AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

BPA NO.	1. CONTRACT ID CODE	PAGE	OF
	NRC-DR-04-09-122	1	2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
M003	06/02/2010	RES-C10-580	

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Mail Stop: TWB-01-B10M Washington, DC 20555	3100	U.S. Nuclear Regulatory Commission Div. of Contracts Mail Stop: TWB-01-B10M Washington, DC 20555	3100

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)	(X)	9A. AMENDMENT OF SOLICITATION NO.
BATTELLE MEMORIAL INSTITUTE 902 BATTELLE BLVD RICHLAND WA 993541793		9B. DATED (SEE ITEM 11)
		10A. MODIFICATION OF CONTRACT/ORDER NO. GS23F0011L NRC-DR-04-09-122 TO1
CODE 007901598 FACILITY CODE	X	10B. DATED (SEE ITEM 13) 08-19-2009

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 ACKNOWLEDGMENT 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) 060-15-111-127 N6687 252A 31X0200.060
OBLIGATE: $200,000.00

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

(X)	
	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.
X	FAR 52.243-4, Changes - Time & Materials or Labor Hours
	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).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	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.)

The purpose of this modification is to increase the level of effort to Task 1 PWSCC Safety Issues in accordance with the attached summary of the modification to the Statement of Work. As a result a revised Statement of Work is provided including the modified level of effort.

Funding is hereby added in the amount of $200,000.00. This includes the verbal authorization of $50,000 to continue work provided on May 27,2010.

Total Value of Task Order: $988,108.00 (Unchanged)
Total Obligation of Task Order: $835,613.00 (Changed)
Period of Performance: 08/19/2009 - 08/31/2011 (Unchanged)

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

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
Timothy L. Feeser, Contracting Officer	Sharlene McCubbin Contracting Officer

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
Timothy L. Feeser (Signature of person authorized to sign)	3 Jun 2010	BY (Signature of Contracting Officer)	6/2/2010

NSN 7540-01-152-8070
PREVIOUS EDITION NOT USABLE

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

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

ADM002

JUL 8 2010

The contractor's rates are hereby incorporated for Modification 3 of this Task Order

Table 1 - Total
U.S. Nuclear Regulatory Commission
Reactor Coolant Pressure Boundary Analyses – Task 1
Period of Performance: 04/08/2010 - 08/31/2011

GSA Contract No. GS-23F-0011L / SIN 871-1
Modification N6687 / Contract No. NRC-DR-04-09-122
Battelle Proposal No. OP59389

Actual Hours Incurred to Date from 04/08/2010 - 06/13/2010

	GSA RATE SCHEDULE							
	09/01/2009 - 08/31/2010			09/01/2010 - 08/31/2011			Total	
	PES			PES				
	GSA Billing Rate*	Hours	Cost	GSA Billing Rate*	Hours	Cost	Hours	Cost
Battelle - BCO								
PES Manager III	[redacted]	[redacted]	[redacted]	[redacted]	-	-	[redacted]	[redacted]
PES Engineer VI					-	-		
PES Engineer III					-	-		
PES Engineer II					-	-		
PES Engineer I					-	-		
PES Functional Specialist II					-	-		
PES Functional Specialist I					-	-		
PES Administrative Assistant I					-	-		
BCO Total					-	-		
Total Labor		[redacted]	192,559		-	-	[redacted]	192,559

Costs Incurred 04/08/2010 - 06/13/2010

Total Labor	$ 192,559
Total Costs Incurred	$ 192,559

Proposed Hours from 05/14/2010 - 08/31/2011

	GSA RATE SCHEDULE							
	09/01/2009 - 08/31/2010			09/01/2010 - 08/31/2011			Total	
	PES			PES				
	GSA Billing Rate*	Hours	Cost	GSA Billing Rate*	Hours	Cost	Hours	Cost
Battelle - BCO								
PES Manager III	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PES Engineer VI								
PES Engineer II								
PES Engineer I								
PES Functional Specialist II								
PES Functional Specialist I								
PES Administrative Assistant I								
BCO Total								
Total Labor		[redacted]	11,798		[redacted]	138,152	[redacted]	149,949

05/14/2010 - 08/31/2011	Subtotal	G&A	COFC G&A	Total
Other Direct Costs				
Travel**	$ [redacted]			$ [redacted]
Total Other Direct Costs				$ [redacted]

Costs Incurred	$ [redacted]
Proposed Labor	$
Total Other Direct Costs	$
Total Estimated Cost	$ 352,495

*Rates contain a 1% discount from Battelle's PES
**See attached for travel details.

STATEMENT OF WORK FOR COMMERCIAL
Modification to Job Code N6687
(in support of NRC-DR-04-09-122)

TITLE: Reactor Coolant Pressure Boundary Analyses - Task 1 in support of NRC-DR-04-09-122

SCOPE OF WORK

Additional efforts

Task 1: PWSCC Safety Issues:

Subtask 2) Support of xLPR Code Development (1000 hours):

- The contractor shall provide additional technical support by participating in and providing assistance to the models, inputs, and computational groups through meetings, teleconferences, information exchange, etc.
- The contractor shall participate in the configuration management program by developing conceptual documentation, and checking modules as needed
- The contractor shall refine the importance sampling routines using the discrete probability method for inclusion into xLPR

Subtask 3) Weld Residual Stress Modeling of NRC & EPRI Fabricated Mockups (400 hrs):

- Compile predictions from participants in the international round-robin
- Compare predictions made in with others from both NRC contractors and industry.
- Compile comparisons into the subtask summary report

Subtask 4) Provide additional Technical assistance to the NRC staff for (190 hours)

- Review of pertinent industry reports, guidelines, and efforts in these areas, including base assumptions, computer codes used, and operational experience
- NRC review of licensee submittals
- NRC/EPRI/licensee coordination efforts, proposals, meetings, and conference calls
- Advisory Committee for Reactor Safeguards (ACRS)/NRC meetings - provide technical expertise to the NRC as necessary

Task 1 Deliverable Schedule Modification:

Subtask 2) a) Provide technical support as required.
b.) Provide configuration management support as dictated by the program manager
c.) Provide sampling routines within 6 months of modification initiation

Subtask 3) Add comparison summary and results to Subtask 3 technical letter report for Phase I-IV results 6 months of modification initiation

Subtask 4) Provide technical assistance as required.

LEVEL OF EFFORT

The level of effort for this modification raises the total level of effort for task by 1590 hours

PERIOD OF PERFORMANCE

Period of performance for this task order will be from the date of task order award to December 31, 2010.

STATEMENT OF WORK FOR COMMERCIAL
Modification to Job Code N6687
(in support of NRC-DR-04-09-122)

TITLE: Reactor Coolant Pressure Boundary Analyses - Task 1 in support of NRC-DR-04-09-122

BACKGROUND

Many pressurized water reactor (PWR) primary reactor coolant pressure boundary (RCPB) components contain nickel-based alloys to include Alloys 82, 182, and 600. Primary coolant water coupled with the operating conditions of PWR plants has been shown to cause cracking of Alloy 82, 182, and 600 through a process called primary water stress corrosion cracking (PWSCC). PWSCC in nickel-based RCPB components is a safety concern due to the potential for reactor pressure boundary leaks and the associated potential of boric acid corrosion of low alloy steels at nozzle-to-safe end dissimilar metal (DM) butt welds. Either condition, depending on the size and location of the flaws, could result in a loss of coolant accident (LOCA). Specific plant operating experiences identifying PWSCC in Alloy 82, 182, and 600 through leakage or in-service inspections include:

- In 1993, Palisades discovered a leak through a circumferential crack in the Alloy 600 safe end on the pressurizer nozzle for the power-operated relief valve. The circumferential extent of the crack was about 3 inches in the 4-inch diameter pipe. Metallurgical analysis of a sample characterized the cracking as PWSCC of the Alloy 600 safe end material in the heat-affected zone of the Alloy 82 and 182 weld. This was the first instance of PWSCC associated with butt welds at a U.S. reactor licensed by the Nuclear Regulatory Commission.

- In 2000, ultrasonic examination of a reactor pressure vessel (RPV) hot leg nozzle-to-safe end DM weld at Ringhals 4 in Sweden revealed four axial part-through-wall flaws. Metallurgical analysis attributed the cracking to PWSCC. Two small axial indications were identified in a Ringhals 3 RPV hot leg nozzle-to-safe end DM weld. These indications were left in service until a follow up inspection in 2001, at which time; the indications were sampled and analyzed to be PWSCC.

- In 2000, a large accumulation of boric acid deposits was observed during a refueling outage at V.C. Summer which led to the discovery of cracking in the "A" hot leg pipe-to-RPV nozzle DM weld. The weld contained a through-wall axial flaw and small part-through-wall axial flaws, as well as a circumferential flaw. Metallurgical analysis attributed the cracking to PWSCC. Small axial and circumferential cracks were identified in the "B" hot leg pipe-to-RPV nozzle DM welds; a small circumferential crack was identified in the "C" hot leg pipe-to-RPV nozzle DM weld; and a small circumferential crack was found in both the "A" and "C" cold leg pipe-to-RPV nozzle DM welds.

- In 2003, ultrasonic examination of the pressurizer surge line hot leg nozzle-to-safe end weld at Three Mile Island Unit 1 revealed an axial part-through-wall indication in a DM weld. The licensee attributed the indication to PWSCC.

- In 2003, Tsuruga 2 in Japan observed boron deposits on the surface of a pressurizer relief valve nozzle that led to the discovery of three axially oriented flaws in the nozzle-to-safe end DM weld. Subsequent nondestructive examination (NDE) of the safety valve nozzle revealed two additional axial flaws in the nozzle-to-safe end DM weld. Metallurgical analysis of the flaws identified PWSCC as the mechanism for flaw initiation and growth.

- In 2003, ultrasonic examination revealed a shallow axial indication in the pressurizer-to-surge line weld at Tihange 2 in Belgium. This indication was attributed to PWSCC.

- In 2005, ultrasonic examination identified two axial part-through-wall indications approximately 180 degrees apart in a 2 inch hot leg drain nozzle-to-safe end DM weld at Calvert Cliffs Unit 2. The Licensee attributed the indications to PWSCC.

- In 2005, ultrasonic examination identified an axial part-through-wall indication in a pressurizer nozzle-to-safe end DM weld for the pressurizer safety valve at D. C. Cook Unit 1. The licensee attributed the indication to PWSCC.

- In 2006, ultrasonic examinations at Calvert Cliffs Unit 1 identified an axial indication in the pressurizer relief nozzle-to-safe end DM weld and a circumferential indication in the hot leg surge line nozzle-to-safe end DM weld and a hot leg drain nozzle-to-safe end DM weld. The circumferential indication in the hot leg to surge line nozzle-to-safe end was 2.4 inches in length and approximately 25 percent through-wall in depth. The circumferential indication in the hot leg drain nozzle was 0.45 inches in length and approximately 18 percent through-wall in depth.

- In October 2006, Wolf Creek reported five circumferential indications in three pressurizer DM welds. Three indications were in the pressurizer surge line nozzle-to-safe end weld, and one indication was found in each of the safety and relief nozzle-to-safe end welds. The relief nozzle-to-safe end flaw was measured as 11.5 inches long as projected on the outside diameter of the weld.

- In January 2008, Davis Besse reported a leakage event from a 1.68" axial PWSCC flaw that broke through-wall during the initial bead layering of a full structural weld overlay on the hot leg decay heat removal line.

- In March 2008, Crystal River reported two circumferential flaws in their hot leg decay heat removal line as well with the largest being 10 inches in length with a nominal wall thickness of 1.3".

The industry responded to these PWSCC instances with a detailed research program coordinated through the Materials Reliability Program (MRP). The MRP program has focused

on four key technical areas: 1) non-destructive evaluation techniques to detect and size PWSCC flaws, 2) PWSCC initiation and growth rate statistics, 3) probabilistic and deterministic advanced finite element based component integrity models, and 4) PWSCC mitigation technologies. The objective of these mitigation technologies is to significantly retard future PWSCC initiation and growth. Several technologies have been identified by the industry such as water chemistry modifications (zinc additions and hydrogen injection), mechanical stress improvement, full structural weld overlays, optimized weld overlays, peening, inlays, onlays, and other potential processes. NRC reviews of these technologies are ongoing and will require continued assessments for a variety of different plant specific applications and RCPB locations to include leak-before-break (LBB) piping systems.

NRC started approving LBB analyses in 1984 by granting exemptions from General Design Criterion (GDC) - 4, "Environmental and dynamics effects design bases." In 1987, GDC-4 was revised to allow dynamic effects associated with postulated pipe ruptures to be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low (i.e., less than 10^{-6}/RY). The statement of considerations for the proposed revision to GDC-4 in 1986 said that "the LBB approach should not be considered applicable to fluid system piping that operating experience has indicated is particularly susceptible to failure from the effects of corrosion." Draft Standard Review Plan (SRP) 3.6.3, "LBB Evaluation Procedures," says, "...evaluations must demonstrate that these [degradation] mechanisms are not potential sources of pipe rupture." In practice, review criteria were implemented by excluding systems with potential corrosion degradation mechanisms. Satisfying draft SRP review criteria was considered a demonstration that the probability of fluid system piping rupture is extremely low.

SRP 3.6.3 also contains guidance on the application of LBB to boiling water reactor (BWR) piping which is susceptible to intergranular stress corrosion cracking (IGSCC). The draft SRP indicates that LBB could be considered for this piping provided two mitigation methods (e.g., resistant materials, stress improvement, enhanced water chemistry) were applied to the piping. In the regulatory actions taken to provide acceptable inspection intervals for managing IGSCC in BWR piping, credit has been given for the number of mitigation techniques employed. At the time these criteria were developed, they were based on engineering judgment. However, it has been observed through operating experience that two mitigation methods in BWR piping provided improved resistance to IGSCC as compared to one method and that the use of two mitigation methods renders the piping highly resistant to cracking. Nevertheless, owners of BWRs have not requested NRC approval to apply LBB to this piping.

Recently, the MRP has prepared inspection and evaluation guidelines for DM butt welds in the reactor coolant system. These guidelines are contained in MRP-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines," and the Nuclear Energy Institute provided them to the NRC staff on July 27, 2005. These guidelines were issued with "mandatory" implementation under the NEI 03-08, "Guidelines for the Management of Materials Initiatives." The purpose of these guidelines is to manage PWSCC through a combination of inspection and mitigation. These industry guidelines do not discriminate between welds approved by the NRC staff for LBB and other DM butt welds. In a draft user need letter dated August 5, 2005, from J.E. Dyer, Director, Office of Nuclear Reactor Regulation, to Carl J. Paperiello, Director, Office of Nuclear Reactor Regulation, "User Need Request on PWSCC in LBB Systems," assistance

from the RES was requested in the development of a position on the management of PWSCC in LBB piping systems.

As a result, the NRC has developed several research programs to address the various aspects of developing a strategy to manage PWSCC in LBB and RCPB components. The NRC programs mirrors the MRP program to confirm the industry's claims related to: 1) capabilities of non-destructive evaluation techniques to detect and size PWSCC flaws, 2) PWSCC initiation and growth rate statistics, 3) probabilistic and deterministic advanced finite element based component integrity models, and 4) PWSCC mitigation technologies. For 3), a robust component integrity analysis typically consists of PWSCC flaw growth calculations that evaluate the specific component design, configuration, fabrication, applied loads, and environmental degradation effects such as PWSCC growth rates. It is only through evaluating all four areas that a PWSCC mitigation and management strategy can be developed for LBB and RCPB systems.

OBJECTIVE

The objective of this project is to provide flexible technical analyses to research to develop and/or confirm the technical bases for future regulatory decisions related to RCPB and LBB system integrity and associated PWSCC mitigation assessments.

SCOPE OF WORK

Amend and increase level of effort on existing task:

Task 1: PWSCC Safety Issues:

Subtask 2) Support of XLPR Code Development:

- 2a) The contactor shall use existing infrastructure to set-up and maintain a SharePoint site for use by the NRC-led XLPR team members. This site will allow NRC approved users to access relevant XLPR data and codes.
- 2b) The contractor shall use the current version of the SQUIRT leak rate estimation software and convert the SQUIRT2 module into a usable Fortran subroutine for inclusion into the XLPR code.
- 2c) The contractor shall provide technical support by participating in and providing assistance to the models, inputs, and computational groups through meetings, teleconferences, information exchange, etc.
- 2d) The contractor shall participate in the configuration management program by developing conceptual documentation, and checking modules as needed
- 2e) The contractor shall refine the importance sampling routines using the discrete probability method for inclusion into XLPR

Subtask 3) Weld Residual Stress Modeling of NRC & EPRI Fabricated Mockups: Weld residual stress models using finite element analyses of Alloy 82/182/600 dissimilar metal butt welds configurations have been

conducted in NRC licensee relief requests and confirmatory regulatory evaluations thereof. Subtask 3 focuses on benchmarking and validating the use of finite element models for these Alloy 82/182/600 dissimilar metal butt welds using the Phase I-IV NRC and EPRI fabricated mockups. The contractor shall:

- Predict and refine the through-thickness weld residual stress profiles of the Phase I-IV NRC and EPRI fabricated dissimilar metal weld mockups. For this modeling effort, the NRC will provide the detailed fabrication specifications and welding parameters for each mockup within 12 months after the task initiation.

- Compare these predictions with others from both NRC contractors and industry.

- Compile comparisons in a summary report

Subtask 4) Provide Technical assistance to the NRC staff for:

- Reviewing pertinent industry reports and guidelines related to the industry-proposed criteria for PWSCC mitigation processes

- NRC review of licensee submittals

- NRC/EPRI/licensee coordination efforts, proposals, meetings, and conference calls

- Advisory Committee for Reactor Safeguards (ACRS)/NRC meetings - provide technical expertise to the NRC as necessary

- Review of pertinent industry reports, guidelines, and efforts in these areas, including base assumptions, computer codes used, and operational experience

Task 1 Deliverable Schedule Modification:

Subtask 2) a) Provide the SharePoint site within one month of task initiation.
b) Provide the SQUIRT2 Fortran module 4 months of task initiation.
c) Provide technical assistance as required.
d.) Provide configuration management support as dictated by the program manager
e.) Provide sampling routines within 6 months of modification initiation

Subtask 3) Provide technical letter report for Phase I-IV results 6 months of modification initiation

Subtask 4) Provide technical assistance as required.

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 project manager and technical monitor will review all research products with these criteria in mind.

TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

The program manager, key personnel, and any other senior technical staff performing work under this contract shall have expertise, experience, and/or education in the following key areas:

(a) Expertise in materials and structural mechanics
(b) Expertise in finite element analyses
(c) Expertise in developing probabilistic codes
(d) Expertise in leakage detection methodology and leak-rate calculations with existing leak-rate codes
(e) Detailed knowledge of pressurized water reactor piping system design and manufacturing methods including material property information
(f) Detailed knowledge of techniques used to evaluate residual stresses in pipe welds, e.g. weld sequencing
(g) Detailed knowledge of industry and NRC staff analyses regarding reported occurrences of primary water stress corrosion cracking and NRC actions, e.g., notices, bulletins, etc.

LEVEL OF EFFORT

The level of effort for this modification raises the total level of effort for task by 1590 hours.

PERIOD OF PERFORMANCE

Period of performance for this contract will be from the date the modification contract award to August 31, 2011.

REPORTING REQUIREMENTS

All reports shall be submitted electronically as a Microsoft Word or PDF file to the Project Officer and Contracting Officer.

Monthly Letter Status Report.

A Monthly Letter Status Report (MLSR) is to be submitted by the 20th of the month to following:

RESDEMLSR.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, list monthly spending, total spending to date, and the remaining funds and will contain information as directed in NRC Management Directive 11.1. 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 project manager.

PUBLICATIONS NOTE

RES encourages the publication of the scientific results from RES sponsored programs in refereed scientific and engineering journals as appropriate. If the laboratory 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 Project Manager. The RES Project Manager shall either approve the material as submitted, approve it subject to NRC suggested revisions, or disapprove it. In any event, the RES Project Manager 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 Project Manager determines that it will benefit the RES project, the Project Manager may authorize payment of travel and publishing costs, if any, from the project funds. If the Project Manager 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 Project Manager in both electronic and camera-ready copy.

All 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 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.

DELIVERABLES/SCHEDULES AND/OR MILESTONES

The Task 1 Deliverable Schedule is to be modified as follows due to this contract modification:

Subtask 1) No change
Subtask 2) a) Provide the SharePoint site within one month of task initiation.
b) Provide the SQUIRT2 Fortran module 4 months of task initiation.

c) Provide technical assistance as required.
d.) Provide configuration management support as dictated by the program manager
e.) Provide sampling routines within 6 months of modification initiation

Subtask 3) Provide technical letter report for Phase I-IV results 6 months of modification initiation

Subtask 4) Provide technical assistance as required.

A Monthly Letter Status Report (MLSR) is to be submitted to the NRC Project Manager by the 20th of the month.

ORGANIZATIONAL CONFLICT OF INTEREST DISCLOSURE (to be inserted by Division of Contracts)

MEETINGS AND TRAVEL

Additional travel requirements due to this modification will include up to three two-day trips for up to two people to Rockville, MD or NRC-designated location to provide expertise in the various technical areas associated with this task.

NRC-FURNISHED MATERIAL

None

TECHNICAL DIRECTION

Technical direction will be provided by the Project Manager, (**David Rudland**), who can be reached at:

Mail Stop: CSB-5CA24
U. S. Nuclear Regulatory Commission
Washington, D. C.. 20555-0001

Phone: (301) 251-7622
Fax: (301) 251-7420
Email: (david.rudland@nrc.gov)

Express mail should be sent to:
U. S. Nuclear Regulatory Commission
Mail Stop: XXXX
11545 Rockville Pike
Rockville, MD 20852-2738