two partially mitigated cases, and the fully mitigated case, adding layers of controls. The effects of varying release parameters, such as using evaporation models and boiling point effects from NRC, EPA, and DOE documents will be included. As part of the analysis, CNWRA will identify the potential locations, possible causes of failures, and the associated Materials at Risk (MAR) for such accidents.

**Subtask A2 PRA (0.6 FTE)**

Using the aqueous reprocessing reference facility description, CNWRA will assess the feasibility of applying the PRA method to advanced fuel cycle facilities including reprocessing facilities. This shall be done by independently exercising the PRA method for two representative sub-processes of the reference aqueous reprocessing facility which involve accidents that could potentially result in consequences that are much above the High Consequence thresholds contained in 10 CFR 70.61. The sub-processes will be selected in consultation with NRC staff.

**Task A Deliverables:**

NRC comments on reference facility description	October 11, 2012
CNWRA to propose potential sub-processes for PRA analyses	October 31, 2012
NRC comments/recommendations on proposed sub-processes	November 16, 2012
CNWRA's draft consequence assessment report	November 23, 2012
CNWRA to finalize reference facility description	November 30, 2012
NRC's comments on draft consequence report	January 11, 2013
CNWRA to finalize consequence assessment report	January 31, 2013

CNWRA to complete initial PRA analyses on two selected sub-processes	January 31, 2013
NRC comments on PRA analyses	February 15, 2013
CNWRA to finalize PRA analyses	February 22, 2013

**Task A Estimated Resources:**

**0.85 FTE**

**Task B: Applying Technical Specifications and General Design Criteria to Reprocessing Facilities**

Under Task B, CNWRA will illustrate the application of technical specifications and general design criteria to aqueous reprocessing facilities. CNWRA will develop example technical specifications and general design criteria for the two selected representative sub-processes. The example technical specifications will follow the format established for the standard technical specifications for power reactors in Revision 3 of NUREGs 1430, 1431, 1432, 1433, and 1434. In addition, CNWRA will develop general design criteria for the two selected representative sub-processes. These will be derived from the list proposed in Table 2-5 of "Draft Regulatory Basis for Licensing and Regulating Reprocessing Facilities" dated November 2011. It is noted that it is not necessary for the technical specifications and general design criteria to be quantitative since the primary objective of this task is to simply illustrate to the reader the application of these regulatory features to advanced reprocessing or other similar complex fuel cycle facilities. However, it is recognized that quantification does in many instances provide improved illustration of concepts.

**Task B Deliverables:**

Letter Report, containing example technical specifications and general design criteria, for NRC comment	January 18, 2013
NRC comments	February 1, 2013
Final draft	February 15, 2013

**Task B Estimated Resources:**

**0.25 FTE**

**5.0 PROJECT MANAGEMENT**

Maintain Effective Communication with NRC Staff

The contractor shall maintain effective communication with the NRC TO COR to help coordinate and integrate work conducted under Tasks A-I with NRC's technical and decision-making activities. For the duration of this task order, the contractor shall participate in periodic telephone calls with the NRC's TO COR and monthly conference calls with NC's staff's reprocessing working group to discuss the progress to date.

For All Communications

The contractor shall coordinate all necessary NRC communication for the specific task through

the NRC's TO COR or NRC'S ALTERNATE TO COR.

#### NRC Comments

The contractor shall resolve NRC comments through the NRC TO COR when making revisions to any deliverable under each task in this task description.

#### Quality Assurance for the Project

The contractor shall implement and maintain quality assurance requirements for the project in accordance with the umbrella contract.

### **6.0 ACCEPTANCE CRITERIA**

The contractor shall document the preparation of its deliverables and maintain appropriate records. An inventory list or copies of such records shall be provided upon request by the NRC TO COR.

All deliverables shall provide sufficient detail for members of the public to understand the basis of the conclusions reached. The text of these documents shall be written for the general public, as close as possible; the use of acronyms is discouraged or minimal; and the document is supported by appropriate tables and graphics. Each deliverable provided by the contractor shall include directly or be accompanied by enough technical detail so that the NRC and the public may be able to confirm the contractor's methodologies and calculations.

### **7.0 LEVEL OF EFFORT**

The total level of effort for all tasks is 2,314 hours.

### **8.0 MEETINGS AND TRAVEL**

The NRC TO COR may choose to periodically meet with the contractor in the contractor's offices to review progress and provide input into the project, as necessary. Alternatively, these meetings may be held by telephone/teleconference at the discretion of the NRC TO COR.

### **9.0 NRC FURNISHED MATERIAL**

No new NRC materials are expected to be furnished

### **10.0 CONTRACTOR ACQUIRED MATERIAL**

No materials are expected to be acquired.

### **11.0 PERIOD OF PERFORMANCE**

The period of performance of this task order shall begin on or about October 1, 2012, and will expire on September 30, 2013. The deliverables and schedule for work conducted under this task order are summarized in Section 4 above.

### **12.0 REPORTS**

All deliverables shall be added to the reprocessing sharepoint site. Notification of this shall be provided to the NRC TO COR AND ALTERNATE TO COR and Contracting Officer (CO) in the form of a letter on or within two business days of the posting of the deliverable on reprocessing sharepoint site. Five hard copies of all final deliverables shall be provided to the NRC TO COR within ten business days of completing the task.

### **13.0 TECHNICAL/PROJECT DIRECTION**

Yawar Faraz is the NRC TO COR and Deborah DeMarco is the NRC Alternate TO COR. The NRC TO COR is the focal point for all task order-related activities.

Technical direction may be provided by the NRC TO COR to the contractor during the duration of this task order. Technical direction shall not constitute new assignments of work or changes of such a nature as to justify an adjustment in cost or period of performance. Directions, if any, for changes in scope of work, cost, or period of performance will be issued by the NRC CO.