

**ORDER FOR SUPPLIES OR SERVICES**

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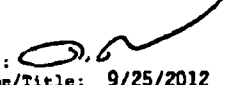
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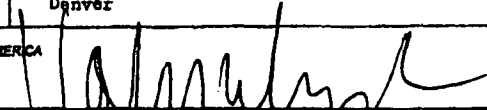
IMPORTANT: Mark all packages and papers with contract and/or order numbers.

BPA NO.

1. DATE OF ORDER 9/21/12		2. CONTRACT NO. (if any) NRC-HQ-12-C-02-0089		6. SHIP TO:	
3. ORDER NO. T001		4. REQUISITION/REFERENCE NO.		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Valerie Whipple Mail Stop: TWB-01-B10M Washington, DC 20555				b. STREET ADDRESS Deborah DeMarco Mail Stop EBB E2 C12	
7. TO:		c. CITY Washington		d. STATE DC	e. ZIP CODE 20555
8. NAME OF CONTRACTOR SOUTHWEST RESEARCH INSTITUTE S W R I				9. SHIP VIA	
DUNS: 007936842				8. TYPE OF ORDER	
b. COMPANY NAME				<input type="checkbox"/> a. PURCHASE <input checked="" type="checkbox"/> b. DELIVERY	
c. STREET ADDRESS 6220 COLEBRA RD				REFERENCE YOUR Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated.	
d. CITY SAN ANTONIO		e. STATE TX	f. ZIP CODE 782385166		
9. ACCOUNTING AND APPROPRIATION DATA RFPA: NMS-12-074; FAIMIS: 123204 B&R: 12-50-387-183; Job Code: J5664; BOC: 252A Approp. No.: X0200; Obligation: \$359,000; DUNS: 007936842				10. REQUISITIONING OFFICE NMS	
11. BUSINESS CLASSIFICATION (Check appropriate box(es))				12. F.O.B. POINT N/A	
<input type="checkbox"/> a. SMALL <input checked="" type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> d. WOMEN-OWNED <input type="checkbox"/> e. HUBZone					
<input type="checkbox"/> f. SERVICE-DISABLED VETERAN-OWNED <input type="checkbox"/> g. WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOSB PROGRAM <input type="checkbox"/> h. EDWOSB					
13. PLACE OF		14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)	
a. INSPECTION		b. ACCEPTANCE		16. DISCOUNT TERMS	

17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	<p>The Contractor shall provide services in accordance with the attached Statement of Work, entitled: "Development of the Regulatory Basis for General Design Criteria and Solidified High-Level Waste Storage and Support for Public Meetings."</p> <p>Total CPAF Amount: \$371,195 Total Obligated Amount: \$359,000 Period of Performance: 10-1-2012 through 9-28-2013</p> <p>NRC COR: Deborah DeMarco 301-492-3143 NRC Task Order COR: Yawar Faraz 301-492-3207</p> <p>DUNS: 007936842 NAICS: 562211 PSC: R499</p> <p>ACCEPTED: Signature:  Print Name/Title: 9/25/2012 R.B. Kalmbach Executive Director, Contracts</p>					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		17(h) TOTAL (Cont. pages)  17(i) GRAND TOTAL
	21. MAIL INVOICE TO:						
	a. NAME Department of Interior / NSC NRCPayments NSCDenver@NSC.gov		PHONE:		FAX:		
	b. STREET ADDRESS (or P.O. Box) Attn: Fiscal Services Branch - D2770 7301 W. Mansfield Avenue		c. CITY Denver		d. STATE CO	e. ZIP CODE 80235-2230	
22. UNITED STATES OF AMERICA BY (Signature) 				23. NAME (Typed) Valerie Whipple Contracting Officer, NSA TITLE: CONTRACTING/ORDERING OFFICER			

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OPTIONAL FORM 347 (REV. 2/2012) PRESCRIBED BY GSA/FAR 48 CFR 63.213(f)

**SUNSI REVIEW COMPLETE**

OCT 09 2012

TEMPLATE - ADMCO2

**ADMCO2**

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**STATEMENT OF WORK.....Attachment 1**

## DELIVERY ORDER TERMS AND CONDITIONS NOT SPECIFIED IN THE CONTRACT

### A.1 BRIEF PROJECT TITLE AND WORK DESCRIPTION (AUG 2011)

(a) The title of this project is: DEVELOPMENT OF THE REGULATORY BASIS FOR GENERAL DESIGN CRITERIA AND SOLIDIFIED HIGH-LEVEL WASTE STORAGE AND SUPPORT FOR PUBLIC MEETINGS

(b) Summary work description:

The objective of is task order is (1) to complete the worst-case consequence assessments and assess the feasibility of applying the ISA/PRA hybrid and PRA methods to aqueous reprocessing facility processes, and (2) to develop a readily accessible and user-friendly electronic data library that the NRC can use to inform NRC's reprocessing regulatory framework activities including the development of an Environmental Impact Statement and to independently conduct a technical review of a potential license application for a reprocessing facility.

### 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 **\$371,195**, of which the sum of \$ represents the estimated reimbursable costs, and of which \$ represents the base fee.

(b) An award fee pool of \$ 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 **\$359,000**.

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

### A.3 PACKAGING AND MARKING (AUG 2011)

(a) The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Surface Transportation Board, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation.

(b) On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

(c) Additional packaging and/or marking requirements are as follows: N/A

### A.4 PLACE OF DELIVERY--REPORTS (AUG 2011)

The items to be furnished electronically to:

[Deborah.DeMarco@nrc.gov](mailto:Deborah.DeMarco@nrc.gov)

[Yawar.Fazar@nrc.gov](mailto:Yawar.Fazar@nrc.gov)

[Valerie.whipple@nrc.gov](mailto:Valerie.whipple@nrc.gov)

**NRC-HQ-12-C-02-0089, TASK ORDER 1**

**A.5 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (AUG 2011)**

This order shall commence on October 1, 2012 and will expire on September 28, 2013.

**A.6 2052.215-70 KEY PERSONNEL (JAN 1993)**

(a) The following individuals are considered to be essential to the successful performance of the work hereunder:

Dr. Yi-Ming Pan	Project Manager
Dr. Biswajit Daasgupta	Principal Investigator
Dr. Sui-Min Hsiung	Staff Engineer

The contractor agrees that personnel may not be removed from the contract work or replaced without compliance with paragraphs (b) and (c) of this section.

(b) If one or more of the key personnel, for whatever reason, becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the contractor shall immediately notify the contracting officer and shall, subject to the concurrence of the contracting officer, promptly replace the personnel with personnel of at least substantially equal ability and qualifications.

(c) Each request for approval of substitutions must be in writing and contain a detailed explanation of the circumstances necessitating the proposed substitutions. The request must also contain a complete resume for the proposed substitute and other information requested or needed by the contracting officer to evaluate the proposed substitution. The contracting officer and the project officer shall evaluate the contractor's request and the contracting officer shall promptly notify the contractor of his or her decision in writing.

(d) If the contracting officer determines that suitable and timely replacement of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the contract work is not reasonably forthcoming, or that the resultant reduction of productive effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the contracting officer for default or for the convenience of the Government, as appropriate. If the contracting officer finds the contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss, or damage.

**A.7 A.8 2052.215-71 CONTRACTING OFFICER'S REPRESENTATIVE AUTHORITY (NOVEMBER 2006)**

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

Name: Deborah DeMarco

Address: Mail Stop EBB/E2 C12  
Washington, DC 20555

Telephone Number: 301-492-3143

(b) Performance of the work under this contract is subject to the technical direction of the NRC COR. The term "technical direction" is defined to include the following:

## NRC-HQ-12-C-02-0089, TASK ORDER 1

(1) Technical direction to the contractor which shifts work emphasis between areas of work or tasks, authorizes travel which was unanticipated in the Schedule (i.e., travel not contemplated in the Statement of Work (SOW) or changes to specific travel identified in the SOW), fills in details, or otherwise serves to accomplish the contractual SOW.

(2) Provide advice and guidance to the contractor in the preparation of drawings, specifications, or technical portions of the work description.

(3) Review and, where required by the contract, approval of technical reports, drawings, specifications, and technical information to be delivered by the contractor to the Government under the contract.

(c) Technical direction must be within the general statement of work stated in the contract. The COR does not have the authority to and may not issue any technical direction which:

(1) Constitutes an assignment of work outside the general scope of the contract.

(2) Constitutes a change as defined in the "Changes" clause of this contract.

(3) In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.

(4) Changes any of the expressed terms, conditions, or specifications of the contract.

(5) Terminates the contract, settles any claim or dispute arising under the contract, or issues any unilateral directive whatever.

(d) All technical directions must be issued in writing by the COR or must be confirmed by the COR in writing within ten (10) working days after verbal issuance. A copy of the written direction must be furnished to the contracting officer. A copy of NRC Form 445, Request for Approval of Official Foreign Travel, which has received final approval from the NRC must be furnished to the contracting officer.

(e) The contractor shall proceed promptly with the performance of technical directions duly issued by the COR in the manner prescribed by this clause and within the COR's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the COR is within one of the categories as defined in paragraph (c) of this section, the contractor may not proceed but shall notify the contracting officer in writing within five (5) working days after the receipt of any instruction or direction and shall request the contracting officer to modify the contract accordingly. Upon receiving the notification from the contractor, the contracting officer shall issue an appropriate contract modification or advise the contractor in writing that, in the contracting officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the "Changes" clause.

(g) Any unauthorized commitment or direction issued by the COR may result in an unnecessary delay in the contractor's performance and may even result in the contractor expending funds for unallowable costs under the contract.

(h) A failure of the parties to agree upon the nature of the instruction or direction or upon the contract action to be taken with respect thereto is subject to 52.233-1 -Disputes.

(i) In addition to providing technical direction as defined in paragraph (b) of the section, the COR shall:

(1) Monitor the contractor's technical progress, including surveillance and assessment of performance, and recommend to the contracting officer changes in requirements.

## **NRC-HQ-12-C-02-0089, TASK ORDER 1**

(2) Assist the contractor in the resolution of technical problems encountered during performance.

(3) Review all costs requested for reimbursement by the contractor and submit to the contracting officer recommendations for approval, disapproval, or suspension of payment for supplies and services required under this contract.

(4) Assist the contractor in obtaining the badges for the contractor personnel.

(5) Immediately notify the Security Branch, Division of Facilities and Security (SB/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return of any NRC issued badge to SB/DFS within three days after their termination.

(6) Ensure that all contractor employees that require access to classified Restricted Data or National Security Information or matter, access to sensitive unclassified information (Safeguards, Official Use Only, and Proprietary information) access to sensitive IT systems or data, unescorted access to NRC controlled buildings/space, or unescorted access to protected and vital areas of nuclear power plants receive approval of SB/DFS prior to access in accordance with Management Directive and Handbook 12.3.

(7) For contracts for the design, development, maintenance or operation of Privacy Act Systems of Records, obtain from the contractor as part of closeout procedures, written certification that the contractor has returned to NRC, transferred to the successor contractor, or destroyed at the end of the contract in accordance with instructions provided by the NRC Systems Manager for Privacy Act Systems of Records, all records (electronic or paper) which were created, compiled, obtained or maintained under the contract.

### **A.8 2052.215-78 TRAVEL APPROVALS AND REIMBURSEMENT -ALTERNATE 1 (OCT 1999)**

(a) Total expenditure for travel may not exceed \$0 without the prior approval of the contracting officer.

(b) All foreign travel must be approved in advance by the NRC on NRC Form 445, Request for Approval of Official Foreign Travel, and must be in compliance with FAR 52.247-63 Preference for U.S. Flag Air Carriers. The contractor shall submit NRC Form 445 to the NRC no later than 30 days prior to the commencement of travel.

(c) The contractor will be reimbursed only for those travel costs incurred that are directly related to this contract and which are allowable subject to the limitations prescribed in FAR 31.205-46.

(d) It is the responsibility of the contractor to notify the contracting officer in accordance with the FAR Limitations of Cost clause of this contract when, at any time, the contractor learns that travel expenses will cause the contractor to exceed the travel ceiling amount identified in paragraph (a) of this clause.

(e) Reasonable travel costs for research and related activities performed at State and nonprofit institutions, in accordance with Section 12 of Pub. L. 100-679, shall be charged in accordance with the contractor's institutional policy to the degree that the limitations of Office of Management and Budget (OMB) guidance are not exceeded. Applicable guidance documents include OMB Circular A-87, Cost Principles for State and Local Governments; OMB Circular A-122, Cost Principles for Nonprofit Organizations; and OMB Circular A-21, Cost Principles for Educational Institutions.

### **A.9 ELECTRONIC PAYMENT (AUG 2011)**

The Debt Collection Improvement Act of 1996 requires that all payments except IRS tax refunds be made by Electronic Funds Transfer. Payment shall be made in accordance with FAR 52.232-33, entitled "Payment by Electronic Funds- Central Contractor Registration".

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To receive payment, the contractor shall prepare invoices in accordance with NRC's Billing Instructions. Claims shall be submitted on the payee's letterhead, invoice, or on the Government's Standard Form 1034, "Public Voucher for Purchases and Services Other than Personal," and Standard Form 1035, "Public Voucher for Purchases Other than Personal - Continuation Sheet." The preferred method of submitting invoices is electronically to the Department of the Interior at [NRCPayments\\_NBCDenver@nbc.gov](mailto:NRCPayments_NBCDenver@nbc.gov). If the contractor submits a hard copy of the invoice, it shall be submitted to the following address:

Department of the Interior  
National Business Center  
Attn: Fiscal Services Branch - D2770  
7301 West Mansfield Avenue  
Denver, CO 80235-2230

### **A.10 WHISTLEBLOWER PROTECTION FOR NRC CONTRACTOR AND SUBCONTRACTOR EMPLOYEES (AUG 2011)**

(a) The U.S. Nuclear Regulatory Commission (NRC) contractor and its subcontractor are subject to the Whistleblower Employee Protection public law provisions as codified at 42 U.S.C. 5851. NRC contractor(s) and subcontractor(s) shall comply with the requirements of this Whistleblower Employee Protection law, and the implementing regulations of the NRC and the Department of Labor (DOL). See, for example, DOL Procedures on Handling Complaints at 29 C.F.R. Part 24 concerning the employer obligations, prohibited acts, DOL procedures and the requirement for prominent posting of notice of Employee Rights at Appendix A to Part 24 entitled: "Your Rights Under the Energy Reorganization Act".

(b) Under this Whistleblower Employee Protection law, as implemented by regulations, NRC contractor and subcontractor employees are protected from discharge, reprisal, threats, intimidation, coercion, blacklisting or other employment discrimination practices with respect to compensation, terms, conditions or privileges of their employment because the contractor or subcontractor employee(s) has provided notice to the employer, refused to engage in unlawful practices, assisted in proceedings or testified on activities concerning alleged violations of the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act of 1974 (as amended).

(c) The contractor shall insert this or the substance of this clause in any subcontracts involving work performed under this contract.

### **A.11 GREEN PURCHASING (JUN 2011)**

(a) In furtherance of the sustainable acquisition goals of Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" products and services provided under this contract/order shall be energy- efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient, biobased, environmentally preferable (e.g., Electronic Product Environmental Assessment Tool (EPEAT) certified), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives, where such products and services meet agency performance requirements. <http://www.fedcenter.gov/programs/eo13514/>

(b) The contractor shall flow down this clause into all subcontracts and other agreements that relate to performance of this contract/order.

### **A.12 USE OF AUTOMATED CLEARING HOUSE (ACH) ELECTRONIC PAYMENT/REMITTANCE ADDRESS (AUG 2011)**

The Debt Collection Improvement Act of 1996 requires that all Federal payments except IRS tax refunds be made by Electronic Funds Transfer. It is the policy of the Nuclear Regulatory Commission to pay government vendors by the Automated Clearing House (ACH) electronic funds transfer payment system. Item 15C of the Standard Form 33 may be disregarded.

**[REDACTED]**

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

**TASK TITLE:** DEVELOPMENT OF THE REGULATORY BASIS FOR GENERAL DESIGN CRITERIA AND SOLIDIFIED HIGH-LEVEL WASTE STORAGE AND SUPPORT FOR PUBLIC MEETINGS

**TASK ORDER NUMBER:** 001  
**JOB CODE:** J5664  
**B&R NUMBER:**  
**ISSUING OFFICE:** NMSS  
**NRC TASK ORDER CONTRACTING OFFICER'S REPRESENTATIVE (COR):** Yawar Faraz (301) 492-3207  
**NRC CONTRACTING OFFICER REPRESENTATIVE (COR):** 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 NRC staff is currently finalizing the regulatory basis document to support potential rulemaking for a new reprocessing regulation.

The technical assistance tasks to be authorized under the Program Element Plan (PEP) of Job Code J5664 request that CNWRA help NRC finalize the regulatory basis document including rationale for the development of the regulatory framework needed for licensing reprocessing facilities. Specifically, CNWRA is requested to conduct analyses for closing Gap 5 (Safety and Risk Assessment Methodologies and Considerations).

## **2.0 OBJECTIVE**

The objective of Task A is to complete the worst-case consequence assessments and assess the feasibility of applying the ISA/PRA hybrid and PRA methods to aqueous reprocessing facility processes. The feasibility of applying the ISA/PRA hybrid and PRA methodologies to reprocessing will be assessed by independently exercising the two methodologies for two representative processes of the reference 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 objective of Task B is to develop a readily accessible and user-friendly electronic data library that the NRC can use to inform NRC's reprocessing regulatory framework activities including the development of an Environmental Impact Statement and to independently conduct a technical review of a potential license application for a reprocessing facility. To exercise an ISA/PRA hybrid or PRA approach in Task A, in addition to basic design information, failure-rate



[REDACTED]

data for safety-related hardware and human actions is needed. The availability and robustness of such data will be explored as part of Task B.

### **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 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. Shielding Expert
11. Nuclear Fuel Facility, and/or Spent Fuel Facility Expert
12. Reprocessing facility technology, design and operation
13. 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 the ISA/PRA hybrid and PRA methodologies to two representative processes of the aqueous reprocessing reference facility, and (3) develop a readily accessible and user-friendly electronic data library for aqueous reprocessing. Subject to the availability of funds, as optional tasks, CNWRA will assist the NRC in completing the regulatory basis document and provide draft regulatory language for reprocessing in areas related to Gaps 9, 15, 1, 3, 11, and 19 and natural phenomena. The scope of work includes the following tasks and subtasks.

#### **Task A: Finalize Consequence Assessments and Exercise PRA for Aqueous Reprocessing**

The objective of Task A is to finalize the consequence assessments for the most significant aqueous reprocessing accidents (Subtask A1) and to exercise PRA for certain processes of an aqueous reprocessing facility (Subtask A2).



**Subtask A1 Consequence Assessments for Worst-Case Accidents**

For the aqueous reprocessing facility reference design, CNWRA will finalize its draft consequence assessment document due by October 31, 2012, which identifies 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 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 Application of ISA/PRA hybrid and PRA methods**

Using the aqueous reprocessing facility reference design, CNWRA will assess the feasibility of applying the ISA/PRA hybrid and PRA methods to advanced fuel cycle facilities including reprocessing facilities. This shall be done by independently exercising the ISA/PRA hybrid and PRA methodologies for two representative 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 processes will be selected in consultation with NRC staff.

**Task A Deliverables:**

CNWRA's draft consequence assessment report	October 31, 2012
NRC's comments on draft consequence report	December 14, 2012
CNWRA to finalize consequence assessment report	January 31, 2013
CNWRA to propose potential processes for ISA/PRA and PRA analyses	November 30, 2012
NRC comments/recommendations on proposed processes	December 31, 2012
CNWRA to complete ISA/PRA hybrid and PRA analyses on selected processes	May 31, 2013
NRC comments on ISA/PRA hybrid and PRA analyses report	July 15, 2013
CNWRA to finalize ISA/PRA hybrid and PRA analyses report	September 30, 2013

**Task A Estimated Resources:**

**0.8FTE**



**Task B: Develop Data Library for Use in Hazards and Risk Analyses for Reprocessing Facilities**

In support of revising the regulatory framework for reprocessing and for conducting potential licensing reviews and environmental impact assessments, estimates of the hazards and risks from reprocessing facilities are needed. The CNWRA will develop a readily accessible and user friendly data library that the NRC can use for such purpose. This is recognized as a multi-year project. Any gaps in the form of data that are not available, but are needed for hazards and risk assessments, will be documented.

CNWRA will develop hardware and human reliability data bases that may be applicable to advanced fuel cycle facilities including aqueous reprocessing facilities. CNWRA will clearly identify any reliability data gaps. CNWRA will appropriately address data uncertainties.

**Task B Deliverables:**

Letter Report, for NRC comment, recommending the proposed form and process by which the data will be assimilated and its user friendly design	November 30, 2012
Beta-data Library for NRC comment	June 30, 2013
Beta-Data Library incorporating NRC Comments	September 30, 2013

**Task B Estimated Resources:**

**0.25 FTE**

The following Tasks may be initiated if funding becomes available. Additional NRC guidance will be provided to the CNWRA at that time.

**Task C (Optional – Pending Resource Availability): Gap 9—General Design Criteria**

CNWRA will support NRC staff to develop draft general design criteria and technical bases for the potential areas identified in the current draft regulatory basis document. The bases for each proposed GDC should be identified. Comparisons with NEI's white paper GDCs should be addressed. If available, comparisons of GDCs from foreign regulatory authorities (British, French, and Japanese) for reprocessing facilities should be addressed.

**Task D (Optional – Pending Resource Availability): Gap 15—Waste Confidence for Solidified HLW**

The CNWRA staff will recommend experiments to evaluate the degradation processes of potential solidified HLW canisters under inland and coastal conditions. The experiments will assess potential failure modes such as localized corrosion or corrosion induced by industrial pollutants. Experiments evaluating degradation of other potential components such as concrete overpack, radiation shielding materials, or sealing materials will also be recommended.

**Task E (Optional – Pending Resource Availability): Gap 11—Technical Specifications**

[REDACTED]

The CNWRA staff will support NRC staff to develop example draft technical specifications for a reference reprocessing facility to be developed in a separate project.

**Task F (Optional – Pending Resource Availability): Gap 3—HLW Definition**

The CNWRA staff will support NRC staff in developing criteria to define HLW.

**Task G (Optional – Pending Resource Availability): Gap 1—Regulatory Framework Options**

The CNWRA staff will support NRC staff in developing rationale and bases for recommending the contents of a new 10 CFR Part 7x for licensing reprocessing facilities.

**Task H (Optional – Pending Resource Availability): Gap 19—Effluent Control and Monitoring**

The CNWRA staff will support NRC staff to recommend appropriate effluent release as low as reasonably achievable (ALARA) limits for reprocessing and associated technical bases.

**Task I (Optional – Pending Resource Availability): Natural Phenomena**

The CNWRA staff will support NRC staff to develop recommendations for requirements and criteria with technical bases to ensure reprocessing facility safety from natural phenomena.

**Task J (Optional – Pending Resource Availability): Gap 5— Safety and Risk Assessment Methodology**

The CNWRA staff will support NRC staff in developing rationale and bases for recommending appropriate risk assessment methodology and risk criteria for reprocessing. The contractor shall provide draft technical basis and draft regulations for general design criteria and solidified HLW storage safety associated with a reprocessing or its related facility including a HLW solidification and mixed-oxide fuel fabrication facility.

**Task K (Optional – Pending Resource Availability): Public Meetings**

**Subtask K1: Public Meeting and Workshop Facilitation**

The CNWRA staff will provide a qualified facilitator to coordinate and facilitate public meetings and a workshop to collect input and feedback from external stakeholders and members of the public.

**Subtask K2: Public Meeting and Workshop Planning and Support**

The CNWRA staff and the meeting facilitator will assist NRC staff in planning, coordinating, and documenting these public meetings and workshop with external stakeholders and members of the public and supporting other public outreach efforts.

## **5.0 PROJECT MANAGEMENT**

### Maintain Effective Communication with NRC Staff

The contractor shall maintain effective communication with the NRC COR/TO COR to help

[REDACTED]

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 COR/TO COR and monthly conference calls with NRC'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 designee (as may be temporarily established via electronic or hard-copy written communication from the NRC 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 PO.

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 level of effort is 2,263 hours.

**8.0 MEETINGS AND TRAVEL**

The NRC COR/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 COR/TO COR.

There is a potential for a need for two CNWRA staff to visit the Sellafield reprocessing facility in the UK for a one week visit to conduct information exchange activities on reliability data and PRA studies for aqueous reprocessing facilities.

**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 REPORTS**

All deliverables shall be added to the reprocessing sharepoint site. Notification of this shall be provided to the NRC 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 COR within ten business days of completing the task.

**12.0 TECHNICAL/PROJECT DIRECTION**

Yawar Faraz is the NRC 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.