
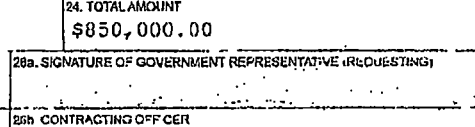


INTERAGENCY AGREEMENT		1. IAA NO. NRC-HQ-25-16-T-0014		PAGE OF 1 3	
2. ORDER NO.		3. REQUISITION NO. NRO-16-0096		4. SOLICITATION NO.	
5. EFFECTIVE DATE 08/30/2016		6. AWARD DATE 08/30/2016		7. PERIOD OF PERFORMANCE 09/01/2016 TO 12/31/2018	
8. SERVING AGENCY BROOKHAVEN NATIONAL LABORATORY ALC: DUNS: 027579460 +4: BROOKHAVEN SITE OFFICE PO BOX 5000 BLDG 464 UPTON NY 11973-5000 POC Kim Nokulak TELEPHONE NO. 631-344-7439			9. DELIVER TO MICHAEL MONTAGUE US NUCLEAR REGULATORY COMMISSION 11555 ROCKVILLE PIKE MAILSTOP TWEN 6 E7 ROCKVILLE MD 20852		
10. REQUESTING AGENCY ACQUISITION MANAGEMENT DIVISION ALC: 31000001 DUNS: 040535809 +4: US NUCLEAR REGULATORY COMMISSION ONE WHITE FLINT NORTH 11555 ROCKVILLE PIKE ROCKVILLE MD 20852-2738 POC SHASHI MALHOTRA TELEPHONE NO. 301-415-7803			11. INVOICE OFFICE US NUCLEAR REGULATORY COMMISSION ONE WHITE FLINT NORTH 11555 ROCKVILLE PIKE MAILSTOP O3-E17A ROCKVILLE MD 20852-2738		
12. ISSUING OFFICE US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWEN-5E03 WASHINGTON DC 20555-0001			13. LEGISLATIVE AUTHORITY Energy Reorganization Act of 1974		
			14. PROJECT ID		
			15. PROJECT TITLE SEE BLOCK 18		
16. ACCOUNTING DATA 2016-K0200-FEEBASED-25-25D008-17-4-151-1030-251D					
17. ITEM NO	18. SUPPLIES/SERVICES	19. QUANTITY	20. UNIT	21. UNIT PRICE	22. AMOUNT
	TASK ORDERING AGREEMENT: NRC-HQ-25-14-D-0002 TASK ORDER NUMBER: NRC-HQ-25-16-T-0014 The NRC and the DOE Lab (BNL) hereby enter into this Agreement/Task Order, NRCHQ2514D0002-NRC-HQ-25-16-T-0014, for the project entitled, Non-Light Water Reactor Policy and Guidance Support The performance period for this agreement shall commence on September 1, 2016 and will expire on December 31, 2018. Continued ...				
23. PAYMENT PROVISIONS			24. TOTAL AMOUNT \$850,000.00		
25a. SIGNATURE OF GOVERNMENT REPRESENTATIVE (SERVING) 			25b. SIGNATURE OF GOVERNMENT REPRESENTATIVE (REQUESTING) 		
25b. NAME AND TITLE Kim M. Nokulak Contracting Officer		25c. DATE SEP 14 2016	25d. CONTRACTING OFFICER JEFFREY R. MITCHELL		25e. DATE

SEP 27 2016

TEMPLATE - ANM001

SUNSI REVIEW COMPLETE

ANM002

Consideration and Obligations:

(a) Authorized Cost Ceiling \$2,401,035.00.

(b) The amount presently obligated with respect to this DOE Agreement is \$850,000.00 . When and if the amount(s) paid and payable to the DOE Laboratory hereunder shall equal the obligated amount, the DOE Laboratory shall not be obligated to continue performance of the work unless and until the NRC Contracting Officer shall increase the amount obligated with respect to this DOE Agreement. Any work undertaken by the DOE Laboratory in excess of the obligated amount specified above is done so at the DOE Laboratory's sole risk.

The following documents are hereby made part of this Agreement:

Attachment No. 1: Statement of Work

BNL PROJECT MANAGER: Dr. William C. Horak
CONTRACTING OFFICERS REPRESENTATIVE (COR):
Mr. Michael Montague
BNL's Principal Investigator: Dr. David Diamond

This agreement is entered into pursuant to the authority of the Energy Reorganization Act of 1974, as amended (42 U.S.C 5801 et seq.). This work will be performed in accordance with the NRC/DOE Memorandum of Understanding dated November 24, 1998. To the best of our knowledge, the work requested will not place the DOE and its contractor in direct competition with the domestic private sector.

- [] Fee Recoverable Work
- [x] Non-fee Recoverable Work

Notwithstanding the agreement effective dates and period of performance start dates stated elsewhere in the agreement, the effective date of the agreement and start date of the period of performance are the last date of signature by the parties.

Continued ...

00001	<p>DUNS:040535809 TAS:31X0290.320 AIC:31000001 Master IAA: NKCHQ2514D0002</p> <p>Request to issue a new task order under BNL EWA NRC-HQ-25-14-D-0002 for Non-Light Water Reactor Policy and Guidance Support. Incrementally fund with \$850,000.</p> <p>This agreement is entered into pursuant to the authority of the Energy Reorganization Act of 1974, as amended (42 U.S.C 5801 et seq.). This work will be performed in accordance with the NRC/DOE Memorandum of Understanding dated November 24, 1998. To the best of our knowledge, the work requested will not place the DOE and its contractor in direct competition with the domestic private sector.</p> <p><input type="checkbox"/>] Fee Recoverable Work <input checked="" type="checkbox"/>] Non-fee Recoverable Work</p> <p>Notwithstanding the agreement effective dates and period of performance start dates stated elsewhere in the agreement, the effective date of the agreement and start date of the period of performance are the last date of signature by the parties.</p> <p>The total amount of award: \$850,000.00. The obligation for this award is shown in box 24.</p>			850,000.00
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STATEMENT OF WORK (SOW)

NRC Agreement Number NRCHQ2514D0002	NRC Agreement Modification Number 	NRC Task Order Number (If Applicable) NRC-HQ-25-16-T-0014	NRC Task Order Modification Number (If Applicable)
Project Title Non-Light Water Reactor Policy and Technical Guidance Support			
Job Code Number 1030	B&R Number 17-4-151	Servicing Agency Brookhaven National Laboratory	
NRC Requisitioning Office NRO/DEIA		Period of Performance September 2016 through December 2018	
NRC Form 187, Contract Security and Classification Requirements <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable		<input type="checkbox"/> Involves Proprietary Information <input type="checkbox"/> Involves Sensitive Unclassified	
<input checked="" type="checkbox"/> Non Fee-Recoverable		<input type="checkbox"/> Fee-Recoverable (If checked, complete all applicable sections below)	
Docket Number (If Fee-Recoverable/Applicable)		Inspection Report Number (If Fee Recoverable/Applicable)	
Technical Assignment Control Number (If Fee-Recoverable/Applicable)		Technical Assignment Control Number Description (If Fee-Recoverable/Applicable)	

1.0 BACKGROUND

The Nuclear Regulatory Commission (NRC) regulates the construction and operation of new commercial nuclear power facilities. The Office of New Reactors (NRO) serves the public interest by enabling the safe, secure, and environmentally responsible use of nuclear power in meeting the Nation's future energy needs. NRO supports the mission to protect public health, safety, and the environment by leading and managing the licensing activities associated with advanced reactor designs.

Recent interest in Generation IV reactors indicate a possible renewed interest in non-light water reactors (non-LWRs), including liquid metal reactors (LMRs) for high-temperature use and reduction of actinide inventories in used nuclear fuel.

With the increased focus on non-LWR technology it is reasonably expected that the NRC could expect to become involved with regulatory reviews of non-LWR designs as early as 2030. What is known is that there are positive indications of interest in non-LWRs continue to surface and the staff expects that the work load will continue to grow over the next several years. To address this projected increase in non-

LWR work, and acknowledging the specialized skill sets needed to develop the infrastructure and conduct these reviews of various technologies, DOE laboratory resources are required to supplement the NRC staff resources. The NRC is currently expanding the regulatory framework (e.g., Advanced Reactor Design Criteria) and associated review infrastructure needed to review these non-LWR designs.

The NRC is seeking to establish a more flexible, risk-informed and performance-based regulatory review process within the bounds of existing regulations, including the use of conceptual design reviews and staged-review processes. This flexibility will accommodate potential applicants having a range of financial, technical, and regulatory maturity, and considering a range of design maturity and completeness.

2.0 OBJECTIVE

The objective of this task order is to obtain technical assistance services to provide qualified, competent, and fully trained personnel that will perform the support activities delineated under this task order that will address several of the near-term strategies and areas of concern addressed in several advanced non-light water reactor workshops and public meetings. The support activities include:

- Assisting in developing a risk-informed, performance-based, technology-inclusive regulatory infrastructure for non-LWR designs;
- Providing technical assistance in performing pre-application reviews of non-LWR designs
- Performing training on non-LWR technologies; providing technical assistance in conducting reviews and developing technical guidance related to use of codes/standards for non-LWR designs
- Acquiring or developing computer codes, data, and tools to perform non-LWR regulatory reviews
- Assisting the NRC in developing risk-informed, performance-based regulations for emergency preparedness.

3.0 SCOPE OF WORK/TASKS

The servicing agency shall provide all resources necessary to accomplish the tasks and deliverables described in this Statement of Work (SOW).

The DOE laboratory shall provide support to the NRC in a wide range of technical and scientific disciplines aimed at ensuring the overall safety and adequacy of advanced nuclear power plant design, construction, and operations. The scope of work is described in tasks below.

Task 1: Kickoff Meeting

Prior to the initiation of work, the NRC COR will conduct a face-to-face kickoff meeting with the DOE Laboratory to discuss the project.

The purpose is to have alignment and propose potential adjustments to the SOW based on the projected workload and demands.

Task 2: Risk-Informed, Performance-Based, Technology-Inclusive Regulatory Infrastructure

Provide technical assistance in developing a risk-informed, performance-based, technology-inclusive regulatory infrastructure to support the regulatory review of non-LWR designs. Assist the NRC staff in various areas related to developing this regulatory infrastructure for non-LWR designs, including (but not limited to):

- Performing technical reviews of industry documentation
- Developing methodology, criteria, templates, and procedures;
- Determining licensing bases and accident sets;
- Identifying regulatory gaps;
- Providing risk-informed review guidance;

- Supporting policy development, preparation of commission papers, and rulemaking activities;
- Coordinating workshops on the resolution of policy and key technical issues;
- Supporting public meetings; and
- Assisting with responses to public comments

Following technical direction provided by the NRC COR, the DOE Laboratory shall do a study and write a report that compares a technology-neutral approach and a technology-focused (e.g., molten chloride cooled) approach.

Task 3: New Regulatory Review Processes

Assist the NRC staff in developing a conceptual design review process for non-LWR designs during the pre-application review stage. Assist the NRC staff in developing a staged-review process for non-LWR applications. This includes (but is not limited to):

- Supporting policy development, preparation of commission papers, and rulemaking activities;
- Developing methodology, criteria, guidance, regulatory review agreements/contracts, project plans, templates, office instructions, and procedures;
- Supporting public meetings and workshops; and
- Assisting with responses to public comments

Task 4: Pre-application Reviews

Provide technical assistance in the pre-application review of non-LWR designs. Participate in meetings and other interactions with non-LWR designers. Review topical reports, conceptual design documents, or research being conducted on the non-LWR designs to support the NRC's conceptual design assessment.

Task 5: Training

Provide support in developing a training program for and delivering training to the NRC staff on various non-LWR designs and specific technical areas of non-LWR designs that will provide the NRC staff with sufficient knowledge, technical skills, and capacity to perform non-LWR regulatory reviews.

Task 6: Industry Codes and Standards

Provide technical assistance in conducting reviews and developing technical guidance related to use of industry codes and standards for the design, testing and operation of non-LWRs. Some specific areas that may need to be addressed are:

- In conjunction with the NRC, the DOE Laboratory shall identify industry codes and standards needed to support the non-LWR life cycle (including fuels and materials);
- In conjunction with the NRC, the DOE Laboratory shall work with stakeholders (standards organizations, vendors, etc.) to determine and clarify the applicability of codes, standards, and criteria needed for non-LWRs.
- In conjunction with the NRC, the DOE Laboratory shall participate with key industry standard formulation organizations to develop industry codes and standards for non-LWRs. Those organizations include (but are not limited to) the American Society of Mechanical Engineers (ASME), American Nuclear Society (ANS), and Institute of Electrical and Electronics Engineers (IEEE).

Task 7: Computer Codes, Data, and Tools

The purpose of this task is to acquire/develop sufficient computer codes, data, and tools to perform non-LWR regulatory reviews. Activities include:

- Prioritize the non-LWR technologies most likely to achieve regulatory review readiness, using inputs from NRC, DOE, industry, and international organizations.
- Develop computer codes, data and tools that would enable the NRC staff to perform regulatory reviews of non-LWR designs. These codes, data and tools would enable the NRC to independently verify the results of the designer or applicant's calculations, models, and other design documentation.

Task 8: Emergency Preparedness for Small Modular Reactors and Other New Technologies

Provide technical assistance to the NRC staff in efforts related to emergency preparedness for small modular reactors and other new technologies as described in the Commission SRMs to SECY-14-0038 (ADAMS No. ML14259A589), SECY-15-0077 (ADAMS No. ML15216A492), and SECY-16-0069 (ADAMS No. ML16174A166). All of these references are publicly available.

4.0 LIST OF DELIVERABLES

Task	Deliverables	Deliverable Format	Scheduled Completion*
1. Kick-off Meeting			Within four weeks of being awarded the contract.
2. Risk-Informed, Performance-Based, Technology-Inclusive Regulatory Infrastructure	Draft task plan	Microsoft Word	Four weeks from when NRC assigns the task.
	Final task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Draft report for non-LWRs	Microsoft Word	72 weeks from when NRC assigns the task
	Final report for non-LWRs	Microsoft Word	96 weeks from when NRC assigns the task.
3. New Regulatory Review Processes	Draft task plan	Microsoft Word	Four weeks from when NRC assigns the task.
	Final task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Draft report for non-LWRs	Microsoft Word	36 weeks from when NRC assigns the task
	Final report for non-LWRs	Microsoft Word	48 weeks from when NRC assigns the task.
4. Pre-Application Reviews	Review technical issues		Within one week when NRC assigns the task.
	Draft technical response	Microsoft Word	TBD by NRC, based on complexity of review and response.
	Participate in public meetings	In person	TBD by NRC
5. Training	Draft task plan	Microsoft Word	Four weeks from when NRC assigns the task.

Task	Deliverables	Deliverable Format	Scheduled Completion*
	Final task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Deliver training	In person	TBD by NRC
	Draft presentation and study materials for a set of classes	Microsoft Power Point Microsoft Word	TBD by NRC
	Final presentation and study materials for a set of classes	Microsoft Power Point Microsoft Word	TBD by NRC
6. Industry Codes and Standards	Draft task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Final task plan	Microsoft Word	Eight weeks from when NRC assigns the task.
	Draft technical report	Microsoft Word	40 weeks from when NRC assigns the task.
	Final technical report	Microsoft Word	48 weeks from when the NRC assigns the task.
7. Computer Codes, Data, and Tools	Draft task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Final task plan	Microsoft Word	Eight weeks from when NRC assigns the task.
	Draft technical report	Microsoft Word	40 weeks from when NRC assigns the task.
	Final technical report	Microsoft Word	48 weeks from when the NRC assigns the task.
8. Risk-Informed Performance-Based Emergency Planning	Draft task plan	Microsoft Word	Six weeks from when NRC assigns the task.
	Final task plan	Microsoft Word	Eight weeks from when NRC assigns the task.
	Review technical issues		40 weeks from when NRC assigns the task.
	Draft technical response	Microsoft Word	48 weeks from when the NRC assigns the task.
	Participate in public meetings	In person	TBD by NRC staff

5.0 ESTIMATED LABOR CATEGORIES, KEY PERSONNEL AND LEVELS OF EFFORT

5.1 Labor Categories, Requirements and Key Personnel. The work requires personnel with expertise in the area of non-LWR technology with specific emphasis on molten chloride fast reactor and pebble bed

high temperature reactor designs. All personnel performing work under this task order agreement shall have pertinent technical experience by discipline and technical area.

Experience in risk-informed, performance based regulation is required to identify and resolve current regulatory framework gaps for non-LWRs. The ability to determine the applicability of previously identified policy issues to non-LWRs is required. The ability to identify additional risk-informed and technology-neutral policy issues for non-LWRs is required.

Experience with severe accident analyses is required to review non-LWR licensing bases and accident sets with emphasis on molten chloride fast reactor and pebble bed high temperature reactor designs.

Knowledge and ability to create "plain language" guidance to NRC staff reviewers and NRC applicants that reflects risks posed by non-LWR technology is required.

Oral and technical writing skills are required. Technical training skills are required.

Knowledge and ability to assess and leverage the experience available from international counterparts and industry to determine state-of-the-art non-LWR computer codes and tools is required.

6.0 CERTIFICATION AND LICENSE REQUIREMENTS

N/A

7.0 MEETINGS AND TRAVEL

Servicing agency personnel will be authorized travel expenses consistent with the Federal Travel Regulation (FTR) and the limitation of funds specified for the travel within this agreement/order. All travel requires prior written approval from the COR.

Foreign travel for the servicing agency personnel requires a 60-day lead time for NRC approval. For prior approval of foreign travel, the servicing agency shall submit to the COR an NRC Form 445, "Request for Approval of Official Foreign Travel." NRC Form 445 is available in the MD 11.7 Documents library and on the NRC Web site at: <http://www.nrc.gov/reading-rm/doc-collections/forms/>. All foreign travel requires prior written approval from the NRC Executive Director for Operations (EDO).

FY16

- One, two-person, three-day trip to kickoff meeting and discuss the project at NRC HQ.

FY17

- Two, two-person, three-day trips to review documents.

FY18

- One, two-person, three-day trip to support a public meeting.
- One, two-person, three-day trip to administer training.

NOTE: Trip durations of three days assume two travel days and one full day for task activities.

8.0 REPORTING REQUIREMENTS

The servicing agency is responsible for structuring the deliverables to current agency standards. Deliverables shall be submitted free of spelling and grammatical errors and shall conform to requirements stated in this section.

8.1 Monthly Letter Status Report (MLSR)

The servicing agency shall provide a Monthly Letter Status Report which consists of a technical progress report and financial status report and submit electronically by the 20th day of each month. The report will be used by the sponsoring agency to assess the adequacy of the resources utilized by the servicing agency to accomplish the work contained in this SOW and to provide status of the servicing agency progress in achieving tasks and producing deliverables. The report shall include agreement/order summary information, work completed during the specified period, milestone schedule information, problem identification and resolution, travel plans, and staff hour summary. Copies of MLSR shall be sent to the COR and AMD at ContractsPOT.Resource@nrc.gov.

9.0 REQUIRED MATERIALS, FACILITIES, HARDWARE/SOFTWARE

N/A

10.0 APPLICABLE PUBLICATIONS (CURRENT EDITIONS)

The servicing agency shall comply with the following applicable regulations, publications, manuals, and local policies and procedures:

1. NUREG-1379, "NRC Editorial Style Guide", Rev.2 (May 2009)
2. NUREG-0650, "Preparing NUREG-Series Publications," Rev. 2 (January 1999)

11.0 DATA RIGHTS

The NRC shall have unlimited rights to and ownership of all deliverables provided under this agreement/order, including reports, recommendations, briefings, work plans and all other deliverables. All documents and materials, to include the source codes of any software, produced under this agreement/order are the property of the NRC with all rights and privileges of ownership/copyright belonging exclusively to the NRC. These documents and materials may not be used or sold by the servicing agency without prior written authorization from the CO. All materials supplied to the NRC shall be the sole property of the NRC and may not be used for any other purpose. This right does not abrogate any other Government rights.

12.0 CONTRACTING OFFICER'S REPRESENTATIVE

Name: Mick Montague
Agency: U.S. Nuclear Regulatory Commission
Office: NRO/DEIA/POB
Mail Stop: TWFN 6E7
Washington, DC 20555-0001
E-Mail: Michael.Montague@nrc.gov
Phone: (301) 415-7078
Washington, DC 20555-0001

Alternate Contracting Officer's Representative

Name: Mike Jones
Agency: U.S. Nuclear Regulatory Commission
Office: NRO/DEIA/ARPB
Mail Stop: TWFN 6E4
Washington, DC 20555-0001
E-Mail: Michael.Jones2@nrc.gov
Phone: (301) 415-0189
Washington, DC 20555-0001

The COR monitors all technical aspects of the agreement and assists in its administration. The COR is authorized to perform the following functions: assure that the DOE Laboratory performs the technical requirements of the agreement; perform inspections necessary in connection with agreement performance; maintain written and oral communications with the DOE Laboratory concerning technical aspects of the agreement; issue written interpretations of technical requirements, including Government drawings, designs, specifications; monitor the DOE Laboratory's performance and notify the DOE Laboratory of any deficiencies; coordinate availability of NRC-furnished material and/or GFP; and provide site entry of DOE Laboratory personnel.

15.0 NRC-FURNISHED PROPERTY/MATERIALS

N/A

16.0 STANDARDS FOR CONTRACTORS WHO PREPARE NUREG-SERIES MANUSCRIPTS

The U.S. Nuclear Regulatory Commission (NRC) began to capture most of its official records electronically on January 1, 2000. The NRC will capture each final NUREG-series publication in its native application. Therefore, please submit your final manuscript that has been approved by your NRC Project Manager in both electronic and camera-ready copy.

The final manuscript shall be of archival quality and comply with the requirements of NRC Management Directive 3.7 "NUREG-Series Publications." The document shall be technically edited consistent with NUREG-1379, Rev. 2 (May 2009) "NRC Editorial Style Guide." The goals of the "NRC Editorial Style Guide" are readability and consistency for all agency documents.

All format guidance, as specified in NUREG-0650, "Preparing NUREG-Series Publications," Rev. 2 (January 1999), will remain the same with one exception. You will no longer be required to include the NUREG-series designator on the bottom of each page of the manuscript. The NRC will assign this designator when we send the camera-ready copy to the printer and will place the designator on the cover, title page, and spine. The designator for each report will no longer be assigned when the decision to prepare a publication is made. The NRC's Publishing Services Branch will inform the NRC Project Manager for the publication of the assigned designator when the final manuscript is sent to the printer.

For the electronic manuscript, the Contractor shall prepare the text in Microsoft Word, and use any of the following file types for charts, spreadsheets, and the like.

File Types to be Used for NUREG-Series Publications	
File Type	File Extension
Microsoft®Word®	.doc
Microsoft® PowerPoint®	.ppt
Microsoft®Excel	.xls
Microsoft®Access	.mdb
Portable Document Format	.pdf

This list is subject to change if new software packages come into common use at NRC or by our licensees or other stakeholders that participate in the electronic submission process. If a portion of your manuscript is from another source and you cannot obtain an acceptable electronic file type for this portion (e.g., an appendix from an old publication), the NRC can, if necessary, create a tagged image file format (file extension.tif) for that portion of your report. Note that you should continue to submit original photographs, which will be scanned, since digitized photographs do not print well.

If you choose to publish a compact disk (CD) of your publication, place on the CD copies of the manuscript in both (1) a portable document format (PDF); (2) a Microsoft Word file format, and (3) an Adobe Acrobat Reader, or, alternatively, print instructions for obtaining a free copy of Adobe Acrobat Reader on the back cover insert of the jewel box.