

AUG 03 2015

<b>INTERAGENCY AGREEMENT</b>		1. IAA NO. NRC-HQ-60-15-D-0011		PAGE 1 OF 2	
2. ORDER NO.		3. REQUISITION NO. RES-15-0296		4. SOLICITATION NO.	
3. EFFECTIVE DATE 07/15/2015		5. AWARD DATE 07/10/2015		7. PERIOD OF PERFORMANCE 07/15/2015 TO 09/30/2018	
6. SERVICING AGENCY ALBUQUERQUESANDIA NATL LAB ALC: DUNS: 155505027 +4: DOENNSASFO CONTRACTING OFFICER PO BOX 5400 ALBUQUERQUE NM 87185-5400  POC Mary Cocco TELEPHONE NO. 505-845-8008		9. DELIVER TO DONALD HELTON US NUCLEAR REGULATORY COMMISSION RESDRAPRAB MAIL STOP T10A12 11555 ROCKVILLE PIKE ROCKVILLE MD 20852			
10. REQUESTING AGENCY ACQUISITION MANAGEMENT DIVISION ALC: 31000001 DUNS: +4: US NUCLEAR REGULATORY COMMISSION ONE WHITE FLINT NORTH 11555 ROCKVILLE PIKE ROCKVILLE MD 20852-2738  POC MORIE GUNTER-HENDERSON TELEPHONE NO.		11. INVOICE OFFICE US NUCLEAR REGULATORY COMMISSION ONE WHITE FLINT NORTH 11555 ROCKVILLE PIKE MAILSTOP 03-E17A ROCKVILLE MD 20852-2738			
12. ISSUING OFFICE US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-5E03 WASHINGTON DC 20555-0001		13. LEGISLATIVE AUTHORITY Energy Reorganization Act of 1974			
		14. PROJECT ID			
		15. PROJECT TITLE LEVEL 2 PRA DYNAMIC SIMULATION			
16. ACCOUNTING DATA 2015-C0200-FEEBASED-60-60D002-11-6-213-1052-253D					
17. ITEM NO.	18. SUPPLIES/SERVICES	19. QUANTITY	20. UNIT	21. UNIT PRICE	22. AMOUNT
	Title: Extension of AIM Platform for Dynamic PRA  The NRC and Sandia National Laboratory (SNL) hereby enter into this Agreement for the project entitled: Extension of AIM Platform for Dynamic PRA  Period of Performance: July 15, 2015 - September 30, 2018  Consideration and Obligations:  Continued ...	450140374 (7000100)	3Z		
		SNL \$169,902.91			
		58 \$ 5,097.09			
		NRCHQ6015D0011			
		2015.07.30			
		'00'06- 13:12:25			
23. PAYMENT PROVISIONS		24. TOTAL AMOUNT \$175,000.00			
25a. SIGNATURE OF GOVERNMENT REPRESENTATIVE (SERVICING) <i>Lindsay VanNess</i>		25b. SIGNATURE OF GOVERNMENT REPRESENTATIVE (REQUESTING) <i>Morie E. Gunter-Henderson</i>			
25c. NAME AND TITLE Lindsay VanNess, Contracting Officer 8/3/15		25d. CONTRACTING OFFICER MORIE E. GUNTER-HENDERSON			
		25e. DATE 8/3/15		25f. DATE 7/10/15	

SUNSI REVIEW COMPLETE

TEMPLATE - ADMIN

AUG 17 2015

ADMIN02

(a) Authorized Cost Ceiling \$852,932.00

(b) The amount presently obligated with respect to this DOE Agreement is \$175,000.00. 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 a part of this Agreement:

Attachment No. 1: Statement of Work

Attachment No. 2: DOE Standard Terms and Conditions

- 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.

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.

[ ] Fee Recoverable Work

[ X ] Non-fee Recoverable Work

DUNS: 040535809

ALC: 31000001

TAS: 31X0200.320

# STATEMENT OF WORK

NRC Agreement Number NRC-HQ-50-15-D-0011	NRC Agreement Modification Number	NRC Task Order Number (If Applicable)  n/a	NRC Task Order Modification Number (If Applicable)  n/a
Project Title Extension of AIM Platform for Dynamic PRA			
Job Code Number TBD	B&R Number 1052	DOE Laboratory SNL	
NRC Requisitioning Office RES			
NRC Form 187, Contract Security and Classification Requirements <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Note Applicable		<input checked="" 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)  n/a		Inspection Report Number (If Fee Recoverable/Applicable)  n/a	
Technical Assignment Control Number (If Fee- Recoverable/Applicable)  n/a		Technical Assignment Control Number Description (If Fee- Recoverable/Applicable)  n/a	

## 1.0 BACKGROUND

SECY-07-0192, "Agency Long-Term Research Activities for Fiscal Year 2009," identified Level 2/3 probabilistic risk assessment (PRA) as an area that could benefit from long-term research related to methods development. That document provided a description of an activity that would include an in-house scoping study and a subsequent contractor-led effort, as well as a description of the attributes being sought by advanced methods. The NRC conducted the first portion of that work, primarily internally, and documented the scoping study in a document entitled, "Scoping Study on Advancing Modeling Techniques for Level 2/3 PRA," dated May 2009 (ML091320454). The white paper provides a review of relevant past methods, recent developments, and regulatory uses. It goes on to create a taxonomy for comparing the spectrum of potential advanced approaches, qualitatively assesses these approaches against desired attributes, and recommends further investigation of a particular approach utilizing dynamic event tree modeling in combination with other modifications to the existing framework in common use. Following this, a contract was awarded to Sandia National Laboratories (SNL) (with subcontracts subsequently awarded to the University of Maryland and the Ohio State University [OSU]) to pursue this work. Under that contract, a dynamic PRA platform was developed leveraging the ADS-IDAC dynamic operator response model in conjunction with the NRC's MELCOR severe accident analysis code. That platform was then applied to a station blackout scenario for the Surry plant. The platform - ADS-IDAC/MELCOR (AIM) - utilized MELCOR v2.1, and the circa 2008 Surry model from the NRC's SOARCA study, NUREG-1935 (ML12332A057).

From SNL's project report, SAND2012-9346 (ML12305A351):

Both short-term and long-term SBO sequences were included in the demonstration evaluation. Due to technical issues that could not be resolved with the available resources, the evaluation of the demonstration problem was not completed. However, the evaluation did progress far enough to demonstrate the feasibility of modeling the dynamics of interactions between the plant and the operating crew actions with the AIM tool. In particular, the IDAC framework for incorporating knowledge-driven and procedural responses provided significant flexibility in modeling the Surry EOPs and SAMGs. Simulated accident progression information from the MELCOR code was successfully transferred to ADS where it was utilized by IDAC to help make simulated operator decisions. Resulting operator decisions were successfully implemented in the MELCOR simulations to model operator actions through the use of interactive control functions.

The AIM model developed for the demonstration problem is tailored to address a SBO at Surry. Only Surry-specific design and operational information are included in the MELCOR input model, and only Surry SBO-specific EOP and SAMG procedures are included in the IDAC model. For ADS, only SBO-specific branching rules are included in the input model. However, the methods/approaches that were used to develop the AIM model are applicable to any plant and any scenario.

AIM successfully executed 145 SBO sequences for the demonstration problem and has revealed interesting results. The results of the SBO demonstration problem clearly indicate that the dynamic behavior of when failures occur, when operator actions are taken, and phenomenological uncertainties in severe accident progression can potentially result in substantial differences in the resulting accident behavior.

SAND2012-9346 also identifies areas for improvement, in Section 6.2. These deal with: (i) code coupling, (ii) MELCOR source code enhancements, (iii) use of the multi-processor version of ADS-IDAC, (iv) leveraging other ADS-IDAC enhancements, and (v) integration of ADAFT in to the framework.

Regarding this overall effort, the NRC has benefited from the program, by cultivating a better understanding of the challenges and benefits of developing an advanced Level 2/3 PRA analysis tool. The high-level conclusions from the effort were that methods exist (namely discrete dynamic event tree (DDET) methodologies) that have reached a sufficient state of maturity that they can be deployed in situations where the scope and complexity of a particular problem warrants an approach that integrates the probabilistic and deterministic aspects of a Level 2 PRA. The tool developed could be particularly useful for validating binning decisions (e.g., placing accident sequences within plant damage states) made for traditional Level 2 PRA analysis and evaluating sequences where there are significant operator interactions, complex timing, or dependencies. The work places the agency in a better position to utilize the DDET approach in particular problem domains, and to evaluate any future licensing applications or oversight activities where licensees elect to utilize this class of tools. Despite this success, there are aspects of the effort that did not reach culmination, and the present proposal seeks to resolve these limitations.

Since the time of that work, domestic work in the area of dynamic PRA has been centered on two separate Department of Energy initiatives. The first, led by Sandia National Laboratories focused on a MELCOR and Bayesian network-based platform, and was conducted under the Office of Nuclear Energy's Small Modular Reactors Research and development program as a project work package under the Advanced Small Modular Reactor Licensing/Probability Risk Assessments project element.

The other, led by Idaho National Laboratories focuses on a RELAP7 and RAVEN-based platform, and is conducted under the Light Water Reactor Sustainability project. The latter of these is focused on developing tools for the nuclear industry (including the use of the industry-used RELAP code), and involves structured collaboration with the nuclear industry. Thus, the former initiative is more in line with the NRC's role as an independent regulator.

#### **Severe Accident Analysis Precision Considerations for Accident Management**

Severe accident modeling presents very different challenges to analysts and code developments compared to those addressed in design basis accident modeling due to the high degree of dependency on discrete event treatments in severe accident models. Severe accident models often have multiple sources of discrete events (e.g., safety valve cycling, molten core candling models, volume dry out determinations, and transitions from intact fuel to rubbilize fuel debris) which can cause reduced numerical precision in the severe accident code outputs. Evaluation of the robustness of the recommended decisions given the available precision, e.g., through time step stability studies, is important to consider when evaluating accident management.

## **2.0 OBJECTIVE**

The objective of this project is to further explore and develop the Level 2/3 modeling approach described above. The specific tasks envisioned are articulated in Section 3 of this proposal, and are intended to make tangible progress toward the following high-level goals:

- Leverage the prior AIM work as much as possible, and where appropriate, leverage other NRC-developed or commercially available tools;
- Improve the computational stability of the AIM platform, via either enhancements or replacements to the individual tools as well as their interfaces;
- Make the AIM platform more accessible to other users, other plant types, and/or other problem domains;
- Develop actionable results or insights for one or more of the following high-level concerns:
  - Use of dynamic PRA methods in practical applications;
  - Effect of instrument survivability on accident management – e.g., effect of injecting instrumentation failures in to accident response;
  - HRA Level 1 to Level 2 dependency;
  - Cognitive modeling of post-core damage accident management decision-making with TSC, main control room, and field operator interactions;
  - Effect of calculation truncation time and modeling of offsite resources.

## **3.0 SCOPE OF WORK**

The DOE Laboratory shall provide all resources necessary to accomplish the tasks and deliverables described in this statement of work (SOW).

The DOE Laboratory must support the Extension of AIM Platform for Dynamic PRA.

#### **4.0 SPECIFIC TASKS**

SNL shall perform the following tasks:

##### **Task 1: Familiarization and Status Check**

SNL shall review "Scoping Study on Advancing Modeling Techniques for Level 2/3 PRA," dated May 2009 (ML091320454) and SAND2012-9346 (ML12305A351) as well as pertinent references therein, to become familiar with the past work performed in this technical area by NRC and other parties. SNL shall also compile and review references for this technical area since October 2012. SNL shall summarize this review, and provide its perspective on the relevance of the proposed work to this line of research.

##### **Task 2: Formulation of Platform Enhancement Specifications and Demonstration Problem**

###### **2a) Formulation of Platform Enhancement Specifications**

SNL shall formulate specific recommendations for enhancing the AIM platform. Two software platforms will be evaluated.

###### **1) ADS-IDAC/MELCOR**

The existing ADS-IDAC/MELCOR platform will be evaluated in the following criteria;

- An assessment of the current ADS-IDAC configuration against the insights documented in SAND2012-9346.
- An assessment of necessary code coupling improvements to address the insights of SAND2012-9346, including an assessment of the requirements that would be needed to directly couple IDAC with MELCOR
- An assessment of the utility for leveraging using SNAP to manage code coupling, GUI and scheduling.

###### **2) ADAPT-IDAC/MELCOR (recommendation v from SAND2012-9346)**

The existing SNL ADAPT/MELCOR platform will be evaluated in the following criteria:

- An assessment of coupling IDAC with MELCOR through ADAPT.
- An assessment of establishing an ADAPT-IDAC/MELCOR Linux based platform.
- An assessment of establishing an ADAPT-IDAC/MELCOR Windows based platform.

At the end of Task 2, SNL will present to the NRC its insights and recommendations regarding which platform should be pursued in Tasks 3 and 4 and on which computer system the proposed platform should be developed.

OSU was awarded NRC research grant NRC-HQ-60-14-FOA-0001 entitled "Severe Accident Management Guideline (SAMG) Validation within the Context of Severe Accident Uncertainties." This grant also involves formulating recommendations and utilizing those recommendations to improve the AIM platform. Thus, SNL will coordinate with OSU AIM enhancements to avoid duplication of NRC funded research.

###### **2b) Formulation of Demonstration Problem**

SNL shall formulate specific recommendations for the demonstration problem that will be used to exercise the enhanced platform in Task 4, with consideration to the following:

- How one or more of the following technical challenges can be investigated:
  - Use of dynamic PRA methods in practical applications;
  - Effect of instrument survivability on accident management – e.g., effect of injecting instrumentation failures in to the accident progression and the potential impact upon operator response;
  - HRA Level 1 to Level 2 dependency;
  - Cognitive modeling of post-core damage accident management decision-making with TSC, main control room, and field operator interactions;
  - Effect of calculation truncation time and modeling of offsite resources.
- Which plant model should be utilized, and which version of the model should be utilized.
  - Should a plant model other than Surry be utilized?
- Should a robust-plant model (e.g., robust-Surry, robust-Peach Bottom) be developed to facilitate the dynamic branch requirements? Tradeoffs between long-running scenarios (that can more comprehensively address ex-vessel phenomena) versus computational burden.
- Impacts of code precision as mentioned in the background section uncertainty on recommended accident management actions.

Candidate scenarios of particular interest to be considered are:

- Loss of nuclear service water (due to complexity of capturing the effect of system degraded availability prior to failure/unavailability);
- Interfacing system LOCA (due to the high degree of uncertainty in the fission product attenuation modeling outside of containment); and
- Containment isolation failure (due to the wide range of potential failure sites/characteristics).

Specific recommendations will be made at this point with regard to what software quality processes are appropriate for this activity.

#### **2c) Identification of subcontracting requirements**

As Task 2 progresses, the need (or lack thereof) of subcontracting will be discussed by SNL and the NRC. SNL will make recommendations on this front the NRC.

#### **2d) Identification of Dynamic Event Tree severe accident modeling and code coupling research issues.**

SNL will present to the NRC in the Task 2 Letter Report insights regarding the scope and breadth of unresolved dynamic event tree severe accident modeling issues and for unresolved code coupling and enhancement issues. SNL will identify the potential effect of those issues upon the direction of further work under Tasks 3 and 4. SNL will recommend a specific AIM platform from the insights developed in Task 2a for execution of Tasks 3 and 4.

SNL and NRC staff shall hold one or more teleconferences to discuss these issues.

#### **Task 3: Implement Changes to the Platform**

Following SNL and NRC consensus on the recommendations made in Task 2, SNL shall implement the high priority changes to the AIM platform given available schedule and budget constraints. SNL shall engage in monthly teleconferences as directed by the NRC to discuss status and obstacles.

At the end of Task 3, SNL and NRC shall evaluate the changes that were successfully implemented into the AIM framework and determine whether or not the demonstration problem identified in Task 2 should be modified.

The schedule for Task 3 in Section 5 is based upon the assumption that no unforeseen technical barrier is encountered when updating the AIM framework.

#### Task 4: Application of the Platform to the Selected Demonstration Problem

Using the demonstration problem formulated in Task 2, and the platform developed in Task 3, SNL shall execute and document the demonstration problem that includes the robustness of the recommended actions given the modeling precision.

SNL and NRC may travel to OSU during Task 4 to ensure that OSU enhancements and severe accident management insights, developed under OSU's NRC research grant NRC-HQ-60-14-FOA-0001 are fully leveraged in SNL's demonstration problem – should the OSU work be relevant to the AIM platform option selected from Task 2.

During Task-4, SNL and NRC shall hold periodic meetings to discuss progress of the demonstration problem. These meetings can be in the form of teleconference calls or webinars. If unforeseen delays are experienced in researching the coupling of MELCOR, ADS, ADAPT and IDAC within the AIM framework, none of which are production codes, SNL shall immediately inform NRC to discuss modifications to the project schedule for deliverables and milestones as defined in Section 5.0. If the need for delays regarding milestones and deliverables become imminent delayed due to research nature of the codes involved, SNL will immediately contact NRC to reformulate scope and/or schedule considerations.

The schedule for Task 4 in Section 5 is based upon the assumption that no major computational issues are encountered during the demonstration problem which will require code developer support or extensive reconfiguring of the dynamic event tree branching logic based on insights derived from preliminary results.

#### Task 5: Documentation of the Results of Tasks 1-4 into a SAND Report

Documentation shall include a full description of the methodology (leveraging the letter report from Tasks 3 – See Section 5.0), and its application, and the identification of insights gained from the work.

#### Task 6: Platform Handoff

SNL shall perform a demonstration of the working version of the AIM platform at NRC Headquarters. This will include conveyance of all available software and supporting applications relevant to tool application (including limited user instructions given the developmental nature of the AIM platform). SNL shall also document the overall effort in a Laboratory report, including incorporation of NRC comments on the Task 3 and Task 4 letter reports (see Section 5.0).



## 5.0 DELIVERABLES AND/OR MILESTONES SCHEDULE

All products must be delivered (electronically and/or hardcopy, as specified below) to the Contracting Officer's Representative: Donald Helton, [Donald.helton@nrc.gov](mailto:Donald.helton@nrc.gov).

Task Number	Deliverable/Milestone Description (include NRC acceptance criteria if applicable)	Due Date (if any)
All	Monthly Letter Status Report Email to: <a href="mailto:Donald.Helton@nrc.gov">Donald.Helton@nrc.gov</a> ; <a href="mailto:ContractsPOT.Resource@nrc.gov">ContractsPOT.Resource@nrc.gov</a>	Monthly
1	Email attachment summarizing the effort under Task 1	NLT 2 months after commencement of Task 1.
2	A letter report (electronic only) documenting the effort under Task 2 and recommendations (including the proposed sequence of events for the remainder of the project)	NLT 2 months after completion of Task 1.
3	Monthly teleconferences, preceded by email status updates	Monthly
3	A letter report (electronic only) documenting the effort under Task 3	NLT 9 months after completion of Task 2.
4	Monthly teleconferences, preceded by email status updates	Monthly
5	A letter report (electronic only) documenting the effort under Task 4	NLT 9 months after completion of Task 3.
-	NRC will provide comments on the Task 3 and Task 5 letter reports	NLT 1 month after receiving both letter reports
	A final laboratory report (electronic and 10 hardcopies) providing the full methodology description and pilot application*	NLT 24 months after commencement of work
5	A DVD containing all necessary software and supporting applications needed for tool use	NLT 1 months after publication of final laboratory report
6	A demonstration seminar (slides to be provided electronically) at NRC	NLT 25 months after commencement of work

\* Since the Laboratory personnel may have no control over the publication schedule of the lab report, this deliverable can be satisfied by providing an electronic copy of the report submitted for publication, along with a commitment to provide 10 hardcopies of the report (and an updated electronic file if it changes) once the report has been published.

## 6.0 TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

The DOE Laboratory must have personnel available to work on the project that, collectively, possess most or all of the following characteristics:

- Be expert in the analysis of severe accidents at nuclear power plants,
- Be familiar with the dynamic PRA concept, relevant literature, and current suggested approaches,

- Be familiar with historical Level 1, Level 2, and Level 3 PRA studies,
- Be knowledgeable with regard to the treatment of severe accident phenomena, human interaction (including emergency response), structural response, and consequence analysis issues in contemporary Level 2 and Level 3 PRAs, and in contemporary deterministic analyses,
- Possess a good understanding of how emergency procedures and accident management guidelines are utilized,
- Be proficient in the analysis of severe accidents using MELCOR,
- Possess a good understanding of the human reliability analysis technology, as applied in Level 1 PRA, and
- Be proficient in software development and interface issues.

**Key Personnel:**

**Matthew R. Denman, Ph.D.**, is a senior research and development staff member in the Risk and Reliability Analysis department of the Nuclear Energy Safety Technologies Group at SNL. His group focuses on the applications of Probabilistic Risk Assessment to advanced fuel cycle facility licensing, severe accident analysis and risk management. Currently, Dr. Denman is working on focused on improving parameter and model uncertainty characterization for Level 2 PRA analysis as well as developing a new risk-informed accident diagnostic and response tool. Previously, Dr. Denman conducted the statistical portion of the MELCOR uncertainty analysis for the 1F1 meltdown, conducted a dynamic event tree analysis of an integral PWR, led a multi-laboratory initiative to examine and catalog safety and licensing gaps impeding the deployment of the Sodium Fast Reactor, participated in a review of the Attucha II Level 2 PRA, and developed advanced dynamic analysis fault tree formulations to risk-inform severe accident management guidance and passive system reliability.

**Don Kalinich** is a Principal Member of Technical Staff in the Severe Accident Analysis department. He has a BS and an MS in Mechanical Engineering from the University of Florida. He joined Sandia National Laboratories (SNL) in 2003. Currently he is involved with the development MELCOR models to evaluate potential severe accident conditions in commercial nuclear power plants, as well as the application of uncertainty analysis to severe accident modeling. Previously, Mr. Kalinich was the lead engineer for the Total System Performance Assessment (TSPA) group where he directed the development and production of the Yucca Mountain Project TSPA model. Prior to joining SNL, Mr. Kalinich was a Senior Engineer at Framatome ANP DES, a Senior Engineer at Duke Engineering & Services, Inc., a Senior Engineer at Westinghouse Safety Management Solutions, an Engineer at Westinghouse Savannah River Company, and a Research Engineering in the Department of Physiology at the University of Florida.

**Mr. Timothy A. Wheeler** is a Principal Member of Technical Staff at SNL in the Structural Integrity and Licensing Department in the Nuclear Energy & Global Security Technology Center. Since coming to SNL in 1980, he has worked in several areas involving systems safety and risk assessment of NPPs and transportation of radioactive materials. He was the Sandia Principal Investigator for the NRC Aircraft Threat Assessment program, on which he was also the lead BWR systems analyst and also supported PWR systems analyses. He was responsible for the identification of potential target points for threats, special dependencies for SSCs for the NRC's two pilot plant threat assessments and six follow on assessments, and was responsible for the integration of the structural, fire, and shock analyses to form a final damage assessment for the entire plant assessment. He has worked extensively on several programs in support of NRC safety analyses, including system analysis support for NRC Triennial Fire Safety inspections, low power shutdown safety analysis, and plant safety systems analysis for NRC PRA projects including NUREG-1150. He has also supported both NRC and DOE risk analysis for the transportation of radioactive wastes and environmental impact statements for

NEPA compliance. His extensive investigation of system dependencies, interactions, and vulnerabilities in support of NRC PRA, Aircraft Threat assessments, and fire safety inspections is highly germane to the requirements for reviewing BOP systems. He holds a BS in mechanical engineering from the University of New Hampshire and a MS in systems engineering from the University of Virginia.

**Katrina M. Groth, Ph.D.**, is a Senior Member of Technical Staff in the Risk and Reliability Analysis department of Sandia National Laboratories. She received her Ph.D. in Reliability Engineering in 2009 from the University of Maryland. She also holds an M.S. in Reliability Engineering and a B.S. in Engineering (Nuclear option) from the University of Maryland. Dr. Groth's work focuses on building quantitative causal models to support risk-informed decision making in complex engineered systems. Since coming to Sandia in 2010, she has worked on safety and risk assessment in multiple areas, including nuclear power plants, hydrogen fuel cells, and natural gas. Dr. Groth has over 8 years of experience developing advanced Human Reliability Analysis (HRA) methods, including participation in the NRC HRA Empirical Studies and early work on the IDHEAS project. In her graduate work, Dr. Groth used a combination of human performance data and expert models to develop a Bayesian Network model to assess human error probability based on specific aspects of the scenario context. She was PI for a Sandia-funded research effort to use emerging sources of human performance data to calibrate existing expert-based HRA methods. She is currently the PI for a DOE-EERE project to create methodology for analyzing risks associated with hydrogen infrastructure for transportation and stationary power applications. She was also PI for a Sandia-funded research effort to use emerging sources of human performance data to calibrate existing expert-based Human Reliability Analysis methods. Currently, Dr. Groth is also researching expert systems for use in nuclear power plant severe accident management.

**John Reynolds** is a senior software developer on contract with SAIC assigned to the Severe Nuclear Analysis Accident Group at SNL. He built and maintains clustering, software copy protection and MELCOR user support software packages with assistance from a small team of interns. He manages the source code database and the build and release cycle for MELCOR. He also wrote and manages the department download site software. He supports users on an as-needed basis on the Windows and Linux platforms and serves as liaison between the center and Sandia support personnel for all information technology needs.

## 7.0 ESTIMATED LABOR CATEGORIES AND LEVELS OF EFFORT (OPTIONAL SECTION)

Task Number	Labor Category	FY15 Est. Labor Hours	FY16 Est. Labor Hours	FY17 Est. Labor Hours	FY 18 Est. Labor Hours	Total
1	Senior Nuclear Engineer	60	-	-	-	60
	Principal Nuclear Engineer	50	-	-	-	50
2	Senior Nuclear Engineer	30	30	-	-	60
	Principal Nuclear Engineer	20	-	-	-	20
	Senior Nuclear Engineer	20	20	-	-	40
	Principal Nuclear Engineer	40	120	-	-	160
	Principal Nuclear Engineer	30	30	-	-	60
3	Senior Nuclear Engineer	-	240	-	-	240
	Senior Nuclear Engineer	-	80	-	-	80
	Principal Nuclear Engineer	-	200	-	-	200
	Principal Nuclear Engineer	-	440	-	-	440
4	Senior Nuclear Engineer	-	40	215	30	285
	Senior Nuclear Engineer	-	200	30	30	260
	Principal Nuclear Engineer	-	540	370	160	1070
5	Senior Nuclear Engineer	-	-	40	40	80
	Senior Nuclear Engineer	-	-	40	40	80
	Principal Nuclear Engineer	-	-	40	40	80
6	Senior Nuclear Engineer	-	-	-	80	80
	Principal Nuclear Engineer	-	-	-	80	80
<b>Total</b>		<b>250</b>	<b>1900</b>	<b>700</b>	<b>500</b>	<b>3390</b>

Assumption regarding labor estimates: As stated in Task 2, additional subcontracting may be required. The costs associated with additional subcontracting are not included in this proposal.

## 8.0 MEETINGS AND TRAVEL

There are two domestic trips to OSU expected under this project to coordinate research efforts with OSU's NRC research grant NRC-HQ-60-14-FOA-0001 entitled "Severe Accident Management Guideline (SAMG) Validation within the Context of Severe Accident Uncertainties," involving two SNL personnel traveling to Columbus, OH for a total of three days each (including travel time). The purpose of these trips are to align and incorporate potentially unpublished NRC sponsored dynamic PRA research from OSU that could directly impact the requirements described in Task 2.

There is one domestic trip to the NRC expected under this effort, involving two personnel traveling to NRC Headquarters for a total of four days (including travel time). The purpose of this trip is to perform the demonstration described in Task 5.

All travel requires written Government approval from the CO, unless otherwise delegated to the COR. Foreign travel for the SNL personnel requires a 60-day lead time for NRC approval. For prior approval of foreign travel, the SNL personnel shall submit 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/>. Foreign travel is approved by the NRC Executive Director for Operations (EDO).

## 9.0 REPORTING REQUIREMENTS

The DOE Laboratory is responsible for structuring the deliverable to follow agency standards. The current agency standard is Microsoft Office Suite 2010. The current agency Portable Document Format (PDF) standard is Adobe Acrobat 9 Professional. Deliverables must be submitted free of spelling and grammatical errors and conform to requirements stated in this section.

### **Monthly Letter Status Reports**

Where possible, software applications developed under this effort shall be compatible with the NRC's standard computing environment (currently Windows 7 Enterprise). In accordance with Management Directive 11.7, NRC Procedures for Placement and Monitoring of Work with the U.S. Department of Energy, the SNL personnel must electronically submit a Monthly Letter Status Report (MLSR) by the 20th day of each month to the Contracting Officer Representative (COR) with copies to the Contracting Officer (CO) and the Office Administration/Division of Contracts to ContractsPOT.Resource@nrc.gov. If a project is a task ordering agreement, a separate MLSR must be submitted for each task order with a summary project MLSR, even if no work has been performed during a reporting period. Once NRC has determined that all work on a task order is completed and that final costs are acceptable, a task order may be omitted from the MLSR.

The MLSR must include the following: agreement number; task order number, if applicable; job code number; title of the project; project period of performance; task order period of performance, if applicable; COR's name, telephone number, and e-mail address; full name and address of the performing organization; principal investigator's name, telephone number, and e-mail address; and reporting period. At a minimum, the MLSR must include the information discussed in Attachment 1. The preferred format for a MLSR can also be found in Attachment 1.

### **10.0 PERIOD OF PERFORMANCE**

The estimated period of performance for this work is 36 months from the date of agreement award.

### **11.0 CONTRACTING OFFICER'S REPRESENTATIVE**

The COR monitors all technical aspects of the agreement/task order 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/task order; perform inspections necessary in connection with agreement/task order performance; maintain written and oral communications with the DOE Laboratory concerning technical aspects of the agreement/task order; 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.

#### Contracting Officer's Representative

Name: Donald Helton

Agency: U.S. Nuclear Regulatory Commission

Office: Office of Nuclear Regulatory Research / 11555 Rockville Pike

Mail Stop: ~~2000~~ T10 A12

~~2000~~ Rockville MD 20852

E-Mail: Donald.Helton@nrc.gov

Phone: 301-415-~~1545~~ 1545

Alternate Contracting Officer's Representative

Name: Michelle Gonzalez

Agency: U.S. Nuclear Regulatory Commission

Office: Office of Nuclear Regulatory Research / 11555 Rockville Pike

Mail Stop: [REDACTED] Rockville MD 20852

E-Mail: Michelle.Gonzalez@nrc.gov

Phone: 301-415-7000

**12.0 MATERIALS REQUIRED**

N/A

**13.0 NRC-FURNISHED PROPERTY/MATERIALS**

The following NRC-furnished property/material will be provided to the DOE Laboratory:

<b>NRC-Furnished Property/Material</b>	<b>Quantity</b>	<b>Date provided to DOE Laboratory</b>	<b>Method of Shipment</b>
<i>ADS-IDAC source code (if applicable)</i>	n/a	At the start of Task 3	E-mail
<i>Any applicable proprietary information (procedures and design information) for the subject plant</i>	n/a	At the start of Task 3	E-mail

**14.0 RESEARCH QUALITY**

The quality of NRC research programs are assessed each year by the Advisory Committee on Reactor Safeguards. Within the context of their reviews of RES programs, the definition of quality research is based upon several major characteristics:

Results meet the objectives (75% of overall score)

Justification of major assumptions (12%)

Soundness of technical approach and results (52%)

Uncertainties and sensitivities addressed (11%)

Documentation of research results and methods is adequate (25% of overall score)

Clarity of presentation (16%)

Identification of major assumptions (9%)

It is the responsibility of the DOE Laboratory to ensure that these quality criteria are adequately addressed throughout the course of the research that is performed. The NRC COR will review all research products with these criteria in mind.

#### **15.0 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.

## **16.0 OTHER CONSIDERATIONS**

### References

US NRC, "Scoping Study on Advancing Modeling Techniques for Level 2/3 PRA," dated May 2009. (ML091320454)

Sandia National Labs, "Discrete Dynamic Probabilistic Risk Assessment Model Development and Application," dated October 2012. (ML12305A351)

### Access to Non-NRC Facilities/Equipment

N/A

### Applicable Publications

N/A

### Controls over document handling and non-disclosure of materials

In accordance with standard terms and conditions for NRC/DOE Lab Agreements.

## **17.0 CONFLICT OF INTEREST INFORMATION**

Upon submitting a proposal to the NRC, Sandia National Laboratories continues to acknowledge the disclosure requirements of: 1) the NRC Clause, the NRC Conflict of Interest, Management Directive 11.7, Section 2.3.2.12 and Section 2.33; and 2) the provisions of the Memorandum of Understanding (MOU) between DOE and NRC, dated 1998 (which states, in part, that DOE recognizes that Section 170A of the Atomic Energy Act of 1954, as amended, requires that NRC be provided with disclosures on potential conflicts when NRC obtains technical, consulting, research and other supporting services). DOE further recognizes that the assignment of NRC work to Sandia National Laboratories must satisfy NRC's organizational conflict of interest (OCOI) standards.

Therefore, Sandia National Laboratories in its proposal to NRC (which will be incorporated into an interagency agreement between NRC and DOE), makes an assertion per #1 or #2 of Part A below. If Sandia National Laboratories selects #1, then, it also fills out the accompanying Part B; whereby Sandia National Laboratories, again, makes an assertion by answering each of the five (5) NRC OCOI provisions per the NRC Acquisition Regulation (NRCAR).



**STANDARD TERMS AND CONDITIONS TO BE ATTACHED TO ALL NRC INTERAGENCY  
AGREEMENTS AWARDED TO DEPARTMENT OF ENERGY (DOE) NATIONAL  
LABORATORIES**

All work performed for NRC at a DOE laboratory is conducted under the terms and conditions of the DOE contract in place to manage and operate that laboratory. The below set of terms and conditions provide additional guidance in specific areas that are particular to work performed for NRC and supplement the DOE contract provisions.

**1. Technical Direction**

The NRC Contracting Officer's Representative (COR), as named in the NRC Statement of Work (SOW), is responsible for ensuring that the services required under this project are delivered in accordance with the terms of the SOW. All technical direction instructions to the DOE Laboratory must be issued through the COR.

Technical direction includes interpreting technical specifications, providing needed details, and suggesting possible lines of inquiry. Technical direction must not constitute new work or affect overall project cost or period of performance. Technical direction must be confirmed in writing to the DOE Laboratory, a copy provided to the DOE Site Office or the DOE Field Office, and a copy placed in the NRC Program Office project file.

**2. Key Personnel**

The individual(s) identified as key personnel in the Technical Proposal, is (are) considered essential to the successful performance of the work. The DOE Laboratory agrees that these personnel shall not be removed from the project or replaced without complying with the following:

- 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 workdays, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the DOE Laboratory shall immediately notify the Contracting Officer (CO) in NRC's Acquisition Management Division of its intent to make key personnel replacements.
- All requests for approval of substitutions on a project shall be in writing and shall provide detailed explanation of the circumstances necessitating the proposed substitutions. The request shall contain a complete résumé for the proposed substitute and other information requested by the NRC office to approve or disapprove the proposed substitution. The NRC will evaluate such requests and promptly notify the DOE Laboratory of its approval or disapproval thereof in writing.
- The project may be terminated if the office determines that:

Suitable and timely replacements of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the project is not reasonably forthcoming.

The resultant reduction of effort or expertise would be so substantial as to impair the successful completion of the project or work order.

### **3. Billing Requirements**

DOE shall bill NRC monthly for costs paid in support of NRC projects by the agreement number and task order number (if applicable). The DOE shall bill and collect from NRC by an electronic transfer of funds through the U.S. Treasury Intergovernmental Payment and Collection System (IPAC).

The DOE voucher shall identify the NRC Agreement Number and the NRC Task Order number (if applicable). The DOE voucher, as a minimum, shall indicate the month that costs were incurred and the dollar amount of these costs. In some instances because of accrual accounting and other adjustments, the amounts may differ slightly from the original accrual amount.

When monthly letter status report (MLSR) costs differ from the amount billed, DOE shall provide an explanation of the difference on the voucher.

The DOE voucher shall be sent to support the IPAC funds transfer. The instructions must identify the billable activities as specified by 10 CFR Part 170. The DOE voucher and other required documentation shall be submitted to—

NRC Payments  
U.S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Mailstop O3-E17A  
Rockville, MD 20852-2738

#### **Electronic Commercial Vendor and IPAC Payments:**

Effective immediately, commercial vendors and Federal entities should use the new electronic mailing addresses shown below:

Invoice and training billing Email address – [NRCPayments@NRC.gov](mailto:NRCPayments@NRC.gov)

IPAC billing Email address – [NRCIPAC.Resource@NRC.gov](mailto:NRCIPAC.Resource@NRC.gov)

### **4. Monthly Letter Status Reports (MLSR)**

In accordance with MD 11.7, the DOE laboratory shall submit a Monthly Letter Status Report (MLSR) by the 20th day of each month to:

- NRC Contracting Officer's Representative

With copies to the following:

- Office of Administration/Acquisition Management Division (electronic copy only) to [ContractsPOT.Resource@nrc.gov](mailto:ContractsPOT.Resource@nrc.gov)

The MLSR should contain at a minimum all of the information required in the instructions for completing Monthly Letter Status Reports as defined in Attachment 1 of the NRC SOW.

### **5. Limitation of Funds**

NRC is not obligated to reimburse DOE for costs incurred by its contractors in excess of the total amount obligated by an appropriately executed interagency agreement form. The NRC CO in NRC's Acquisition Management Division will formally notify the appropriate DOE Site Office or the DOE Field Office of any projects that are intended to be phased out or terminated as soon as such intent is known, preferably at least 30 days before the proposed termination date. For work orders with fixed performance periods, the DOE Site Office or the DOE Field Office should assume that the program will terminate on the last day of the period specified in the award form unless notified otherwise.

If at any time the Laboratory has reason to believe that the costs will exceed the total amount authorized, the Laboratory must notify NRC and the DOE Site Office or the DOE Field Office. In the absence of formal NRC instructions to continue or to terminate a work order, the DOE Site Office or the DOE Field Office contract officer or his or her designee will notify NRC by e-mail or other suitable written means when the accrued costs of any NRC work order approaches 75 percent of the authorized funding level for a project or task order (TO).

The notification should include the estimated date when the accrued costs will equal the authorized funds, and may, if appropriate, recommend or request the NRC action desired. The notification should be sent to the appropriate NRC CO and COR with a copy to DOE. After this notification, the NRC will evaluate costs incurred against technical progress and, if necessary, will:

- Increase funding authorization
- Change the scope of the work
- Change the period of performance
- Terminate the project

The performance of work shall be completed within the period stated in the most current authorization document. When the DOE Laboratory anticipates that the work cannot be completed within the fixed time period, it shall notify the NRC CO and COR in writing and send a copy of the notice to the DOE Site Office or the DOE Field Office. Notification shall be made in sufficient time to allow for the issuance of a modification to the agreement, authorizing an extension of the work period to the date necessary to complete the authorized work. If the period of performance is not extended, the office shall notify DOE and the DOE Laboratory via issuance of a modification which should contain closeout instructions, including the reconciliation of any excess funds.

#### **6. Organizational Conflict of Interest**

Upon submitting a proposal to the NRC, each DOE Laboratory would continue to acknowledge the disclosure requirements of: 1) MD 11.7, "Organizational Conflict of Interest"; and 2) the provisions of the Memorandum of Understanding (MOU) between DOE and NRC, dated 1998 (which states, in part, that DOE recognizes that Section 170A of the Atomic Energy Act of 1954, as amended, requires that NRC be provided with disclosures on potential conflicts when NRC obtains technical, consulting, research and other supporting services). DOE further recognizes that the assignment of NRC work to DOE laboratories must satisfy NRC's organizational conflict of interest (OCOI) standards.

Therefore, each DOE Laboratory, in its proposal to NRC (which will be incorporated into an interagency agreement between NRC and DOE), is required to make an assertion per #1 or #2 of Part A below for themselves and all subcontractors proposed prior to their award. If the

Laboratory selects #1, then, it must also fill out the accompanying Part B – whereby the Laboratory must, again, make an assertion by answering each of the five (5) NRC OCOI provisions per the NRC Acquisition Regulation (NRCAR).

PART A:

"In accordance with [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] role in, and responsibility for, disclosing its relationships with organizations which conduct business in the same and/or similar technical area as described by the present and/or ongoing NRC project's scope of work, and in accordance with the NRC clause as stated herein, [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby asserts that it has examined its relationships with all such organizations, and has also examined its current and future/planned work, and where appropriate, its past work (generally for the previous five years), for DOE and other organizations, and [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] states the following:

1) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses the following relationships \_\_\_\_\_ [state the name of persons, organizations, and business relationships, etc. \*\*] \_\_\_\_\_ that may give rise to a potential OCOI. (DOE Laboratory or subcontractor must answer the questions in Part B below);

Or

2) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] to the best of its knowledge and belief, asserts that it has no current work, planned work, and where appropriate, past work for DOE and others (to mean - organizations in the same and/or similar technical area as the present and/or ongoing NRC project scope of work); and [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby asserts that it is not aware of any same/similar technical work that would give rise to any potential OCOI as defined in the Atomic Energy Act of 1954, as amended, and in the NRC/DOE MOU.

Signed: \_\_\_\_\_

PART B:

In accordance with [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] role/responsibility regarding OCOI disclosure, as stated in Part A, above [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] further discloses, to the best of its knowledge and belief, that:

1) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] and/or any of its organizational affiliates\* as defined in Part A above [does/does not] provide advice and recommendations to the NRC in the same technical area (e.g., fire protection, PRA, seismic, vulnerability analysis, fracture mechanics) where it is also providing consulting assistance to any organization regulated by NRC. If [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] "does" - the [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses such organization(s) in Part A above;

2) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] and/or any of its organizational affiliates as defined in Part A above [does/does not] provide advice and recommendations to the NRC on the same or similar matter (e.g., particular licensing

amendment, particular EIS, particular high level waste repository site) on which it is also providing assistance to any organization regulated by NRC. If [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] "does" - the [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses such organization(s) in Part A above;

3) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] and/or any of its organizational affiliates as defined in Part A above [will/will not] be required to evaluate its own products or services, or has been substantially involved in the development or marketing of the products or services of another entity. If [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] "does" - the [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses such organization(s) in Part A above;

4) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] and/or any of its organizational affiliates as defined in Part A above [does/does not] have a conflicting role, given the award of the present and/or ongoing NRC project, in which its judgment or the judgment of any of its organizations may be biased in relation to its work for NRC. If [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] "does" - the [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses such conflicting role(s) with organization(s) in Part A above;

5) [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] and/or any of its organizational affiliates as defined in Part A above [are/are not] soliciting or performing concurrent work at an applicant or licensee site, while performing work in the same/similar technical area for NRC at the same site. If [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] "does" - then the [INSERT NAME OF DOE LABORATORY OR SUBCONTRACTOR] hereby discloses such organization(s) in Part A above."

Signed: \_\_\_\_\_

\*Organization affiliate - Business concerns which are affiliates (related) to each other when either directly or indirectly, one concern or individual controls or has the power to control another, or when a third party (i.e. parent firm) has the power to control both.

\*\* The Atomic Energy Act of 1952 uses the term "person" to mean any entity - e.g., sole proprietorship, partnership, joint venture, corporation; university; limited partnership, subchapter S corporation; limited liability company, etc.

#### **7. Incompatibility Between Regular Duties and Private Interests**

(a) Employees of a management and operating contractor shall not be permitted to make or influence any decision on behalf of the contractor which directly or indirectly affects the interest of the Government, if the employee's personal concern in the matter may be incompatible with the interest of the Government. For example: An employee of a contractor will not negotiate, or influence the award of, a subcontract with a company in which the individual has employment relationship or significant financial interest; and an employee of a contractor will not be assigned the preparation of an evaluation for DOE or for any DOE contractor of some technical aspect of the work of another organization with which the individual has an employment relationship, or significant financial interest, or which is a competitor of an organization (other than the contractor who is the individual's regular employer) in which the individual has an employment relationship or significant financial interest.

(b) The contractor shall be responsible for informing employees that they are expected to disclose any incompatibilities between duties performed for the contractor and their private interests and to refer undecided questions to the contractor.

### **8. Intellectual Property Rights**

The statutory, regulatory, and procedural intellectual property policies of DOE will be applicable to the work falling under this work order—

- Provided that information concerning disclosures of inventions identified as having been conceived or first actually reduced to practice under Commission-funded work will be reported to the Commission, and the Commission will be kept advised as to their status.
- Except that the Commission reserves the right to control title to inventions as to any rights that vest in the Commission under statute. If DOE and DOE's contractor, where the contractor has such rights, should determine not to protect these inventions either domestically or abroad, the Commission will have the right to protect these inventions.
- Provided that if the technology covered by an invention disclosure upon which DOE intends to file a patent application on behalf of the U.S. Government is deemed by the Commission to fall within the Commission's mission, that is, when the technology relates to nuclear facilities and materials safety, safeguards, and environmental protection in support of the Commission's licensing and regulatory functions, the Commission may so notify DOE and a determination will be made by the parties as to which party will file the patent application or applications.
- Provided that neither party shall grant an exclusive patent license on an agency owned invention without the approval of the other party.

### **9. Acquired Material, Equipment, or Software (Property)**

In accordance with Management Directive 11.7, the Laboratory proposal must include a description of the property required for project performance that has an estimated acquisition cost of \$500 or more. The proposal must also identify the potential development of NRC-funded software during the project. NRC-funded software is software specifically developed for NRC by the Laboratory and is generally the deliverable for the project.

After the NRC reviews the list of property and NRC-funded software included in the Laboratory proposal, any questions regarding the acquisition of property or the development of NRC-funded software will be addressed with the Laboratory during negotiations. After negotiating project terms and conditions, NRC shall issue an agreement authorizing the work and approving acquisition of property or development of NRC-funded software.

Laboratories shall submit a written request to the NRC project manager for approval to develop additional NRC-funded software or purchase additional property with an estimated acquisition cost of \$500 or more after work initiation. The project manager shall approve or disapprove the acquisition or development of any additional items in writing.

DOE Laboratories shall report property, including software, with an acquisition cost of \$500 or more in the monthly letter status report in the month the property or software was acquired. DOE laboratories shall forward an electronic copy of all monthly letter status reports to the NRC

Office of Administration, Acquisition Management Division: [ContractsPOT.Resource@nrc.gov](mailto:ContractsPOT.Resource@nrc.gov), in addition to the NRC COR. DOE Laboratories shall provide the information listed in the Monthly Letter Status Report instructions for each item reported as appropriate, in the monthly letter status report.

#### **10. Dissemination of Project Information/Publication Requirements**

(a) Prior to any dissemination, display, publication, presentation, or release of papers, articles, reports, summaries, or abstracts developed under the NRC/DOE Agreement, the DOE Laboratory shall submit them to the NRC for review and comment. NRC shall have a review and comment period of at least [60] days, after which both an NRC and DOE Laboratory representative at the lowest management level, shall attempt to resolve any differing viewpoints or statements which are the subject of NRC objection. If the matter cannot be resolved at that level, the issue shall be brought up to the next management level in both organizations until an agreement can be reached or it reaches the Office Director level. Matters which cannot be resolved at this level shall be submitted for resolution to the Laboratory's Technology Partnership Ombudsman (as set forth in the Laboratory's Management and Operating contract with DOE or NNSA pursuant to § (p) of Department of Energy Acquisition Regulation (DEAR) 970.5227-3 "Technology Transfer Mission" (Aug 2002)). In the event resolution cannot be achieved by the Ombudsman, the NRC may direct the Laboratory/DOE to not publish the work as a NUREG/CR, but publish as a Laboratory report without the NRC office name or Project Manager's name listed on the report, and with a Disclaimer conspicuously noted on the report, article, summary, abstract or related document that the Laboratory/DOE intends to release, display, disseminate or publish to other persons, the public or any other entities:

"The views expressed in this [paper, journal article, report, summary, or abstract] do not represent those of the U.S. Nuclear Regulatory Commission."

(b) The NRC and DOE agree to handle all classified information provided or developed during the course of this project in accordance with all applicable laws and regulations governing the handling of such information. In the event NRC determines during its review and comment period that a draft Laboratory paper, article, report, summary, or abstract contains classified information regarding the work performed for NRC, NRC, in addition to commenting on the subject matter, shall also direct the Laboratory/DOE to direct an authorized classification authority to appropriately review, classify and mark the product, pursuant to nationally acceptable standards/guidelines. Under these circumstances, the Laboratory will either publish the work solely as a classified product pursuant to NRC direction, or not publish the work in any format. In cases where classification of the product is in dispute, NRC may consult with DOE's Office of Classification; however NRC retains the ultimate authority over the classification of the product.

(c) In addition, travel costs to present papers or reports developed under the NRC/DOE Agreement may not be authorized if the NRC program manager determines that presentation of the paper does not support the NRC program or project. Such determination will not affect payment of the contract work costs.

(d) The DOE Laboratory contractor, to the extent it is permitted to and asserts copyright therein, grants a royalty-free, nonexclusive, irrevocable worldwide license to the Government to use, reproduce, modify, distribute, prepare derivative works, release, display or disclose the articles, reports, summaries, abstracts, and related documents developed under the Agreement, for any governmental purposes and to have or authorize others to do so.

### **11. Review and Approval of Reports**

The Laboratory/DOE shall comply with the terms and conditions of the agreement regarding the contents of the draft and final reports, summaries, data and related documents, to include correcting, deleting, editing, revising, modifying, formatting and supplementing and of the information contained therein. Corrective actions shall not be undertaken unless sufficient funding from NRC is available to cover the costs of the corrective actions. Performance under the agreement shall not be deemed accepted or completed until it complies with NRC's directions.

Identification/Marking of Sensitive Unclassified and Safeguards Information. DOE shall comply with the requirements stated MD's 12.7 "NRC Safeguards Information Security Program" as follows:

#### **a) Classification Clause**

To the extent that the performance of work under this work order involves classified information, the following clause is applicable:

- In the performance of work under this work order, DOE shall ensure that a DOE authorized classifier shall assign classification levels to all documents, material, and equipment originated or generated by the performing organization in accordance with classification guidance furnished by the Commission. Each subcontract and purchase order issued hereunder involving the generation of classified documents, material, or equipment shall include a provision to the effect that in the performance of such subcontract or purchase order, a DOE authorized classifier shall assign classification levels to all such documents, material, and equipment in accordance with classification guidance furnished by the NRC.
- When appropriate, the attached NRC Form 187, "Contract Security and/or Classification Requirements," is a part of this work order. It is the responsibility of the NRC office originating the work order to review the classification assigned and to refer any problems to the NRC Division of Security Operations (DSO), NSIR, for resolution.

#### **b) Safeguards Information, Unclassified Controlled Nuclear Information, or Unescorted Access to Protected and Vital Areas of Nuclear Power Plants**

To the extent that the performance of work under this work order involves Safeguards Information (SGI), the following clause is applicable:

In the performance of the work under this project, DOE shall assure that the DOE laboratory shall mark and protect all documents, material, and equipment originated, generated, or received by the performing organization in accordance with the provisions of Section 147 of the Atomic Energy Act of 1954, as amended, its implementing regulations (10 CFR 73.21), "Protection of Safeguards Information: Performance Requirements." Further guidance on the protection of Safeguards Information and examples of proper marking of cover, title page, and back cover are contained in NRC Management Directive (MD) 12.7, "NRC Safeguards Information Security Program" and the NRC Guide to Marking Safeguards Information.



To the extent that performance of work under this work order involves unclassified controlled nuclear information (UNCI), the following clause is applicable:

In the performance of the work under this project, DOE shall assure that the DOE laboratory shall mark and protect all documents, material, and equipment originated, generated, or received by the performing organization in accordance with the provisions of Section 148 of the Atomic Energy Act of 1954, as amended, is implementing DOE regulations, and DOE orders and guidance.

It is the responsibility of the NRC office originating the work to indicate whether the work will involve SGI or unescorted access to protected and vital areas of nuclear power plants. An NRC Form 187, "Contract Security and/or Classification Requirements," shall be completed to indicate such access.

**c) Proprietary Information**

In connection with the performance of work under this work order, NRC may furnish for DOE review, evaluation, or other use certain trade secrets or confidential or privileged commercial or financial information determined by the office to be exempt from public inspection or disclosure. A synopsis of such information must be submitted in writing to the DOE contracting officer for reaching agreement with the office on the acceptance and use of the information. Up-to-date guidance on the protection of proprietary information used in reports prepared by the DOE laboratory on proper marking of cover, title page, and back cover may be obtained from the NRC COR.

Proprietary or other privileged information may be provided by the office on an individual basis to DOE laboratory employees working as NRC consultants with the understanding that it shall be protected from disclosure and shall be returned to the office upon completion of the work. Any such claimed proprietary data will be appropriately identified and marked as such. The use of proprietary information in reports prepared by consultants requires protection. Further information may be obtained from the NRC COR.

**d) Other Sensitive Unclassified Non-Safeguards Information (SUNSI)**

Information other than safeguards, unclassified controlled nuclear, proprietary information, and pre-decisional information may at times be determined to be sensitive. The use of such information in reports requires the specific NRC designation and protection as prescribed by the NRC SUNSI policy. Further information may be obtained from the NRC COR.

**12. Sensitive Information Work Efforts**

To the extent that the performance under this work order involves classified information, the following clauses are applicable:

- Responsibilities. DOE and the DOE contractor (performing organization) shall be responsible for safeguarding Restricted Data, Formerly Restricted Data, and other National Security Information and for protecting it against sabotage, espionage, loss, and theft in accordance with applicable NRC and DOE security regulations and requirements.
- Transmission of Classified Matter. Except as otherwise expressly provided, DOE or the DOE contractor shall, upon completion or termination of the work order, transmit to the NRC

program office all classified matter in its possession or in the possession of any person under its control in connection with performance of this project or work order. If retention of any classified matter is required by DOE or the DOE contractor, DOE must obtain the approval of the NRC program office and complete a certificate of possession specifying the classified matter to be retained.

- Regulations. DOE and the DOE contractors shall be responsible for compliance with all applicable NRC and DOE security regulations and requirements.
- Definition of Restricted Data. The term "Restricted Data," as used in this clause, means all data concerning (1) the design, manufacture, or utilization of atomic weapons; (2) the production of special nuclear material; or (3) the use of special nuclear material in the production of energy, but does not include data declassified or removed from the Restricted Data category pursuant to Section 142 of the Atomic Energy Act of 1954, as amended.
- Definition of Formerly Restricted Data. The term "Formerly Restricted Data," as used in this clause, means classified information related primarily to the military utilization of atomic weapons that can be adequately safeguarded as National Security Information, subject to the restrictions on transmission to other countries and regional defense organizations that apply to Restricted Data.
- Definition of National Security Information. National Security Information is information that has been determined pursuant to Executive Order 13526 or any predecessor order to require protection against unauthorized disclosure and is so designated.
- Security Clearance of Personnel. DOE and DOE laboratories shall not permit any individual to have access to Restricted Data, Formerly Restricted Data, or National Security Information, except in accordance with the Atomic Energy Act of 1954, as amended, Executive Orders 12968 and 10865, and DOE regulations or requirements applicable to the particular type or category of classified information to which access is required.
- Safeguards Information Access. DOE and DOE laboratories shall not permit any individual to have access to Safeguards Information, except in accordance with 10 Code of Federal Regulations Part 73.22 and NRC Management Directive 12.7.
- Liability. It is understood that the unauthorized disclosure or the failure to properly safeguard Restricted Data, Formerly Restricted Data, or National Security Information that may come to the DOE or to any person under an NRC/DOE work order in connection with work under the work order may subject the performing organization, and its agents, employees, or subcontractors, to administrative sanctions and criminal liability under the laws of the United States. (See the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011et seq.], 18 U.S.C. 793 and 794; and Executive Orders 13526 and 12968.)
- Subcontracts and Purchase Orders. Except as otherwise authorized in writing by the Commission, DOE shall insert provisions similar to the foregoing in all subcontracts and purchase orders under this project or work order.

### **13. Software Development**

Systems development efforts shall comply with applicable Government-wide Federal

Information Processing Standards developed by the National Institute of Standards and Technology, applicable public laws, Office of Management and Budget circulars, and NRC policies and procedures. Particular attention is necessary to incorporate security features in the design of systems that process sensitive data. The format of software deliverables is specified in NRC Bulletin 0904-4. If any deliverable is provided on diskette, the diskette shall be scanned for viruses by the contractor and verified to be free of viruses before delivery to NRC. All software development, modification, or maintenance tasks shall follow general guidance provided in NUREG/BR-0167, "Software Quality Assurance Program and Guidelines." NRC shall advise the DOE Patent Counsel with respect to any rights in the software that NRC desires under any particular project, which rights include NRC imposing restrictions on use, and distribution of the software by DOE or the Laboratory.

#### **14. Copyright in Computer Software and Codes**

In the event that a DOE Laboratory desires to assert a copyright of any computer software or computer code funded in whole or in part by NRC, the Laboratory shall request, in writing, the written approval of the cognizant NRC division director or designee before advising DOE's patent counsel of the Laboratory's desire to seek the copyright.

If NRC determines that public health and safety or other programmatic considerations dictate that the DOE Laboratory contractor should not be given permission to copyright the computer software or code, the NRC CO, after consultation with the NRC Office of the General Counsel (OGC) and the division director or designee, shall so advise the Laboratory in writing.

Alternatively, if permission to copyright computer software or a computer code is granted, the cognizant NRC CO, after consultation with OGC and division director or designee, shall provide the Laboratory with written notice of that decision. In those cases in which the cognizant NRC CO determines that the rights retained by the Government pursuant to the copyright provisions of the Laboratory contract should be modified to protect NRC's interests, NRC will advise DOE's patent counsel of NRC's desire to modify DOE's standard policy with respect to permission for a contractor to assert copyright in that code. DOE and NRC will then jointly determine the appropriate provisions for the code. The DOE patent counsel shall provide the Laboratory with written notice, with a copy to the cognizant NRC division director or designee, of that joint determination. The Laboratory may then proceed to assert copyright.

In no case shall the DOE Laboratory take action relating to assertion of copyright until the NRC CO provides written approval to the Laboratory's request to assert copyright. Further, DOE shall not permit a contractor to assert copyright of an NRC-funded computer code or computer software without the written approval of the cognizant NRC division director or designee. Where NRC has not granted permission to copyright, NRC recognizes that once a Laboratory has delivered to NRC a developed version of a particular code, the Laboratory may exercise the existing right that both the Laboratory and other parties have to further develop, without NRC funds, software codes that are in the public domain and to copyright the new, non-NRC-funded versions of these codes without NRC approval.

#### **15. Appropriate Use of Government Furnished Information Technology (IT) Equipment and/or its Services/Access**

When the NRC work at a DOE site requires electronic processing of information, DOE will follow NIST Special Publication (SP) 800-37 Rev. 1 or later, and SP 800-53 Rev. 3 or later (which are based on FIPS-199 and FIPS-200). For those specific projects with electronic processing of

Safeguards Information (SGI), Restricted Data (RD) and/or Unclassified Nuclear Information (UCNI), the NRC shall provide DOE with the appropriate requirements that must be met on a project by project basis. In addition, for those specific projects that require classified electronic information processing, DOE will follow the CNSS policy, directives, instructions, and guidance.

#### **16. NRC Information Technology Security Training**

Agencies/Contractors shall ensure that their employees, consultants, and subcontractors with access to the NRC's information technology (IT) equipment and/or IT services complete NRC's online initial and refresher IT security training requirements to ensure that their knowledge of IT threats, vulnerabilities, and associated countermeasures remains current. Both the initial and refresher IT security training courses generally last an hour or less and can be taken during the employee's regularly scheduled work day. Agency/Contractor shall ensure that their employees, consultants, and subcontractors, with access to the NRC's IT equipment, complete the Information Security (INFOSec) Awareness Training annually; no later than December 31<sup>st</sup>.

Agency/Contractor employees, consultants, and subcontractors shall complete the NRC's online, "Computer Security Awareness" course on the same day that they receive access to the NRC's IT equipment and/or services, as their first action using the equipment/service. For those Agency/Contractor employees, consultants, and subcontractors who are already working under an existing agreement/contract, the online training must be completed in accordance with agency Network Announcements issued throughout the year.

Agency/Contractor employees, consultants, and subcontractors who have been granted access to NRC information technology equipment and/or IT services must continue to take IT security refresher training offered online by the NRC throughout the term of the agreement/contract. Agency/Contractor employees will receive notice of NRC's online IT security refresher training requirements through agency-wide notices.

The NRC reserves the right to deny or withdraw Agency/Contractor use or access to NRC IT equipment and/or services should the Agency/Contractor violate the Agency/Contractor's responsibility under this clause.

#### **17. Contract Security Requirements for Unescorted Access to Nuclear Power Plants**

If performance under this work order involves unescorted access to protected and vital areas of nuclear power plants or access to nuclear power reactor SGI, individual contractors requiring access to protected and vital areas of nuclear power plants or access to nuclear power reactor SGI shall be approved for unescorted access in accordance with the following procedures:

##### **17.1 Temporary Approval**

The contractor (DOE laboratory employees and laboratory contractors) does not need a temporary approval if he or she has a valid Government clearance, for example, a DOE "Q" or "L" clearance. If the contractor employee does not have such a clearance, the contractor shall submit the information discussed below within 30 calendar days following contract award, modification, or proposal of new personnel for contract tasks. This information shall be provided for each person proposed to perform tasks requiring unescorted access to nuclear power plants or access to nuclear power reactor SGI. If access to SGI is needed, and unescorted access is not required, the provisions of 10 CFR 73.22 must be followed as a condition for access to SGI.

The information shall be provided to the NRC Division of Facilities and Security (DFS) through the NRC COR and consists of the following:

- A completed Personnel Security Forms Packet, including an SF 86, "Questionnaire for National Security Positions," and copies of the individual's 5-year employment and education history checks, including verification of the highest degree obtained
- A reference from at least one additional person not provided by the individual
- Results of a psychological evaluation (This is not a requirement of the background check that is required for access to SGI.
- Form FD-258, ORIMDNRC000Z (Fingerprint Card)
- A certification that the contractor has found all checks acceptable

The results of a psychological examination that uses a reliable written personality test or any other professionally accepted clinical evaluation procedure shall be used to evaluate a subject's trustworthiness, reliability, and stability. The contractor shall review all required information for accuracy, completeness, and legibility, except Part 2 of the SF 86, which must be completed in private and submitted, along with the Form FD-258 by the individual to the contractor in a sealed envelope, or the individual shall be fingerprinted by the subject utility, and the contractor shall be subject to the utility's access authorization program. As described in this section, DFS shall conduct criminal history and credit checks and a security assurance interview with the individual. On the basis of the results of these checks, DFS shall determine the individual's eligibility for temporary access and indicate an objection or no objection to NRC pending completion of the required background investigation.

#### 17.2 Final Approval

Final approval shall be granted if:

- The individual has completed processing (by the Office of Personnel Management) of the required investigation resulting in NRC endorsement for unescorted access at all nuclear facilities for the life of the contract.
- The contractor has obtained unescorted access authorization (other than temporary access) at the specific utility through that utility's access authorization program, resulting in unescorted access at a specific facility.
- The individual possesses a valid Government-issued clearance as verified by DFS.
- A valid Government-issued clearance is defined as a U.S. Government-issued security clearance equivalent to or higher than an NRC "L" clearance (i.e., Secret) based on a comparable investigation not more than 10 years old. The investigation specified in MD 11.7, Section 11.12.2 may involve an National Agency Check and Inquiries (NACI) or other investigation as deemed necessary by DFS in accordance with 10 CFR Part 10, 10 CFR 73.22, NRC MD's 12.3, "NRC Personnel Security Program" and 12.7 "NRC Safeguards Information Security Program." Any question regarding the individual's eligibility for unescorted access to protected or vital areas of nuclear power facilities will be resolved in accordance with the provisions set forth in MD 12.3, which are incorporated into the work

order by reference as though fully set forth therein. The contractor shall, for each contractor individual approved for access under the provisions of this section, submit to DFS through NRC a signed statement from the individual that he or she understands his or her responsibility to report information bearing on his or her continued eligibility for access authorization as specified in MD 12.3. Access to SGI not also involving unescorted access to protected and vital areas of nuclear power plants shall require the submission of a completed Personnel Security Forms Packet to DFS through NRC and will require a Background Check in accordance with 10 CFR Part 73.22 and MD 12.7. Any questions regarding the individual's eligibility for access to nuclear power reactor SGI shall be resolved in accordance with the provisions set forth in MD 12.7, which is incorporated into this contract by reference as though fully set forth herein. On the basis of the review of the applicant's security forms by DFS and/or the receipt of adverse information by NRC, the individual may be denied access to nuclear power reactor SGI until a final determination of his or her eligibility for access is made under the provisions of MD 12.7.

### 17.3 Fitness for Duty

Pursuant to NRC policy, all individuals proposed for work under this contract who require unescorted access to nuclear power plants shall be subject to the requirements of the licensee's fitness-for-duty program (10 CFR Part 26).

### 17.4 Basic Exposure Control and Personnel Dosimetry Training Requirements

The contractor shall certify that personnel working under the scope of this contract have completed basic exposure control and personnel dosimetry training sufficient to meet the requirements of commercial nuclear power plants for unescorted access. Site specific training obtained at each site shall still be required during the performance of work under this contract in addition to the basic training.

### 17.5 Subcontractor Information—Subcontracting

The DOE organization shall notify the issuing NRC CO in writing reasonably in advance of entering into any major or significant technical service subcontract not contained in the original proposal. "Major or significant" must be used with judgment and related to the total value of the project and/or impact on the results. This advance notification shall include the following:

- A description of services to be called for by the subcontract
- Identification of the proposed subcontractor
- The proposed subcontract costs (in total)
- A signed conflict of interest statement

The NRC CO may require additional specific subcontractor information or limitations. The NRC CO will issue a modification to the agreement upon approval of the subcontracting effort.

## **18. Information on NRC Cooperative Programs with Foreign Governments and Organizations and With U.S. Industry**

DOE facilities, contractors, and subcontractors working on NRC cooperative programs with foreign governments and organizations and with U.S. industry perform this work with the understanding that draft or formal reports on this work are to be available only to participants in the program until public availability is authorized by the NRC office. Reports or codes (including data) on this work shall be issued as "Draft Preliminary Reports (Codes)" until the office authorizes issuance of the report as a formal report with the designation NUREG/IA-XXXX for international agreement reports or NUREG/CR-XXXX for contractor reports. Details of the handling of reports may be obtained from the NRC COR.

#### **19. Stop-Work Order**

The NRC CO may, at any time, by modification to the agreement to the DOE CO, require the DOE Laboratory to stop all or any part of the work called for by this work order for a period of up to 90 days after the order is delivered to the DOE Laboratory, and for any further period to which the parties may agree. Any such order will be specifically identified as a "stop-work order" issued pursuant to this clause. Upon receipt of such an order, the DOE Laboratory shall forthwith comply with its terms and take all reasonable steps to minimize the incurrence of cost allocable to the work covered by the order during the period of work stoppage.

Within a period of 90 days after a stop-work order is delivered to DOE or within any extension of that period to which the parties shall have agreed the office shall either:

- Cancel the stop-work order
- Terminate the work covered by this work order

If a stop-work order issued under this clause is cancelled or the period of the stop-work order or any extension thereof expires, DOE will authorize its contractor to resume work. An adjustment will be made in the delivery schedule or cost, or both, and the work order must be modified in writing accordingly. If a stop-work order is not cancelled and the work covered by the order is terminated in accordance with the terms of this work order, costs resulting from the stop-work order will be allowed in arriving at the termination settlement.

#### **20. Termination**

Circumstances may arise in which either NRC or DOE wishes to terminate performance of a project in whole or in part. If both parties agree, the work order may be terminated. If DOE wishes to terminate the project, it shall advise the cognizant NRC CO. If NRC wishes to terminate the project, the cognizant NRC CO will advise the cognizant DOE Site Office or the DOE Field Office and send a copy of the termination agreement to the DOE Laboratory.

Within 60 days after the effective date of the termination of the work order, the DOE Laboratory shall submit a termination settlement proposal to the cognizant NRC CO, through the cognizant DOE Site Office or the DOE Field Office. When additional time is required to compile all outstanding costs, such as subcontractor costs, the DOE Site Office or the DOE Field Office shall provide a written notification to the NRC CO that includes a proposed due date for the final settlement proposal. In the event of disagreement between the parties, the cognizant NRC CO will make the final decision. The DOE Laboratory shall not incur new obligations for the terminated portion of the project after the effective date and must cancel as many outstanding obligations as possible. NRC will allow full credit to the DOE Laboratory for obligations properly incurred by the recipient before termination.

