

INTERAGENCY AGREEMENT		1. IAA NO. NRC-HQ-60-17-T-0003			PAGE OF 1 11	
2. ORDER NO.		3. REQUISITION NO. RES-17-0129		4. SOLICITATION NO.		
5. EFFECTIVE DATE 07/01/2017		6. AWARD DATE 07/18/2017		7. PERIOD OF PERFORMANCE 07/01/2017 TO 06/30/2022		
8. SERVICING AGENCY ENERGY IDAHO OPERATIONS OFFICE UNITED STATES DEPT OF ALC: DUNS: 048105530 +4: 1955 FREMONT AVE IDAHO FALLS ID 834021510  POC Laurie Acosta TELEPHONE NO. 208-526-5909				9. DELIVER TO MICHELLE GONZALEZ US NUCLEAR REGULATORY COMMISSION OFFICE OF NUCLEAR REGULATORY RESEARCH 11555 ROCKVILLE PIKE 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 Sandra Nesmith TELEPHONE NO. 301-415-6836				11. INVOICE OFFICE US NUCLEAR REGULATORY COMMISSION TWO WHITE FLINT NORTH 11545 ROCKVILLE PIKE MAILSTOP T9-B07 ROCKVILLE MD 20852-2738		
12. ISSUING OFFICE US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-8E06M WASHINGTON DC 20555-0001				13. LEGISLATIVE AUTHORITY Energy Reorganization Act of 1974		
				14. PROJECT ID		
				15. PROJECT TITLE TASK 3-ROUTINE SPAR MODEL UPDATES (T.O. UNDER NRC-		
16. ACCOUNTING DATA 2017-C0200-FEEBASED-60-60D002-60B205-1052-11-6-213-253D-11-6-213-1052						
17. ITEM NO.	18. SUPPLIES/SERVICES		19. QUANTITY	20. UNIT	21. UNIT PRICE	22. AMOUNT
	INL Contract No. DE-AC07-051D14517  Task Ordering Agreement No.: NRC-HQ-60-17-D-0005 Task Order No.: NRC-HQ-60-17-T-0003  Title: Task 3 Routine SPAR Model Updates  The NRC and Idaho National Laboratory (INL) hereby enter into this Agreement for the task order entitled "Task 3 Routine SPAR Model Updates."  Continued ...					
23. PAYMENT PROVISIONS				24. TOTAL AMOUNT \$279,019.00		
25a. SIGNATURE OF GOVERNMENT REPRESENTATIVE (SERVICING)				25a. SIGNATURE OF GOVERNMENT REPRESENTATIVE (REQUESTING) 		
25b. NAME AND TITLE		25c. DATE	26b. CONTRACTING OFFICER JEFFREY R. MITCHELL		26c. DATE 07/18/2017	

Period of Performance: July 1, 2017 - June 30, 2022

Consideration and Obligations:

(a) Authorized Cost Ceiling \$1,778,327.00

(b) The amount presently obligated with respect to this DOE Agreement is \$279,019.00. 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 document is hereby made a part of this Agreement:

Attachment: Statement of Work

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

Continued ...

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DUNS: 040535809            TAS: 31X0200.320  
ALC: 31000001  
Master IAA: NRCHQ6017D0005

00001

Award - authorized ceiling  
Line Item Ceiling: \$1,778,327.00  
Incrementally Funded Amount: \$279,019.00

1,778,327.00

The total amount of award: \$1,778,327.00. The obligation for this award is shown in box 24.

## STATEMENT OF WORK (SOW)

<b>NRC Agreement Number</b>  NRC-HQ-60-17-D-0005	<b>NRC Agreement Modification Number</b>  	<b>NRC Task Order Number (If Applicable)</b>  NRC-HQ-60-17-T-0003	<b>NRC Task Order Modification Number (If Applicable)</b>  
<b>Project Title</b> TASK 3 ROUTINE SPAR MODEL UPDATES			
<b>Job Code Number</b>  	<b>B&amp;R Number</b> 2017-60-11-6-213-1052	<b>Servicing Agency</b> Idaho National Laboratory (INL)	
<b>NRC Requisitioning Office</b> Office of Nuclear Regulatory Research		<b>Period of Performance</b> July 1, 2017 - June 30, 2022	
<b>NRC Form 187, Contract Security and Classification Requirements</b> <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)	
<b>Docket Number (If Fee-Recoverable/Applicable)</b>  		<b>Inspection Report Number (If Fee Recoverable/Applicable)</b>  	
<b>Technical Assignment Control Number (If Fee-Recoverable/Applicable)</b>  		<b>Technical Assignment Control Number Description (If Fee-Recoverable/Applicable)</b>  	

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## **CONTRACTING OFFICER'S REPRESENTATIVE**

### Contracting Officer's Representative

Michelle Gonzalez

Agency: U. S. Nuclear Regulatory Commission

Mail Stop TWFN 10A12

Washington, D. C. 20555-0001

Phone: (301) 892-8133

Email: (michelle.gonzalez@nrc.gov)

### Alternate Contracting Officer's Representative

Name: Suzanne Dennis

Agency: U.S. Nuclear Regulatory Commission

Office: RES

Mail Stop: T10A14

Washington, DC 20555-0001

E-Mail: Suzanne Dennis

Phone: (301) 415-0752

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## DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

### 1.0 BACKGROUND

The purpose of this task order is to provide sufficient resources and planning capability to maintain and update a set of Level 1 SPAR models. SPAR model updates typically are the result of a significant plant change or a significant licensee PRA/PSA modification. SPAR model updates may also be required in support of a Significance Determination Process, Accident Sequence Precursor evaluation, or other NRC activity that utilizes SPAR models.

This new task order is follow-on work for the project in fiscal years (FY) 2012 through 2016 under Job Code V6314. The main purpose of that project was to improve the SPAR models via cut-set level reviews (i.e., comparing licensee PRA model cut-sets to SPAR model cut-sets). During this time, INL also performed major revisions and updates to the SPAR models under the same contract.

NRC staff analysts will use the SPAR models in their regulatory activities as follows:

- Promptly assess the risk significance of events to identify regulatory actions. [Office of Nuclear Reactor Regulation (NRR) and the Regional Offices]
- Evaluate the significance of inspection findings in Phase 3 of the Significance Determination Process (SDP). [NRR and the Regional Offices]
- Support risk-informed technical reviews of proposed license amendments [NRR].  
Support decisions to issue generic communications. [NRR]
- Establish plant-specific thresholds for unreliability and unavailability performance indicators (PIs). [NRR and the Office of Nuclear Regulatory Research (RES)]
- Evaluate the effectiveness of regulatory requirements. [RES]
- Estimate the risk associated with operational events/conditions as part of the ASP Program. [RES]
- Perform regulatory analyses to resolve generic issues. [RES]

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## **2.0 OBJECTIVE**

The objective of this task order is to update a set of Level 1 SPAR models. INL shall perform up to six (6) routine SPAR Model updates per year. SPAR model updates typically are the result of a significant plant change or a significant licensee PRA/PSA modification. SPAR model updates may also be required in support of a Significance Determination Process, Accident Sequence Precursor evaluation, or other NRC activity that utilizes SPAR models.

The methodology, quality and philosophy, used to develop the current set of SPAR models for the nearly 100 operating commercial nuclear power plants, shall be used to update the SPAR models to the extent practicable. This includes model construct, event nomenclature, assumptions, preferred technical positions and other key aspects of the existing models to allow NRC staff the ease of use of the model. INL shall also perform a cut set level review of the updated SPAR model against the respective plant PRA, in a manner similar to the review performed during the comparison exercise conducted with the Pilot Plants in the Mitigating Systems Performance Index (MSPI) Development Program.

## **3.0 SCOPE OF WORK/TASKS**

INL must provide all resources necessary to accomplish the tasks and deliverables described in this Statement of Work (SOW). The activities that must be completed by INL are listed below.

### **Subtask 1: Identification of SPAR Models Requiring Updates.**

INL, working with the NRC Contracting Officer Representative (COR), shall identify the need to update a SPAR Model. SPAR model updates typically are the result of a significant plant change or a significant licensee PRA/PSA modification. SPAR model updates may also be required in support of a Significance Determination Process, Accident Sequence Precursor evaluation, or other NRC activity that utilizes SPAR models. Minor model modifications will normally be performed via the SPAR Model Technical Support for Model Users and Risk Informed Programs (JCN V6365).

A list with the status of SPAR Models should be kept current on the SPAR website.

Approval from the COR is required before a major revision or update is performed on a SPAR Model.

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## Subtask 2: Update SPAR Model Identified in Subtask 1

This subtask consists of performing a cut set level review of the present SPAR model. In this subtask, INL shall perform a cut set level review of the Revision 3 SPAR model against the respective licensee's plant PRA. The approach to be taken in this review is similar to that used to perform the cut set level review in the comparison exercise conducted with the Pilot Program Plants in the MSPI Development Program and identical to the models already reviewed under Job Code V6314. In this task, INL shall:

- (a) Compare results (i.e., cut sets, importance measures, etc.) and input parameter values (e.g., initiating event frequencies, equipment failure probabilities, human error probabilities, etc.) from the revised SPAR models with results and input parameter values from the licensees' PRAs,
- (b) Identify the differences between the two sets of results and input parameter values,
- (c) Determine the reasons for these differences,
- (d) Revise the SPAR model accordingly to resolve differences that are due to problems with model fidelity [i.e., the SPAR model does not properly account for the plant's anticipated response to the specific initiating event, or the SPAR model incorrectly models the relationship between a system and its supporting subsystems (e.g., the SPAR model has a system power supply coming from the wrong bus)], and not modelling issues (e.g., system success criteria for pressurizer power-operated relief valves for feed and bleed cooling).
- (e) Revise SPAR Model Documentation:
  - i. Revise and update internal events SPAR model documentation.
  - ii. Revise PRIB documentation with every SPAR model Revision,
  - iii. Revise and update external events, Level 2 and/or shutdown models documentation as needed.
- (f) Enhance SPAR-H documentation to include the following;
  - i. For each human failure event, explain why factors or values were chosen (e.g., PSF, probability, percentage, multiplier, etc.). For example, explain why *available time shaping factor* of nominal was chosen. If the factor or value was not known, for example if the procedure was not available, then provide a generic write-up.



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- a. Since many factors were/are not known such as Experience/Training, Procedures, Ergonomics/HMI and Fitness for Duty, a single generic write-up to explain the process for choosing these factors is sufficient.
  - ii. Why was diagnosis included or excluded?
  - iii. Why were dependencies included or excluded?
  - iv. Was a comparison to the licensee HEP a consideration in making any of these the decisions?
- (g) Document the revisions.
  - (h) Coordinate SPAR model updates under Task Order 2 – Coordination and Integration of SPAR Models (currently JCN V6364).
  - (i) Perform model updates in accordance with the RASP Handbook Volume 3 – SPAR Models Reviews; Revision 2.

**Subtask 3: Update SPAR models to reflect recent plant modifications related to RCP seals**

Update SPAR models to reflect latest plant configuration after the incorporation of new RCP seals. Models shall be updated as instructed by the COR and following steps listed on Subtask 2.

- Subtask 3.1 Update SPAR models for the plants that have incorporated Westinghouse Generation III SHIELD RCP seals (COR will provide the list of plants to the PI).

**4.0 LIST OF DELIVERABLES**

<b>Subtask Number</b>	<b>Deliverable and Acceptance Criteria</b>	<b>Deliverable Format</b>	<b>Due Date</b>
1	None	N/A	N/A
2	FY17 - approximately 6 Revised SPAR Models	Updated models posted to the SAPHIRE website	9/30/17
	FY18 - approximately 6 Revised SPAR Models	Updated models posted to the SAPHIRE website	9/30/18
	FY19 - approximately 6 Revised	Updated models posted to the	9/30/19

	SPAR Models	SAPHIRE website	
	FY20 - approximately 6 Revised SPAR Models	Updated models posted to the SAPHIRE website	9/30/20
	FY21 - approximately 6 Revised SPAR Models	Updated models posted to the SAPHIRE website	9/30/21
	FY22- approximately 6 Revised SPAR Models	Updated Models posted to the SAPHIRE website	5/31/22
3	11 models to be completed	Updated models posted to the SAPHIRE website	11 months after project start

Monthly letter status reports (MLSRs) shall be included as project deliverables. The SOW for each task order shall state who will receive the MLSR electronically in the program office, and that copies shall also be sent to the Acquisition Management Division [ContractsPOT.Resource@nrc.gov](mailto:ContractsPOT.Resource@nrc.gov).

## 5.0 ESTIMATED LABOR CATEGORIES, KEY PERSONNEL AND LEVELS OF EFFORT

**5.1 Labor Categories, Requirements and Key Personnel.** Personnel working under this agreement/order shall meet the minimum requirements for experience and education, as follows:

Task #	Labor Category	Position Minimum Requirements	Key Personnel (yes or no)
Task 1	Senior/Probabilistic Risk Analysts	PRA Analysts and Senior PRA Analysts who have a very strong technical background (i.e., 5 or more years) in PRA, extensive experience with SPAR models (i.e., 5 or more years), and who are familiar with the standardized methods and conventions used to construct SPAR models.	Yes
Subtask 2	Senior/Probabilistic Risk Analysts	Same as Task 1	Yes
Subtask 3	Senior/Probabilistic Risk Analysts	Same as Task 1	Yes

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## **6.0 CERTIFICATION AND LICENSE REQUIREMENTS – N/A**

### **7.0 MEETINGS AND TRAVEL**

Although travel might not be necessary, three 4-day trips to Rockville for one staff member have been anticipated in support of project meetings and presentations.

### **8.0 REPORTING REQUIREMENTS**

INL is responsible for structuring the deliverables to current agency standards. INL must submit deliverables free of spelling and grammatical errors and shall conform to requirements stated in this section.

#### **8.1 Monthly Letter Status Report (MLSR)**

INL shall provide a Monthly Letter Status Report which consists of a technical progress report and financial status report. This report will be used by the NRC to assess the adequacy of the resources utilized by INL to accomplish the work contained in this SOW and to provide status of INL's progress in achieving tasks and producing deliverables.

In accordance with Management Directive 11.7, NRC Procedures for Placement and Monitoring of Work with the U.S. Department of Energy, INL shall electronically submit a Monthly Letter Status Report (MLSR) by the 20<sup>th</sup> day of each month to the COR with copies to the Contracting Officer (CO) and the Office of Administration/Acquisition Management Division to [ContractsPOT.Resource@nrc.gov](mailto:ContractsPOT.Resource@nrc.gov). Once task orders are awarded, a separate MLSR shall be submitted for each task order, even if no work has been performed during a reporting period.

The MLSR shall include the following:

- agreement number;
- task order number,
- job code number if applicable,
- title of the project;
- project period of performance,
- task order period of performance, if applicable,
- agreement/order summary information,
- work completed during the specified period,
- milestone schedule information,
- problem identification and resolution,

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- travel plans,
  - staff hour summary,
  - 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

**9.0 REQUIRED MATERIALS, FACILITIES, HARDWARE/SOFTWARE – N/A**

**10.0 APPLICABLE PUBLICATIONS (CURRENT EDITIONS) – N/A**

**11.0 DATA RIGHTS N/A**