IMPORTANT: Mark all packages and papers with contract and/or order numbers. EPA NO. 1

1. DATE OF ORDER: 09-09-2004	2. CONTRACT NO. (If any)
3. ORDER NO. DR-04-04-087 MODIFICATION NO.	4. REQUISITION/REFERENCE NO. RES-04-087 8/5/04

5. ISSUING OFFICE (Address correspondence to)
U.S. Nuclear Regulatory Commission
Div of Contracts
Two White Flint North - MS T-7-I-2
Contract Management Center No. 1
Washington, DC 20555

6. SHIP TO:
a. NAME OF CONSIGNEE: U.S. Nuclear Regulatory Commission
b. STREET ADDRESS: Attn: B. P. Jain, RES
c. CITY: Washington | d. STATE: DC | e. ZIP CODE: 20555
f. SHIP VIA

7. TO:
a. NAME OF CONTRACTOR: SOUTHWEST RESEARCH INSTITUTE
b. COMPANY NAME
c. STREET ADDRESS: 6220 CULEBRA ROAD
d. CITY: SAN ANTONIO | e. STATE: TX | f. ZIP CODE: 782385166

8. TYPE OF ORDER
[X] a. PURCHASE ORDER — Reference your 8/19/2004. 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.
[ ] b. DELIVERY/TASK ORDER — Except for billing instructions on the reverse, this delivery/task order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.

9. ACCOUNTING AND APPROPRIATION DATA $37,887.00
B&R 46015110191 JC: N6061 BOC: 252A 31X0200.460
Obligate: $37,887

10. REQUISITIONING OFFICE RES
B.P. Jain 301-415-6303

11. BUSINESS CLASSIFICATION (Check appropriate box(es))
[ ] a. SMALL [X] b. OTHER THAN SMALL [ ] c. DISADVANTAGED [ ] d. WOMEN-OWNED

12. F.O.B. POINT	14. GOVERNMENT B/L NO.	15. DELIVER TO F.O.B. POINT ON OR BEFORE	16. DISCOUNT TERMS
Destination		See SOW	N/A

13. PLACE OF		FOR INFORMATION CALL: (No collect calls)
a. INSPECTION	b. ACCEPTANCE	Barbara Meehan 301-415-6730

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)
	Contractor shall provide services in accordance with the attached statement of work entitled, "GSI-191 PWR SUMP Blockage Chemical Effects Test" Period of Performance: Date of Award through 12/31/04					
1	Firm Fixed Price for completion of Draft Letter Report (Due November 30, 2004)			[redacted]	$26,399.00	
2	Firm Fixed Price for completion of Final Report (Due December 31, 2004)			[redacted]	$8,968.00	
3	Estimated Cost for Travel to NRC Headquarters			[redacted]	$2,520.00	
	Total Amount: $37,887 Project Officer is B. P. Jain 301-415-6303 Optional Task 3 is priced at $7,048. If the Government exercises this option, this order will be modified to reflect that action. Duns #: 007936842 FFS Committment #: RES-CO4-476					

18. SHIPPING POINT	19. GROSS SHIPPING WEIGHT	20. INVOICE NO.	$37,887.00	SUBTOTAL

SEE BILLING INSTRUCTIONS ON REVERSE

21. MAIL INVOICE TO:
a. NAME: U.S. Nuclear Regulatory Commission, Contract Management Center No. 1
b. STREET ADDRESS (or P.O. Box): Attn: (DR-04-04-087)), M/S T7I2
c. CITY: Washington | d. STATE: DC | e. ZIP CODE: 20555

17(h) TOTAL (Cont. pages)
17(i) GRAND TOTAL $37,887.00

22. UNITED STATES OF AMERICA BY (Signature) Barbara Meehan

23. NAME (Typed) Barbara Meehan
TITLE: CONTRACTING/ORDERING OFFICER

OPTIONAL FORM 347 (6/95)

TEMPLATE - ADM001

ADM002

SUPPLEMENTAL INVOICING INFORMATION

If desired, this order (or copy thereof) may be used by the Contractor as the Contractor's invoice, instead of a separate invoice, provided the following statement, (signed and dated) is on (or attached to) the order: "Payment is requested in the amount of $__________. No other invoice will be submitted." However, if the Contractor wishes to submit an invoice, the following information must be provided: contract number (if any), order number, item number(s), description of supplies or services, sizes, quantities, unit prices, and extended totals. Prepaid shipping costs will be indicated as a separate item on the invoice. Where shipping costs exceed $10 (except for parcel post), the billing must be supported by a bill of lading or receipt. When several orders are invoiced to an ordering activity during the same billing period, consolidated periodic billings are encouraged.

RECEIVING REPORT

Quantity in the "Quantity Accepted" column on the face of this order has been: ☐ inspected, ☐ accepted, ☐ received by me and conforms to contract. Items listed below have been rejected for the reasons indicated.

SHIPMENT NUMBER	PARTIAL / FINAL		DATE RECEIVED	SIGNATURE OF AUTHORIZED U.S. GOV'T REP.	DATE
TOTAL CONTAINERS		GROSS WEIGHT	RECEIVED AT	TITLE	

REPORT OF REJECTIONS

ITEM NO.	SUPPLIES OR SERVICES	UNIT	QUANTITY REJECTED	REASON FOR REJECTION

ADDITIONAL SIMPLIFIED ACQUISITION TERMS AND CONDITIONS

A.1 NOTICE LISTING CLAUSES INCORPORATED BY REFERENCE

The following clauses are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" contained in this document. FAR 52.252-2 contains the internet address for electronic access to the full text of a clause.

NUMBER	TITLE	DATE
	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	
52.222-42	STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES	MAY 1989
52.222-47	SERVICE CONTRACTS ACT (SCA) MINIMUM WAGES AND FRINGE BENEFITS	MAY 1989
52.223-6	DRUG-FREE WORKPLACE	MAY 2001
52.237-1	SITE VISIT	APR 1984
52.237-2	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION	APR 1984
52.242-10	F.O.B. ORIGIN--GOVERNMENT BILLS OF LADING OR PREPAID POSTAGE	APR 1984
52.243-1	CHANGES--FIXED PRICE ALTERNATE I (APR 1984)	AUG 1987
52.213-3	NOTICE TO SUPPLIER	APR 1984

A.2 52.213-4 TERMS AND CONDITIONS - SIMPLIFIED ACQUISITIONS (OTHER THAN COMMERCIAL ITEMS) (JUL 2004)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses that are incorporated by reference:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-3, Convict Labor (June 2003) (E.O. 11755).

(ii) 52.222-21, Prohibition of Segregated Facilities (Feb 1999) (E.O. 11246).

(iii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iv) 52.225-13, Restrictions on Certain Foreign Purchases (Dec 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

(v) 52.233-3, Protest After Award (Aug 1996) (31 U.S.C. 3553).

(2) Listed below are additional clauses that apply:

(i) 52.232-1, Payments (Apr 1984).

(ii) 52.232-8, Discounts for Prompt Payment (Feb 2002).

(iii) 52.232-11, Extras (Apr 1984).

(iv) 52.232-25, Prompt Payment (Oct 2003).

(v) 52.233-1, Disputes (Jul 2002).

(vi) 52.244-6, Subcontracts for Commercial Items (Jul 2004).

(vii) 52.253-1, Computer Generated Forms (Jan 1991).

(b) The Contractor shall comply with the following FAR clauses, incorporated by reference, unless the circumstances do not apply:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (Jun 2004) (E.O. 13126). (Applies to contracts for supplies exceeding the micro-purchase threshold.)

(ii) 52.222-20, Walsh-Healey Public Contracts Act (Dec 1996) (41 U.S.C. 35-45) (Applies to supply contracts over $10,000 in the United States, Puerto Rico, or the U.S. Virgin Islands).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts of $25,000 or more).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793). (Applies to contracts over $10,000, unless the work is to be performed outside the United States by employees recruited outside the United States.) (For purposes of this clause, United States includes the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.)

(v) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts of $25,000 or more).

(vi) 52.222-41, Service Contract Act of 1965, As Amended (May 1989) (41 U.S.C. 351, et seq.) (Applies to service contracts over $2,500 that are subject to the Service Contract Act and will be performed in the United States, District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, Johnston Island, Wake Island, or the outer continental shelf lands).

(vii) 52.223-5, Pollution Prevention and Right-to-Know Information (AUG 2003) (E.O. 13148) (Applies to services performed on Federal facilities).

(viii) 52.225-1, Buy American Act--Supplies (June 2003) (41 U.S.C. 10a-10d) (Applies to contracts for supplies, and to contracts for services involving the furnishing of supplies, for use in the United States or its outlying areas, if the value of the supply contract or supply portion of a service contract exceeds the micro- purchase threshold and the acquisition--

_(A) Is set aside for small business concerns; or

(B) Cannot be set aside for small business concerns (see 19.502-2), and does not exceed $25,000.)

(ix) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (OCT 2003). (Applies when the payment will be made by electronic funds transfer (EFT) and the payment office uses the Central Contractor Registration (CCR) database as its source of EFT information.)

(x) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (May 1999). (Applies when the payment will be made by EFT and the payment office does not use the CCR database as its source of EFT information.)

(xi) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241). (Applies to supplies transported by ocean vessels (except for the types of subcontracts listed at 47.504(d).)

(2) Listed below are additional clauses that may apply:

(i) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment (JULY 1995) (Applies to contracts over $25,000).

(ii) 52.211-17, Delivery of Excess Quantities (SEPT 1989) (Applies to fixed-price supplies).

(iii) 52.247-29, F.o.b. Origin (JUN 1988) (Applies to supplies if delivery is f.o.b. origin).

(iv) 52.247-34, F.o.b. Destination (NOV 1991) (Applies to supplies if delivery is f.o.b. destination).

(c) FAR 52.252-2, Clauses Incorporated by Reference (FEB 1998). This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

(d) Inspection/Acceptance. The Contractor shall tender for acceptance only those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. The Government must exercise its postacceptance rights--

(1) Within a reasonable period of time after the defect was discovered or should have been discovered; and

(2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(e) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence, such as acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(f) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges that the Contractor can demonstrate to the satisfaction of the Government, using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred that reasonably could have been avoided.

(g) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide

the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(h) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

A.3 NRC ACQUISITION CLAUSES - (NRCAR) 48 CFR CH. 20

2052.209-72	CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST	JAN 1993

A.4 OTHER APPLICABLE CLAUSES

[] *See Addendum for the following in full text (if checked)*

[] 52.216-18, Ordering

[] 52.216-19, Order Limitations

[] 52.216-22, Indefinite Quantity

[] 52.217-6, Option for Increased Quantity

[] 52.217-7, Option for Increased Quantity Separately Priced Line Item

[] 52.217-8, Option to Extend Services

[] 52.217-9, Option to Extend the Term of the Contract

A.5 SEAT BELTS

Contractors, subcontractors, and grantees, are encouraged to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented, or personally owned vehicles.

A.6 COMPLIANCE WITH U.S. IMMIGRATION LAWS AND REGULATIONS

NRC contractors are responsible to ensure that their alien personnel are not in violation of United States Immigration and Naturalization (INS) laws and regulations, including employment authorization documents and visa requirements. Each alien employee of the Contractor must be lawfully admitted for permanent residence as evidenced by Alien Registration Receipt Card Form 1-151 or must present other evidence from the Immigration and Naturalization Services that employment will not affect his/her immigration status. The INS Office of Business Liaison (OBL) provides information to contractors to help them understand the employment eligibility verification process for non-US citizens. This information can be found on the INS website, http://www.ins.usdoj.gov/graphics/services/employerinfo/index.htm#obl.

The NRC reserves the right to deny or withdraw Contractor use or access to NRC facilities or its equipment/services, and/or take any number of contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor=s responsibility under this clause.

(End of Clause)

OFFICE OF NUCLEAR REGULATORY RESEARCH
DIVISION OF ENGINEERING TECHNOLOGY
STATEMENT OF WORK
RES-04-087

TITLE: GSI-191 PWR SUMP BLOCKAGE CHEMICAL EFFECTS TESTS

BACKGROUND

A stuck pressurizer relief valve and the use of the emergency core cooling system (ECCS) at Three-Mile Island (TMI) led to the release of coolant water into the reactor building basement. The residual heat from the reactor pressure vessel produced a cycle of water evaporation, condensation, and drainage back down into the basement. By the time the TMI accident had ended, the discharged reactor coolant water contained fuel debris, radionuclides, and fission products. Reports from the time indicated that the total volume of sump water used was ~570,000 gallons which included approximately 188,000 gallons from the Susquehanna River. The maximum pool depth was about eight feet. After 153 days from the loss-of-coolant accident (LOCA), the TMI containment water with a green gelatinous precipitate phase covered the containment floor and walls. The containment water and gelatinous material were then chemically analyzed and documented by Oak Ridge National Lab (ORNL).

The purpose of the GSI-191 study is to determine if the transport and accumulation of debris in a containment following a LOCA will impede the operation of the ECCS by increasing the head loss across the sump pump strainers. The purpose of this test plan is to determine whether or not some type(s) of gelatinous material similar to that found on the TMI containment water could be formed and once formed could exacerbate the sump strainer head loss either by (a) chemically reacting with or (b) agglomerating onto the insulation and other debris that may block the sump strainer. The objective of this investigation is to determine if plausible reactions may occur during credible post-accident time-temperature-pressure conditions to produce chemical compounds that would degrade the ability of the sump strainer to pass coolant water sufficiently enough to maintain the required recirculation rates. It should be noted that the goal of this work is not to reproduce the gelatinous material found at TMI since that incident is considered an atypical LOCA event.

A recent Los Alamos National Lab (LANL) report detailed a test program conducted at the University of New Mexico (UNM) that tried to establish the conditions for gelatinous material formation under laboratory conditions that simulated the time-temperature characteristics of representative LOCAs. The LANL/UNM analysis did not have access to the ORNL data and did not examine other major constituent elements found in the TMI gelatinous phase such as Cu, Ni, Mg, S, Cr, and Cl. At the time, LANL/UNM only considered the following elemental additions for typical cooling-system waters:

- Al from scaffolding and insulation jackets
- Fe from corroding steels
- Zn from paint leaching and corroding galvanic coatings
- Ca from eroding and corroding concrete
- B additions to the coolant waters at concentrations of ~2,000 ppm
- Li additions to the coolant waters at concentrations of 0.1-1.44 ppm
- HCl, Na_3PO_4, and NaOH for pH control.

Clearly, the amount of dissolved cationic additions assumed for this investigation must be reconciled with the ORNL TMI data which shows relatively high amounts of Cu, Ni, and S. The high Cu content was speculated to originate from the river water pumped into the TMI containment system, however, an Environmental Protection Agency report indicates that the Cu content in the Susquehanna River was three to five orders of magnitude lower than that found in the TMI containment system. Another major question is whether these elements played a significant role in the precipitation of the gelatinous material. This situation is further confused with the uncertainty associated with determining appropriate representative amounts of aqueous and spray-induced corrosion products contained in the sump water. This quantity depends on the typical corrosion rates of the aforementioned materials under the time-temperature-pressure-pH conditions of representative LOCA events. However, due to the lack of comprehensive data for the corrosion and leaching rates of the metallic and insulation materials, it is important that further experiments be conducted to ascertain the uncertainty bounds associated with the simulation inputs.

OBJECTIVES

The objective of the overall project is to develop and operate a circulating water test loop to determine whether gelatinous products may form in the typical time-temperature-pressure-chemistry-pH regime following a representative LOCA event. The objective of this specific investigation is to determine the corrosion and leaching rates of the aforementioned metallic, concrete, and insulation materials as a function of temperature in a borated alkaline solution. These results will be compared to the assumed input values used for the simulations conducted previously in support of the overall integrated chemical effects test loop experiments which modeled the chemical speciation of plausible reaction products in coolant waters after a representative LOCA event. The results of this research project will be used to determine whether enough corrosion and leaching products can produce the gelatinous material under typical LOCA conditions that may increase the head loss across the sump pump strainers.

SCOPE OF WORK

Task 1: Corrosion Rate Measurements of Al, Zn, Cu, and C Steel Samples and Leaching Rate Measurements of Low-density Fiberglass Insulation, and Concrete.

The time-temperature-pressure-chemistry-pH conditions of representative LOCA events are complex and difficult to model experimentally. This is because the identity of critical parameters affecting the formation of plausible reaction products is not always obvious. The need arises to constrain and rank the list of critical variables like pressure, pH, constituent and corrosion product concentrations, and time-temperature parameters before conducting actual laboratory experiments. This identification and ranking was previously conducted through complex computational modeling of the representative LOCA by employing the OLI Systems, Inc. suite of thermodynamics programs. These simulations further determined that a pressurized test loop was not necessary and identified the chemical speciation and amount of plausible reaction products that formed during the representative LOCA events as a function of temperature, pressure, pH, and parametric inputs of likely cationic and anionic corrosion product constituents. The simulation software was subsequently validated to actual experimentally obtained results which showed good agreement.

Nevertheless, the data used in this thermodynamic simulation were obtained from literature sources for similar and analog materials that were either highly uncertain or were not measured experimentally in borated alkaline waters as a function of temperature and pH up to 10. Thus, the corrosion rates from Al, Cu, Zn, and carbon steel and the leaching rates from low-density fiberglass insulation (Nukon) and concrete will be determined in borated alkaline waters to increase the confidence of the thermodynamic simulations to real world conditions. Specifically, the corrosion and leaching rates will be measured per applicable ASTM standard practices at 60, 90, and 110°C in borated alkaline waters with NaOH (pH=10) for all of the metallic and concrete samples NaOH (pH=10) and TSP(pH=7) for low-density Nukon fiberglass.

Task 2: Additional Thermodynamic Simulation of the Chemical Speciation of Plausible Reaction Products.

If the corrosion and leaching rates obtained in Task 1 vary significantly from the assumed values in the previous thermodynamic simulations, the modeling efforts will need to be readdressed to account for the latest data. Hence, the NRC reserves the right to ask for a recalculation of the thermodynamic simulations to incorporate the latest corrosion and leaching rate data obtained in Task 1.

PUBLICATION NOTE

RES encourages the publication of the scientific results from RES sponsored programs in referred scientific and engineering journals as appropriate. If CNWRA proposes to publish in the open literature or present the information at meeting in addition to submitting the required technical reports, approval of the proposed article or presentation should be obtained from the NRC Project Manager. The RES Project Manager shall either approve the material as submitted, approve it subject to NRC suggested revisions, or disapprove it. In any event, the RES Project Manager may disapprove or delay presentation or publication of papers on information that is subject to Commission approval that has not been ruled upon or which has been disapproved. Additional information regarding the publication of NRC sponsored research is contained in NRC Management Directives 3.8, "Unclassified Contractor and Grantee Publications in the NUREG Series," and 3.9, "NRC Staff and Contractor Speeches, Papers, and Journal Articles on Regulatory and Technical Subjects."

If the presentation or paper is in addition to the required technical reports and the RES Project Manager determines that it will benefit the RES project, the Project Manager may authorize payment of travel and publishing costs, if any, from the project funds. If the Project Manager determines that the article or presentation would not benefit the RES project, the costs associated with the preparation, presentation, or publication will be borne by CNWRA. For any publication or presentations falling into this category, the NRC reserves the right to require that such presentation or publication will not identify the NRC's sponsorship of the work.

Reminder: An electronic version of camera-ready NUREG/CRs and draft and final versions of NUREG/CRs shall be submitted to the NRC Project Manager with the paper versions.

MEETINGS AND TRAVEL

All travel shall be approved by and coordinated with the NRC Project Manager. For the purpose of estimate, the project should assume on two-person trip to NRC Headquarters (Rockville, MD) to brief the NRC Project Manager on the results.

NRC FURNISHED MATERIALS

None.

CNWRA ACQUIRED MATERIAL

None.

DELIVERABLE/SCHEDULE AND/OR MILESTONES

Monthly Letter Status Report

A monthly letter status report (MLSR) will be submitted by the 30th of each month, for the previous month, to the NRC Project Manager, with copies to the Director, Division of Engineering Technology; Chief, Engineering Research Applications Branch; Assistant Chief, Engineering Research Applications Branch; and to the Division of Contracts, Office of Administration. Each MLSR will provide information in accordance with NRC Management Directive 11.7 Handbook, with the agreed upon capability of the CNWRA accounting system, including the title of the project, the JCN, the Principal Investigators, the period of performance, and the reporting period.

The MLSR will contain two sections as follows:

a) Project Status Section:

(1) Objective: A brief statement of CNWRA's understanding of the objective of the program.

(2) Progress During Reporting Period: A listing of efforts completed during the period, milestones reached, or if missed, and explanation provided. This will include all contacts made with industry during this period.

(3) Travel: Travel taken during the reporting period will be described.

(4) Anticipated and Encountered Problem Areas: Any problems or delays encountered or anticipated, and recommendations for resolution will be identified. (Note: If the recommended resolution involves a contract modification, i.e., change of work requirements, level of effort (costs), or period of performance, a separate letter will be prepared and submitted to the NRC Project Manager).

(5) Plans for Next Reporting Period: A brief summary of plans for the next reporting period, including work to be performed and anticipated travel. Milestones that will be completed will be described.

(6) Variance: Any variance in either schedule or spending will be identified and discussed, including the cause and proposed solutions.

b) Financial Status Section:

(1) Financial Status: CNWRA will provide a narrative description of the financial status of the project, including a discussion of the status of the projected cost and the schedule of the project. In addition, financial information will be provided in accordance with NRC Management Directive 11.7 within the agreed-upon capabilities of the CNWRA accounting system.

(2) Spending Plan (SP) Update: Any required updates to the spending plan will be reported and discussed.

Major Milestones:

The major deliverable, i.e., the letter report, and associated milestone due dates for the period from August 15, 2004 to December 31, 2004 should contain the information provided in the report PO #NRC-DR-04-04-070.

Task 1: Corrosion Rate Measurements of Al, Zn, Cu, and C Steel Samples and Leaching Rate Measurements of Low-density Fiberglass Insulation, and Concrete.

(1) Milestone #1: The September monthly report should describe the experimental results from the leaching rate measurements in borated alkaline waters for low-density Nukon fiberglass with NaOH and TSP buffering agents and concrete with NaOH only.

(2) Milestone #2: A video teleconference presentation by September 30, 2004 should detail the findings of the fiberglass and concrete corrosion experiments and their ramifications on the modeling of the chemical reactions in representative sump waters.

(3) Milestone #3: The October monthly report should describe the experimental results from the corrosion rate measurements in borated alkaline waters for the metallic samples with NaOH.

Task 2: Additional Thermodynamic Simulation of the Chemical Speciation of Plausible Reaction Products.

(1) Milestone #1: If the NRC asks for recalculating the thermodynamic simulations, the November monthly report should contain the thermodynamic simulations as conducted in PO #NRC-DR-04-04-070 to incorporate the latest corrosion and leaching rate data from Task 1.

Letter Report:

(1) Deliverable: A letter report documenting the method, results, and conclusions for tasks 1 and possibly 2 and their ramifications on the modeling of the chemical reactions in representative sump waters is required. The report should append the thermodynamic simulations and validation efforts contained in the milestone reports from PO #NRC-DR-04-04-070.

An electronic version of camera-ready NUREG/CRs and draft and final versions of NUREG/CRs shall be submitted to the NRC Project Manager with the paper versions.

(2) Delivery Schedule: Tests should be conducted and completed by October 2004. A draft letter report shall be delivered by November 30, 2004. NRC will provide comments within two weeks of delivery of the draft report. The final NUREG/CR report shall be provided to the NRC PM by December 31, 2004.

NRC PROJECT OFFICER

B.P. Jain, RES, 301-415-6303
Engineering Research Applications Branch
Division of Engineering Technology
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Mail Stop: T-10D20

TECHNICAL REVIEWER

Dr. Aldar A. Csontos
High-Level waste Branch
Office of Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop: T-7F-3

PERIOD OF PERFORMANCE

Five months.

LEVEL OF EFFORT

The estimated effort level for the performance period 08/15/04 - 12/31/04 is 0.15 staff-year.

BILLING INSTRUCTIONS FOR
FIXED PRICE CONTRACTS (October 2003)

General: The contractor is responsible during performance and through final payment of this contract for the accuracy and completeness of the data within the Central Contractor Registration (CCR) database, and for any liability resulting from the Government's reliance on inaccurate or incomplete CCR data. The contractor shall prepare vouchers or invoices as prescribed herein. FAILURE TO SUBMIT VOUCHERS/INVOICES IN ACCORDANCE WITH THESE INSTRUCTIONS WILL RESULT IN REJECTION OF THE VOUCHER/INVOICES AS IMPROPER.

Form: Claims shall be submitted on the payee's letterhead, voucher/invoices, 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." These forms are available from the U.S. Government Printing Office, 710 North Capitol Street, Washington, DC 20401.

Number of Copies: An original and three copies shall be submitted. Failure to submit all the required copies will result in rejection of the voucher/invoice as improper.

Designated Agency Billing Office: Vouchers/Invoices shall be submitted to the following address:

U.S. Nuclear Regulatory Commission
Division of Contracts - T-7-I-2
Washington, DC 20555-0001

A copy of any invoice which includes a purchase of property valued at the time of purchase at $5000 or more, shall additionally be sent to:

NRC Property Management Officer
Administrative Services Center
Mail Stop -O-2G-112
Washington, DC 20555-0001

HAND-DELIVERY OF VOUCHERS/INVOICES IS DISCOURAGED AND WILL NOT EXPEDITE PROCESSING BY THE NRC. However, should you choose to deliver vouchers/invoices by hand, including delivery by any express mail service or special delivery service which uses a courier or other person to deliver the vouchers/invoices in person to the NRC, such vouchers/invoices must be addressed to the above Designated Agency Billing Office and will only be accepted at the following location:

U.S. Nuclear Regulatory Commission
One White Flint North - Mail Room
11555 Rockville Pike
Rockville, MD 20852

HAND-CARRIED SUBMISSIONS WILL NOT BE ACCEPTED AT OTHER THAN THE ABOVE ADDRESS

Note that the official receipt date for hand-delivered vouchers/invoices will be the date it is received by the official agency billing office in the Division of Contracts.

Agency Payment Office: Payment will continue to be made by the office designated in the contract in Block 12 of the Standard Form 26 or Block 25 of the Standard Form 33, whichever is applicable.

Frequency: The contractor shall submit a voucher or invoice only after the NRC's final acceptance of services rendered or products delivered in performance of the contract unless otherwise specified in the contract.

Preparation and Itemization of the Voucher/Invoice: The voucher/invoice shall be prepared in ink or by typewriter (without strike-overs). Corrections or erasures must be initialed. To be considered a proper voucher/invoice, all of the following elements must be included:

1. Contractor's Data Universal Number (DUNS) or DUNS+4 number that identifies the contractor's name and address. The DUNS+4 number is the DUNS number plus a 4-character suffix that may be assigned at the discretion of the contractor to identify alternative Electronic Funds Transfer (EFT) accounts for the same parent concern.

2. Contract number.

3. Sequential voucher/invoice number.

4. Date of voucher/invoice.

5. Payee's name and address. Show the name of the Payee as it appears in the contract and its correct address. If the Payee assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Payee shall require as a condition of any such assignment, that the assignee shall register separately in the Central Contractor Registration (CCR) database at http://www.ccr.gov and shall be paid by EFT in accordance with the terms of this contract. See Federal Acquisition Regulation 52.232-33(g) Payment by Electronic Funds Transfer - Central Contractor Registration (October 2003).

6. Description of articles or services, quantity, unit price, and total amount.

7. For contractor acquired property list each item purchased costing $50,000 or more and having a life expectancy of more than 1 year and provide: (1) an item description, (2) manufacturer, (3) model number, (4) serial number, (5) acquisition cost, (6) date of purchase, and (7) a copy of the purchasing document.

8. Weight and zone of shipment, if shipped by parcel post.

9. Charges for freight or express shipments. Attach prepaid bill if shipped by freight or express.

10. Instructions to consignee to notify the Contracting Officer of receipt of shipment.

11. For Indefinite Delivery contracts or contracts under which progress payments are authorized, the final voucher/invoice shall be marked "FINAL VOUCHER" OR "FINAL INVOICE."

Currency: Billings may be expressed in the currency normally used by the contractor in maintaining his accounting records and payments will be made in that currency. However, the U.S. dollar equivalent for all vouchers/invoices paid under the contract may not exceed the total U.S. dollars authorized in the contract.

Supersession: These instructions supersede any previous billing instructions.

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