

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

BPA NO.

1. DATE OF ORDER <b>SEP 23 2005</b>		2. CONTRACT NO. (If any)		6. SHIP TO:	
3. ORDER NO. DR-03-05-034		MODIFICATION NO.		4. REQUISITION/REFERENCE NO. NRR-05-034	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: CMB2 Mail Stop T-7-I-2 Washington, DC 20555				a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission Attn: Bernard L. Grenier (301-415-2726)	
				b. STREET ADDRESS 11545 Rockville Pike Mail Stop 09E3	
				c. CITY Washington	d. STATE DC
				e. ZIP CODE 20555	
7. TO:					
a. NAME OF CONTRACTOR COSTANTINO, CARL DUNS 243672624					
b. COMPANY NAME					
c. STREET ADDRESS 4 ROCKINGHAM RD					
d. CITY SPRING VALLEY		e. STATE NY		f. ZIP CODE 109771114	
9. ACCOUNTING AND APPROPRIATION DATA 520-15-113-107 J-3234 252A 31X0200.520 OBLIGATE: \$89,460.00					
10. REQUISITIONING OFFICE NRR NRR/DE					

11. BUSINESS CLASSIFICATION (Check appropriate box(es))				12. F.O.B. POINT Destination	
<input checked="" type="checkbox"/> a. SMALL	<input type="checkbox"/> b. OTHER THAN SMALL	<input type="checkbox"/> c. DISADVANTAGED	<input type="checkbox"/> d. SERVICE-DISABLED VETERAN-OWNED		
<input type="checkbox"/> d. WOMEN-OWNED	<input type="checkbox"/> e. HUBZone	<input checked="" type="checkbox"/> f. EMERGING SMALL BUSINESS			
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 NET 30	

## 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)
	The Contractor shall provide technical support to the U.S. Nuclear Regulatory Commission in accordance with the attached Statement of Work (Attachment 1).					
0001	Project Manager				\$54,000.00	
0002	Engineer I				\$24,960.00	
0003	Engineer II				\$8,000.00	
	Travel Costs (Not to Exceed)				\$2,500.00	
	Period of Performance: 10/1/2005 through 9/30/2007					
	Attachments: (1) Statement of Work - "Updating Criteria for Standard Review Plan Sections 3.7.1, 3.7.2, and 3.7.3 Pertaining to the Review of Seismic Analysis and Design of Nuclear Power Plants" (16 pages) (2) Billing Instructions (3 pages)					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		\$89,460.00	17(h) TOTAL (Cont. pages)
	21. MAIL INVOICE TO:							
	a. NAME U.S. Nuclear Regulatory Commission Division of Contracts							17(i). GRAND TOTAL
	b. STREET ADDRESS (or P.O. Box) Mail Stop: T-7-I-2 Attn: DR-03-05-034							
c. CITY Washington						d. STATE DC	e. ZIP CODE 20555	

22. UNITED STATES OF AMERICA  
BY (Signature)23. NAME (Typed)  
Stephen M. Pool  
Contracting Officer  
TITLE: CONTRACTING/ORDERING OFFICERAUTHORIZED FOR LOCAL REPRODUCTION  
PREVIOUS EDITION NOT USABLEOPTIONAL FORM 347 (REV. 3/2005)  
PRESCRIBED BY GSA/FAR 48 CFR 53.213(e)

TEMPLATE - ADM001

SISP REVIEW COMPLETE

ADM002

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.

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

[illegible]

## **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)	

### **A.2 52.212-4 CONTRACT TERMS AND CONDITIONS--COMMERCIAL ITEMS (OCT 2003)**

(a) Inspection/Acceptance. The Contractor shall only tender for acceptance 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 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.

(b) Assignment. The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727). However, when a third party makes payment (e.g., use of the Governmentwide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) Changes. Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) Disputes. This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) Definitions. The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) 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.

(g) Invoice.

(1) The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include--

(i) Name and address of the Contractor;

(ii) Invoice date and number;

(iii) Contract number, contract line item number and, if applicable, the order number;

(iv) Description, quantity, unit of measure, unit price and extended price of the items delivered;

(v) Shipping number and date of shipment, including the bill of lading number and weight of shipment if shipped on Government bill of lading;

(vi) Terms of any discount for prompt payment offered;

(vii) Name and address of official to whom payment is to be sent;

(viii) Name, title, and phone number of person to notify in event of defective invoice; and

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision, contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer-- Central Contractor Registration, or 52.232-34, Payment by Electronic Funds Transfer--Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(2) Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) prompt payment regulations at 5 CFR part 1315.

(h) Patent indemnity. The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) Payment.

(1) Items accepted. Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract.

(2) Prompt payment. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and prompt payment regulations at 5 CFR part 1315.

(3) Electronic Funds Transfer (EFT). If the Government makes payment by EFT, see 52.212-5(b) for the appropriate EFT clause.

(4) Discount. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.

(5) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.

(j) Risk of loss. Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon:

(1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or

(2) Delivery of the supplies to the Government at the destination specified in the contract, if transportation is f.o.b. destination.

(k) Taxes. The contract price includes all applicable Federal, State, and local taxes and duties.

(l) 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 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 which reasonably could have been avoided.

(m) 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.

(n) Title. Unless specified elsewhere in this contract, title to items furnished under this contract shall pass to the Government upon acceptance, regardless of when or where the Government takes physical possession.

(o) 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.

(p) Limitation of liability. Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) Other compliances. The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) Compliance with laws unique to Government contracts. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C 327, et seq., Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.c. 2409 relating to whistle blower protections; 49 U.S.C 40118, Fly American; and 41 U.S.c. 423 relating to procurement integrity.

(s) Order of precedence. Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order: (1) the schedule of supplies/services; (2) the Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause; (3) the clause at 52.212-5; (4) addenda to this solicitation or contract, including any license agreements for computer software; (5) solicitation provisions if this is a solicitation; (6) other paragraphs of this clause; (7) the Standard Form 1449; (8) other documents, exhibits, and attachments; and (9) the specification.

(t) Central Contractor Registration (CCR).

(1) Unless exempted by an addendum to this contract, the Contractor is responsible during performance and through final payment of any contract for the accuracy and completeness of the data within the CCR database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the CCR database to ensure it is current, accurate and complete. Updating information in the CCR does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(2)(i) If a Contractor has legally changed its business name, "doing business as" name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in FAR subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the CCR database; (B) comply with the requirements of subpart 42.12; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (t)(2)(i) of this clause, or fails to perform the agreement at paragraph (t)(2)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the CCR information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract.

(3) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the CCR record to reflect an assignee for the purpose of assignment of claims (see Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the CCR database. Information provided to the Contractor's CCR record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the "Suspension of payment" paragraph of the EFT clause of this contract.

(4) Offerors and Contractors may obtain information on registration and annual confirmation requirements via the internet at <http://www.ccr.gov> or by calling 1-888-227-2423 or 269-961-5757.

**A.3 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO  
IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL  
ITEMS (JUL 2005)**

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

(1) 52.233-3, Protest after Award (AUG 1996) (31 U.S.C. 3553).

(2) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Pub. L. 108-77, 108-78)

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: [Contracting Officer check as appropriate.]

☐ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (JUL 1995), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).

☐ (2) 52.219-3, Notice of Total HUBZone Set-Aside (JAN 1999) (15 U.S.C. 657a).

☐ (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JUL 2005) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

☐ (4) (i) 52.219-5, Very Small Business Set-Aside (JUNE 2003) (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).

☐ (ii) Alternate I (MAR 1999) of 52.219-5.

☐ (iii) Alternate II (JUNE 2003) of 52.219-5.

☒ (5)(i) 52.219-6, Notice of Total Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

☐ (ii) Alternate I (OCT 1995) of 52.219-6.

☐ (iii) Alternate II (MAR 2004) of 52.219-6.

☐ (6)(i) 52.219-7, Notice of Partial Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

☐ (ii) Alternate I (OCT 1995) of 52.219-7.

☐ (iii) Alternate II (MAR 2004) of 52.219-7.

☐ (7) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637 (d)(2) and (3)).

☐ (8)(i) 52.219-9, Small Business Subcontracting Plan (JUL 2005) (15 U.S.C. 637(d)(4)).

☐ (ii) Alternate I (OCT 2001) of 52.219-9.

☐ (iii) Alternate II (OCT 2001) of 52.219-9.

☐ (9) 52.219-14, Limitations on Subcontracting (DEC 1996) (15 U.S.C. 637(a)(14)).

- ☐ (10)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (JUL 2005) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).
- ☐ (ii) Alternate I (JUNE 2003) of 52.219-23.
- ☐ (iii) Alternate II (OCT 1998) of 52.219-23.
- ☐ (11) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (OCT 1999) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- ☐ (12) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (OCT 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- ☐ (13) 52.219-27, Notice of Total Service-Disabled Veteran-Owned Small Business Set-Aside (May 2004)
- ☒ (14) 52.222-3, Convict Labor (JUNE 2003) (E.O. 11755).
- ☒ (15) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (JUN 2004) (E.O. 13126).
- ☐ (16) 52.222-21, Prohibition of Segregated Facilities (FEB 1999).
- ☒ (17) 52.222-26, Equal Opportunity (APR 2002) (E.O. 11246).
- ☐ (18) 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).
- ☒ (19) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).
- ☐ (20) 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).
- ☐ (21) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).
- ☐ (22)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (AUG 2000) (42 U.S.C. 6962(c)(3)(A)(ii)).
- ☐ (ii) Alternate I (AUG 2000) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).
- ☐ (23) 52.225-1, Buy American Act--Supplies (JUNE 2003) (41 U.S.C. 10a-10d).
- ☐ (24)(i) 52.225-3, Buy American Act--Free Trade Agreements-- Israeli Trade Act (JAN 2005) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, Pub. L. 108-77, 108-78, 108-286).
- ☐ (ii) Alternate I (JAN 2004) of 52.225-3.
- ☐ (iii) Alternate II (JAN 2004) of 52.225-3.
- ☐ (25) 52.225-5, Trade Agreements (JAN 2005) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).
- ☐ (26) 52.225-13, Restrictions on Certain Foreign Purchases (MAR 2005) (E.O.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).



- ☐ (27) 52.225-15, Sanctioned European Union Country End Products (FEB 2000) (E.O. 12849).
- ☐ (28) 52.225-16, Sanctioned European Union Country Services (FEB 2000) (E.O. 12849).
- ☐ (29) 52.232-29, Terms for Financing of Purchases of Commercial Items (FEB 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- ☐ (30) 52.232-30, Installment Payments for Commercial Items (OCT 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- ☒ (31) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (OCT 2003) (31 U.S.C. 3332).
- ☐ (32) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (MAY 1999) (31 U.S.C. 3332).
- ☐ (33) 52.232-36, Payment by Third Party (MAY 1999) (31 U.S.C. 3332).
- ☐ (34) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a).
- ☐ (35)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631).
- ☐ (ii) Alternate I (APR 2003) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: [Contracting Officer check as appropriate.]

- ☐ (1) 52.222-41, Service Contract Act of 1965, as Amended (JUL 2005) (41 U.S.C. 351, et seq.).
- ☐ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).
- ☐ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act--Price Adjustment (Multiple Year and Option Contracts) (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).
- ☐ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act--Price Adjustment (February 2002) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).
- ☐ (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreements (CBA) (May 1989) (41 U.S.C. 351, et seq.).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or

for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e)(1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in paragraphs (i) through (vi) of this paragraph in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause--

(i) 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (April 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (December 2001) (38 U.S.C. 4212).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(v) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).

(vi) 52.222-41, Service Contract Act of 1965, as Amended (JUL 2005), flow down required for all subcontracts subject to the Service Contract Act of 1965 (41 U.S.C. 351, et seq.).

(vii) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (April 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the contractor May include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

#### A.4 2052.215-71 PROJECT OFFICER AUTHORITY

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

Name: Bernard L. Grenier

Address: U.S. Nuclear Regulatory Commission  
NRR/DE  
One White Flint North - MS O-9-E-3  
Washington, DC 20555

Telephone Number: 301-415-2726

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

(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 or changes to specific travel identified in the Statement of Work), fills in details, or otherwise serves to accomplish the contractual statement of work.

(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 project officer 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 project officer or must be confirmed by the project officer 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 project officer in the manner prescribed by this clause and within the project officer's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the project officer 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 project officer 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 project officer shall:

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

(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 Personnel Security Branch, Division of Facilities and Security (PERSEC/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return the individual's badge to PERSEC/DFS within three days after their termination.

#### **A.5 2052.209-72 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST REPRESENTATION**

I represent to the best of my knowledge and belief that:

The award to Carl Costantino of a contract or the modification of an existing contract does [X] does not [ ] involve situations or relationships of the type set forth in 48 CFR 2009.570-3(b).

(a) If the representation, as completed, indicates that situations or relationships of the type set forth in 48 CFR 2009.570-3(b) are involved, or the contracting officer otherwise determines that potential organizational conflicts of interest exist, the offeror shall provide a statement in writing which describes in a concise manner all relevant factors bearing on his representation to the contracting officer. If the contracting officer determines that organizational conflicts exist, the following actions may be taken:

- (1) Impose appropriate conditions which avoid such conflicts,
  - (2) Disqualify the offeror, or
  - (3) Determine that it is otherwise in the best interest of the United States to seek award of the contract under the waiver provisions of 48 CFR 2009-570-9.
- (b) The refusal to provide the representation required by 48 CFR 2009.570-4(b), or upon request of the contracting officer, the facts required by 48 CFR 2009.570-3(b), must result in disqualification of the offeror for award.

#### 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:



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.

52.223-6	DRUG-FREE WORKPLACE	MAY 2001
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
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	APR 1984

52.243-1

LADING OR PREPAID POSTAGE  
CHANGES--FIXED PRICE  
ALTERNATE I (APR 1984)  
NOTICE TO SUPPLIER

AUG 1987

52.213-3

APR 1984

## A.7 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.8 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)

## Attachment 1 - Statement of Work

Title: Updating Criteria for Standard Review Plan Sections 3.7.1, 3.7.2 and 3.7.3 Pertaining to the Review of Seismic Analysis and Design of Nuclear Power Plants

TAC Numbers: MC6562 for work related to Section 3.7.1  
MC6563 for work related to Section 3.7.2  
MC6564 for work related to Section 3.7.3

### BACKGROUND

The latest version of Sections 3.7.1, 3.7.2 and 3.7.3 of the Standard Review Plan (SRP)<sup>1</sup> was revised and published in August 1989. Since then, significant research work and development in the areas of structural and earthquake engineering have been conducted by university researches and the industry, and other developments have arisen through the activities associated with early site permit applications. These developments have provided the staff with substantial new insights for improvements in seismic analysis approaches and techniques that can be applied to the safety review of nuclear power plant structures, systems and components conducted by the NRC. Some of this information has been documented in the following publications: (1) NUREG/CR-6728, "Technical Basis for Revision of Regulatory Guidance on Design ground Motions: Hazard and Risk-Consistent Ground Motion Spectra Guidelines," (2) ASCE Standard 4-98, "Seismic Analysis of safety-related Nuclear Structures and Commentary," (3) FEMA Publication 368, "NEHRP Recommended Provisions for seismic Regulations for new Buildings and other Structures, and miscellaneous topical reports.

Some of the new analysis approaches and techniques were proposed in the design certification application of advanced reactors, specifically those related to the Advanced Boiling Water Reactor (ABWR), the Combustion Engineering (CE) System 80+ and the Westinghouse AP600 and AP1000. Because of these new approaches and techniques have not been incorporated in SRP Sections 3.7.1, 3.7.2 and 3.7.3, the staff had to perform independent confirmatory analysis, on a case-by-case basis, to determine the acceptability of the proposed methods on these applications and draw safety conclusion for each separate application. Performing assessments on a case-by-case basis is inefficient and time consuming.

A number of new licensing applications, such as the Economic and Simplified Boiling Water Reactor (ESBWR), are scheduled to be submitted to the NRC for the design certification review. As a result of these new applications, there is a need to revise and update the current sections of the SRP to incorporate the new analysis and design approaches and techniques as well as the lessons learned from the review of aforementioned advanced reactors reviews.

---

<sup>1</sup> In addition to legislation, regulations, and rules, the Office of Nuclear Reactor Regulation (NRR) established the Standard Review Plan (SRP) which consists of procedures, acceptance criteria and guidance for the staff's use to ensure its activities meet the requirements and performance goals imposed by the regulations. The SRP is used by the staff in performing its safety reviews of applications to construct or operate nuclear power plants and reviewing applications to approve standard designs and sites for nuclear power plants. The SRP is published as NUREG-0800.

Based on industry, university and government research and development work over the past 15 years or so, and NRC's experience with the review of design certification applications, as referenced above, in the areas related to seismic analysis and design of nuclear power plants, the NRC has identified the following related technical approaches, methods and techniques that need further analysis or substantiation before being incorporated into the NRC Standard Review Plan:

1. The target Power Spectrum Density (PSD), both horizontal and vertical when the design round response spectra other than RG 1.60 design spectra are to be used and perform parametric calculations to generate basis for the revised guidelines.
2. Guidelines for calculating design ground response spectra at different damping ratios from the design ground response spectra at 5% damping ratio, if the design ground response spectra other than the RG 1.60 response spectra are to be used.
3. Guidelines for generating design ground motion time histories suitable for performing nonlinear structural analyses, reference: SRP Section 3.7.1.II.b.
4. Validation the current staff position (the correlation coefficient of 0.16) for demonstrating the statistical independence of the three components of the design ground motion time histories reference: SRP Section 3.7.1.II.1.b.
5. Guidelines for considering the missing mass effects for the case of modal time history analyses, reference: SRP Sections 3.7.2.II.1.a and -.2.
6. Guidelines for defining "thin soil layers (shallow soil sites)" (including the location for specifying input ground motion), reference: SRP Sections 3.7.1.II.1.a and 3.7.2.II.4.
7. Guidelines and procedures for Soil-Structure Interaction (SSI) analyses (including site amplification and deamplification) that accommodate the variability in site-specific soil material properties as well as structural properties to maintain the hazard level of the input design bedrock motions, reference: SRP Section 3.7.2.II.4.
8. Guidelines for determining the condition (minimum shear wave velocity of supporting soil) for which the fixed-base assumption is acceptable for the seismic analysis (the SSI analysis is not required), reference: SRP Section 3.7.2.II.4.
9. Guidelines for generating the appropriate best-estimate, upper-bound, and lower-bound soil properties to be used in the SSI analyses, reference: SRP Section 3.7.2.II.4.c.
10. Guidelines for selection of model types (lumped-mass stick model, 3D finite element model, or combined 3D finite element model and stick model) for the seismic analysis, reference: SRP Section 3.7.2.11.3.
11. Guidelines for consideration of the flexibility of floors and walls in the seismic models, reference: SRP Section 3.7.2.11.3.
12. Guidelines for the modeling of superstructures and soil foundation of the soil-structure system, reference: SRP Section 3.7.2.11.3.



13. Guidelines for an acceptable approach for distributing the seismic member forces (shear forces, vertical member forces and bending moments) resulted from a lumped-mass stick model to each individual member for the seismic design, reference: SRP Section 3.7.2.11.3.
14. Guidelines for performing nonlinear time history analysis (e.g., foundation mat uplifting and/or sliding, modeling of cracked concrete sections, etc.), reference: SRP Sections 3.7.2.11.1, -.3 and -4.
15. Guidelines for the analysis of piping systems using multiple independent support motions (floor response spectra or floor time histories, reference: SRP Section 3.7.3.11.9.

In order to verify and ensure the applicability and acceptability of these new analyses and design approaches and techniques before they are to be incorporated in the SRP updates, the NRC requires technical support from a specialized expert(s) in the field to review and develop sound analytical bases that can support incorporating the new and updated approaches and techniques in the Standard Review Plan for staff use and industry guidance.

### OBJECTIVE

The objective of this procurement is to obtain technical expertise of an independent contractor to assist the staff in developing and performing confirmatory analyses and parametric studies that will provide technical bases so that some or all of the new and/or updated seismic approaches and techniques developed and proposed by the industry and other can be used to update SRP Section 3.7, specifically subsections 3.7.1, 3.7.2 and 3.7.3 which pertain to seismic analysis and design of nuclear power plants.

## WORK REQUIREMENTS AND SCHEDULE

NOTE: For all items marked with an asterisk (\*) within each of the tasks below, in the technical letter report, provide the basis for the sample and/or source selected.

	<u>Tasks</u>	<u>Completion Schedule</u>
1.	This task includes: (1) review and become familiar with the current NRC review guidelines in the areas of seismic analysis and design of nuclear power plant structures which include: SRP sections 3.7.1 through 3.7.3; the early draft of the review SRP subsections specified in the "background" section above ((marked-up copy by the staff); Regulatory Guides 1.60, 1.61, 1.92, 1.122, 1.132, 1.138, and 1.165, (2) review and become familiar with the seismic analysis guidelines developed by industry and other agencies (such as ASCE Standard 4-98, FEMA Publication 368 and miscellaneous topical reports ), (3) review and become familiar with staff positions related to the above mentioned SRP subsections in the NRC safety evaluation reports (SERs) for the approved design certification application for advanced reactors, and (4) identify differences between the staff's review guidelines (SRP, Regulatory Guides and staff's positions) and those used by industry and evaluate the significance of these differences. Prepare a technical letter report.	Two (2) weeks after authorization of work, or on the date specified by the NRC Technical Monitor.
2.	Perform a limited literature survey of related technical papers by researchers and others in the industry, government and universities to identify analysis and design approaches, techniques and methods that are different from those in the current SRP. Evaluate and recommend their acceptability for adoption as the staff's review guidelines; provide the bases for the recommendation. Prepare a technical letter report	Two (2) weeks after completion of Task 1, or on the date specified by the NRC Technical Monitor.
3.	Reference: SRP Section 3.7.1.II.1.b and Appendix A to Section 3.7.1. Using the recommendations from NUREG/CR-6728 and other suitable industry information (if any), develop guidelines and procedures for generating the horizontal and vertical target power spectrum (PSD) for the design ground response spectra that are different from those provided in RG 1.60. Using real earthquake recording data selected from NUREG/CR-6728 or other sources* perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 2, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.

	Tasks	Completion Schedule
4.	Reference: SRP Section 3.7.1.II.1.b. Using the recommendations from NUREG/CR-6728 and the proposed industry approach contained in ASCE 4-28 and ASCE 43-05, as bases, develop guidelines and procedures for calculating design ground response spectra at different damping ratios from the design ground response spectra at 5% damping ratio, if the design ground response spectra other than those provided in RG 1.60 are to be used. Using sample* ground response spectra from either early site permit (ESP) applications or design certification applications, perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 3, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
5.	Reference SRP Section 3.7.1.II.b. Using current SRP guidelines and existing industry information as contained in ASCE/SEI 43-05, develop guidelines for generating design ground motion time histories suitable for performing nonlinear structural analyses. Using a sample problem*, perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 4, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
6.	Reference SRP Section 3.7.1.II.1.b. Use existing strong earthquake ground motion time histories from NUREG/CR-6728 or other sources*, calculate correlation coefficients of real earthquake ground motion time histories to establish bases and validate the current staff's position (the correlation coefficient of 0.16) that demonstrates the statistical independence of the three components of the design ground motion time histories. If the calculated correlation coefficients are different more than 10% from that of the current staff's position, provide recommendation for the new guidelines together with the basis for the recommendation. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 5, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified

	by the NRC Technical Monitor.
--	-------------------------------

	Tasks	Completion Schedule
7.	Reference: SRP Sections 3.7.2.II.1.a and -.2. Using the recommendations documented in NUREG/CR-6645 as basis, develop guidelines to consider the missing mass effects for the case of modal time history analyses. Using a sample* problem, perform confirmatory calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 6, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
8.	Reference SRP Sections 3.7.1.II.1.a and 3.7.2.II.4. Using the recommendations documented in NUREG/CR reports (e.g., NUREG/CR-5347, NUREG/CR-5956, etc.) and industry guidelines (e.g., ASCE 4-98, ASCE 43-05, etc.), develop guidelines for defining "thin soil layers (shallow soil sites)," including the location for specifying input ground motion. Using a sample* site condition, perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 7, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
9.	Reference: SRP Section 3.7.2.II.4. Using guidelines and recommendations documented in NUREG/CR-6728 and ASCE 43-05 as bases, develop guidelines and procedures for SSI analyses (including site amplification and deamplification) that accommodate the variability in site-specific soil material properties as well as structural properties to maintain the hazard level (resulting from SRP Section 2.5.2 review) of the input design bedrock motions. (This analysis procedure will be equivalent in scope to current deterministic processes, but is consistent with the probabilistically derived hazard ground motion.) Using a sample* problem, perform confirmatory analyses to validate and establish the bases for the new analysis approach. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 8, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.

	Tasks	Completion Schedule
10.	Reference: SRP Section 3.7.2.II.4. Using results from the staff's previous licensing review of advanced reactors (This information can be found in Section 3.7.2 of the safety evaluation reports, such as NUREG-1503 for ABWR, NUREG-1512 for AP600, and NUREG-1793 for AP1000), develop guidelines to determine the minimum shear wave velocity of supporting soil media for which a fixed-base assumption is acceptable for the seismic analysis (an SSI analysis is not required). Using a sample* site condition, perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 9, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
11.	Reference: SRP Section 3.7.2.II.4.c. Using guidelines in Regulatory Guide 1.132 (including DG-1101), NUREG/CR-5347 and other NUREG/CR reports as basis, develop guidelines and bases for determining the appropriate best-estimate, upper-bound and lower-bound soil properties to be used in the SSI analyses. Prepare a technical letter report.	
	a. Draft	One (1) week after completion of Task 10, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
12.	Reference: SRP Section 3.7.2.II.3. Using the results from the staff's previous licensing review of advanced reactors (Section 3.7.2 of the SERs) and industry guidelines contained in ASCE 4-98, ASCE 43-05, etc. as reference, develop guidelines and bases for the selection of model types (lumped-mass stick model, 3D finite element model, or combined 3D finite element model and stick model) of nuclear power plant structures for the seismic analysis. Prepare a technical letter report.	
	a. Draft	One (1) week after completion of Task 11, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.

	Tasks	Completion Schedule
13.	Reference: SRP Section 3.7.2.II.3. Using the results from the staff's previous licensing review of advanced reactors (Section 3.7.2 of the SERs) and industry guidelines contained in ASCE 4-98, ASCE 43-05, etc. as reference, develop guidelines and bases for considering the flexibility effects of nuclear plant structural floors and walls in the seismic models. Prepare a technical letter report.	
	a. Draft	One (1) week after completion of Task 12, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
14.	Reference SRP Section 3.7.2.II.3 and -.4. Using the results from the staff's licensing review of advanced reactors (Section 3.7.2 of the SERs) and the industry guidelines contained in ASCE 4-98, ASCE 43-05, etc. as reference, develop guidelines and bases for the modeling of superstructures and soil foundation of the soil-structure system. Prepare a technical letter report.	
	a. Draft	One (1) week after completion of Task 13, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
15.	Reference: SRP Section 3.7.2.II.3. Using the results and conclusions from the staff's licensing review of advanced reactors (Section 3.7.2 of the SERs) and the industry guidelines contained in ASCE 4-98, ASCE 43-05, etc. as reference, develop guidelines and bases for distributing the seismic member forces (shear forces, vertical member forces and bending moments) resulting from a lumped-mass stick model to each individual structural member for the seismic design. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 14, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.

	Tasks	Completion Schedule
16.	Reference: SRP Sections 3.7.2.II.1, -.3 and -4. Using the results and conclusions from the staff's licensing review of advanced reactors (Section 3.7.2 of the SERs) and the industry guidelines contained in ASCE 4-98, ASCE 43-05, etc. as basis, develop guidelines and bases for performing nonlinear time history analysis for foundation mat uplifting and/or sliding, modeling of cracked concrete sections, and other nonlinear effects. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 15, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
17.	Reference: SRP Section 3.7.3.II.9. Using the industry guidelines for the distribution systems contained in ASCE 4-98 and ASCE 43-05 as reference, develop guidelines for the analysis of piping systems with multiple independent support motions (floor response spectra or floor time histories). Using a sample piping problem*, perform parametric calculations to validate and establish the bases for the recommended guidelines. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after completion of Task 16, or on the date specified by the NRC Technical Monitor.
	b. Incorporate NRC comments and prepare the final report.	Three (3) weeks after receipt of NRC comments, or on the date specified by the NRC Technical Monitor.
18.	Using the results from Tasks 3 through 17, the staff will update the appropriate sections of the Standard Review Plan. Review the staff draft SRP and provide comments and/or recommendations on the revision (stricken-out and highlighted) of the staff's SRP revisions in the subsections specified in Tasks 3 through 17. Prepare a technical letter report.	
	a. Draft	Two (2) weeks after receipt of the revised SRP sections from the NRC Technical Monitor, or on the date specified by the NRC Technical Monitor.
	b. Prepare for and travel to NRC to discuss the draft report with the staff.	A date to be determined and mutually agreed upon.
	c. Incorporate NRC's comments and prepare a final report.	Two (2) weeks after completion of trip (Item 18b), or on the date specified by the NRC Technical Monitor.

## PERIOD OF PERFORMANCE

The projected period of performance is twenty four (24) months from authorization of work.

## DELIVERABLES

### Technical Reporting Requirements

NOTE: All reports are to be submitted electronically using WordPerfect 10.0 (Font Arial regular 11 point) or compatible software program to the Technical Monitor with a copy provided to the Project Officer. In all correspondence, include the following information: JCN J-3234, Task No., TAC Nos. (MC6562, MC6563 and MC6564), and NRC/NRR Branch: Mechanical and Civil Engineering Branch, DE, NRR.

1. At the completion of Task 1, submit a technical letter report that contains (1) a summary of documents reviewed, (2) a comparison of current NRC guidelines (including the staff's position taken during the advanced reactor design certification reviews) for seismic analysis with those developed by industry, (3) a summary of differences identified, and (4) an evaluation of the significance of all differences including the determination of whether analysis approaches by industry can be incorporated in the SRP and the basis for the adoption.
2. At the completion of Task 2, submit a technical letter report that contains a summary of documents reviewed, recommendations of analysis and design approaches, techniques and/or methods that can be incorporated in the SRP and basis for the recommendations.

NOTE: For the following deliverables, the technical letter report should be prepared in the following outline:

1. Introduction
  2. Description of recommended changes and/or new guidelines
  3. Description of sample problem together with source and basis for the selection
  4. Summary of parametric or confirmatory analysis results
  5. Recommendations, together with the bases, for the SRP revision.
3. At the completion of each of Tasks 3, 4, and 9, submit a technical letter report, draft and final as appropriate, that contains (1) recommended changes and/or new review guidelines, (2) sample selected (including source and basis of selection) for the parametric calculation, (3) results of parametric analysis, and (4) basis for the changes of review guidelines.
  4. At the completion of each of Tasks 5, 7, 8, 10, and 17, submit a technical letter report, draft and final as appropriate, that contains: (1) recommended revision and/or new addition of the review guidelines, (2) description of sample problem together with source and basis for the section, (3) results of parametric analysis or confirmatory calculations, and (4) basis for making these recommendations.
  5. At the completion of Task 6, submit a technical letter report, draft and final as appropriate, that contains: (1) the selected strong ground motion time histories (three components) together with the basis for the selection; (2) results of correlation coefficient calculated from those time histories, the current staff's position can be validated; or (3) recommended guidelines for demonstrating the statistical independence of the three components of the design ground motion time history, together with the basis for the recommendation, if the calculated correlation coefficients are different more than 10% from that of the current staff's position.



6. At the completion of each of Tasks 11 through 16, submit a technical letter report, draft and final as appropriate, that contains a summary of the recommended changes and/or new addition of review guidelines, and basis for these changes.
7. At the completion of Task 18, submit a technical letter report, draft and final as appropriate, that contains comments and/or recommendations (with bases) on the revised SRP subsections contained in this scope of work.

#### Monthly Business Letter Report (MBLR)

A monthly business letter report (MBLR) shall be submitted by the 15th of each month to Project Officer, Division of Engineering, NRR, E-mail: \_\_\_\_@NRC.GOV; with copies provided to the Technical Monitor, E-Mail: \_\_\_\_@NRC.GOV, the Chief, Civil and Engineering Mechanics Section, EMEB, DE/NRR, E-mail: \_\_\_\_@NRC.GOV, the Funds Certification Officer, NRR, E-mail: \_\_\_\_@NRC.GOV, and to the Contract Specialist, Division of Contracts/ADM: \_\_\_\_@NRC.GOV.

The Monthly Business Letter Report shall include the following sections:

#### I. WORK PROGRESS AND STATUS.

##### 1.a. Task Order Identification Information

- The Job Code Number (JCN) and title
- The principal investigator and telephone number
- The NRC Project Officer and telephone number
- The NRC Technical Monitor and telephone number

##### 1.b. Financial Summary

- The authorized ceiling amount for the purchase order
- The total amount of funds obligated
- The total cost for the period, fiscal year to date and cumulative to date
- Percent of funds expended against obligated funds

#### 2. Schedule/Milestone Information.

<u>Tasks</u>	<u>Planned Completion Date</u>	<u>Revised Completion Date</u>	<u>Actual Completion Date</u>
Provide a <u>brief</u> summary of the work; include any deliverables or travel.	The day, month and year scheduled for completion, or time-frame if a date is not known or projected.	The revised day, month and year based on a change. The reason for the change must be given in the "Problem/Resolution" section below.	The day, month and year <u>all</u> of the work is actually completed.

3. Work Performed During the Report Period.

- A description of the work performed and accomplished commensurate with the amount of funds expended; i.e., the description should provide the reader with sufficient explanation of the work to justify the amount of expenditures.
- Any travel performed during the reporting period should also be summarized in this section of the report. Each travel summary should identify the persons traveling, the duration of the travel, the purpose of the travel, and any work/accomplishments not reflected elsewhere.

4. Problem and Proposed Resolution.

- All problems encountered during the reporting period should be clearly and succinctly identified and stated. The resolution or the proposed solution for each problem should be briefly described. Who is responsible for solving the problem should be clearly evident from the description, should it still exist at the time the report is written.
- Notwithstanding the status of the problem at the time the MBLR is written, all problems should be recorded in the "Problem/ Resolution" section of the MBLR for documentation/historical purposes. If the problem still exists in a subsequent month, in whole or in part, it should be described as it currently exists; otherwise, it should be deleted from the report.
- Problems or circumstances that may require a change in the level of effort/costs, scope, or travel requirements are to be described in the MBLRs for documentation purposes but are to be dealt with separately in a letter addressed and sent to the Contracting Officer.

5. Plans for Next Reporting Period.

Provide a brief description of the work to be performed/accomplished during the next reporting period. If a milestone is expected to be completed during the next report ing period, it should be stated.

II. FINANCIAL STATUS

1. Provide the total direct staff use (including subcontractor hours) and the amount of funds expended (costed) during the period and total cumulative year to date in the following categories for each task order:

	<u>Current Month</u>	<u>Fiscal Year to Date</u>	<u>Total To Date</u>
a. <u>Direct Labor (hours)</u>			
(1) Management	XX XX	XX	
(2) Technical	XX XX	XX	
(3) Support	XX XX	XX	
Subtotal	XX XX	XX	
Contractor hours	XX	XX	XX
Total Hours	<u>XX XX</u>	<u>XX</u>	<u>      </u>

b. Costs

Labor Costs

(1) Direct Labor Costs	XXXX	XX	
(2) Indirect Labor Costs	XXXX	XX	
Subtotal	<u>XXXX</u>	<u>XX</u>	<u>    </u>

Other Direct Costs

(1) Subcontractor/Consultant Cost	XXXX	XX	
(2) Material and Services Costs	XXXX	XX	
(3) Computer Usage Costs	XXXX	XX	
(4) Travel			
(a) Domestic	XXXX	XX	
(b) Foreign	<u>XXXX</u>	<u>XX</u>	
Total Travel	XXXX	XX	
Subtotal Other Direct Costs	<u>XXXX</u>	<u>XX</u>	<u>    </u>
<u>G&amp;A Costs</u>	XXXX	XX	
<u>DOE Adder</u>	XX	XX	XX
Total Reimbursable Costs	<u>XX</u>	<u>XX</u>	<u>XX</u>

III. SPENDING PLAN BY TASK

A budget is to be developed for each Task based on the agreed upon allocation of the level of effort among the Tasks. Separate expenditures for each Task will be reported in the MBLR against the budget using the following format:

Authorized Cost Ceiling: \$ \_\_\_\_\_ Funds Obligated to date: \$ \_\_\_\_\_

Tasks	Planned Budget	Expenditures for Period	Task Expenditures – Cumulative	Percentage Expended - Cumulative
1	\$	\$	\$	%
2	\$	\$	\$	%
3	\$	\$	\$	%
4	\$	\$	\$	%
5	\$	\$	\$	%
...				
Total	\$	\$	\$	%

## MEETINGS AND TRAVEL

One, one-person five-day trip to NRC Headquarters.

## NRC-FURNISHED MATERIALS

NRC will provide copies of Staff Technical Positions referenced in Task 1 at least one week prior to the start of Task

## OTHER APPLICABLE INFORMATION

### License Fee Recovery

The work specified in this Statement of Work is not license fee recoverable.

### Assumptions and Understandings

The level of effort estimates developed by the NRC are based on the assumption that the contractor is thoroughly familiar with the documents referenced in Task 1.

The NRC Regulations, Standard Review Plan and the Regulatory Guides referenced in the Statement of Work is readily available on the NRC web site. It is assumed that the contractor can retrieve these documents from there. The items listed under NRC Furnished Materials will be provided at the time of contract award.

It is further assumed that the contractor can obtain the other documents referenced, particularly in Task 1 and Task 2 on the World Wide Web.

To help in the preparation of the technical letter reports, the general format of Appendix A to Standard Review Plan, Section 3.7.2 is provided; see Attachment 1. This is how NRC will use the information provided by the contractor.

# APPENDIX A TO SRP SECTION 3.7.2 ACCEPTABLE METHODOLOGIES TO ACCOUNT FOR HIGH-FREQUENCY MODES

Section 3.7.2 of the SRP requires that sufficient modes be included in a dynamic response analysis to ensure that an inclusion of additional modes does not result in more than a 10 percent increase in responses. The implementation of this requirement may require the inclusion of modes with natural frequencies at which the spectral acceleration roughly returns to the zero period acceleration. The square-root-of-sum-of-squares (SRSS) combination of such modes is highly inaccurate and may be significantly non-conservative.

The SRSS combination of modal responses is based on the premise that peak modal responses are randomly phased in time. This assumption has been shown to be adequate throughout the majority of the frequency range for earthquake-type responses. However, this premise is invalid at frequencies approximately equal to or greater than those at which spectral acceleration ( $S_a$ ) roughly returns to the zero-period acceleration (ZPA). Phasing of the maximum response from modes at such frequencies (roughly 33 Hz and greater for the Regulatory Guide 1.60 response spectra) will be essentially deterministic and the structure simply responds to the inertial forces from the peak ZPA in a pseudo static fashion.

There are several solutions to the problem of how to combine responses associated with high frequency modes when the lower-frequency modes do not adequately define the mass content of the structure.

The following is one acceptable procedure for incorporating responses associated with high frequency modes.

Step 1. Determine the modal responses only for those modes that have natural frequencies less than that at which the spectral acceleration approximately returns to the ZPA (33 Hz for the Regulatory Guide 1.60 response spectra). Combine such modes in accordance with the methods delineated in Regulatory Guide 1.92.

Step 2. For each degree of freedom (DOF) included in the dynamic analysis, determine the fraction of DOF mass included in the summation of all of the modes included in Step 1. This fraction  $d_i$  for each DOF  $i$  is given by:

$$d_i = \sum_{n=1}^N c_n \Phi_{n,i}$$

where

$n$  is order of the mode under consideration,

$N$  is the number of modes included in Step 1,

$\Phi_{n,i}$  is the  $n$ th natural mode of the system, and

$c_n$  is the participation factor given by:

$$c_n = \frac{\{\Phi_n\}^T [m] \{1\}}{\{\Phi\}^T [m] \{\Phi_n\}}$$

Next, determine the fraction of DOF mass not included in the summation of these modes:

$$e_i = d_i - \delta_{ij}$$

where  $\delta_{ij}$  is the Kronecker delta, which is one if  $\text{DOF}_i$  is in the direction of the earthquake motion and zero if  $\text{DOF}_i$  is a rotation or not in the direction of the earthquake input motion.

If, for any  $\text{DOF}_i$ , the absolute value of this fraction  $e$  exceeds 0.1, one should include the response from higher modes with those included in Step 1.

Step 3. Higher modes can be assumed to respond in phase with the ZPA and, thus, with each other; hence, these modes are combined algebraically, which is equivalent to pseudo static response to the inertial forces from these higher modes excited at the ZPA. The pseudo static inertial forces associated with the summation of all higher modes for each  $\text{DOF}_i$  are given by:

$$P_i = \text{ZPA} \times M_i \times e_i \text{ where}$$

$P_i$  is the force or moment to be applied at  $\text{DOF}_i$ .

$M_i$  is the mass or mass moment of inertia associated with  $\text{DOF}_i$ .

The structure is then statically analyzed for this set of pseudo static inertial forces applied to all of the degrees of freedom to determine the maximum responses associated with high-frequency modes not included in Step 1.

Step 4. The total combined response to high-frequency modes (Step 3) are combined by the square-root-of-sum-of-squares method with the total combined response from lower-frequency modes (Step 1) to determine the overall structural peak responses.

This procedure requires the computation of individual modal responses only for lower-frequency modes (below 33 Hz for the Regulatory Guide 1.60 response spectrum). Thus, the more difficult higher-frequency modes need not be determined. The procedure ensures inclusion of all modes of the structural model and proper representation of DOF masses.

An acceptable alternative to this procedure is as follows:

Modal responses are computed for enough modes to ensure that the inclusion of additional modes does not increase the total response by more than 10 percent. Modes that have natural frequencies less than that at which the spectral acceleration approximately returns to the ZPA (33 Hz in the case of Regulatory Guide 1.60 response spectra) are combined in accordance with Regulatory Guide 1.92. Higher-mode responses are combined algebraically (i.e., retain sign) with each other. The absolute value of the combined higher modes is then added directly to the total response from the combined lower modes.

**Attachment 2 - BILLING INSTRUCTIONS FOR  
LABOR HOUR TYPE CONTRACTS**

**General:** The contractor shall prepare vouchers/invoices for reimbursement of costs in the manner and format described herein or a similar format. **FAILURE TO SUBMIT VOUCHERS/INVOICES IN ACCORDANCE WITH THESE INSTRUCTIONS WILL RESULT IN REJECTION OF THE VOUCHER/INVOICE AS IMPROPER.**

**Number of Copies:** An original and three copies, including supporting documentation shall be submitted. A copy of all supporting documents must be attached to each copy of your voucher/invoice. 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  
Mail Stop T-7-1-2  
Washington, D.C. 20555

**HAND DELIVERY OF VOUCHERS/INVOICES IS DISCOURAGED AND WILL NOT EXPEDITE PROCESSING BY NRC.** However, should you choose to deliver vouchers/invoices by hand, including delivery by any express mail services or special delivery services which use a courier or other person to deliver the voucher/invoice 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  
11555 Rockville Pike - Mail Room  
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 and Property Management.

Agency Payment Office: Payment will be made by the following office:

U.S. Nuclear Regulatory Commission  
Division of Accounting and Finance GOV/COMM  
Mail Stop T-9-H4  
Washington, DC 20555

Frequency: The contractor shall submit claims for reimbursement once each month, unless otherwise authorized by the Contracting Officer.

Format: Claims should be submitted in the format depicted on the attached sample form entitled "Voucher/Invoice for Purchases and Services Other Than Personal" (see Attachment ) or a similar format. **THE SAMPLE FORMAT IS PROVIDED FOR GUIDANCE ONLY AND IS NOT REQUIRED FOR SUBMISSION OF A VOUCHER/INVOICE. ALTERNATE FORMATS ARE PERMISSIBLE PROVIDED ALL REQUIREMENTS OF THE BILLING INSTRUCTIONS ARE ADDRESSED.**

Billing of Costs After Expiration of Contract/Purchase Order: If the costs are incurred during the purchase order period and claimed after the purchase order has expired, the period during which these costs were incurred must be cited. To be considered a proper voucher/invoice, the contractor shall clearly mark it 'EXPIRATION VOUCHER" OR "EXPIRATION INVOICE".

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



ATTACHMENT

**INVOICE/VOUCHER FOR PURCHASES AND  
SERVICES OTHER THAN PERSONAL**

(SAMPLE FORMAT - COVER SHEET)

Official Agency Billing Office  
U.S. Nuclear Regulatory Commission  
Division of Contracts and Property  
Management MS: T-7-I2  
Washington, DC 20555-0001

(a) Purchase Order No: \_\_\_\_\_  
(b) Voucher/Invoice No: \_\_\_\_\_  
(c) Date of Voucher/Invoice: \_\_\_\_\_

Payee's Name and Address

(d) Individual to Contact Regarding Voucher/Invoice  
Name: \_\_\_\_\_  
Telephone No: \_\_\_\_\_

(e) This voucher/invoice represents reimbursable costs for the billing period  
\_\_\_\_\_ to \_\_\_\_\_.

	<u>Current Period</u>	<u>Amount Billed</u>	<u>Cumulative</u>
(f) <u>Direct Costs:</u>			
(1) Direct Labor*	\$ _____		\$ _____
(2) Travel*	\$ _____		\$ _____
Total Direct Costs:	\$ _____		\$ _____

\* The contractor shall submit as an attachment to its invoice/voucher cover sheet a listing of labor categories, hours billed, fixed hourly rates, total dollars, and cumulative hours billed to date under each labor category, authorized under the purchase order for each of the three activities to be performed under the purchase order. In addition, the contractor shall include travel costs incurred with the required supporting documentation, as well as, the cumulative total of travel costs billed to date by activity.