

AWARD/CONTRACT		1. THIS CONTRACT IS RATED ORDER UNDER DPAS (15 CFR 350)	RATING N/A	PAGE 1 OF 1 PAGES			
2. CONTRACT NO. (Proc Incl Ident) RRC-04-03-071		3. EFFECTIVE DATE SEP 17 2003	4. REQUEST/PURCHASE REQUEST/PROJECT NO.				
5. ISSUED BY U.S. Nuclear Regulatory Commission Div of Contracts Two White Flint North - MS T-7-Y-2 Washington, DC 20555		CODE 3100	6. ADMINISTERED BY (If other than Item 5) U.S. Nuclear Regulatory Commission Div of Contracts Two White Flint North - MS T-7-Y-2 Washington, DC 20555				
7. NAME AND ADDRESS OF CONTRACTOR  THOMAS E. MURLEY 9106 McDonald Drive  Bethesda MD 20817		8. DELIVERY <input type="checkbox"/> FOB ORIGIN <input checked="" type="checkbox"/> OTHER (See below) 9. DISCOUNT FOR PROMPT PAYMENT N/A 10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: 11. EMP TO MARK FOR U.S. Nuclear Regulatory Commission Washington DC 20555					
12. PAYMENT WILL BE MADE BY U.S. Nuclear Regulatory Commission Payment Team, Mail Stop T-9-H-4 Attn: (insert contract or order number) Washington DC 20555		13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION. <input type="checkbox"/> 10 U.S.C. 2304(d) <input type="checkbox"/> 41 U.S.C. 253(d)					
14. ACCOUNTING AND APPROPRIATION DATA 31X0200 B&R:36015110191 BOC:252A JCN:Y6737 RES ID: RES-C03-424 OBLIGATE: 550,000		15. ITEM NO. 15A. SUPPLIES/SERVICES 15B. QUANTITY 15C. UNIT 15D. UNIT PRICE 15E. AMOUNT See Section B.1					
15G. TOTAL AMOUNT OF CONTRACT		550,000.00					
16. TABLE OF CONTENTS See Attached Table of Contents							
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CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE							
17. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 2 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise furnished above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (A) this award/contract, (B) the solicitation, if any, and (C) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (All documents are listed herein.)				18. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer of \$A Solicitation Number: RES-03-071 including the additions or changes made by you which additions or changes are set forth in full above, to hereby accepted as to the terms listed above and on any continuation sheets. This award consummated the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.			
19A. NAME AND TITLE OF SIGNER (Type or print) THOMAS E. MURLEY				20A. NAME OF CONTRACTING OFFICER M. Mace			
19B. NAME OF CONTRACTOR BY Thomas E. Murley (Signature of person authorized to sign)				20B. LIMITED TO THE USE OF AMERICA BY [Signature] (Signature of Contracting Officer)			
19C. DATE SIGNED 9-17-03				20C. DATE SIGNED 9/16/03			

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**PART I - THE SCHEDULE****SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS****B.1 SCHEDULE**

CLINN NO.	SCHEDULE ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL
1	Consulting Services				\$50,000
TOTAL					\$50,000

**B.2 PROJECT TITLE**

The title of this project is as follows:

Peer Review of Technical Basis for Potential Revision in The PTS Rule (10 CFR 50.61)

**B.3 BRIEF DESCRIPTION OF WORK (MAR 1987)**

The objective of the peer review is to perform a review to assess the adequacy and reasonableness of the developed technical basis (as detailed by the draft PTS NUREG report and other supporting documents) to support a potential revision of the PTS rule (10CFR50.61).

## SECTION D - PACKAGING AND MARKING

### D.1 PACKAGING AND MARKING (MAR 1987)

The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission Regulations, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation. On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

## SECTION E - INSPECTION AND ACCEPTANCE

### E.1 PLACE OF INSPECTION AND ACCEPTANCE (MAR 1987)

Inspection and acceptance of the deliverable items to be furnished hereunder shall be made by the Project Officer at the destination.

**SECTION F - DELIVERIES OR PERFORMANCE****F.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE**

The following contract clauses pertinent to this section are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" in Section I of this contract. See FAR 52.252-2 for an internet address (if specified) for electronic access to the full text of a clause.

NUMBER	TITLE	DATE
	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	
52.247-34	F.O.B. DESTINATION	NOV 1991
52.247-48	F.O.B. DESTINATION--EVIDENCE OF SHIPMENT	FEB 1999

**F.2 2052.211-70 PREPARATION OF TECHNICAL REPORTS (JAN 1993)**

All technical reports required by Section C and all Technical Progress Reports required by Section F are to be prepared in accordance with the attached Management Directive 3.8, "Unclassified Contractor and Grantee Publications in the NUREG Series." Management Directive 3.8 is not applicable to any Contractor Spending Plan (CSP) and any Financial Status Report that may be included in this contract. (See List of Attachments).

**F.3 PLACE OF DELIVERY--REPORTS (JUN 1988)**

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

(a) Project Officer (Shah Malik copies)

RES/DET/MEB MS T-10-E10

(b) Contracting Officer (1 copy)

**F.4 DURATION OF CONTRACT PERIOD (MAR 1987)**

This contract shall commence on effective date of this contract and will expire April 02, 2004.

To meet the RES operating plan milestone of PTS Rule (10 CFR 50.61) technical basis re-evaluation (Activity: 1A1ABD, User Need: NRR-2002-025), the peer review and report preparation is estimated to start September 2003.

**SECTION G - CONTRACT ADMINISTRATION DATA****G.1 2052.215-71 PROJECT OFFICER AUTHORITY**

(a) The contracting officer's authorized representative hereinafter referred to as the project officer for this contract is:

Name: Shah Malik  
Address: RES/DET/MEB  
MST-10-E10  
Washington, DC 20555  
Telephone Number: 301-415-6007

(b) Performance of the work under this contract is subject to the technical direction of the NRC project officer. The term "technical direction" is defined to include the following:

(1) Technical direction to the contractor which shifts work emphasis between areas of work or tasks, authorizes travel which was unanticipated in the Schedule (i.e., travel not contemplated in the Statement of Work or changes to specific travel identified in the Statement of Work), fills in details, or otherwise serves to accomplish the contractual statement of work.

(2) Provide advice and guidance to the contractor in the preparation of drawings, specifications, or technical portions of the work description.

(3) Review and, where required by the contract, approval of technical reports, drawings, specifications, and technical information to be delivered by the contractor to the Government under the contract.

(c) Technical direction must be within the general statement of work stated in the contract. The project officer does not have the authority to and may not issue any technical direction which:

(1) Constitutes an assignment of work outside the general scope of the contract.

(2) Constitutes a change as defined in the "Changes" clause of this contract.

(3) In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.

(4) Changes any of the expressed terms, conditions, or specifications of the contract.

(5) Terminates the contract, settles any claim or dispute arising under the contract, or issues any unilateral directive whatever.

(d) All technical directions must be issued in writing by the project officer or must be confirmed by the project officer in writing within ten (10) working days after verbal issuance. A copy of the written direction must be furnished to the

contracting officer. A copy of NRC Form 445, Request for Approval of Official Foreign Travel, which has received final approval from the NRC must be furnished to the contracting officer.

(e) The contractor shall proceed promptly with the performance of technical directions duly issued by the project officer in the manner prescribed by this clause and within the project officer's authority under the provisions of this clause.

(f) If, in the opinion of the contractor, any instruction or direction issued by the project officer is within one of the categories as defined in paragraph (c) of this section, the contractor may not proceed but shall notify the contracting officer in writing within five (5) working days after the receipt of any instruction or direction and shall request the contracting officer to modify the contract accordingly. Upon receiving the notification from the contractor, the contracting officer shall issue an appropriate contract modification or advise the contractor in writing that, in the contracting officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the "Changes" clause.

(g) Any unauthorized commitment or direction issued by the project officer may result in an unnecessary delay in the contractor's performance and may even result in the contractor expending funds for unallowable costs under the contract.

(h) A failure of the parties to agree upon the nature of the instruction or direction or upon the contract action to be taken with respect thereto is subject to 52.233-1 - Disputes.

(i) In addition to providing technical direction as defined in paragraph (b) of the section, the project officer shall:

(1) Monitor the contractor's technical progress; including surveillance and assessment of performance, and recommend to the contracting officer changes in requirements.

(2) Assist the contractor in the resolution of technical problems encountered during performance.

(3) Review all costs requested for reimbursement by the contractor and submit to the contracting officer recommendations for approval, disapproval, or suspension of payment for supplies and services required under this contract.

(4) Assist the contractor in obtaining the badges for the contractor personnel.

(5) Immediately notify the Personnel Security Branch, Division of Facilities and Security (PERSEC/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return the individual's badge to PERSEC/DFS within three days after their termination.

## **G.2 2052.215-78 TRAVEL APPROVALS AND REIMBURSEMENT**

### **-ALTERNATE 1 (OCT 1999)**

(a) Total expenditure for travel may not exceed \$ 0 without the prior approval of the contracting officer.

(b) All foreign travel must be approved in advance by the NRC on NRC Form 445, Request for Approval of Official Foreign Travel, and must be in compliance with FAR 52.247-63 Preference for U.S. Flag Air Carriers. The contractor shall submit NRC Form 445 to the NRC no later than 30 days prior to the commencement of travel.

(c) The contractor will be reimbursed only for those travel costs incurred that are directly related to this contract and which are allowable subject to the limitations prescribed in FAR 31.205-46. (d) It is the responsibility of the contractor to notify the contracting officer in accordance with the FAR Limitations of Cost clause of this contract when,



at any time, the contractor learns that travel expenses will cause the contractor to exceed the travel ceiling amount identified in paragraph (a) of this clause.

(e) Reasonable travel costs for research and related activities performed at State and nonprofit institutions, in accordance with Section 12 of Pub. L. 100-679, shall be charged in accordance with the contractor's institutional policy to the degree that the limitations of Office of Management and Budget (OMB) guidance are not exceeded. Applicable guidance documents include OMB Circular A-87, Cost Principles for State and Local Governments; OMB Circular A-122, Cost Principles for Nonprofit Organizations; and OMB Circular A-21, Cost Principles for Educational Institutions.

## SECTION H - SPECIAL CONTRACT REQUIREMENTS

### H.1 2052.209-72 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST (JAN 1993)

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor:

(1) Is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract; and

(2) Does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor, as defined in 48 CFR 2009.570-2 in the activities covered by this clause.

(c) Work for others.

(1) Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe, with respect to itself or any employee, that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer before the execution of such contractual arrangement.

(2) The contractor may not represent, assist, or otherwise support an NRC licensee or applicant undergoing an NRC audit, inspection, or review where the activities that are the subject of the audit, inspection, or review are the same as or substantially similar to the services within the scope of this contract (or task order as appropriate) except where the NRC licensee or applicant requires the contractor's support to explain or defend the contractor's prior work for the utility or other entity which NRC questions.

(3) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site, the contractor shall neither solicit nor perform work in the same or similar technical area for that licensee or applicant organization for a period commencing with the award of the task order or beginning of work on the site (if not a task order contract) and ending one year after completion of all work under the associated task order, or last time at the site (if not a task order contract).

(4) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site,

(i) The contractor may not solicit work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate.

(ii) The contractor may not perform work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate, and for one year thereafter.

(iii) Notwithstanding the foregoing, the contracting officer may authorize the contractor to solicit or perform this type of work (except work in the same or similar technical area) if the contracting officer determines that the situation will not pose a potential for technical bias or unfair competitive advantage.

## (d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, that it does not have any organizational conflicts of interest as defined in 48 CFR 2009.570-2.

(2) The contractor agrees that if, after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(3) It is recognized that the scope of work of a task-order-type contract necessarily encompasses a broad spectrum of activities. Consequently, if this is a task-order-type contract, the contractor agrees that it will disclose all proposed new work involving NRC licensees or applicants which comes within the scope of work of the underlying contract. Further, if this contract involves work at a licensee or applicant site, the contractor agrees to exercise diligence to discover and disclose any new work at that licensee or applicant site. This disclosure must be made before the submission of a bid or proposal to the utility or other regulated entity and must be received by the NRC at least 15 days before the proposed award date in any event, unless a written justification demonstrating urgency and due diligence to discover and disclose is provided by the contractor and approved by the contracting officer. The disclosure must include the statement of work, the dollar value of the proposed contract, and any other documents that are needed to fully describe the proposed work for the regulated utility or other regulated entity. NRC may deny approval of the disclosed work only when the NRC has issued a task order which includes the technical area and, if site-specific, the site, or has plans to issue a task order which includes the technical area and, if site-specific, the site, or when the work violates paragraphs (c)(2), (c)(3) or (c)(4) of this section.

## (e) Access to and use of information.

(1) If in the performance of this contract, the contractor obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the Government based on the information until one year after the release of the information to the public; or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) Subject to patent and security provisions of this contract, the contractor shall have the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 48 CFR 2009.570-2, the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms contract, contractor, and contracting officer, must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any

relevant interest required to be disclosed concerning this contract or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing to the contracting officer in accordance with the procedures outlined in 48 CFR 2009.570-9.

(i) Follow-on effort. The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefor (solicited or unsolicited), which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor may not perform any technical consulting or management support services work or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of the products or services.

(1) If the contractor, under this contract, prepares a complete or essentially complete statement of work or specifications, the contractor is not eligible to perform or participate in the initial contractual effort which is based on the statement of work or specifications. The contractor may not incorporate its products or services in the statement of work or specifications unless so directed in writing by the contracting officer, in which case the restrictions in this paragraph do not apply.

(2) Nothing in this paragraph precludes the contractor from offering or selling its standard commercial items to the Government.

## **H.2 GOVERNMENT FURNISHED EQUIPMENT/PROPERTY - NONE PROVIDED (JUN 1988)**

The Government will not provide any equipment/property under this contract.

## **H.3 SEAT BELTS**

Contractors, subcontractors, and grantees, are encouraged to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented, or personally owned vehicles.

## **H.4 COMPLIANCE WITH U.S. IMMIGRATION LAWS AND REGULATIONS**

NRC contractors are responsible to ensure that their alien personnel are not in violation of United States Immigration and Naturalization (INS) laws and regulations, including employment authorization documents and visa requirements. Each alien employee of the Contractor must be lawfully admitted for permanent residence as evidenced by Alien Registration Receipt Card Form 1-151 or must present other evidence from the Immigration and Naturalization Services that employment will not affect his/her immigration status. The INS Office of Business Liaison (OBL) provides information to contractors to help them understand the employment eligibility verification process for non-US citizens. This information can be found on the INS website, <http://www.ins.usdoj.gov/graphics/services/employerinfo/index.htm#obl>.

The NRC reserves the right to deny or withdraw Contractor use or access to NRC facilities or its equipment/services, and/or take any number of contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor's responsibility under this clause.

(End of Clause)

## PART II - CONTRACT CLAUSES

## SECTION I - CONTRACT CLAUSES

## I.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE

The following contract clauses pertinent to this section are hereby incorporated by reference (by Citation Number, Title, and Date) in accordance with the clause at FAR "52.252-2 CLAUSES INCORPORATED BY REFERENCE" in Section I of this contract. See FAR 52.252-2 for an internet address (if specified) for electronic access to the full text of a clause.

NUMBER	TITLE FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	DATE
52.215-8	ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT	OCT 1997
52.222-3	CONVICT LABOR	JUN 2003
52.222-21	PROHIBITION OF SEGREGATED FACILITIES	FEB 1999
52.222-26	EQUAL OPPORTUNITY	APR 2002
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS	DEC 2001
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES	JUN 1998
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS	DEC 2001
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	JUN 2003
52.227-14	RIGHTS IN DATA--GENERAL	JUN 1987
52.227-17	RIGHTS IN DATA--SPECIAL WORKS	JUN 1987
52.232-7	PAYMENT UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS ALTERNATE II (JAN 1986)	FEB 2002
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986
52.232-34	PAYMENT BY ELECTRONIC FUNDS TRANSFER-- OTHER THAN CENTRAL CONTRACTOR REGISTRATION	MAY 1999
52.233-1	DISPUTES	JUL 2002
52.233-3	PROTEST AFTER AWARD	AUG 1996
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS	APR 1984
52.243-3	CHANGES--TIME-AND-MATERIALS OR LABOR-HOURS	SEP 2000
52.244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS	JUN 2003
52.249-6	TERMINATION (COST-REIMBURSEMENT) ALTERNATE IV (SEP 1996)	SEP 1996
52.249-14	EXCUSABLE DELAYS	APR 1984

52.253-1  
52.232-25

COMPUTER GENERATED FORMS  
PROMPT PAYMENT

JAN 1991  
FEB 2002

## **I.2 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)**

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

## PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

## SECTION J - LIST OF ATTACHMENTS

ATTACHMENT NUMBER	TITLE	DATE	NO. PAGES
1	Statement of Work		
2	ACH Vendor Miscellaneous Payment Enrollment Form		
3	FIXED PRICE/LABOR HOUR BILLING INSTRUCTION		



OFFICE OF NUCLEAR REGULATORY RESEARCH  
DIVISION OF ENGINEERING TECHNOLOGY  
STATEMENT OF WORK FOR RES-03-071  
JCN Y6737

**TITLE:** Peer Review of Technical Basis for Potential Revision in Screening Criteria In The PTS Rule (10 CFR 50.61)

**1. BACKGROUND**

NRC's Office of Nuclear Regulatory Research (RES) is organizing a peer review of the draft technical basis [Ref. 1] for a proposed revision to the screening criteria in the pressurized thermal shock (PTS) rule (10 CFR 50.61). The draft technical basis has received comments by the stakeholders within NRC, Advisory Committee on Reactor Safeguards (ACRS) and the industry, and is being revised to address those comments and to finalize the remaining activities.

A peer review panel is being set up to perform a detailed review of the technical basis, and to provide written comments from that review. It is expected that the majority of the technical basis development will be completed by the time the peer review panel is established. The objective, scope, and activities for the peer review panel are discussed in this work statement.

The peer review panel will consist of a chairperson (or co-chairpersons) and the peer reviewers from each of the three main subject areas – probabilistic risk assessment and human reliability analysis (PRA/HRA), thermal-hydraulics (TH), and probabilistic fracture mechanics (PFM). Each reviewer will prepare comments on the PTS methodology and the results. The chairperson (or co-chairpersons) will compile the comments from the other reviewers, provide his/her comments, and assemble the peer review panel report. The RES review panel coordinator will provide assistance in assembling the review panel report, if needed.

**2. OBJECTIVE**

The objective of the peer review is to perform a review to assess the adequacy and reasonableness of the developed technical basis (as detailed by the draft PTS NUREG report and other supporting documents) to support a potential revision of the PTS rule (10CFR50.61).

**3. SCOPE OF WORK**

The scope of peer review involves:

- A. Review the developed methodology, technical approach, data and results in the technical basis
- B. Provide comments on the adequacy and reasonableness of the methodology used and the results obtained. This will involve assessing that the developed models, data and concepts are sufficient for their intended use. While we are not expecting the review panel to run the developed computer codes, the review panel may at their discretion

perform calculations to check the validity of the results. Before undertaking such computations, any additional resources and level of effort (beyond what is authorized here) have to be requested in the form of a revision to this statement of work.

- C. The review process will compare the major elements of the PTS methodology against the desired characteristics and attributes that are elaborated in a PRA standard (e.g., ASME PRA Standard RA-S-2002 [Ref. 2]). The peer review will identify both strengths and weaknesses in the PTS methodology. Key assumptions are to be reviewed to determine if they are appropriate, and if they have a significant impact on the results.
- D. A description of the qualifications of the peer review team members and the peer review process are documented. The results of the peer review for each of the major technical element of PTS methodology are documented including those areas where the developed methodology do not meet or exceed the desired characteristics and attributes used in the review process. This includes an assessment of the importance of any identified deficiencies on the results, and how these deficiencies could be addressed and resolved.

The peer review is expected to be performed in two steps:

- Step-1:** In the first step, a preliminary review is to be performed of the available draft reports on the PTS methodology development and draft results. This step is expected to commence in August 2003, after the peer reviewer receives available draft reports on methodology development and results. One to two days' presentation on the draft reports and results will be made by the RES staff during September 29 to October 17, 2003. Also, in this meeting the review panel would develop its charter and plan their activities. RES will provide the finalized reports on analysis procedure to the review panel by November 21, 2003. The reviewer is to develop preliminary comments on the analysis procedures and available draft results during this step, that will continue thru December 31, 2003. At the end of Step 1, a draft letter report is to be provided to RES by the reviewer on the preliminary review comments by January 16, 2004.
- Step-2:** In the second step, a review is to be performed of the finalized reports on results and conclusions drawn from application of the methodology and data. This step is expected to commence on January 1, 2004 and continue through April 2, 2004. During January 1 to January 16, 2004, a presentation will be made by the RES staff and contractors on the finalized results and conclusions. During this meeting, the review panel will also provide the preliminary review comments that were developed in the Step 1. The peer review panel is expected to meet again with the RES staff, at the completion of the review, during March 1 to March 12, 2004 to communicate the findings of the peer review. It is anticipated that the peer review, communication of the review

findings, and reporting on the peer review will be completed by April 2, 2004 with the final report on peer review delivered to RES.

The peer reviewer may hold additional discussions (e-mails, phone calls) and meetings as needed with the technical members of the PTS project in any of the subject areas. The RES review panel coordinator will facilitate and arrange these discussions and meetings.

As a general guideline, peer review for the PTS project is proposed to include major elements of the peer review process as described in the American Society of Mechanical Engineers (ASME) Standard RA-S-2002 [Ref. 2], "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications, (Section 6: Peer Review)". Section 6 (Peer Review) of the ASME standard provides the requirement for a peer review to determine if the analysis methodology and its implementation meet the requirements of the Section 4 (Risk Assessment Technical Requirements) of that standard.

Recently RES/NRC has developed a draft regulatory guide [Ref. 3] on determining technical adequacy of the PRA results for risk informed activities, and has developed a draft regulatory position [Ref. 4] on the ASME PRA Standard RA-S-2002. The draft regulatory guide [Ref. 3] provides a brief description on the characteristics and attributes of a peer review (in Section 3.4). The draft peer review guidance in References 3 and 4 is also recommended to be considered in the peer review process by the review panel.

#### 4. REVIEWER'S QUALIFICATIONS & AREAS OF EXPERTISE

Peer reviewers are needed in with qualifications and expertise in one or more of the following three subject areas related to PTS rule technical basis re-evaluation:

##### A. Probabilistic Risk Assessment and Human Reliability Analysis (PRA/HRA):

Internationally recognized expert in PRA/HRA methods, and application of these methods to nuclear reactor power plants' assessment. The reviewer should also have experience in application of PRA standards, such as: ASME PRA Standard RA-S-2002. The reviewer should have actively participated in numerous risk studies and application of those risk studies to support decision making, and have made numerous presentations and publications in conferences, proceedings and journals.

##### B. Thermal-Hydraulics (TH) Analysis and Experimental Validation:

Internationally recognized expert in computational and experimental TH and reactor safety, TH computer codes development, experimental validation of the analytical predictions, and application of TH codes to water-cooled nuclear power plants' analyses to support decision making. The reviewer should have actively participated in numerous multi-organization cooperative research projects on TH computational methodologies' development and applications, and should have made numerous presentations and publications in technical conferences, proceedings and journals.

C. Probabilistic Fracture Mechanics (PFM) Analysis and Experimental Validation:

Internationally recognized expert in reactor pressure vessel (RPV) structural integrity assessment, analytical and experimental methods development in fracture mechanics areas, modeling of irradiation embrittlement effects on mechanical behavior of RPV ferritic materials, and have applied the developed fracture mechanics models and correlations to predict the experimentally observed data on fracture behavior of RPV ferritic steel materials. The reviewer should have actively participated in numerous multi-organization cooperative research projects on RPV integrity evaluation and should have made numerous presentations and publications in technical conferences, proceedings and refereed-journals on RPV integrity assessment areas.

D. Chairperson:

In addition to internationally-recognized expertise in one or more of the above 3 subject areas (PRA/HRA, TH, PFM), a chairperson (or co-chairpersons) shall also have performed leadership role for many years in comprehensive, high-level, broad-scope management of programs on water-cooled nuclear reactor power plants' safety and risk assessments.

5. SELECTION OF CHAIRPERSON

The chairperson (or co-chairpersons) shall be selected from among one of the awarded contracts by the NRC project officer after the panel has been formed based on stated interest from the offerors. The chairman or co-chairs responsibilities will include the following, chairing the meetings, keeping copies of panel members schedules, and compile the comments from the other reviewers, provide his/her comments, and assemble the review panel report. Differences or dissenting views among peers reviewers are documented, and recommended alternatives for resolution of any differences are reported. The RES review panel coordinator will provide assistance in assembling the review panel report if needed.

5. REPORTING REQUIREMENTS

- A draft letter report is to be provided to NRC at the end of Step-1 of the peer review process.
- A final report shall be submitted to the NRC by the end of Step-2, no later than the end of the performance period, on the peer review as stated in the Scope of Work.
- The chairperson (or co-chairpersons) will compile the comments from the other reviewers, provide his/her comments, and assemble the review panel report. Differences or dissenting views among peers reviewers are documented, and recommended alternatives for resolution or any differences are reported. RES review panel coordinator will provide assistance in assembling the review panel report, if needed.

6. NRC FURNISHED MATERIAL

NRC-published reports (e.g.: References [1, 3, 4]) will be provided.

## 7. MEETINGS AND TRAVEL

### Domestic Travel:

For the peer reviewer residing in the U.S., it is anticipated that there would be three trips, each lasting up to 2 days, to NRC Offices in Rockville, MD, for one person to conduct discussions on the subject matter and to perform the peer review.

### International Travel:

For the peer reviewer residing outside the U.S., it is anticipated that there would be three trips, each lasting up to 2 days, to NRC Offices in Rockville, MD, for one person to conduct discussions on the subject matter and to perform the peer review.

## 8. LIST OF REFERENCES

- [Ref. 1] US NRC, Draft NUREG, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Criteria in the PTS Rule (10CFR50.61)," December 2002.
- [Ref. 2] ASME Standard RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," An American National Standard, The American Society of Mechanical Engineers, April 5, 2002.
- [Ref. 3] US NRC, "Attachment 1: Draft Regulatory Guide on Determining Technical Adequacy of the PRA Results for Risk Informed Activities," July 1, 2002, ADAMS Document Accession Numbers: ML021830643.
- [Ref. 4] US NRC, "Attachment 2: Appendix A, NRC Regulatory Position on ASME PRA Standard," July 2, 2002, ADAMS Document Accession Number: ML021830613.