

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>		1. CONTRACT ID CODE		PAGE OF PAGES 1 2	
2. AMENDMENT/MODIFICATION NO. M0004		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. RES-16-0331	
6. ISSUED BY US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-5E03 ATTN ARACELIS PEREZ-ORTIZ WASHINGTON DC 20555-0001		CODE NRCHQ		7. ADMINISTERED BY (If other than Item 6) US NRC - HQ ACQUISITION MANAGEMENT DIVISION MAIL STOP TWFN-5E03 WASHINGTON DC 20555-0001	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) ENERGY RESEARCH INC 6189 EXECUTIVE BLVD ROCKVILLE MD 208523901		(x)		9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
		X		10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-HQ-25-14-E-0002 NRC-HQ-60-15-T-0001	
				10B. DATED (SEE ITEM 13) 06/30/2015	
CODE 621211259		FACILITY CODE			

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)  
See Schedule Net Increase: \$75,000.00

**13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 43.103(a) Bilateral (Supplemental Agreements - Mutual Agreement of the Parties)
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not. ☒ is required to sign this document and return 1 copies to the issuing office.

**14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)**

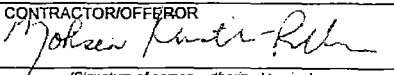
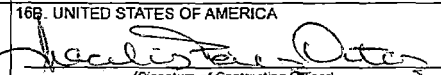
NRC-HQ-25-14-E-0002/NRC-HQ-60-15-T-0001

The purpose of this modification is to: (1) revise the Statement of Work (SOW) thereby increasing the total estimated cost by \$104,754.26 from \$380,917.03 to \$485,671.29; and (2) provide incremental funding in the amount of \$75,000.00, thereby increasing the total obligated amount from \$235,000.00 to \$310,000.00.

Accordingly, paragraphs (a) and (b) under section NRCB040A, CONSIDERATION AND OBLIGATION--COST-PLUS-FIXED-FEE ALTERNATE I, are deleted in their entirety and replaced with the following:

Continued ...

Except as provided herein, all terms and conditions of the document referenced in item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Mohsen Khatib-Rahbar, President		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) ARACELIS PEREZ-ORTIZ	
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	15C. DATE SIGNED 5/4/16	16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	16C. DATE SIGNED 05/05/2016

NSN 7540-01-152-8070  
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)  
Prescribed by GSA  
FAR (48 CFR) 53.243

SUNSI REVIEW COMPLETE

JUN - 2 2016

ADM002

TEMPLATE - ADM001

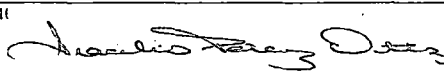
CONTINUATION SHEET

REFERENCE NO. OF DOCUMENT BEING CONTINUED  
NRC-HQ-25-14-E-0002/NRC-HQ-60-15-T-0001/M0004

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NAME OF OFFEROR OR CONTRACTOR  
ENERGY RESEARCH INC

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	<p>"(a) The total estimated cost to the Government for full performance of this contract is \$485,671.29 of which the sum of \$458,180.46 represents the reimbursable costs, and of which \$27,490.83 represents the fixed-fee.</p> <p>(b) The amount currently obligated by the Government with respect to this contract is \$310,000.00, of which the sum of \$292,453.00 represents the reimbursable costs, and the sum of \$17,547.00 represents the fixed fee."</p> <p>Attachment: Revised Statement of Work</p> <p>All other terms and conditions remain unchanged.</p> <p>Based and Exercised Options: \$485,671.29 (Changed) Base and All Options: \$485,671.29 (Changed)</p> <p>LIST OF CHANGES: Reason for Modification : Supplemental Agreement for work within scope Total Amount for this Modification: \$104,754.26 New Total Amount for this Award: \$485,671.29 Obligated Amount for this Modification: \$75,000.00 New Total Obligated Amount for this Award: \$310,000.00 Incremental Funded Amount changed: from \$235,000.00 to \$310,000.00</p> <p>CHANGES FOR LINE ITEM NUMBER: 1 Total Amount changed from \$380,917.03 to \$485,671.29 Obligated Amount for this modification: \$75,000.00 Incremental Funded Amount changed from \$235,000.00 to \$310,000.00</p> <p>Account code: 2016-X0200-FEEBASED-60-60D003-17-6-100-1061-252A Amount: \$75,000.00 FOB: Origin</p>				

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E. IMPORTANT: Contractor <input type="checkbox"/> is not. <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.					
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15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
			ARACELIS PEREZ-ORTIZ		
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16C. DATE SIGNED	
(Signature of person authorized to sign)				05/05/2016	

## CONTINUATION SHEET

REFERENCE NO. OF DOCUMENT BEING CONTINUED

NRC-HQ-25-14-E-0002/NRC-HQ-60-15-T-0001/M0004

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NAME OF OFFEROR OR CONTRACTOR  
ENERGY RESEARCH INC

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## **SECTION C - Description/Specifications**

### **Statement of Work**

#### **1. PROJECT TITLE**

MELCOR Model Development, Model Maintenance, and Technical Assistance for Licensing and Pre-licensing Activities Related to Design Basis and Beyond Design Basis Accidents

This task order effort falls under paragraph 3.7 "APR-1400 Design Center", within the scope of the Small Business EWC SOW.

#### **2. BACKGROUND**

On December 23 2014, the Applicant, Korea Hydro and Nuclear Power Co., Ltd. (KHNP), submitted the revised APR1400 Design Certification (DC) for review by the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactors (NRO). The NRC staff has completed an acceptance review and judged that the APR1400 design certification application is sufficiently complete to conduct a detailed technical review.

In support of reviewing the APR1400 design, NRO requires technical assistance to maintain the APR1400 MELCOR model that has been under development by an NRC contractor based on the design and other updates provided to the NRC by the Applicant or based on further analyses that are performed. Additional technical assistance is required to complete in-house confirmatory calculations, development of refined MELCOR models, and performance of confirmatory calculations for both containment Design Basis Accidents (DBAs) and Beyond Design Basis Accidents (BDBAs) in support of the on-going licensing review activities.

The U.S. Nuclear Regulatory Commission (NRC) will be receiving design certification applications for Small Modular Reactors (SMRs) for staff review. Currently, NuScale has proposed its plans for submission of its application. The Office of New Reactors (NRO) intends to proceed early to identify and examine key technical issues related to these reactors. In support of these efforts, NRO requires assistance in developing computer code input models, and assessing code capabilities and experimental benchmarking studies are important as they can provide insights into these technical issues.

The MELCOR models used as the basis for the tasks under this SOW were developed by Energy Research, Inc. (ERI) over the past two years. The contractor of this task order must have extensive experience with MELCOR Modeling, associated control logic, and Analyses, and be able to expeditiously become familiar with the historical analyses currently available to the NRC in a time frame which would meet the scheduling needs of NRO.

The Office of Research (RES) is providing support to NRO in the aforementioned areas.

#### **3. SCOPE OF WORK**

The objective of this work is for the contractor to maintain MELCOR models developed for DBA and BDBA accidents, provide technical assistance to NRC staff with in-house MELCOR analysis of DBA and BDBA accidents for licensing reviews (and pre-licensing activities), such as Design Certification, Environmental, Combined License, Rulemaking, etc., for advance reactor designs, and assist in the development of technical documents, audits of applicants' analyses,

and review meetings, such as ACRS reviews. The contractor may be called to perform DBA and BDBA confirmatory calculations if requested. Additional analysis for regulatory purposes may be required during the period of performance for this task order.

The Contractor must provide resources necessary to accomplish the tasks and deliverables described in this statement of work (SOW).

#### **4. SPECIFIC TASKS**

##### **Task 0: Kick-off Meeting**

Discuss plan of actions and logistics. Provide the required feedback, information and staff clarifications to complete the tasks for this task order. This meeting shall be held during the first week after the task order is awarded.

##### **Task 1: Develop and Maintain MELCOR models used for Licensing and Pre-licensing Activities**

###### **SUBTASK 1.1: Maintain MELCOR models and provide technical assistance**

The contractor shall maintain the MELCOR models that have been under development by Energy Research, Inc. (ERI) used for DBA and BDBA accidents when updates, or requests for improvements, are provided by the NRC. The contractor shall maintain calculation notebooks which reflect updates to the model. Also, in the course of performing analyses with the model, the staff may uncover modeling errors, and the contractor shall correct these errors. After making requested model updates and error corrections, the contractor shall re-run test (shakedown) cases and document the results to ensure the adequacy of the deck.

The contractor shall provide technical assistance to NRC staff performing in-house confirmatory analyses using the MELCOR model for licensing reviews, such as design certification, construction permits, rulemaking, and licensing. The in-house calculations may be either DBAs or BDBAs. In addition, the contractor may suggest performing MELCOR calculations in support of the licensing review of documents submitted by the Applicant. Furthermore, the contractor shall provide technical assistance in the development of Requests for Additional Information (RAI's) to improve the performance of the MELCOR model and determine the reason for deviations between the MELCOR results and those presented by the Applicant, as needed. The technical assistance provided to NRC staff is expected to include the following:

- Assistance with understanding the workings of the model.
- Assistance with developing additional scenario-specific input beyond that included in the base model.
- Assistance with understanding the bases for modeling choices made in developing the model.
- Help understanding unexpected or counter-intuitive results obtained with the model.
- Support for emerging issues encountered when using the model.

The contractor shall provide technical assistance to NRC staff during licensing documentation reviews, technical and public meetings, such as ACRS and ASLB meetings or hearings, etc., and drafting licensing documentation. The contractor may also be requested to provide technical support in interactions with applicants.

The contractor may be requested to provide knowledge management seminars to NRC staff on the results of model development and calculation results. These seminars shall take the form of a briefings or seminars. These seminars/briefings should focus on MELCOR modeling of the plant and the results of confirmatory/verification analyses for both containment design basis accidents and beyond design basis accidents.

All work performed under this task will come from the direct request of the NRC COR. If the level of effort for any task extends in excess of 16 hours, the COR shall be contacted to seek guidance and approval. Because technical assistance is requested for multiple designs, APR1400 and NuScale, the contractor shall provide a breakdown of the level of effort expended on this task for each design.

Standard: The contractor shall submit the deliverable on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: Documentation and input models developed as part of this task will be submitted to an internal Quality Assurance (QA) review. This QA review requires that documented information, as well as MELCOR models, are reviewed and verified by an independent reviewer (another competent engineer who did not contribute to the development or documentation of the section being reviewed).

#### SUBTASK 1.2: Develop MELCOR Input Decks for the NuScale-Like Test Facility

The contractor shall develop MELCOR input decks for the NuScale-specific test facilities in order to assess the performance of MELCOR in predicting the measured test conditions.

Contractor shall review the facility design report, prepare requests for additional information (RAIs), where applicable, prepare a facility-specific MELCOR 2.1 input deck and associated calculation notebook. The calculation deck shall include assumptions, modeling options, and code work-arounds (where applicable).

Standard: The contractor shall submit the deliverable on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: The documentation should list benchmarking results, and summarize the recommendations succinctly and consistently with the results of the analyses on which they are based.

#### SUBTASK 1.3: Benchmarking of NuScale MELCOR Predictions Against Selected Test Data & Development of Insights and Recommendations

Contractor shall identify up to six test cases for which experimental data are available from the NuScale vendor and/or identify specific measured parameters to be acquired from the vendor, if not already reported in the vendor reports submitted to NRC. Subsequently, contractor shall perform MELCOR simulations of the selected tests, documenting comparisons with the available test data, and shall document potential improvements or recommendations that would enhance MELCOR's predictive capabilities applicable to the phenomena specific to NuScale design (e.g., evaluation of performance of MELCOR modeling of heat transfer in helical tube steam generators, and condensation of steam at near vacuum, sub-atmospheric, and high pressure conditions, etc. as appropriate).

Standard: The contractor shall submit the deliverable on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: The documentation should list benchmarking results, and summarize the recommendations succinctly and consistently with the results of the analyses on which they are based. Documentation and input models developed as part of this task will be submitted to an internal Quality Assurance (QA) review by the Contractor. This QA review requires that documented information, as well as MELCOR models, are reviewed and verified by an independent reviewer (another competent engineer who did not contribute to the development or documentation of the section being reviewed).

## Task 2: Perform Confirmatory Licensing Calculations

### SUBTASK 2.1: APR1400 Design Basis Accident Confirmatory Calculations

The NRC has the option to request the contractor perform confirmatory assessments of licensing documentation, such as construction permit/design certification submittals, etc., using the MELCOR input models under DBA conditions. The scenarios shall be selected for cases for which adequate results for comparison are also available in the KHNP submittals or material available for staff review. These analyses shall be defined in close coordination with pertinent cognizant NRC staff. The models should be based on conservative assumptions regarding initial and boundary conditions (e.g., heat transfer correlations, stored energy, mass and energy release, initial pressure, nodalization, and delay in safety system actuation, etc.) with comparisons of results to that utilize best-estimate models in MELCOR. The confirmatory calculations are expected to be limited to no more than three accident scenarios/cases, but additional cases may be performed if deemed necessary. The contractor shall document the results in a report. The report will be reviewed by NRC staff, then revised as necessary and submitted as final.

Standard: The contractor shall submit deliverables on time to the NRC COR and NRC contracting officer (CO). The deliverable will include a letter report or a memorandum describing code assessments performed as part of this task.

Acceptance criteria: Calculations performed as part of this task will undergo an internal review. A QA review requires that calculations are reviewed and verified by an independent reviewer (another competent engineer who did not contributed to the analyses).

### SUBTASK 2.2: APR1400 Beyond Design Basis Accident (Severe) Confirmatory Calculations

The NRC has the option to request the contractor perform confirmatory assessments of licensing documentation, such as construction permit/design certification submittals, etc., using the MELCOR input models under BDBA conditions. These analyses shall be defined in close coordination with pertinent cognizant NRC staff. This shall enable comparisons of the MELCOR-calculated results to those of the Applicant. The contractor shall document the results in a report. The report will be reviewed by NRC staff, then revised as necessary and submitted as final.

Standard: The contractor shall submit deliverables on time to the NRC COR and NRC contracting officer (CO). The deliverable will include a letter report or a memorandum describing code assessments performed as part of this task.



Acceptance criteria: Calculations performed as part of this task will undergo an internal review. A QA review requires that calculations are reviewed and verified by an independent reviewer (another competent engineer who did not contribute to the analyses).

#### SUBTASK 2.3: NuScale Confirmatory Calculations

The contractor shall update the MELCOR input model and calculation notebook for NuScale design based on the latest plant design data submitted by the Applicant. Additionally, the contractor shall support the application of the MELCOR input models for use in confirmatory assessment of the construction permit/design certification submittals. These analyses will be identified by NRO and RES that are expected to focus on phenomena that are either unique or of greater significance to NuScale as compared with large PWRs (e.g., flow chugging behavior, mixing in the riser section, stratification inside the containment cooling pool, impact of non-condensable gases and condensation of steam at near-vacuum, sub atmospheric, and high pressure conditions on the inner surface of the containment, reactor vent valve flow choking, natural circulation heat transfer in the reactor building pool, hydrogen mixing inside containment, impact of boron depletion inside the RPV affecting mass and energy release into the containment and boron plating on the containment wall on its heat removal capability, 3-D effects on containment heat transfer, etc.). The models shall be based on conservative assumptions regarding initial and boundary conditions, e.g., heat transfer correlations, stored energy, M&E release, initial pressure, nodalization, and delay in safety system actuation. The confirmatory calculations will be limited to a total of 5 representative scenarios encompassing design basis and severe accident conditions.

Standard: The contractor shall submit deliverables on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: Analysis results shall be reviewed prior to documentation, and results compared, where available, with the applicant's analyses. Areas where differences are noted shall be highlighted. Documentation and input models developed as part of this task require an internal QA review by the contractor. A QA review requires that documented information, as well as MELCOR models are reviewed and verified by an independent reviewer (another competent engineer who did not contribute to the development or documentation of the section being reviewed).

#### Task 3: Technical Support for Vendor-Specific Audits

##### SUBTASK 3.1. APR1400

NRO anticipates undertaking audits of the APR1400 DBA and BDBA analyses to better understand the analyses performed by the Applicant and to disposition any issues resulting from the NRC's confirmatory calculations. These audits will examine the technical bases for the Applicant's analyses, assumptions, computer codes, and potential modeling limitations. The contractor shall support the NRC by preparing, participating and formulating insights and conclusions as they impact the design certification process.

Standard: The contractor shall submit deliverables on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: Audit issues/areas shall be identified consistent with the issues determined based on the NRC's confirmatory analyses and findings.

### SUBTASK 3.2. NuScale

NRO anticipates undertaking audits of the NuScale DBA and BDBA analyses to better understand the analyses performed by the Applicant and to disposition any issues resulting from the NRC's confirmatory calculations. These audits will examine the technical bases for the Applicant's analyses, assumptions, computer codes, and potential modeling limitations. The contractor shall support the NRC by preparing, participating and formulating insights and conclusions as they impact the design certification process.

Standard: The contractor shall submit deliverables on time to the NRC COR and NRC contracting officer (CO) and the deliverable shall include items specified above.

Acceptance criteria: Audit issues/areas shall be identified consistent with the issues determined based on the NRC's confirmatory analyses and findings.

## **5. 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 contractor to ensure that these quality criteria are adequately addressed throughout the course of the research that is performed. The NRC COR and technical monitor will review research products with these criteria in mind.

## **6. APPLICABLE DOCUMENTS AND STANDARDS**

N/A

## **7. DELIVERABLES AND DELIVERY SCHEDULE/REPORTING REQUIREMENTS**

A Monthly Letter Status Report (MLSR) is to be submitted to the NRC COR by the 20<sup>th</sup> of the month following the month to be reported with copies provided to the following:

[RESDSAMLSR.Resource@nrc.gov](mailto:RESDSAMLSR.Resource@nrc.gov)

[ContractsPOT.Resource@nrc.gov](mailto:ContractsPOT.Resource@nrc.gov)

The MLSR will identify the title of the project, the job code, the Principal Investigator, the period of performance, the reporting period, summarize each month's technical progress, the monthly spending, total spending to date, and the remaining funds and will contain information as directed in NRC Management Direction 11.1. The contractor shall itemize the progress

presented in the MLSR based on the subtasks presented in the statement of work. Any administrative or technical difficulties which may affect the schedule or costs of the project shall be immediately brought to the attention of the NRC COR.

The contractor shall provide the deliverables in electronic format unless directed by the COR. The electronic format shall be provided using a Microsoft-based product, (e.g., Outlook, Word, Excel, PowerPoint) unless the COR and the contractor specifically agree on another format. Deliverables shall be in the format of draft version, revision version with redline/strikeout with a change-control appendix, and a revised version which can be the final version. The contractor shall maintain appropriate revision control in an electronic format.

For each "final" deliverable (e.g., preliminary, draft, or final) that accomplishes a specific portion of a subtask activity, the contractor shall provide an electronic copy to the COR. The contractor shall explicitly state in its submittal that the product provided is the deliverable for Task/Subtask XX, as further described below.

The schedule for deliverables shall be contained in the approved Project Plan for the task order effort, which is included as a deliverable in the table below.

The above deliverables shall be submitted to the task order CO and task order COR. Unless otherwise directed by the COR or the CO, the contractor must provide deliverables except the Monthly Letter Status Reports (MLSR) as draft products. The COR will review draft deliverables (and coordinate any internal NRC staff review, if needed) and provide comments back to the contractor. The contractor shall revise the draft deliverable based on the comments provided by the COR and then deliver a revised version of the deliverable, which will then be considered the Final Version. When mutually-agreed upon between the contractor and the COR, the contractor may submit preliminary or partial drafts to help gauge the contractor's understanding of the particular work requirement. More than one round of drafts may be needed if the contractor does not successfully incorporate the COR's comments on the previous draft.

## **8. PUBLICATIONS NOTE**

RES encourages the publication of the scientific results from RES sponsored programs in refereed scientific and engineering journals as appropriate. If the contractor proposes to publish in the open literature or present the information at meeting in addition to submitting the required technical reports, approval of the proposed article or presentation should be obtained from the NRC COR. The RES COR shall either approve the material as submitted, approve it subject to NRC suggested revisions, or disapprove it. In any event, the RES COR may disapprove or delay presentation or publication of papers on information that is subject to Commission approval that has not been ruled upon or which has been disapproved. Additional information regarding the publication of NRC sponsored research is contained in NRC Management Directives 3.7, "NUREG Series Publications," and 3.9, "NRC Staff and Contractor Speeches, Papers, and Journal Articles on Regulatory and Technical Subjects."

If the presentation or paper is in addition to the required technical reports and the RES COR determines that it will benefit the RES project, the COR may authorize payment of travel and publishing costs, if any, from the project funds. If the COR determines that the article or presentation would not benefit the RES project, the costs associated with the preparation, presentation, or publication will be borne by the contractor. For any publication or presentations falling into this category, the NRC reserves the right to require that such presentation or publication will not identify the NRC's sponsorship of the work.

## NEW 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 COR in both electronic and camera-ready copy.

Format guidance, as specified in NUREG-0650, Revision 2, 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 COR 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
Microsoft® Word®
Microsoft® PowerPoint®
Microsoft® Excel
Microsoft® Access
Portable Document Format

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.

### **9. REQUIRED LABOR CATEGORIES**

The NRC will rely on representations made by the contractor concerning the qualifications of the personnel proposed for this task order, including assurance that information contained in the technical and cost proposals, including resumes, is accurate and truthful. The resume for each professional proposed to work under this task order (contractor, subcontractor, or consultant) shall describe the individual's experience in applying his or her area of engineering specialization to work in the proposed area.

The Contractor must provide individuals who have the required educational background and

work experience to meet the objectives of the work specified in this task order. Specific qualifications for this effort include: a) expertise in the use of the MELCOR computer code, models, correlations, and code experimental assessment studies; b) expertise in Design Basis Accident and Beyond Design Basis Accident analyses, and NRC regulations pertaining to those analyses; c) familiarity of the response of advanced reactors (APR1400 and SMRs) to severe accidents and accident progression; d) expertise and experience in analysis of nuclear reactor thermal-hydraulics; e) familiarity with requests for additional information (RAI) development.

## **10. GOVERNMENT-FURNISHED PROPERTY**

The NRC will provide to the contractor information and design data and any available input data that is provided by the applicant. Proprietary submitted documentation will be provided by the NRC in the form of CD-ROMs, or as an encrypted email attachment. Deliverables produced will become property of the NRC.

The contractor shall be responsible for the protection of NRC documentation in its possession during the course of contract performance in accordance with the procedures as set forth in NRC's policy entitled, Sensitive Unclassified Non-Safeguards Information (SUNSI), Handling Requirements for Proprietary Information.

## **11. PLACE OF PERFORMANCE**

COR may request certain work be performed at an NRC site, or request the presence of contractor staff during public ACRS, ASLB, or other meetings or workshops.

## **12. SPECIAL CONSIDERATIONS**

### **12.1 TRAVEL/MEETINGS**

In addition to the kick-off meeting, additional meetings will be held as needed either in person at NRC facilities or by teleconference.

Task 1 may require kick-off meetings, outlined by Task 0, at the request of the NRC to discuss a plan of action, logistics, and provide feedback, information, and staff clarifications to complete the items presented in the Statement of Work. The timing of these meetings, if necessary, is to be determined.

Task 3 will require travel to NRC or Applicants Offices to assist in the NRC's audit efforts. The timing of these meetings, if necessary, is to be determined. Specifically, the planned audits require:

- Subtask 3.1: Two audits of three days in duration either at the NRC Headquarters or at the Applicant's Virginia Offices are anticipated.
- Subtask 3.2: Two audits of three days in duration either at the NRC Headquarters or at the Applicant's Oregon Offices are anticipated.

Travel requires prior written approval from the COR.

### **12.2 SECURITY**

Work on this task order may involve the handling of documents that contain proprietary

information. The contractor shall safeguard documents containing proprietary information against unauthorized disclosure. After completion of work, the contractor must either destroy the documents or return them to the NRC. If they are destroyed, please confirm this in an e-mail to the COR with a copy to the CO and include the date and manner in which the documents were destroyed.

### **12.3 LICENSE FEE RECOVERY**

Most of the work performed on Subtasks involving the APR1400 will be License Fee Recoverable. It is not expected that Subtasks involving NuScale will be License Fee Recoverable.