

ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES

1

18

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

1. DATE OF ORDER 07/27/2015		2. CONTRACT NO. (If any) NRC-HQ-25-14-E-0001		6. SHIP TO:					
3. ORDER NO. NRC-HQ-25-15-T-0001		4. REQUISITION/REFERENCE NO. NRO-15-0085		a. NAME OF CONSIGNEE US NUCLEAR REGULATORY COMMISSION-					
5. ISSUING OFFICE (Address correspondence to) US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-5E03 ATTN ROB ROBINSON 301-415-0728 WASHINGTON DC 20555-0001				b. STREET ADDRESS MAIL PROCESSING CENTER 4930 BOILING BROOK PARKWAY		c. CITY ROCKVILLE		d. STATE MD	e. ZIP CODE 20852
7. TO:				f. SHIP VIA					
a. NAME OF CONTRACTOR NUMARK ASSOCIATES INC				8. TYPE OF ORDER					
b. COMPANY NAME				<input type="checkbox"/> a. PURCHASE REFERENCE YOUR:		<input checked="" type="checkbox"/> b. DELIVERY			
c. STREET ADDRESS 1220 19TH ST NW STE 500				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.		Except for billing instructions on the reverse, this delivery 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.			
d. CITY WASHINGTON		e. STATE DC							
9. ACCOUNTING AND APPROPRIATION DATA See Schedule				10. REQUISITIONING OFFICE OFFICE OF NEW REACTORS					
11. BUSINESS CLASSIFICATION (Check appropriate box(es)) <input checked="" type="checkbox"/> a. SMALL <input type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> d. WOMEN-OWNED <input type="checkbox"/> e. HUBZone <input type="checkbox"/> f. SERVICE-DISABLED <input type="checkbox"/> g. WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOSB PROGRAM <input type="checkbox"/> h. EDWOSB								12. F.O.B. POINT	
13. PLACE OF				14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)		16. DISCOUNT TERMS	
a. INSPECTION Destination		b. ACCEPTANCE Destination							
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)	
	Task Order 4 entitled, "APR1400 DCD Chapter 15 Technical Review of Korea Hydro & Nuclear Power Co. Ltd (KHNP)" under enterprise-wide Contract Number NRC-HQ-25-14-E-0001. Continued ...								
18. SHIPPING POINT				19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		17(h) TOTAL (Cont. pages)	
21. MAIL INVOICE TO:									
a. NAME US NUCLEAR REGULATORY COMMISSION						\$0.00			
b. STREET ADDRESS (or P.O. Box) ONE WHITE FLINT NORTH 11555 ROCKVILLE PIKE MAILSTOP 03-E17A								17(i) GRAND TOTAL	
c. CITY ROCKVILLE				d. STATE MD	e. ZIP CODE 20852-2738		\$746,224.53		
22. UNITED STATES OF AMERICA BY (Signature)				07/27/2015		23. NAME (Typed) MARK THOMPSON TITLE: CONTRACTING/ORDERING OFFICER			

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PREVIOUS EDITION NOT USABLEOPTIONAL FORM 347 (Rev. 2/2012)
Prescribed by GSA/FAR 48 CFR 53.213(f)

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

JUL 29 2015

ADM002

ORDER FOR SUPPLIES OR SERVICES

PAGE NO

SCHEDULE - CONTINUATION

2

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

DATE OF ORDER

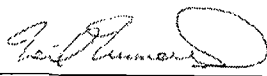
CONTRACT NO.

07/27/2015

NRC-HQ-25-14-E-0001

ORDER NO.

NRC-HQ-25-15-T-0001

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	<p>This Task Order is incrementally funded.</p> <p>Period of Performance: Date of Award - 12/31/2016</p> <p>Task Order Ceiling: \$746,224.53</p> <p>Total Obligated Amount: \$460,000.00</p> <p>Contracting Officer's Representative (COR) Name: John Budzynski Telephone Number: 301-415-1979 Email: john.budzynski@nrc.gov</p> <p>Contractor POC (Business) Name: Paul Edelstein Email: pedelstein@numarkassoc.com Phone: 202-466-2700</p> <p>Contractor POC (Technical) Name: Martin Bowling Email: mbowling@numarkassoc.com Phone: 202-466-2700</p> <p> 7/28/15 Numark Authorized Official Date</p> <p>Accounting Info: 2015-X0200-FEEBASED-25-25D006-17-4-118-3002- 251D</p> <p>Period of Performance: 07/24/2015 to 12/31/2016</p>					

TOTAL CARRIED FORWARD TO 1ST PAGE (ITEM 17(H))

\$0.00

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OPTIONAL FORM 348 (Rev. 4/2009)

Prescribed by GSA FAR (48 CFR) 53.213(f)

TASK ORDER 04 – Small Business Set-Aside EWC IDIQ for Numark

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 PRICE/COST SCHEDULE

CLIN	DESCRIPTION OF SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE (6% - Prime, 3.5% Subcontractor)	TOTAL COST PLUS FIXED FEE
0001	Contractor to provide Technical Assistance in accordance with section C: DESCRIPTION/ SPECIFICATIONS/ STATEMENT OF WORK			
	Total			\$746,224.53

NRCB044 CONSIDERATION AND OBLIGATION—INDEFINITE-QUANTITY CONTRACT

(a) The estimated total quantity of this contract for the products/services under this contract is **\$746,224.53** of which the sum of [REDACTED] represents the estimated reimbursable costs, and of which \$ [REDACTED] represents fixed fee.

(b) The Contracting Officer will obligate funds on each task order issued.

(c) The amount currently obligated by the Government with respect to this contract is [REDACTED], of which the sum of \$ [REDACTED] represents the estimated reimbursable costs, and of which \$ [REDACTED] represents the fixed-fee.

(d) This is an incrementally-funded contract and FAR 52.232-22 – "Limitation of Funds" applies.

(e) The Contractor shall comply with the provisions of FAR 52.232-20 - Limitation of Cost for fully-funded task orders and FAR 52.232-22 - Limitation of Funds for incrementally-funded task orders, issued hereunder.

SECTION C – DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK FOR TASK ORDER 04

NRC Requisition Office: NRO

Fee Recoverable: Yes

TAC Numbers: RX0847

1. PROJECT TITLE

APR1400 DCD Chapter 15 Technical Review of Korea Hydro & Nuclear Power Co. Ltd (KHNP)

2. BACKGROUND

KHNP has submitted the design certificate document of APR1400 (DCD) for its application to U.S. Nuclear Regulatory Commission (NRC) in December, 2014. NRC staff of NRO's Reactor Systems, Nuclear Performance & Code Review Branch (SRSB) has completed the acceptance review and concluded that the applicant design certificate submittal satisfies the conditions to perform an in-depth safety evaluation the design certificate. In 2013, KHNP also submitted topical reports as part of the pre-application package for NRC to review.

The Final Safety Evaluation Report (FSER) must provide sufficient information to adequately explain the NRC staff's rationale for determining that there is reasonable assurance that public health and safety is protected. The FSER should be written in a manner whereby a person with a technical (non-nuclear) background and unfamiliar with the applicant's request could understand the basis for the staff's conclusions. The FSER format is described in Attachment 1 to this task order statement of work (SOW).

A Standard Review Plan (SRP) (NUREG-0800) is prepared for the guidance of staff reviewers in the Office of New Reactors in performing safety reviews of new reactor design certification applications. The principal purpose of the SRP is to assure the quality and uniformity of staff safety reviews. As part of the full scope of APR1400 DCD review, staffs of Reactor Systems, Nuclear Performance & Code Review Branch (SRSB) will conduct review of important parts of DCD corresponding to SRP Chapter 15 and other reactor system related design features in SRP chapter 4, 5, 6, 9 and 14 and RG 1.206. The staff publishes the results of these reviews in a Safety Evaluation Report (SER).

3. PROJECT DESCRIPTION AND OBJECTIVE(S)

The objective of this task order is to obtain technical expertise from the contractor to assist the staff in determining the adequacy of the KHNP APR1400 Chapter 15 and related topical reports and technical reports for use in the APR1400 Design Certification application. The Contractor must provide all resources necessary to accomplish the tasks and deliverables described in this statement of work (SOW).

The Contractor must provide individuals who have the required educational background and work experience to meet the objectives of the work specified in this task order. Specific qualifications for this effort are identified in Section 7 of this document.

NOTE: Work on this task order will involve the handling of proprietary information.

The contractor shall provide a contract project manager (PM) to oversee the effort and ensure the timely submittal of quality deliverables so that all information is accurate and complete as defined in the base contract.

4. STATEMENT OF WORK TASKS

Task 1. Familiarity and initial review of DCD Chapter 15

Contractor will participate in an initial kick-off to discuss the scope of the work and schedule. The contractor will discuss the proposed scope of work and schedule with NRC Staff. After the initial kick-off meeting, the contractor shall get familiar with Chapter 15 and chapters referenced in Chapter 15 of the APR1400 DCD. To become familiar, the contractor shall have personnel with expertise on regulations and technical areas related to transient and accident analyses of Nuclear Power Plants. Previous experience with System 80 plus is highly sought but not required.

During this initial assessment the contractor must evaluate the transient and accident analyses described in DCD Chapter 15. The contractor must evaluate the approach proposed by the Applicant to determine whether or not it follows regulatory guidance. As part of the evaluation the contractor shall perform this evaluation against applicable regulatory requirements and guidance such as: Three Mile Island (TMI) action items; Generic Safety Issues (GSI); Unresolved Safety Issues (USI); Generic Letter (GL); Bulletins (BL) documented in Chapter 15; and Regulatory Guide (RG) 1.206. The contractor shall provide a list and brief description of significant issues identified during this initial review and meet with NRC staff to discuss the technical issues identified.

In addition the contractor will evaluate adequacy and applicability of computer codes used for Non-Loss Of Coolant Accident (LOCA) events. Contractor shall have necessary level of expertise to evaluate the following computer codes: CESEC-III, TORC/CETOP, COAST, HRISE, STRIKIN-II, HERMITE and a general knowledge on reactor physics codes.

Estimated level of total effort Task 1: 186 hours

Estimated completion date: 20 business days after task order award

Task 2. General review for completeness and overall technical adequacy

After the initial assessment, contractor must further evaluate technical issues identified on Task 1 and selected Technical Reports (TeRs) and Topical Reports (ToRs). The contractor must perform a general review for completeness and overall technical adequacy and also identify further issues to be clarified and/or resolved. The contractor must communicate periodically with NRC Staff but must inform the COR immediately in respect to any issues that the contractor identifies during the assessment. As part of this task, the contractor must provide a draft to support the Technical Evaluation Report (TER).

The following is a list of Technical and Topical Reports to assess. The Contractor may be called upon to evaluate additional reports as part of this task, as determined by the COR. Additional reports to be evaluated will be discussed and agreed upon with the COR before starting further assessment of the report in question.

Technical Reports:

- The Effect of Thermal Conductivity Degradation on APR1400 Design and Safety Analysis, APR1400-F-A-NR-14002-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A203).
- Thermal Design Methodology, APR1400-F-C-NR-12001-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A123).
- Diversity and Defense-in-Depth, APR1400-Z-J-NR-14002-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A132).
- CCF Coping Analysis, APR1400-Z-A-NR-14019-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A189).
- CPC Set-point Analysis Methodology for APR1400, APR1400-F-C-NR-14001-NP. This report is non-proprietary and it can be found on public ADAMS (ML15009A195).
- Post-LOCA Long Term Cooling Evaluation Model, APR1400-F-A-NR-14003-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A201).
- Uncertainty Methodology and Application for Instrumentation, APR1400-Z-J-NR-14004-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML14154A104).
- Small Break LOCA Evaluation Model, APR1400-F-A-NR-12003-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13303B467).
- Non-LOCA Safety Analysis Methodology, APR1400-Z-A-NR-13006-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13304B448).
- Pressure-Temperature Limits Methodology for RCS Heat-up and Cooldown, APR1400-Z-M-NR-13010-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13304B200).
- LOCA Mass and Energy Release Methodology, APR1400-Z-A-NR-13007-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13304B238).
- APR1400 Design Features to Address GSI-191, APR1400-E-N-NR-13001-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML15009A130).
- RCP Flywheel Integrity, APR1400-Z-M-TR-13015-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13304B238).

The following 2 Technical Reports contain proprietary information and non-proprietary versions are not available at this moment. These reports will be provided to the contractor after a non-disclosure agreement is in place.

- ATWS Evaluation, APR1400-Z-A-NR-14014-P

This document provides justification for the applicability of Combustion Engineering Report CENPD-158, "Analysis of Anticipated Transient Without a Scram in Combustion Engineering NSSSs," to the Advanced Power Reactor 1400 (APR1400). Licensing requirements and regulations for ATWS are the integrities of the fuel and cladding, the reactor coolant pressure boundary (RCPB), and the containment. However, in this report the ATWS events are evaluated only in view of reactor coolant system (RCS) over-pressurization. The document contains 77 pages.

- Functional Design Requirements for a Core Protection Calculator System for APR1400, APR1400-F-C-NR-14003-P.

This document provides a description of a Core Protection Calculator System (CPCS) functional design with detailed specifications of the reactor protection algorithms and CPC System design bases. The document contains 219 pages.

Topical Reports:

- Realistic Evaluation Methodology for Large-Break LOCA of the APR1400, APR1400-F-A-TR-12004-P & NP. A non-proprietary version of this report can be found on public ADAMS (ML13023A080).

Estimated level of total effort for Task 2: 885 hours

Estimated completion date: 70 business days after task order award

Task 3. Preparation and participation of NRC on-site audit

The contractor shall prepare point presentations as necessary and participate on an NRC on-site audit. The contractor shall discuss issues identified on Task 1 and 2 with NRC staff before the audit. In addition, the contractor shall review supporting documentation provided by the applicant prior the audit. During the audit the contractor will review on-site documents. The contractor will also interact with NRC staff and KHNP technical staff to resolve issues and identify additional supporting materials needed to issue official Request for Additional Information (RAIs) and update the draft TER.

Estimated level of total effort for Task 3: 365 hours

Estimated completion date: 110 business days after task order award

Task 4. Identify 1st round of RAIs and potential Confirmatory Analysis

The contractor shall develop the first round of RAIs. The contractor shall: further evaluate additional supporting material provided by the COR as a result of the audit; participate in meetings with NRC and KHNP technical staff to resolve issues. The contractor shall identify most limiting accident scenarios for LOCA, anticipated operational occurrence (AOO) and rod injection analyses (RIA) events. Further confirmatory analysis will be discussed as necessary.

As part of this task, the contractor shall evaluate applicant's response to the 1st round of RAIs and determine if outstanding issues are adequately resolved. The contractor shall discuss with NRC Staff options to resolve remaining outstanding issues.

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Estimated level of total effort for Task 4: 905 hours
Estimated completion date: 190 business days after task order award

Task 5. Identify 2nd round of RAIs and TER

The contractor shall further review the submitted DCD material and supporting TeR and TR documents and develop 2nd round of RAIs based on results evaluation of the 1st round of RAI responses. If any confirmatory analysis is performed by the contractor, the contractor shall provide and discuss results with NRC Staff and KHNP technical personnel to resolve issues.

The contractor shall evaluate and discuss the 2nd round of RAIs to determine if the outstanding issues are adequately resolved, develop supplemental RAIs and identify open items. The contractor shall incorporate into the draft TER, NRC staff comments and resolution/closure of issues based on applicants responses.

Estimated level of total effort for Task 5: 1090 hours
Estimated completion date: 300 business days after task order award

Task 6. Support for NRC Meetings

The contractor shall provide support to NRC Staff by developing draft presentations to the Advisory Committee on Reactor Safeguards (ACRS). These presentations will be reviewed and approved by NRC Staff before presenting to ACRS. The contractor shall also participate in the ACRS meeting and assist NRC staff to address ACRS comments and/or questions.

The contractor shall submit the final TER draft with open items based on ACRS and staff comments. NRC will revise the final draft and provide comments to the contractor. The contractor shall provide final TER with NRC comments incorporated.

Estimated level of total effort for Task 6: 340 hours
Estimated completion date: 330 business days after task order award

5. APPLICABLE DOCUMENTS AND STANDARDS

Key regulatory requirements are specified in Title 10 of the Code of Federal Regulations, Part 50 – “Domestic Licensing of Production and Utilization Facilities”. Detailed review guidance for the review is provided in Chapter 15 sections of NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition - Transient and Accident Analysis” The principal purpose of the SRP is to assure the quality and uniformity of staff safety reviews with support in Regulatory Guide 1.203, “Transient and Accident Analysis Methods.”

The above requirements and review guidance are available on the U. S. Nuclear Regulatory Commission's public website at www.nrc.gov.

6. DELIVERABLES AND DELIVERY SCHEDULE/REPORTING REQUIREMENTS

All items to be delivered or milestones to be achieved are listed in Table-1. Except as noted for Tasks 5.4 and 6.2, the contractor shall provide deliverables by e-mail to the COR. For Task 5.4, the contractor shall provide the deliverable in Microsoft WORD and Adobe Acrobat format. Presentation slides for Task 6.2 shall be provided in Microsoft PowerPoint format.

The contractor shall provide at a minimum, monthly letter status reports (MLSRs) to the NRC Contract Officer Representation/Technical Monitor and the Contracting Officer. Copies must also be sent to the Division of Contracts at ContractsPOT.Resource@nrc.gov.

Specific tasks are summarized in the Table-1, along with the expected deliverables and approximate timetable.

Table-2 lists the TeR and ToR, and Table-3 computer codes that are applicable to applicant's analysis. The COR has the responsibility of designating other documents and codes as he/she deems necessary to complete the evaluation.

Table-1. Milestone, Deliverables and Schedules applicable for each task

Task No	Task Description	Milestone/Deliverable	Due Date
1	Subtask 1.1 Become familiar with NRC documents: <ul style="list-style-type: none"> • SRP Chapter 15, • All the TMI action items, • Generic Safety Issues (GSI), • Unresolved Safety Issues (USI), • Generic Letter (GL) • Bulletins (BL) documented in Chapter 15, • Regulatory Guide (RG) 1.206, and • As designated by the COR to support review. 	An e-mail to the COR detailing the review plan and the completion of the familiarization with the material	One week after Task Order award.
	Subtask 1.2 Participate in a kick-off meeting with the NRC staff and KHNP to become familiar with: <ul style="list-style-type: none"> • Chapter 15 of DCD submittals, • Selected technical reports (TeR) and topical reports (ToR), • Relevant material related to GSI, USI, GL, BL and TMI action items, and • Documents as designated by the COR to support review. • Non-LOCA computer codes Attendance by individuals designated by NRC technical monitor.	An e-mail to the COR detailing the review plan and the completion of the familiarization with the material	Two weeks after Task award. Meeting will be held by teleconference at a date/time scheduled by the COR, as soon as possible after completion of Task 1.
2	Subtask 2.1 Review the following documents for completeness and overall technical adequacy of the DCD submittals: <ul style="list-style-type: none"> • DCD application Chapter 15, • Related TeR and ToR as designated by the COR, and • Communicate immediately with staff regarding any issues related to the completeness and technical adequacy of submittal documents. 	A memo documenting the results of Provide acceptance review.	5 weeks after authorization of work or directed by NRC COR.

	<p>Subtask 2.2 Perform Detail Review:</p> <ul style="list-style-type: none"> • TeR and ToR <p>Determine:</p> <ul style="list-style-type: none"> • If the methods and approach proposed by the applicant meet the review guidance. <p>Identify:</p> <ul style="list-style-type: none"> • Technical issues and those aspects of the application that need additional or clarifying information (requests for additional information, RAIs). <p>Prepare:</p> <ul style="list-style-type: none"> • Basic draft Technical Evaluation Report (TER) based on the review. <p>STANDARD: Complete draft Technical Evaluation Report that follows the NRC provided template without deviation. However, if deviation is needed, prior approval of the template from NRC technical monitor is needed.</p>	<p>- Draft potential RAIs by e-mail</p> <p>- Draft TER Outline to NRC COR.</p> <p>- Weekly status reports to the NRC COR by e-mail.</p>	<p>7 weeks after the initiation of official DCD review or notified by the NRC COR.</p>
3	<p>Prepare for NRC on-site audit:</p> <ul style="list-style-type: none"> • Identify issues to audit, and • Review pre-audit supporting documents provided by applicant. <p>Participate in NRC on-site audit:</p> <ul style="list-style-type: none"> • Review on-site documents, • Interact with NRC staff and KHNP technical staff to resolve issues, and • Identify additional supporting materials needed to support the official RAI <p>Continue Review based on audit:</p> <ul style="list-style-type: none"> • Of submitted DCD material and supporting TeR and ToR. <p>Participate:</p> <ul style="list-style-type: none"> • In meetings with NRC staff and KHNP personnel to resolve issues. 	<p>Trip report with the list of additional technical reports and RAIs, which identify the potential technical issues.</p> <p>Provide weekly status reports.</p>	<p>12 weeks after the initiation of official DCD review or notified by the NRC COR.</p>
4	<p>Subtask 4.1 Develop:</p> <ul style="list-style-type: none"> • 1st round of RAIs. <p>Identify:</p> <ul style="list-style-type: none"> • Most limiting accident scenarios for LOCA, AOO and RIA events. <p>Recommend:</p> <ul style="list-style-type: none"> • Confirmatory analysis cases to the staff, <p>Update:</p> <ul style="list-style-type: none"> • Draft TER. 	<ul style="list-style-type: none"> • Provide weekly status reports. • Deliver draft RAIs identifying potential technical issues. • Deliver 1st draft TER following NRC's SER template. • Provide a summary report documenting the identified confirmatory cases. 	<p>15 weeks after the initiation of official DCD review or notified by the NRC COR.</p>

	Subtask 4.2 Evaluate: <ul style="list-style-type: none"> Applicant's responses to the 1st round of RAIs identified in Task 6. Determine: <ul style="list-style-type: none"> If the outstanding issues are adequately resolved. Discuss: <ul style="list-style-type: none"> Results with NRC staff with options to resolve remaining outstanding issues. Review: <ul style="list-style-type: none"> Submitted DCD material and supporting TeR and ToR reports. 	<ul style="list-style-type: none"> Provide weekly status reports. Incorporate the resolved RAIs into the draft TER. 	3 weeks after the receipt of RAI responses from the COR.
5	Subtask 5.1 Develop 2nd round of RAIs: <ul style="list-style-type: none"> Based on the evaluation results of the 1st round of RAI responses, and Results of confirmatory analyses recommended (if completed). Participate: <ul style="list-style-type: none"> In meetings with staff and KHNP personnel to resolve issues. 	<ul style="list-style-type: none"> Provide weekly status reports. Deliver 2nd draft RAIs identifying potential technical issues. 	6 weeks after the receipt of RAI responses from the NRC COR.
	Subtask 5.2 Evaluate: <ul style="list-style-type: none"> Chapter 15 Confirmatory results Discuss: <ul style="list-style-type: none"> Chapter 15 Confirmatory analyses as related to KHNP's technical/topical reports supporting Chapter 15 analyses, and Identify open items Participate: <ul style="list-style-type: none"> In meetings with staff and KHNP personnel to resolve issues. 	<ul style="list-style-type: none"> Provide weekly status reports. Deliver a summary review report. 	8 weeks after receipt of RAI responses from the NRC COR.
	Subtask 5.3 Evaluate and discuss: <ul style="list-style-type: none"> Applicant's responses to the 2nd round of RAIs identified in Task 8 to determine if the outstanding issues are adequately resolved. Develop: <ul style="list-style-type: none"> If necessary, supplemental RAIs and identify open items. 	<ul style="list-style-type: none"> Provide weekly status reports. Deliver a draft TER with open items identified. 	4 weeks after the receipt of 2 nd round RAI responses from the COR
	Subtask 5.4 Incorporate and Issue: <ul style="list-style-type: none"> TER with NRC staff comments on the draft TER, and If supplemental RAIs were generated in Task 10, incorporate resolution/closure discussion based on the Applicant's responses. 	<ul style="list-style-type: none"> Final TER and Cover Transmittal Letter provided to the NRC. Electronic files shall be submitted in both Microsoft WORD and ADOBE Acrobat format. 	2 weeks after Contractor's receipt of NRC comments on the draft TER.
6	Subtask 6.1 Develop: <ul style="list-style-type: none"> Draft "Advisory Committee on Reactor Safeguards" (ACRS) presentation slides and material for staff to review and support staff's ACRS presentations. Participate: <ul style="list-style-type: none"> Provide technical support to the staff during related ACRS meeting. 	<ul style="list-style-type: none"> ACRS presentation slides. ACRS meeting trip report. 	<ul style="list-style-type: none"> 3 weeks prior to ACRS meeting (TBD, but likely mid-calendar year 2016) 1 week after ACRS meeting

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	Subtask 6.2 Finalize: <ul style="list-style-type: none"> Final TER with open items based on ACRS and staff comments. 	<ul style="list-style-type: none"> Provide weekly status reports. Final TER with possible open items 	3 weeks after the ACRS meeting or notified by the NRC COR.
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Table 2. APR 1400 Reports

Table of Technical Reports (TeR) and Topical Reports (ToR)		
Document No	Title	Comment
APR1400-F-A-NR-14002-P	The Effect of Thermal Conductivity Degradation on APR1400 Design and Safety Analysis	
APR1400-F-C-NR-12001-P	Thermal Design Methodology	
APR1400-Z-J-NR-14002-P	Diversity and Defense-in-Depth	
APR1400-Z-A-NR-14019-P	CCF Coping Analysis	
APR1400-Z-A-NR-14014-P	ATWS Evaluation	
APR1400-F-C-NR-14001-NP	CPC Setpoint Analysis Methodology for APR1400	
APR1400-F-A-NR-14003-P	Post-LOCA Long Term Cooling Evaluation Model	
APR1400-Z-J-NR-14004-P	Uncertainty Methodology and Application for Instrumentation	
APR1400-F-A-TR-12004-P & NP	Realistic Evaluation Methodology for Large-Break LOCA of the APR1400	
APR1400-F-A-NR-12003-P & NP	Small Break LOCA Evaluation Model	
APR1400-Z-A-NR-13006-P & NP	Non-LOCA Safety Analysis Methodology	
APR1400-F-C-NR-14003-P	Functional Design Requirements for a Core Protection Calculator System for APR1400	
APR1400-Z-M-NR-13010-P & NP	Pressure-Temperature Limits Methodology for RCS Heat-up and Cooldown	
APR1400-Z-M-TR-13015-P & NP	RCP Flywheel Integrity	
APR1400-Z-A-NR-13007-P & NP	LOCA Mass and Energy Release Methodology	
APR1400-E-N-NR-13001-P & NP	APR1400 Design Features to Address GSI-191	

Table 3: APR 1400 Computer Codes

Code Name	Function	
CESEC-III	T/H systems-code	
TORC/CETOP	T/H- sub channel code	
HRISE	Fuel Thermo-mechanical	
STRIKIN-II	Fuel Thermo-mechanical	
HERMITE	Multi-group Reactor Physics	
RADTRAD	Appendix 15A	
RELAP5/MOD3.3	T/H systems-code	
CONTEMPT4/MOD5	Containment Analysis	
CEFLASH-4AS	T/H systems-code	
CEFLASH-4AS	T/H systems-code	
COMPERC	T/H systems-code	
PARCH	T/H systems-code	
CELDA	T/H systems-code	
BORON	T/H systems-code	
CEPAC		
NATFLOW		
Various Reactor Physics Codes (Tier 2 Ch. 4)		

7. REQUIRED LABOR CATEGORIES/ ESTIMATED LEVEL OF EFFORT (Except for Information Technology Services)

The table below shows the types of labor categories anticipated for performance on this Task Order.

Labor Category	FY2015 Estimated Labor Hours	FY2016 Estimated Labor Hours	FY2017 Estimated Labor Hours	Total
Project Manager	30	70	10	110
Subject Matter Expert	91	365	91	547
Senior Technical Reviewer	460	1453	350	2263
Technical Reviewer	116	466	116	698
Administrative Support	13	132	8	153
Total	710	2486	575	3771

At a minimum, the personnel team shall have a "Project Manager" and a "Subject Matter Expert (SME)." When combined, the personnel working on this requirement shall have experience in the areas listed below. With respect to these technical areas, the minimum experience requirement for the Program Manager(s) and Subject Matter Expert(s) is 7 years. The minimum experience requirement for Senior Technical Reviewers is 5 years. The minimum experience requirement for a Technical Reviewer is 3 years.

- a) Expertise and experience in analysis of nuclear reactor thermal-hydraulics;
 - At a minimum, this experience shall include realistic evaluation methodology of Code Scalability, Applicability, and Uncertainty (CSAU)
- b) Expertise in the use of computer codes in performing realistic PWR transient analysis, code development and maintenance, and extensive in-depth knowledge about the code internal numerical schemes and physical models;
 - While equivalent experience will be considered acceptable, RELAP5 and CONTEMPT4 /MOD5 experience is preferred.
- c) Expertise and familiarity with NRC regulations pertaining to analysis of nuclear reactor thermal-hydraulics, specifically under the standard review plan (SRP) Sections 4.4 and Chapter 15 sections;
 - At a minimum, this experience shall demonstrate familiarity with NUREG-0800, Regulatory Guide 1.206, SRP Chapter 15 and associated PWR safety systems.
- d) Expertise in computer software utilized to perform thermal hydraulic transient analyses.
 - Expertise in Combustion Engineering specific software is preferred (to include but not limited to: CEFLASH-4AS, CESEC-III, TORC/CETOP, STRIKIN II, PARCH, COAST, HRISE, HERMITE, CELDA, BORON, CEPAC and NATFLOW)
- e) Familiarity with requests for additional information (RAI) development; and
- f) Experience and familiarity with development of technical evaluation report (TER) supporting positions developed during the review.

At a minimum, all personnel shall have a Bachelor's degree in a related field of science or engineering. In addition, the Program Manager must have at least 7 years of experience as a PM, demonstrating knowledge of Good Management Practices (GMPs), particularly in the areas of quality control and budget management.

8. GOVERNMENT-FURNISHED PROPERTY

None

9. PLACE OF PERFORMANCE

All work shall be performed at the contractor's site, with the exception of Task 2.2 (audit of the Applicant's calculations), which must be performed at the Applicant's U. S. office in Vienna, Virginia, and Task 5 (Technical support to the NRC staff during ACRS meeting), which will be held at NRC's Rockville, Maryland Headquarters.

10. SPECIAL CONSIDERATIONS

TRAVEL/MEETINGS

Task 3: One, 2-person, 3/5-day meeting at the Applicant's Vienna, Virginia office

Task 6: One, 1-person, 1/2-day meeting at the NRC's Rockville, Maryland headquarters

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Contractor will be authorized travel expenses consistent with the substantive provisions of the Federal Travel Regulation (FTR) and the limitation of funds specified in this contract/order. All travel requires written Government approval from the CO, unless otherwise delegated to the COR.

Travel will be reimbursed in accordance with FAR 31.205-46, "Travel costs" and the General Services Administration's Federal Travel Regulations at:
<http://www.gsa.gov/portal/content/104790>

All travel requires prior written approval from the COR,

LICENSE FEE RECOVERY

All work under this task order is license fee recoverable.

SECTION F - Deliveries or Performance

NRCF030A PERIOD OF PERFORMANCE ALTERNATE I

This order shall commence on Date of Award and will expire on December 31, 2016. (See FAR 52.216-18 - Ordering).

SECTION H - Special Contract Requirements

2052.215-70 KEY PERSONNEL. (JAN 1993)

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

Project Manager	M. Bowling
Senior Tech Reviewer	Dr. D. Prelewicz
Subject Matter Expert	Mr. D. Caraher

*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.

2052.215-71 PROJECT OFFICER AUTHORITY. (OCT 1999)

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

Name: John Budzynski
Address: US NRC
NRO/DSRA/SRSB
Washington DC 20555
Telephone Number: 301-415-1979
Email: john.budzynski@nrc.gov

The alternate contracting officer's representative is:

Name: James Gilmer
Address: US NRC
NRO/DSRA/SRSB
Washington DC 20555
Telephone Number: 301-415-2891
Email: james.gilmer@nrc.gov

(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, approve 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 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 that 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 to the instruction or direction 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.

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SECTION J - List of Documents, Exhibits and Other Attachments

Attachments:

1. Monthly Letter Status Report Template

MONTHLY LETTER STATUS REPORT (MLSR)

PROJECT TITLE: [Project Title]

CONTRACT NO.: [Contract No.]

A. TASK ORDER IDENTIFICATION AND FINANCIAL SUMMARY INFORMATION

Note: There shall be 1 MLSR for every Task Order

TASK ORDER TITLE: [Task Order Title]

TASK ORDER NO.: [TO#]

JOB CODE NO. (JCN): [JCN#]

**TECHNICAL ASSIGNMENT
CONTROL NUMBER (TAC):** [TAC#]

PERIOD OF PERFORMANCE: [TO start date to TO finish date]

PERIOD COVERED: [Month 1st to Month 31st]

NRC CONTRACTING OFFICERS REPRESENTATIVE: [Name of COR]

CONTRACTOR TASK MANAGER: [Contractor Lead Reviewer]

CONTRACTING ORGANIZATION: [Contractor Business Name]

1.	Task Order Amount:	\$
2.	Funds Obligated to Date:	\$

		Cost This Period	Cumulative Cost to Date
3.	Total Direct Costs Invoiced	\$	\$
4.	Total Indirect Costs Invoiced	\$	\$
5.	Fee Invoiced	\$	\$
6.	Total Cost Invoiced [Item3+Item4+Item5]	\$	
7.	Percent Expended (%) [Item6/Item2]		\$
8.	Balance of Obligation Funds Remaining based on Invoiced Cost [Item2-Item6]		\$
9.	Total Actual Costs ((Invoiced Cost and Cost Not Yet Invoiced (e.g., Pending/Outstanding Subcontractor /Consultant Costs)		\$
10.	Balance of Obligated Funds Remaining based on Actual Cost [Item2-Item9]		\$
11.	Balance of Funds Required for Completion [Item 1 – Item 10]		\$

Spending Plan:

Month/Year	Oct 12	Nov 12	Dec 12	Jan 13	Feb 13	Mar 13	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13
Planned (\$)												
Revised (\$)												
Actual (\$)												

Month/Year	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14	Apr 14	May 14	Jun 14	Jul 14	Aug 14	Sep 14
Planned (\$)												
Revised (\$)												
Actual (\$)												

Month/Year	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15	Apr 15	May 15	Jun 15	Jul 15	Aug 15	Sep 15
Planned (\$)												
Revised (\$)												
Actual (\$)												

Plan Total: \$ [Sum of planned(\$)]

Revised Total: \$ [Sum of Revised(\$)]

Actual Total: \$ [Sum of Actual(\$)]

B. EPM SCHEDULE MILESTONE INFORMATION (If Applicable)**SER DEVELOPMENT**

Milestone		Percent Complete				
		0%	30%	60%	90%	100%
ACCEPTANCE REVIEW						
AR	Planned Date					
	Actual Date					
SER DEVELOPMENT						
P1	Planned Date					
	Actual Date					
P2	Planned Date					
	Actual Date					
P3	Planned Date					
	Actual Date					
P4	Planned Date					
	Actual Date					
P5	Planned Date					
	Actual Date					
P6	Planned Date					
	Actual Date					

Note: Input date where appropriate. Refer to Attachment 1.1 for description.

C. WORK PERFORMED/ DESCRIPTION

Title	Description

D. PROBLEM(S)/ RESOLUTION(S)

1.	
2.	
3.	
4.	

E. TRAVEL FOR THIS PERIOD

Staff	Start Date	End Date	Destination/ Activity

Print out from contractor's data collection program is acceptable if equivalent to above table.

F. PLANS FOR NEXT PERIOD

1.	
2.	
3.	
4.	

G. STAFF HOURS SUMMARY

Subtask/ Phase	Staff Assigned	Hours Budgeted	Hours Expended This Period	Total Cumulative Hours Expended	Note(s)

Print out from contractor's data collection program is acceptable if equivalent to above table.

Milestone	Percent Complete				
	0	30	60	90	100
ACCEPTANCE REVIEW					
Acceptance Review (AR)	Not Started	N/A	N/A	N/A	Contractor provides AR input to NRC staff. Contractor status marked 100%.
SER DEVELOPMENT					
P1	Not Started	Read application and sent draft TER and RAIs to TM	Incorporated TM's comments and issued final TER and RAIs to TM	TM notified Contractor that PSER and last RAIs submitted to BC	TM notified Contractor that PSER and last RAIs issued to Projects. Contractor status marked 100%. Issues related to PSER and RAIs are charged to P2.
P2	Not Started	RAI responses that have been received have been reviewed. Sent draft TER w/OI to TM	Incorporated TM's comments and issued final TER w/OI to TM	TM notified Contractor that SER w/OI submitted to BC	TM notified Contractor that SER w/OI issued to Projects. Contractor status marked 100%. Issues related to SER w/OI are charged to P4.
P3	Not Started	-	-	-	ACRS briefing completed
P4	Not Started	All OI responses have been received and reviewed. Sent draft TER w/o OI to TM	Incorporated TM's comments and issued final TER w/o OI to TM	TM notified Contractor that SER w/o OI submitted to BC	TM notified Contractor that SER w/o OI issued to Projects. Contractor status marked 100%.
P5	Not Started	-	-	-	ACRS briefing completed
P6	Not Started	All RAI responses addressing ACRS issues have been received and reviewed. Sent draft TER to TM	Incorporated TM's comments and issued final TER to TM	TM notified Contractor that Final SER submitted to BC	TM notified Contractor that Final SER issued to Projects. Contractor status marked 100%.

[CONTRACT#]