

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. Inst. Ident.) NRC-04-06-070		3. EFFECTIVE DATE See Block 19C.		4. REQUISITION/PURCHASE REQUEST/PROJECT NO. RES-06-070			
5. ISSUED BY U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Mail Stop T-7-I-2 Washington, DC 20555		CODE 3100	6. ADMINISTERED BY (If other than Item 5) U.S. Nuclear Regulatory Commission Div. of Contracts Mail Stop T-7-I-2 Washington, DC 20555		CODE 3100		
7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code) BATTELLE MEMORIAL INSTITUTE 505 KING AVE COLUMBUS OH 432012693				8. DELIVERY <input type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER (See below)			
				9. DISCOUNT FOR PROMPT PAYMENT Net 30			
				10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN:		ITEM 5	
CODE		FACILITY CODE 007901598					
11. SHIP TO/MARK FOR U.S. Nuclear Regulatory Commission Office of Nuclear Regulatory Research 11545 Rockville Pike Rockville, MD DC 20852		CODE	12. PAYMENT WILL BE MADE BY U.S. Nuclear Regulatory Commission Payment Team, Mail Stop T-9-H-4 Attn: (RES-06-070) Washington DC 20555		CODE 3100		
13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c)() <input checked="" type="checkbox"/> 41 U.S.C. 253(c)(1)				14. ACCOUNTING AND APPROPRIATION DATA RES-06-601 60-15-111-193 N6172 252A 31X0200.660 \$105,000			
15A. ITEM NO	15B. SUPPLIES/SERVICES		15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT	
	See Section B						
15G. TOTAL AMOUNT OF CONTRACT							
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CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE							
17. <input type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified 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. (Attachments are listed herein.)				18. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates 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 WESLEY JACKSON CONTRACTING OFFICER				20A. NAME OF CONTRACTING OFFICER DONALD A. KING			
19B. NAME OF CONTRACTOR BY <i>Wesley Jackson</i>		19C. DATE SIGNED 7/27/06		20B. UNITED STATES OF AMERICA BY <i>Donald A. King</i>		20C. DATE SIGNED 11/13/2006	
		(Signature of person authorized to sign)				(Signature of Contracting Officer)	

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

STANDARD FORM 101-1 (JULY 1985)

ADM001

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Section B

PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 PROJECT TITLE

The title of this project is as follows:

International Cooperative Research Program For Maximizing Enhancements in Risk Informed Technology (MERIT) For Commercial Nuclear Power Plants

B.2 BRIEF DESCRIPTION OF WORK (MAR 1987)

The purpose of this contract, based upon the unsolicited proposal from Battelle, dated September 2004, entitled, "International Cooperative Research Program for Maximizing Enhancements in Risk Informed Technology (MERIT) for Commercial Nuclear Power Plants", is to enhance risk inherent tools now used as one of the cornerstones for the maintenance and operation of commercial nuclear power plants through the creation of an international cooperative research program. Specifically, the following tasks will be performed under the contract: (1) study of degradation mechanisms associated with non-piping components in order to reduce uncertainty associated with this contribution to the overall loss-of-coolant accident (LOCA) frequency determination (Task 2) (2) assessment of primary water stress corrosion cracking (PWSCC) in different locations and for multiple cracks (Task 6e); and (3) update of NRC computer codes (NRCPIPE, NRCPIPES and seepage quantification of upsets in reactor tubes (SQUIRT)) and databases (pipe FRACTure mechanics property database (PIFRAC), CIRCUMferentially Cracked piping database (CIRCUMCR), and AXIALlly Cracked piping database (AXIALCR)) that Battelle previously developed (Task 10). As noted in the unsolicited proposal under paragraph 6.0, the NRC will share in the results from the commercial contracts with other participating countries. The other participating countries will also share in the results from this contract. **Note that bi-monthly technical and financial status reports will be provided by Battelle.**

B.3 CONSIDERATION AND OBLIGATION--COST PLUS FIXED FEE (JUN 1988) ALTERNATE I (JUN 1991)

(a) The total estimated cost to the Government for full performance of this contract is \$313,539.00, of which the sum of \$282,896 represents the estimated reimbursable costs less CAS 414, of which the sum of \$8,011 presents CAS 414, and of which \$22,632 presents the fixed fee.

(b) There shall be no adjustment in the amount of the Contractor's fixed fee by reason of differences between any estimate of cost for performance of the work under this contract and the actual cost for performance of that work.

(c) The amount currently obligated by the Government with respect to this contract is \$105,000, of which the sum of \$93,930 represents the estimated reimbursable costs less CAS 414, of which the sum of \$2,670 presents CAS 414, and of which \$8,400 presents the fixed fee.

(d) It is estimated that the amount currently allotted will cover performance through 12 months after award of contract.

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SECTION C - DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

See Attachment 1 – (Under this contract the NRC will specifically be covering the costs for: Task 2 Non-Piping Component Degradation; Task 6e – Effect of Primary Water Stress Corrosion Cracking (PWSCC) on Leak-Before-Break (LBB); and Task 10 Update of Computer Codes and Databases)
Note that bi-monthly technical and financial status reports will be provided by Battelle.

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 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
52.246-9	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1) INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM)	APR 1984

E.2 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.

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Section F

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
52.242-15	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1) STOP-WORK ORDER ALTERNATE I (APR 1984)	AUG 1989

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 2052.211-71 TECHNICAL PROGRESS REPORT (JAN 1993)

The contractor shall provide a bi-monthly Technical Progress Report to the project officer and the contracting officer. The report is due within 15 calendar days after the end of the report period and must identify the title of the project, the contract number, appropriate financial tracking code specified by the NRC Project Officer, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report must include the following for each discrete task/task order:

- (a) A listing of the efforts completed during the period, and milestones reached or, if missed, an explanation provided;
- (b) Any problems or delays encountered or anticipated and recommendations for resolution. If the recommended resolution involves a contract modification, e.g., change in work requirements, level of effort (cost) or schedule delay, the contractor shall submit a separate letter to the contracting officer identifying the required change and estimated cost impact.
- (c) A summary of progress to date; and
- (d) Plans for the next reporting period.

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Section F

F.4 2052.211-72 FINANCIAL STATUS REPORT (OCT 1999)

The contractor shall provide a bi-monthly Financial Status Report (FSR) to the project officer and the contracting officer. The FSR shall include the acquisition of, or changes in the status of, contractor-held property acquired with government funds valued at the time of purchase at \$50,000 or more. Whenever these types of property changes occur, the contractor shall send a copy of the report to the Chief, Property and Acquisition Oversight Branch, Office of Administration. The report is due within 15 calendar days after the end of the report period and must identify the title of the project, the contract number, the appropriate financial tracking code (e.g., Job Code Number or JCN) specified by the NRC Project Officer, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report must include the following for each discrete task:

- (a) Total estimated contract amount.
- (b) Total funds obligated to date.
- (c) Total costs incurred this reporting period.
- (d) Total costs incurred to date.
- (e) Detail of all direct and indirect costs incurred during the reporting period for the entire contract or each task, if it is a task ordering contract.
- (f) Balance of obligations remaining.
- (g) Balance of funds required to complete contract/task order.
- (h) Contractor Spending Plan (CSP) status: A revised CSP is required with the Financial Status Report whenever the contractor or the contracting officer has reason to believe that the total cost for performance of this contract will be either greater or substantially less than what had been previously estimated.
 - (1) Projected percentage of completion cumulative through the report period for the project/task order as reflected in the current CSP.
 - (2) Indicate significant changes in the original CSP projection in either dollars or percentage of completion. Identify the change, the reasons for the change, whether there is any projected overrun, and when additional funds would be required. If there have been no changes to the original NRC-approved CSP projections, a written statement to that effect is sufficient in lieu of submitting a detailed response to item "h".
- (i) Property status:
 - (1) List property acquired for the project during the month with an acquisition cost between \$500 and \$49,999. Give the item number for the specific piece of equipment.
 - (2) Provide a separate list of property acquired for the project during the month with an acquisition cost of \$50,000 or more. Provide the following information for each item of property: item description or nomenclature, manufacturer, model number, serial number, acquisition cost, and receipt date. If no property was acquired during the month, include a statement to that effect. The same information must be provided for any component or peripheral equipment which is part of a "system or system unit."
 - (3) For multi-year projects, in the September monthly financial status report provide a cumulative listing of property with an acquisition cost of \$50,000 or more showing the information specified in paragraph (i)(2) of this clause.

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(4) In the final financial status report provide a closeout property report containing the same elements as described above for the monthly financial status reports, for all property purchased with NRC funds regardless of value unless title has been vested in the contractor. If no property was acquired under the contract, provide a statement to that effect. The report should note any property requiring special handling for security, health, safety, or other reasons as part of the report.

(j) Travel status: List the starting and ending dates for each trip, the starting point and destination, and the traveler(s) for each trip.

(k) If the data in this report indicates a need for additional funding beyond that already obligated, this information may only be used as support to the official request for funding required in accordance with the Limitation of Cost (LOC) Clause (FAR 52.232-20) or the Limitation of Funds (LOF) Clause FAR 52.232-22.

F.5 DELIVERY SCHEDULE

The following deliverables shall be due no later than three years after award of contract unless noted otherwise:

NRC sponsored deliverables:

1. Updated Computer Codes including NRCPIPES, NRCPIPE, and SQUIRT
2. Updated pipe fracture experiment databases CIRCUMCK and AXIAL_CK
3. Updated pipe material property database PIFRAC
4. Updated PROC-LOCA Computer Code with User Manual.

International Cooperative Research Program Sponsored deliverables:

1. A final program NUREG Report
2. Encyclopedia CD ROM
3. Catalog of residual stress solutions for dissimilar pipe/component welds
4. A set of guidelines for dissimilar weld repairs and mitigation strategies
5. Bi-monthly Technical and Financial Progress Reports - Due on the 15 calendar days after the end of the reporting period
6. Other deliverable(s) resulting from commercial contracts executed by other participating countries in the MERIT program

F.6 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 (1 copy)
- (b) Contracting Officer (1 copy)

F.7 DURATION OF CONTRACT PERIOD (MAR 1987)

This contract shall commence on Day of Award and will expire three years after award date.

SECTION G - CONTRACT ADMINISTRATION DATA**G.1 PROJECT OFFICER AUTHORITY (FEB 2004),**

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

Name: Shah Malik

Address: 11545 Rockville Pike
MS T-10-E10
Rockville, MD 20852

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 (SOW) or changes to specific travel identified in the SOW), fills in details, or otherwise serves to accomplish the contractual SOW.

(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 Security Branch, Division of Facilities and Security (SB/DFS) (via e-mail) when a contractor employee no longer requires access authorization and return of any NRC issued badge to SB/DFS within three days after their termination.

(6) Ensure that all contractor employees that require access to classified Restricted Data or National Security Information or matter, access to sensitive unclassified information (Safeguards, Official Use Only, and Proprietary information) access to sensitive IT systems or data, unescorted access to NRC controlled buildings/space, or unescorted access to protected and vital areas of nuclear power plants receive approval of SB/DFS prior to access in accordance with Management Directive and Handbook 12.3.

G.2 2052.216-71 INDIRECT COST RATES (JAN 1993)

(a) Pending the establishment of final indirect rates which must be negotiated based on audit of actual costs, the contractor shall be reimbursed for allowable indirect costs as follows:

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Section G

INDIRECT COST POOL

RATE

BASE

Fringe Benefits
Overhead
G&A
CAS Overhead
CAS



DL cost
DL + fringe
Total Cost

(b) The contracting officer may adjust these rates as appropriate during the term of the contract upon acceptance of any revisions proposed by the contractor. It is the contractor's responsibility to notify the contracting officer in accordance with FAR 52.232-20, Limitation of Cost, or FAR 52.232-22, Limitation of Funds, as applicable, if these changes affect performance of work within the established cost or funding limitations.

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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 209.570-2 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 2052.215-70 KEY PERSONNEL (JAN 1993)

(a) The following individuals are considered to be essential to the successful performance of the work hereunder:



The contractor agrees that personnel may not be removed from the contract work or replaced without compliance with paragraphs (b) and (c) of this section.

(b) If one or more of the key personnel, for whatever reason, becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the contractor

shall immediately notify the contracting officer and shall, subject to the concurrence of the contracting officer, promptly replace the personnel with personnel of at least substantially equal ability and qualifications.

(c) Each request for approval of substitutions must be in writing and contain a detailed explanation of the circumstances necessitating the proposed substitutions. The request must also contain a complete resume for the proposed substitute and other information requested or needed by the contracting officer to evaluate the proposed substitution. The contracting officer and the project officer shall evaluate the contractor's request and the contracting officer shall promptly notify the contractor of his or her decision in writing.

(d) If the contracting officer determines that suitable and timely replacement of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the contract work is not reasonably forthcoming, or that the resultant reduction of productive effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the contracting officer for default or for the convenience of the Government, as appropriate. If the contracting officer finds the contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss, or damage.

H.3 2052.235-70 PUBLICATION OF RESEARCH RESULTS (OCT 1999)

(a) The principal investigator(s)/contractor shall comply with the provisions of NRC Management Directive 3.8 (Vol. 3, Part 1) and NRC Handbook 3.8 (Parts I-IV) regarding publication in refereed scientific and engineering journals or dissemination to the public of any information, oral or written, concerning the work performed under this contract. Failure to comply with this clause shall be grounds for termination of this contract.

(b) The principal investigator(s)/contractor may publish the results of this work in refereed scientific and engineering journals or in open literature and present papers at public or association meetings at interim stages of work, in addition to submitting to NRC the final reports and other deliverables required under this contract. However, such publication and papers shall focus on advances in science and technology and minimize conclusions and/or recommendations which may have regulatory implications.

(c) The principal investigator(s) shall coordinate all such publications with, and transmit a copy of the proposed article or paper to, the NRC Contracting Officer or Project Officer, prior to publication. The NRC agrees to review and provide comments within thirty (30) days after receipt of a proposed publication. However, in those cases where the information to be published is (1) subject to Commission approval, (2) has not been ruled upon, or (3) disapproved by the Commission, the NRC reserves the right to disapprove or delay the publication. Further, if the NRC disagrees with the proposed publication for any reason, it reserves the right to require that any publication not identify the NRC's sponsorship of the work and that any associated publication costs shall be borne by the contractor.

H.4 2052.235-71 SAFETY, HEALTH, AND FIRE PROTECTION (JAN 1993)

The contractor shall take all reasonable precautions in the performance of the work under this contract to protect the health and safety of its employees and of members of the public, including NRC employees and contractor personnel, and to minimize danger from all hazards to life and property. The contractor shall comply with all applicable health, safety, and fire protection regulations and requirements (including reporting

requirements) of the Commission and the Department of Labor. If the contractor fails to comply with these regulations or requirements, the contracting office may, without prejudice to any other legal or contractual rights of the Commission, issue an order stopping all or any part of the work. Thereafter, a start work order for resumption of work may be issued at the discretion of the contracting officer. The contractor may not make a claim for an extension of time or for compensation or damages by reason of, or in connection with, this type of work stoppage.

H.5 2052.242-70 RESOLVING NRC CONTRACTOR DIFFERING PROFESSIONAL VIEWS (DPVS) (OCT 1999)

(a) The Nuclear Regulatory Commission's (NRC) policy is to support the contractor's expression of professional health and safety related concerns associated with the contractor's work for NRC that may differ from a prevailing NRC staff view, disagree with an NRC decision or policy position, or take issue with proposed or established agency practices. An occasion may arise when an NRC contractor, contractor's personnel, or subcontractor personnel believes that a conscientious expression of a competent judgement is required to document such concerns on matters directly associated with its performance of the contract. The NRC's policy is to support these instances as Differing Professional Views (DPVs).

(b) The procedure that will be used provides for the expression and resolution of differing professional views (DPVs) of health and safety related concerns associated with the mission of the agency by NRC contractors, contractor personnel or subcontractor personnel on matters directly associated with its performance of the contract. This procedure may be found in Attachments to this document. The contractor shall provide a copy of the NRC DPV procedure to all of its employees performing under this contract and to all subcontractors who shall, in turn, provide a copy of the procedure to its employees. The prime contractor or subcontractor shall submit all DPV's received but need not endorse them.

H.6 2052.242-71 PROCEDURES FOR RESOLVING NRC CONTRACTOR DIFFERING PROFESSIONAL VIEWS (DPVS) (OCT 1999)

(a) The following procedure provides for the expression and resolution of differing professional views (DPVs) of health and safety related concerns of NRC contractors and contractor personnel on matters connected to the subject of the contract. Subcontractor DPVs must be submitted through the prime contractor. The prime contractor or subcontractor shall submit all DPV's received but need not endorse them.

(b) The NRC may authorize up to eight reimbursable hours for the contractor to document, in writing, a DPV by the contractor, the contractor's personnel, or subcontractor personnel. The contractor shall not be entitled to any compensation for effort on a DPV which exceeds the specified eight hour limit.

(c) Before incurring costs to document a DPV, the contractor shall first determine whether there are sufficient funds obligated under the contract which are available to cover the costs of writing a DPV. If there are insufficient obligated funds under the contract, the contractor shall first request the NRC contracting officer for additional funding to cover the costs of preparing the DPV and authorization to proceed.

(d) Contract funds shall not be authorized to document an allegation where the use of this NRC contractor DPV process is inappropriate. Examples of such instances are: allegations of wrongdoing which should be addressed directly to the NRC Office of the Inspector General (OIG), issues submitted anonymously, or issues raised which have already been considered, addressed, or rejected, absent significant new information. This

procedure does not provide anonymity. Individuals desiring anonymity should contact the NRC OIG or submit the information under NRC's Allegation Program, as appropriate.

(e) When required, the contractor shall initiate the DPV process by submitting a written statement directly to the NRC Office Director or Regional Administrator responsible for the contract, with a copy to the Contracting Officer, Division of Contracts and Property Management, Office of Administration. Each DPV submitted will be evaluated on its own merits.

(f) The DPV, while being brief, must contain the following as it relates to the subject matter of the contract:

(1) A summary of the prevailing NRC view, existing NRC decision or stated position, or the proposed or established NRC practice.

(2) A description of the submitter's views and how they differ from any of the above items.

(3) The rationale for the submitter's views, including an assessment based on risk, safety and cost benefit considerations of the consequences should the submitter's position not be adopted by NRC.

(g) The Office Director or Regional Administrator will immediately forward the submittal to the NRC DPV Review Panel and acknowledge receipt of the DPV, ordinarily within five (5) calendar days of receipt.

(h) The panel will normally review the DPV within seven calendar days of receipt to determine whether enough information has been supplied to undertake a detailed review of the issue. Typically, within 30 calendar days of receipt of the necessary information to begin a review, the panel will provide a written report of its findings to the Office Director or Regional Administrator and to the Contracting Officer, which includes a recommended course of action.

(i) The Office Director or Regional Administrator will consider the DPV Review Panel's report, make a decision on the DPV and provide a written decision to the contractor and the Contracting Officer normally within seven calendar days after receipt of the panel's recommendation.

(j) Subsequent to the decision made regarding the DPV Review Panel's report, a summary of the issue and its disposition will be included in the NRC Weekly Information Report submitted by the Office Director. The DPV file will be retained in the Office or Region for a minimum of one year thereafter. For purposes of the contract, the DPV shall be considered a deliverable under the contract. Based upon the Office Director or Regional Administrator's report, the matter will be closed.

H.7 GOVERNMENT FURNISHED EQUIPMENT/PROPERTY - NONE PROVIDED (JUN 1988)

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

H.8 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.9 Annual and Final Contractor Performance Evaluations

Annual and final evaluations of contractor performance under this contract will be prepared in accordance with FAR 42.15, "Contractor Performance Information," normally at the time the contractor is notified of the

NRC's intent to exercise the contract option. If the multi-year contract does not have option years, then an annual evaluation will be prepared (state time for annual evaluation). Final evaluations of contractor performance will be prepared at the expiration of the contract during the contract closeout process.

The Contracting Officer will transmit the NRC Project Officer's annual and final contractor performance evaluations to the contractor's Project Manager, unless otherwise instructed by the contractor. The contractor will be permitted thirty days to review the document. The contractor may concur without comment, submit additional information, or request a meeting to discuss the performance evaluation. The Contracting Officer may request the contractor's Project Manager to attend a meeting to discuss the performance evaluation.

Where a contractor concurs with, or takes no exception to an annual performance evaluation, the Contracting Officer will consider such evaluation final and releasable for source selection purposes. Disagreements between the parties regarding a performance evaluation will be referred to an individual one level above the Contracting Officer, whose decision will be final.

The Contracting Officer will send a copy of the completed evaluation report, marked "For Official Use Only," to the contractor's Project Manager for their records as soon as practicable after it has been finalized. The completed evaluation report also will be used as a tool to improve communications between the NRC and the contractor and to improve contract performance.

The completed annual performance evaluation will be used to support future award decisions in accordance with FAR 42.1502(a) and 42.1503(c). During the period the information is being used to provide source selection information, the completed annual performance evaluation will be released to only two parties - the Federal government personnel performing the source selection evaluation and the contractor under evaluation if the contractor does not have a copy of the report already.

H.10 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	DATE
	FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1)	
52.202-1	DEFINITIONS	JUL 2004
52.203-3	GRATUITIES	APR 1984
52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT	JUL 1995
52.203-7	ANTI-KICKBACK PROCEDURES	JUL 1995
52.203-8	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY	JAN 1997
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	SEP 2005
52.204-4	PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER	AUG 2000
52.204-7	CENTRAL CONTRACTOR REGISTRATION (OCT 2003)	OCT 2003
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	JAN 2005
52.215-2	AUDIT AND RECORDS--NEGOTIATION	JUN 1999
52.215-8	ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT	OCT 1997
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)	OCT 2004
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS (PRB)	JUL 2005
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES	OCT 1997
52.216-7	ALLOWABLE COST AND PAYMENT	DEC 2002
52.216-8	FIXED-FEE	MAR 1997
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS	MAY 2004
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
52.223-6	DRUG-FREE WORKPLACE	MAY 2001
52.225-1	BUY AMERICAN ACT--SUPPLIES	JUN 2003
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	FEB 2006
52.227-1	AUTHORIZATION AND CONSENT ALTERNATE I (APR 1984)	JUL 1995
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT	AUG 1996
52.227-11	PATENT RIGHTS -- RETENTION BY THE CONTRACTOR (SHORT FORM)	JUN 1997
52.227-14	RIGHTS IN DATA--GENERAL	JUN 1987
52.227-16	ADDITIONAL DATA REQUIREMENTS	JUN 1987
52.228-7	INSURANCE--LIABILITY TO THIRD PERSONS	MAR 1996
52.232-17	INTEREST	JUN 1996
52.232-18	AVAILABILITY OF FUNDS	APR 1984
52.232-22	LIMITATION OF FUNDS	APR 1984
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986
52.232-33	PAYMENT BY ELECTRONIC FUNDS--CENTRAL CONTRACTOR REGISTRATION	OCT 2003
52.233-3	PROTEST AFTER AWARD ALTERNATE I (JUN 1985)	AUG 1996
52.233-4	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM	OCT 2004
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS	APR 1984
52.242-3	PENALTIES FOR UNALLOWABLE COSTS	MAY 2001
52.242-4	CERTIFICATION OF FINAL INDIRECT COSTS	JAN 1997
52.242-13	BANKRUPTCY	JUL 1995
52.243-2	CHANGES--COST REIMBURSEMENT ALTERNATE V (APR 1984)	AUG 1987
52.244-2A	SUBCONTRACTS ALTERNATE I (JAN 2006)	JAN 2006
52.244-5	COMPETITION IN SUBCONTRACTING	DEC 1996
52.244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS	FEB 2006
52.246-23	LIMITATION OF LIABILITY	FEB 1997
52.246-25	LIMITATION OF LIABILITY--SERVICES	FEB 1997
52.249-6	TERMINATION (COST-REIMBURSEMENT) (MAY 2004)	MAY 2004
52.249-14	EXCUSABLE DELAYS	APR 1984
52.253-1	COMPUTER GENERATED FORMS	JAN 1991

I.2 52.232-25 PROMPT PAYMENT (OCT 2003)

Notwithstanding any other payment clause in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer (EFT). Definitions of pertinent terms are set forth in sections 2.101, 32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(4) of this clause concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments--

(1) Due date.

(i) Except as indicated in paragraphs (a)(2) and (c) of this clause, the due date for making invoice payments by the designated payment office is the later of the following two events:

(A) The 30th day after the designated billing office receives a proper invoice from the Contractor (except as provided in paragraph (a)(1)(ii) of this clause).

(B) The 30th day after Government acceptance of supplies delivered or services performed. For a final invoice, when the payment amount is subject to contract settlement actions, acceptance is deemed to occur on the effective date of the contract settlement.

(ii) If the designated billing office fails to annotate the invoice with the actual date of receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor's invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) Certain food products and other payments.

(i) Due dates on Contractor invoices for meat, meat food products, or fish; perishable agricultural commodities; and dairy products, edible fats or oils, and food products prepared from edible fats or oils are--

(A) For meat or meat food products, as defined in section 2(a)(3) of the Packers and Stockyard Act of 1921 (7 U.S.C. 182(3)), and as further defined in Pub. L. 98-181, including any edible fresh or frozen poultry meat, any perishable poultry meat food product, fresh eggs, and any perishable egg product, as close as possible to, but not later than, the 7th day after product delivery.

(B) For fresh or frozen fish, as defined in section 204(3) of the Fish and Seafood Promotion Act of 1986 (16 U.S.C. 4003(3)), as close as possible to, but not later than, the 7th day after product delivery.

(C) For perishable agricultural commodities, as defined in section 1(4) of the Perishable Agricultural Commodities Act of 1930 (7 U.S.C. 499a(4)), as close as possible to, but not later than, the 10th day after product delivery, unless another date is specified in the contract.

(D) For dairy products, as defined in section 111(e) of the Dairy Production Stabilization Act of 1983 (7 U.S.C. 4502(e)), edible fats or oils, and food products prepared from edible fats or oils, as close as possible to, but not later than, the 10th day after the date on which a proper invoice has been received. Liquid milk, cheese, certain processed cheese products, butter, yogurt, ice cream, mayonnaise, salad dressings, and other similar products, fall within this classification. Nothing in the Act limits this classification to refrigerated products. When questions arise regarding the proper classification of a specific product, prevailing industry practices will be followed in specifying a contract payment due date. The burden of proof that a classification of a specific product is, in fact, prevailing industry practice is upon the Contractor making the representation.

(ii) If the contract does not require submission of an invoice for payment (e.g., periodic lease payments), the due date will be as specified in the contract.

(3) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(3)(i) through (a)(3)(x) of this clause. If the invoice does not comply with these requirements, the designated billing office will return it within 7 days after receipt (3 days for meat, meat food products, or fish; 5 days for perishable agricultural commodities, dairy products, edible fats or oils, and food products prepared from edible fats or oils), with the reasons why it is not a proper invoice. The Government will take into account untimely notification when computing any interest penalty owed the Contractor.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of the mailing or transmission.)

(iii) Contract number or other authorization for supplies delivered or services performed (including order number and contract line item number).

(iv) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.

(v) Shipping and payment terms (e.g., shipment number and date of shipment, discount for prompt payment terms). Bill of lading number and weight of shipment will be shown for shipments on Government bills of lading.

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(ix) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (e.g., 52.232-38, Submission of Electronic Funds Transfer Information with Offer), contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration, or 52.232-34, Payment by Electronic Funds Transfer--Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(x) Any other information or documentation required by the contract (e.g., evidence of shipment).

(4) Interest penalty. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs

(a)(4)(i) through (a)(4)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment, and there was no disagreement over quantity, quality, or Contractor compliance with any contract term or condition.

(iii) In the case of a final invoice for any balance of funds due the Contractor for supplies delivered or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(5) Computing penalty amount. The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor, Government acceptance is deemed to occur constructively on the 7th day (unless otherwise specified in this contract) after the Contractor delivers the supplies or performs the services in accordance with the terms and conditions of the contract, unless there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. If actual acceptance occurs within the constructive acceptance period, the Government will base the determination of an interest penalty on the actual date of acceptance. The constructive acceptance requirement does not, however, compel Government officials to accept supplies or services, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve claims involving disputes and any interest that may be payable in accordance with the clause at FAR 52.233-1, Disputes.

(6) Discounts for prompt payment. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

(7) Additional interest penalty.

(i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if--

(A) The Government owes an interest penalty of \$1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(7)(ii) of this clause, postmarked not later than 40 days after the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall--

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest is due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible--

(1) The designated payment office that receives the demand will annotate it with the date of receipt, provided the demand is received on or before the 40th day after payment was made; or

(2) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(iii) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract financing payment. If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) Fast payment procedure due dates. If this contract contains the clause at 52.213-1, Fast Payment Procedure, payments will be made within 15 days after the date of receipt of the invoice.

(d) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.

I.3 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	Unsolicited Technical Proposal For MERIT dated September 2004		
2	Billing Instructions - Cost Reimbursement		
3	Contract Spending Plan		
4	NRC Handbook 3.7		
5	NRCAR 2009.5 COI		

ATTACHMENT I

TECHNICAL PROPOSAL

For

International Cooperative Research

Program

For

Maximizing Enhancements in Risk Informed Technology
(MERIT)

For

Commercial Nuclear Power Plants

September 2004

Prepared by:

Battelle

The Business of Innovation

**505 King Avenue
Columbus, Ohio 43201-2693**

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1.0 BACKGROUND AND INTRODUCTION

As the technology associated with commercial nuclear power generation has matured, risk management has become one of the cornerstones behind the maintenance and operation of these plants. Over the years a number of risk management tools have evolved to the point that they are now frequently used in the decision making process. For example, probabilistic risk assessment (PRA) analyses are used by both the industry and regulatory staff. Risk-informed in-service inspection protocols are being incorporated into inspection criteria embodied in ASME Section XI. Probabilistic fracture mechanics (PFM) codes, such as PRAISE and PRODIGAL, and databases of in-service operating experience are being used more to assess potential risks associated with the operation of nuclear power plants.

In order to further enhance some of these risk management tools, Battelle is developing a new international cooperative research program, to be known as MERIT (Maximizing Enhancements in Risk Informed Technology). MERIT is structural much in the motif of the highly successful IPIRG (International Piping Integrity Research Group) and BINP (Battelle Integrity of Nuclear Piping) programs.

Previously a white paper was sent to a number of prospective MERIT members. The white paper contained a survey to solicit interest in this program and to assess which tasks, subtasks, and activities described in that white paper were of most interest and of most importance to the potential membership. A number of organizations responded to that survey and the agreement among the potential members was remarkably consistent, with almost all of the respondents identifying the same set of issues as being the most important to address. Furthermore, almost all of the respondents identified the same issues as being of little interest. As a result, the MERIT program was ultimately structured as a base program with a series of costed options. The base program contains those tasks, subtasks, and activities that the respondents universally agreed were of most importance. The costed options include those tasks for which there was less agreement, i.e., some felt these issues were very important while others felt that other issues were more pressing. The remaining issues, of little interest to the respondents, were not considered further.

Initially the focus will be on the base program tasks. Then, once the group of participants is established, decisions will be made as to which other tasks from the optional list will be addressed, possibly at the first Technical Advisory Group (TAG) meeting. The number of optional tasks that can be addressed will depend on the number of participants who ultimately join this program. For the most part, the proposed base and option program tasks concentrate on addressing one of three focused disciplines with associated specific outcomes:

- Outcome #1 – Continued development of a probabilistic LOCA code and standardized procedures for assessment.
- Outcome #2 - Assessment of weld residual stresses and their impact on stress corrosion cracking.

- Outcome #3 – Continued development of a flaw evaluation criteria for Class 2, 3, and balance of plant (BOP) piping.

Some of these tasks will be part of the base program effort while others will be included in the list of optional tasks. Besides these tasks that are clearly aligned with one of these three focused outcomes, there was one unaligned task (Update of Computer Codes and Databases) that was high on each of the respondents list of priorities that will be addressed as part of the base program.

2.0 STATEMENT OF WORK

The statement of work (SOW) for both the base and optional program tasks for the MERIT program are discussed next.

Outcome #1: Continued development of a probabilistic LOCA code and standardized procedures

- Task 1: Continued development of a Probabilistic LOCA Code (Base Program Task)
- Task 2: Non-Piping Component Degradation (Base Program Task)
- Task 3: Develop Standard Procedures (Optional Task)
- Task 4: Low Cycle Fatigue Procedures (Optional Task)
- Task 5: Extension of the Analysis for the Effect of Weld Residual Stresses on COD Analyses for LBB (Optional Task)

Outcome #2: Assessment of weld residual stresses and their impact on stress corrosion cracking

- Task 6: Bimetallic Weld Issues and PWSCC Cracking (Base Program Task)
- Task 7: Structural Integrity and SCC control of BWR Shrouds and Shroud Supports (Optional Task)

Outcome #3: Continued development of flaw evaluation criteria for Class 2, 3, and BOP piping

- Task 8: Fatigue Crack Growth for Class 2 and 3 Materials (Optional Task)
- Task 9: Validation of the Applicability of Flaw Evaluation Criteria at Lower Operating Temperatures for the Case of Cracks in Welds and Cracks Subjected to Dynamic Loading Rates (Optional Task)

As mentioned previously, in addition, to these tasks associated with the three focused disciplines/outcomes there was one unaligned task from the MERIT white paper that was rated very highly by the respondents (**Task 10: Update of Computer Codes and Databases**). In fact, it, along with Task 1 (Continued Development of a Probabilistic LOCA Code) received the second highest rating from the respondents. As such, it has been included in the base program efforts.

Each of these tasks is described in more detail next.

Outcome #1 – Continued Development of a Probabilistic LOCA Code and Standardized Procedures for Assessment

The first five tasks associated with this SOW are associated with Outcome #1.

Task 1 – Continued Development of a Probabilistic LOCA Code (Base Program) - A new probabilistic fracture mechanics (PFM) code for estimating the frequencies of various size loss-of-coolant accidents (LOCAs) is being developed by Battelle and Engineering Mechanics Corporation of Columbus (Emc²) for the US NRC's Large Break LOCA (LB-LOCA) program. This new code, called PRO-LOCA, will be used to assess frequencies for various size LOCAs as part of the process of risk informing the emergency core cooling system (ECCS) requirements in 10CFR 50.46.

In the LB-LOCA program, many new and improved deterministic procedures are being developed for inclusion into the PRO-LOCA code. However, as the development process for this new PRO-LOCA computer code has proceeded, it became apparent that due to budgetary constraints due to shifting priorities and the associated reallocation of resources, there would be limitations with some of the deterministic models, which would force some conservative assumptions to be made. In addition, the level of validation and benchmarking has also been limited due to these budgetary constraints. Thus, one of the motivations for Task 1 is to build upon this NRC endeavor by addressing aspects that to date have had to be conservatively ignored, and to provide further validation and benchmarking of this new PFM code. In this task, any deterministic add-ons developed as part of this program will be incorporated into the PRO-LOCA code framework.

In addition to the incorporation of new deterministic procedures, continued advancements in run-time will be made by the optimization of the Monte-Carlo approach, the continued development and implementation of the Latin Hypercube sampling method and parallel processing options, and improvements to the input/output algorithm of the PRO-LOCA code. Again, it should be noted that these are continuing efforts that will rely heavily on the efforts that originated in the LB-LOCA program.

As is typical when a running code is significantly modified, debugging, beta testing and continued benchmarking will occur. Results from the LB-LOCA elicitation efforts will be used in the benchmark efforts. In addition, benchmarking against other PFM codes, such as PRAISE and NURBIT, that was initiated in the LB-LOCA program will continue. Finally, updates to the User's Manual generated in the LB-LOCA program will be made to include the efforts from this program.

Task 2 - Non-Piping Component Degradation (Base Program) - Piping LOCAs are just one contributor to the overall LOCA frequency determination. The contribution to the LOCA frequencies from non-piping components can be significant, especially for the smaller size LOCAs (i.e., smaller opening areas/smaller leak rates) where steam generator tube failures may dominate for PWRs. Furthermore, the uncertainty associated with LOCA frequency contributions due to failures of non-piping components may be

much higher than for piping due to a greater lack of understanding of the issues associated with these non-piping components. As such, the objective of this task will be to study the degradation mechanisms associated with non-piping components (valve bodies, bolting, steam generator tubes, manways, etc.), at least in a qualitative sense, in order to reduce the uncertainty associated with this part of the problem. As part of this effort, the existing service history databases will be reviewed. A number of these databases are already available from the recently completed LOCA frequency elicitation effort conducted as part of the US NRC LB-LOCA program. In addition, an assessment/comparison of the non-piping components design bases (i.e., standards, materials, margins, etc.) with the piping design bases will be made. Also, an assessment of the potential for larger size LOCAs due to collateral damage between components will be made.

Another potential concern from a non-piping component perspective is LOCAs resulting from the failure and/or collapse of component support structures (such as the pressurizer support structure) due to some large transient, such as a seismic event. In the aftermath of the Kobe and Northridge earthquakes, there were numerous examples of this type of failure, in a number of non-nuclear applications. The concern is that there are a number of similarly designed support structures in nuclear plants, and that these structures are not designed with the same rigor as a code designed piping system or piping system component. The ultimate concern is that if a structure, like the pressurizer support structure, failed/collapsed due to a seismic event, what would be the ramifications to the attached piping systems, such as the surge line, from a LOCA perspective. As part of this effort, available reports documenting the Kobe and Northridge experience with a non-nuclear perspective will be reviewed to assess what type of damage occurred. In addition, design specifications for both nuclear and non-nuclear applications will be reviewed to assess the relevancy of the non-nuclear experience to a nuclear environment. Finally, a finite element analysis of a piping system/component support structure subjected to a seismic event will be made to assess the potential for LOCA event.

Task 3 - Development of Standard Procedures (Optional Task) - Currently, probabilistic codes, such as PRAISE, NURBIT, and PRODIGAL, are used by engineers throughout the world in predicting leak probabilities in nuclear piping systems. Many of the assumptions and procedures in these codes are proprietary and are only vaguely described in User's Manuals and reports. As part of this effort, a working group of project members will be developed to form a consensus of accepted practices to be used with probabilistic leakage codes. This effort will include a complete review of the codes available and the published assumptions and procedures used. During the course of the MERIT program, two working group meetings will be held in conjunction with the normally scheduled TAG meetings to discuss the problems and develop an accepted practice consensus. To aid in this development, a round-robin effort will be developed that will allow members to exercise their probabilistic code of choice. The results of this round robin will be analyzed and presented at a working group meeting for use in developing the accepted practice. In addition, coordination with the NURBIM working group will occur so that data and technology transfer can occur.

Task 4 - Low Cycle Fatigue Procedures (Optional Task) - In the LB-LOCA redefinition efforts, the effects of large seismic loads on pipes, with and without flaws, were analyzed. This involved examining the plant seismic hazard curves for determining the probability of failure. The EPRI Piping and Fitting Dynamic Reliability program provided experimental data on large amplitude seismic loads for unflawed piping, which eventually became the basis of the modified ASME Section III pipe design rules that were used in the seismic LOCA analysis. The IPIRG and BINP program provided the experimental data and analysis methodology for pipes with large cracks. However, there is also a need to assess the effects of workmanship size flaws on the fatigue/ratcheting failure behavior of nuclear pipe subjected to large seismic loads. This is essentially a low-cycle fatigue failure of the pipe. As part of past NRC and U.S. DOE piping programs, a procedure for determining circumferential through-wall-crack growth due to low-cycle fatigue was developed using a Dowling ΔJ procedure.

This approach was verified using a series of through-wall-cracked pipe-system experiments. The basis of the Dowling ΔJ approach is to relate the area under the load-displacement curve (during the crack opening portion of the loading) to the crack growth on a cycle-by-cycle basis. In Task 4 of MERIT, this procedure will be developed and verified for circumferential surface flaws. Using the data from past inertial-loaded and pipe-system surface-cracked-pipe experiments from the IPIRG, and BINP programs, the Dowling ΔJ approach will be further developed. The difficulty in analyzing surface-cracked pipe experiments is determining the point on the experimental trace where crack closure occurs. In a through-wall-cracked pipe experiment, this point can be seen in both the electric potential and the load-displacement traces, but due to smaller EP signal and crack-opening displacement measurements in a surface-cracked pipe test, crack closure may be difficult to locate. In fact, closure may occur at different load levels along the crack front and the crack may not close completely until high compressive loads are applied. Therefore, as part of this effort, finite element analyses will also be conducted on surface-cracked pipe in order to determine the extent and history of crack closure during typical cyclic loads. The results from these analyses will aid in the development of the Dowling ΔJ procedure that could be used for analysis of workmanship type flaws in pipe subjected to large seismic loads.

Task 5 - Extension of the Analysis for the Effect of Weld Residual Stresses on COD Analyses for LBB (Optional Task) - The BINP program studied the effect of weld residual stresses on COD analyses for LBB assessments [1, 2]. A simple estimation scheme to account for weld induced residual stress effects on crack opening displacements was developed. Typically, for thinner pipe, circumferential residual stresses are tension at the pipe inner diameter and compression at the pipe outer diameter. This typically leads to crack closure (or reduction in COD) at the OD of the pipes. This crack closure effect will restrict the flow of fluid out of the crack such that the postulated leakage crack length from an LBB perspective will be longer than calculated if this effect is ignored as part of a conventional LBB assessment. This reduction in COD, and associated reduction in leakage detectability, will also impact the LOCA frequency, i.e., undetected leaking flaws left in service may continue to grow as a through-wall crack until such time as they become unstable when subjected to some emergency and faulted

loading condition, such as a seismic event. A methodology for modeling this phenomenon will be incorporated into the PRO-LOCA code as part of this task.

The inclusion of residual stresses in COD and leak-rate predictions was found to be a second-order effect on the overall analysis scheme for predicting leak rates for some typical nuclear piping system sizes in the primary loop. However, this analysis methodology was developed for a limited set of pipe diameters and wall thicknesses. This subtask will expand this analysis methodology to develop solutions for more pipe diameters and wall thicknesses. For planning purposes, we assumed that analyses would be performed for four different pipe thicknesses and three different R/t ratios. The geometries will be chosen from regions of the plant where it is known that residual stress effects are important for leak rate calculations. The additional analyses performed here are anticipated to follow the methods used in References [1] and [3].

Outcome #2 - Assessment of weld residual stresses and their impact on stress corrosion cracking

Tasks 6 and 7 are primarily associated with Outcome #2. However, both of these tasks will also feed into Outcome #1, i.e., the continued development of a probabilistic LOCA code.

Task 6 – Bimetallic Weld Issues and PWSCC Cracking (Base Program¹) – This was the Number 1 ranked task from the white paper responses. Every organization that responded to the white paper survey rated this task with a #1 rating (Definite Interest). Bimetallic welds are used to join ferritic pipes or components to austenitic pipes or components at a number of locations in nuclear power plants. A few examples for PWRs include the hot leg to reactor pressure vessel (RPV) weld in Westinghouse plant designs; the cold leg to reactor coolant pump (RCP) housing weld for Combustion Engineering (CE) and Babcock and Wilcox (B&W) plant designs; and the surge line nozzle, spray nozzles, and safety and relief valve nozzles associated with the pressurizer in Westinghouse, CE, and B&W plant designs. These bimetallic welds often consist of a low-alloy (or carbon steel) nozzle (or pipe) welded to a stainless steel pipe (or nozzle) using Inconel 82/182 weld metal. Recently there have been several incidents of primary water stress corrosion cracking (PWSCC) associated with these welds.

As a part of the BINP program, the VC Summer hot-leg bimetallic weld was analyzed in detail. PWSCC growth rates were carefully modeled under residual stress and service load conditions. Both axial and circumferential cracks were considered. In addition, as part of the LB-LOCA program, bimetallic weld residual stress studies are being performed to support the probabilistic LOCA code currently under development. The objective of Task 6 of MERIT is to develop more residual stress solutions for different bimetal welds in nuclear plants and to develop optimum repair and mitigation strategies for bimetal welds subject to PWSCC. The specific subtasks associated with this task are discussed next. After completion of this task, combined with the work on bimetallic welds that has been performed as part of the BINP and LB-LOCA programs, an extensive

¹ While most of this task will be conducted as part of the base program, certain identified tasks will be part of the optional program.

database of bimetallic weld pipe solutions will be available for PWSCC evaluations. The work described in this task will be integrated into the PRO-LOCA code so that a wide range of risk-informed PWSCC analyses will be possible with the PRO-LOCA code.

Subtask 6a – New Bimetal Weld Residual Stress Solutions (Base Program Subtask).

Detailed residual stress calculations were performed as part of the BINP program for the hot leg for the VC Summer nuclear plant in References 4 and 5. Currently, additional analyses are being performed as part of the LB-LOCA program. These additional analyses are for alternative hot and cold-leg geometries, pressurizer nozzle to surge-line welds, and safety-injection system lines. These residual stress analyses conducted during the LB-LOCA program were chosen to cover three size ranges of bimetallic welds, i.e., large-diameter pipe (~30-inch diameter or greater), mid-diameter range pipe (~16-inch diameter), and small-diameter pipe (~6-inch diameter range). The purpose of Subtask 6a in MERIT is to expand on this analysis database to consider other bimetal welds and additional weld conditions. In particular, different weld bevel geometries that have been used and are different than those analyzed in the past will be analyzed. This is important since the geometry of the weld groove may affect the critical location of the axial stresses which drive circumferential cracks. There are a number of potential crack locations within a weld to consider, i.e., at the center of the weld, in the buttered region, or along the fusion-line region of the weld. The additional solutions to investigate will be approved by MERIT TAG member consensus. For planning purposes, we assumed analyses will be performed for hot leg, cold leg, surge line, and safety injection system lines, and have obtained drawings of some actual weld groove geometries that have not been analyzed in the past. In addition, we plan to include resources for two additional bimetallic welds at locations identified by the MERIT members. All PWSCC calculations will consider both weld residual stresses and service loads. This will include both axial and circumferential three-dimensional crack growth predictions from a starter elliptical crack. These predictions can be used to verify and update the models in PRO-LOCA. In Reference [4] a starter crack 0.2-inch deep, with the crack depth to length ratio of 0.5, was used. In this task, we will use several different starter cracks as agreed upon by the MERIT TAG members. We will consider cracks placed at many locations including in the center of the weld, in the heat affected zones, along the fusion line, and even an embedded crack. Finally, there are other Ni-based alloy materials used in nuclear plants that could be studied. These analyses will be performed as needed.

The VFTTM (Virtual Fabrication Technology) predictive weld code [6], developed by Battelle and Caterpillar Inc. will be used for these analyses. The FRAC@ALT finite element alternating method code [7], which has emerged as the fastest and simplest method for obtaining stress intensity factors in complex structures, will be used to determine the stress intensity factors. These stress intensity solutions will be compared to values obtained by using the Anderson influence functions that are currently incorporated in the PRO-LOCA code. Critical locations in the weld will be identified for circumferential crack locations, and those stress fields through the thickness will be fit to a fourth-order polynomial for use in the PRO-LOCA code.

Subtask 6b – Three Dimensional Modeling Effects (Optional Program Subtask). Axi-symmetric solutions as produced in Subtask 6a are considered quite accurate and are considered to adequately represent the residual stress states away from the start-stop locations. The adequacy of this has been shown by a number of researchers as summarized in Reference [8] and the many references cited therein. However, it is known that the residual stress state in the vicinity of a start-stop location is drastically different from the stress state away from this region – often opposite in sign [9]. MERIT Subtask 6b will focus on performing full three-dimensional analyses of selected bimetal welds considered in Subtask 6a. After the three-dimensional residual stress fields are identified, full PWSCC solutions, with starter cracks placed in and near the start-stop locations will be performed. This will quantitatively assess the assumptions made regarding axi-symmetric solutions most often used for PWSCC analysis. Realizing that actual welds do not have start-stop locations that are perfectly lined up in each weld pass, we will determine the “typical” distance between stop-start locations for a downhill field weld (i.e., near the top and bottom of the pipe) and use those distances for our stop-start analysis.

Subtask 6c – Weld Repair Effects. Often weld repairs are made to bimetallic welds in nuclear plants. Indeed, most of the PWSCC service failures were at weld repair locations. Of importance is that some plants have been reported to have a very high number of weld repairs, while others do not. For example, Battelle obtained a cold-leg piping system from a canceled CE plant that has been used in a number of past studies, and the bimetal welds in that piping system had been repaired extensively. As part of the LB-LOCA program, recent work has shown that weld repairs can have a pronounced effect on the final residual stress state, depending on the depth of the repair. (Recent work as part of the LB-LOCA program has also shown that these repairs can significantly influence the number and distribution of pre-existing weld-induced flaws.) The past residual stress work was on 360-degree weld repairs for three different depths. This task will model a range of weld repairs with different lengths. Again the stress fields in the repair areas need to be characterized with a 4th order polynomial for the PRO-LOCA code and the resulting K-solutions verified by the FRAC@ALT finite element alternating method [7]. The activities described above are included in the base program efforts.

Another important aspect that needs further consideration is the effect of surface grinding. Surface grinding was frequently a cause of IGSCCs in BWRs in the past. Emc² has also conducted analyses on the effect of grinding on surface stresses in recent NRC programs on CRDM nozzles. In this subtask, some key experiments will be conducted to provide guidance to the grinding simulation analyses. For instance, it is known that grinding, where a high temperature is developed, will produce tensile surface residual stresses, where grinding when there is mainly cold working (low temperatures) will produce compressive surface residual stresses. The magnitude and depth of the surface residual stresses could also be put in the LB-LOCA code. (Note; recommendations on grinding procedures from this work will also be given in Subtask 6f.) These grinding related activities will be included are part of the optional program.

Subtask 6d – Bimetal Weld Measurements. The VFTTM (Virtual Fabrication Technology) predictive weld code, developed by Battelle and Caterpillar, has been validated extensively. However, residual stress predictions in bimetallic welds need further validation. As part of the base program efforts, surface measurements of the residual stresses will be made on a bimetal weld specifically fabricated and donated to this program by one of the participants. By using a weld specifically fabricated for this program there will be no question as to the procedures used in making this weld. For planning purposes it has been assumed that one of the participants will donate to this program a 12- to 16-inch diameter Schedule 160 bimetal pipe weld and that the procedures used in fabricating this weld will be representative of those used in actual nuclear power plant piping applications. Also, the actual procedures (weld geometry, pre-heat temperatures, heat inputs, etc.) will be well documented and provided to Battelle.

As an optional subtask, the through-thickness residual stress field will be assessed using the deep hole drilling method developed at the University of Bristol. The deep hole drilling technique has emerged as the most advanced method developed to date to obtain through thickness residual stress measurements. The plan here is to perform measurements on the same donated pipe as used for the surface measurements as part of the base program efforts associated with this subtask.

Subtask 6e– Effect of PWSCC on LBB (Base Program Subtask). The dominant PWSCC crack at the hot leg/reactor pressure vessel (RPV) nozzle at the VC Summer plant had an axial orientation. Axial cracks that are restricted to the weld region are of little concern from a pipe break perspective in that they should not grow in length to the extent that they would become critical. However, there was a secondary circumferential crack. This crack was only about 5 mm deep and 40 mm long in the circumferential direction. Furthermore, once the crack grew through the cladding it arrested in the low alloy nozzle material. As such, it was of little concern from a structural integrity perspective. The question was raised, however, as to what would have happened if that circumferential crack had initiated another 5 to 10 mm down the length of the weld and grown into the fusion line region instead of into the nozzle material. If it had grown into the fusion line and linked up with other similar fusion-line PWSCC cracks, what impact would such a circumferential crack had on LBB. An initial assessment of this question was the focus of a recent ASME Pressure Vessel and Piping (PVP) paper by Battelle, Emc², and NRC staff [10]. The objective of this subtask will be to make an assessment of the likelihood and impact of such an occurrence through a more rigorous assessment. This includes examining other actually used, but different weld groove geometries, to see if the peak longitudinal stresses line up more with the main part of the weld and not just the buttering region, and an assessment of how many additional crack initiation sites would have to exist and what their minimum spacing would have to be to grow a crack that would threaten LBB behavior.

Prior work to date (References [4, 5]) considered PWSCC initiating in the center of the bimetallic weld. This was for one crack. This task will consider placing cracks at other locations within the weld and butter zone region. In addition, often PWSCC produces multiple cracking – both circumferential and axial. This will also be investigated within this task by inserting multiple cracks into the pipes and performing PWSCC evaluations.

Multiple crack analysis is simple using FRAC@ALT [7]. Finally, the PRO-LOCA code will be validated by performing several separate PWSCC evaluations using TRACLIFE. This will provide independent verification of the PRO-LOCA code and may lead to improvements.

Subtask 6f – Mitigation Techniques for Requalification of LBB for Bimetallic Welds Susceptible to PWSCC (Base Program Subtask). The occurrence of PWSCC cracks violates the initial requirements in performing an LBB analysis by the NRC's draft Standard Review Plan (SRP) 3.6.3 procedures. Currently there is concern on how to handle pipe system cases that are potentially susceptible to PWSCC and have already been approved for LBB. The draft SRP 3.6.3 says that two mitigation techniques could be used. Weld overlays and mechanical stress improvements have been used in the past for BWR piping for IGSCCs, although they were not approved for LBB mitigation procedures. Of these two methods, the weld overlay repair is probably the best, in that it can reduce the ID tensile stresses (one mitigation method), the overlay can be made with a weld metal that is not susceptible to PWSCC, and the additional thickness would be sufficient to withstand the normal operating loads even if the PWSCC grew completely through the original weld.

The objective of this task is to simulate a weld overlay repair on a bimetallic weld and determine; (1) the change in the stress field on the ID surface, (2) the change in the crack driving force if the weld overlay repair was made on a weld with a crack, and (3) determine the minimum thickness of the overlay required so that the cracked pipe, with overlay applied, would still retain the same strength as the uncracked pipe. Mechanical stress improvement by application of compressive plasticity adjacent to the weld is another method that could be used, but because this requires proprietary equipment and procedures, it will not be explored

Subtask 6g – Optimizing Welding and Repair Procedures (Base Program Subtask). The objective of this task is to provide guidance on girth weld procedures for minimizing high tensile weld residual stresses. In the past, the welding procedures used frequently were made to assure that a weld could be made in a manner that gave an acceptable weld from an initial weld inspection perspective. Unfortunately, in many cases, such procedures created high tensile residual stresses on the ID surface. Based on past and recent weld simulation analyses, this subtask will focus on how to optimize repair and replacement welding procedures. Additionally, if the optional piece of Subtask 6c is funded, this subtask will assess the effects of grinding and optimizing grinding procedures when they are needed. Depending on the grinding procedures used, the surface stresses could be either tensile or compressive.

Depending on which of the optional subtasks get funded, this subtask will incorporate the new bimetallic weld solutions of Task 6a, with the three dimensional modeling effects and weld repair effects of Tasks 6b and 6c, and the mitigation results of Task 6f to develop practical guidelines on 'best practice' weld repairs of bimetallic welds. Some limited additional analyses may be required to fill in gaps to complete the guidelines.

Task 7 - Stress Corrosion Cracking and its Impact on Structural Integrity

Evaluations of Shroud and Shroud Supports (Optional Task) - There is a problem of cracking in the welds in the core shroud of some BWR power plants. It is believed that residual stresses are the main component of the driving force for these cracks. This task will investigate cracking in BWR shroud welds at critical welds known to be prone to stress corrosion cracking (SCC). The typical fabrication of a core shroud proceeds from the top down, i.e. weld H1 is made first between the heavy top ring and the first shroud section, weld H2 is then made, etc. Some shrouds are supported by a conical structure at the bottom which is attached to the reactor vessel wall. Coolant fluid surrounds both the inside and outside of the vessel. The shroud experiences minimal service loads that consist mainly of its own weight and small pressure loads. As such, stress corrosion cracking of the weld region driven by the weld residual stress fields may occur. The work reported in Reference [3] focused on the H4 weld and cracking near the H4 and H3 welds. This effort will focus on additional welds as determined by the MERIT members as well as H4 weld as needed.

Subtask 7a – Residual Stress and Crack Growth. This subtask will identify and quantify the causes of cracking in current shrouds. Both two and three dimensional weld analyses will be performed for numerous core shroud welds to determine the weld induced residual stresses. The two dimensional analyses will use an axi-symmetric solution procedure and the three dimensional analyses will include the effects of the start-stop pattern of the weld torch. These stresses will be combined with service loads (which are minimal) and stress corrosion crack growth will be modeled and SCC life predicted for each weld. It is anticipated that most welds considered will be butt welds with some tee fillet weld analyses performed as well. In addition, seam welds in the interior of the shroud where the curved sections are welded together to form rings will be considered. These rings are subsequently butt welded together to form the vessel and require three dimensional weld analyses. The residual stresses near the junctions of the plates, which may consists of a 'cross' pattern are complicated (see summary in Reference [3] and references therein). As such, some three dimensional simulations to develop the residual stress field near these regions are necessary.

Subtask 7b – Core Shroud Weld Design for SCC Mitigation. The power of weld predictive tools is that they can be used to identify and quantify cracking problems in current nuclear plants. More importantly, weld modeling tools can be used to develop weld procedures to mitigate the propensity for cracking in future construction. Moreover, methods can be designed to modify residual stresses that may lead to SCC in existing shrouds. The purpose of this task is to identify and design weld procedures for new construction to control residual stresses and to investigate methods to modify existing construction to reduce SCC susceptibility. For instance, heat blanket schemes have been developed and heat sequences designed to alter residual stresses in aging plant repair welds.

Alternative weld procedures (e.g., weld sequencing, alternative weld parameters [speed, heat input, etc.], heat sink welding, and thermal tensioning) will be developed to control SCC growth rates. In addition, alternative weld procedures such as electron-beam welding will be investigated as a means of reducing residual stresses and distortions.

Subtask 7c – Three Dimensional Fabrication Distortion Analyses of the BWR Shroud.

The fabrication sequence of the BWR core shroud consists of cutting plate, bending (as required) to form cylindrical shapes, and welding. The welding is performed by first welding bent plates together to form rings or shell sections; then the shell sections are butt welded to complete the shroud. The seam welds along the walls of the shroud can have four way crosses at some locations. At present, we plan to neglect the distortions and residual stresses that result from the cutting and forming operation, unless we find out they are important. It is noted that in some cases the history of residual stresses in the plates being welded can be important. For instance, often the residual stress pattern in the steel plate obtained from the material supplier complicates the weld induced residual stress fields. The weld analysis is involved because the flange rings are 8-inches thick and the shell sections are about two inches thick. For the purpose of these analyses, the flange ring welds (i.e., the six sections welded together to form the ring) will not be considered unless a compelling reason to include these becomes evident. The major causes of the shroud distortions will be identified. Schemes to control the final distortions will be identified. These may be weld sequencing, pre-bending geometry control, pre-cambering, and thermal control techniques.

Subtask 7d – Three Dimensional Distortion Control of a BWR Shroud. This task involves devising a weld fabrication scheme to control shroud fabrication distortions within specified tolerances. This will require a number of weld analyses to optimize the weld fabrication scheme. Schemes to control residual stresses in the shroud will also be investigated. This effort may require some preliminary analyses to be performed on shell element models.

Outcome #3 – Continued development of a flaw evaluation criteria for Class 2, 3, and balance of plant (BOP) piping

Tasks 8 and 9 are associated with Outcome #3.

Task 8 - Fatigue Crack Growth for Class 2 and 3 Materials (Optional Task) - A third focused discipline/outcome of the proposed MERIT program will be to build on the efforts from Task 7 of the BINP program through the further development of a flaw evaluation criteria for Class 2, 3, and balance of plant (BOP) piping. This discipline/outcome did not have the same level of support as did some of the tasks described above for the first two disciplines/outcomes. As such, all of the tasks associated with this outcome will be addressed as part of the Optional Program activities.

The focus of the efforts in Task 7 of the BINP program was on the fracture behavior of Class 2, 3 and BOP piping materials. However, the fracture of these materials at the lower operating temperatures of concern for Class 2 and 3 piping systems is only one part of the overall assessment. There is also a need for determining the subcritical cracking behavior of these materials at lower operating temperatures and associated water environments. Therefore, in this activity, data associated with the fatigue crack growth of these materials will be gathered. A detailed literature search will be conducted. In addition, staff at Argonne National Labs will be surveyed for the data and analysis procedures they have developed over the years. These efforts include one trip to

Argonne to conduct this survey. A database of fatigue crack growth properties will be developed.

Task 9 - Validation of the Applicability of Flaw Evaluation Criteria at Lower Operating Temperatures for the Case of Cracks in Welds and Cracks Subjected to Dynamic Loading Rates (Optional Task) - Class 2, 3, and BOP piping are usually fabricated from ferritic pipe and often operate at temperatures significantly lower than Class 1 piping. Thus, there is the concern of brittle fracture initiation. In the BINP program, a methodology for predicting the fracture initiation transition temperature (FITT) of a surface-cracked pipe, using Charpy specimen data was developed and validated for the case of cracks in the carbon steel base metal subjected to quasi-static loading rates. This methodology, and supporting experimental data, indicated that the FITT for a surface crack in a worse case nuclear grade ferritic steel, from a fracture initiation perspective, was well below any possible operating temperature that the plant might experience. As such, the criteria in ASME Section XI, Appendix H, stipulating "in the absence of specific data, the upper shelf temperature for ferritic piping steels shall be 200 F", may be overly restrictive. However, before making a sweeping conclusion regarding this behavior, additional data is needed for the case of cracks in welds, and cracks subjected to dynamic loading rates. Residual stresses in welds may alter the constraint conditions and cause an increase in the FITT. Likewise, experimental data suggests that the FITT may also increase as a result of dynamic loading. Finally, additional data for another grade and/or another thickness of ferritic piping will be developed.

Subtask 9a – Validation of Flaw Evaluation Criteria for Cracks in Welds. As part of this subtask the proposed fracture criteria for Class 2, 3, and BOP piping will be validated for the case of cracks in welds. Material property specimen tests (Charpy, dynamic tear test, compact (tension), and side-edge notch tension) will be conducted at the lower operating temperatures associated with Class 2 and 3 piping systems for the case where the crack is in the weld metal. In addition, a series of 6-inch diameter surface-cracked pipe experiments, with the cracks in the weld region, will also be conducted at the lower operating temperatures.

Subtask 9b – Validation of Flaw Evaluation Criteria for Cracks Subjected to Dynamic Loading Rates. As part of this subtask the proposed fracture criteria for Class 2, 3, and BOP piping will be validated for the case where the cracks are subjected to dynamic loading rates, such as those that may result from a seismic event. Material property specimen tests (compact (tension) and side-edge notch tension) will be conducted at dynamic loading rates at the lower operating temperatures associated with Class 2 and 3 piping systems. For these tests, the cracks will be in the base metal of the material. In addition, a series of 6-inch diameter surface-cracked pipe experiments, with the cracks in the base metal, will also be conducted at dynamic loading rates.

Subtask 9c – Validation of Flaw Evaluation Criteria for Cracks in a Different Grade/Thickness of Carbon Steel. As part of this subtask, the proposed fracture criteria for Class 2, 3, and BOP piping will be validated for a different grade and different schedule (i.e., thickness) of carbon steel pipe. Material property specimen tests (compact (tension) and side-edge notch tension tests) will be conducted at quasi-static loading rates

for another grade/thickness of carbon steel pipe. For these tests, the cracks will be in the base metal of the material. In addition, a series of 6-inch diameter surface-cracked pipe experiments, with the cracks centered in the base metal, will also be conducted at quasi-static loading rates.

Subtask 9d – Development of a Cohesive Flaw Evaluation Criteria for Class 2, 3, and BOP Piping. As part of this subtask, Dr. Gery Wilkowski from Emc² will present the results from this task to the appropriate ASME Section XI subcommittees/committees. He will also present the results from the BINP and LB-LOCA programs where the effect of the larger R/t ratios typical of Class 2, 3, and BOP piping was addressed. Dr. Wilkowski will work closely with Battelle staff and ASME committee members to develop a technically justified flaw evaluation criteria for Class 2, 3, and BOP piping.

Task 10 - Update of Computer Codes and Databases (Base Program Task) – Along with Task 1 (Continued Development of a Probabilistic LOCA Code), this was the second highest ranked task from the white paper responses. (Only Task 6 was rated more important by the survey respondents.) Every organization but one that responded to the white paper survey rated this task with a #1 rating (Definite Interest). In this task a number of the computer codes and databases developed during the course of the pipe fracture programs conducted at Battelle will be updated. User's Manuals will also be updated as appropriate.

- **NRCPIPE and NRCPIPES** - The NRCPIPE and NRCPIPES J-estimation scheme codes were last updated in the early 1990s. Since then a number of improvements have been made to these estimation schemes. Furthermore, a number of problems have been identified with these codes that have not been addressed to date. A summary of these problems was presented at one of the early BINP TAG meetings. In addition, the J-estimation schemes for surface and through-wall cracked elbows developed as part of the IPIRG and BINP programs, respectively, will be added to these codes.
- **SQUIRT** – As part of the LB-LOCA program a number of improvements were made to SQUIRT. However, one known deficiency is that SQUIRT does not have a working model of the transition flow regime, i.e., as the fluid transitions between two-phase and single-phase flow. A working model will be developed for this regime and programmed into SQUIRT and the leak rate module in PRO-LOCA. In addition, the convergence scheme currently used in the SQUIRT4 module is known to be very sensitive to the initial estimate of the crack size, i.e., depending on the initial estimate, the solution may or may not converge. This problem will also be addressed as part of this task.
- **PIFRAC, CIRCUMCR, and AXIALCR Databases** –The PIFRAC, CIRCUMCR, and AXIALCR databases will be updated with new material and pipe fracture data that has been developed since these databases were last updated in the early 1990's. PIFRAC will also be exercised to provide statistically based values of key material property parameters needed for probabilistic assessments.
- **Encyclopedia CD-ROM** - Since the Encyclopedia CD-ROM set was first developed as part of the IPIRG program, a number of NUREG reports have been prepared and some of the computer codes such as SQUIRT have undergone significant upgrades. The Encyclopedia CD-ROM set will be updated as a single reference source as part of the LB-LOCA program. Further updates to include the

revised computer codes and databases from this task will be made as part of this program. This updated Encyclopedia CD-ROM set will be made available to the MERIT program participants.

Task 11 – Resolution of Issues of Interest to Selected Members of the Group - The objective of this task is to perform experimental and/or analytical research necessary to address issues which arise during the course of this program that are of interest to only a selected group of the members. During the course of the two IPIRG and the BINP programs, research discoveries revealed the need to conduct further evaluations into areas which were not specifically addressed in the original proposal, or which were not of interest to everyone in the group. The scope of this task is to allow individual members to sponsor research in specific areas of interest only to them or a small subset of the group.

3.0 MEETINGS AND REPORTS

As part of the base program there are two Technical Advisory Group (TAG) meetings scheduled. Associated with each of these meetings will be a round robin. The focus of these round robins will be a probabilistic assessment. As additional members join the program, and additional funding is made available, then additional meetings may be added at the discretion of the TAG members.

Monthly reports will be prepared and sent to the TAG members. The monthly reports will summarize the technical accomplishments for the month as well as previewing the goals for the coming month. In addition, these reports will review the financial status and schedule for the program.

In addition, a program final NUREG report will be prepared to document the findings from this program.

4.0 DELIVERABLES

In addition to the deliverables from this program, it is our intent that the program participants will also receive the preliminary version of the PRO-LOCA code, with Users Manual, from the US NRC LB-LOCA program². The participants will receive this code at the beginning of program. In addition, they will receive training on its use at the first TAG meeting. Then, near the end of this program, after the PRO-LOCA code has been updated with the results from this program, the participants will receive an updated version of this code, with updated Users Manual.

In addition, the participants will also receive a copy of the Windows® version of the SQUIRT code which was updated as part of the LB-LOCA program. In addition, the encyclopedia CD-ROM set that was first published as part of the Second IPIRG program will be updated as part of the LB-LOCA program with the latest reports, databases, and computer codes, developed since the end of the Second IPIRG program. In addition, as

² This intent is subject to consent from the NRC and will be finalized once the participating countries have been identified and the formal MERIT agreement has been finalized.

part of this program, this encyclopedia CD-ROM set will be further updated with the latest codes and databases revised as part of this program. Copies of this updated version of the encyclopedia CD-ROM set will be made available to the participants.

The specific deliverables from the MERIT base program efforts include:

- Revised versions of the computer codes NRCPIPES, NRCPIPE, and SQUIRT.
- Updated versions of pipe fracture experiment databases CIRCUMCK and AXIAL_CHK.
- Updated version of the pipe material property database PIFRAC.
- The revised LOCA code (PRO-LOCA) with revised User's Manual.
- A catalog of residual stress solutions for dissimilar pipe/component welds.
- A set of guidelines for dissimilar weld repairs and mitigation strategies.

5.0 ADVANTAGES OF PARTICIPATION

In this era of shrinking research budgets, the MERIT program offers potential participants the opportunity to leverage their research funds by sharing in the development of solutions to a number of technical issues of common interest to the group. By pooling resources to address areas of common interest, the cost to the individual participants is a small percentage of the overall cost. Three key outcomes from this program will be:

- Development of a working/verified probabilistic LOCA code and standardized procedures. Initially this code will be used in the development of the technical basis for risk informing the emergency core cooling system requirements in order to potentially eliminate the somewhat arbitrary double-ended-guillotine pipe break criteria in such regulations as 10 CFR 50.46. As part of this effort, the NRC is currently in the process of wrapping up a formal elicitation process in which estimates of the frequencies for various size LOCAs are being made. This new LOCA code will be used to verify the results from this elicitation process.
- Assessment of weld residual stresses and their impact on stress corrosion cracking. Stress corrosion cracking of piping systems and piping system components is a significant issue currently facing the nuclear industry; whether it be primary water stress corrosion cracking in PWRs or stress corrosion cracking of the shrouds in BWRs. In each case, weld residual stresses are a key contributor to the crack driving force. In particular, weld repairs, and the associated residual stresses need to be properly accounted for. As part of this effort, modeling will be conducted to aid in the design of repair techniques and mitigation strategies, as well as the design for new construction.
- Development of a flaw evaluation criteria for Class 2, 3, and balance of plant (BOP) piping. An ongoing effort in ASME Section XI is the development of a flaw evaluation criteria for Class 2, 3, and BOP piping. Class 2, 3, and BOP piping are being inspected more frequently due to increase inspection requirements in the ASME Code. Additionally, as plants age, flaws are more likely to become a potential problem. Currently, the ASME Code flaw evaluation criteria are only applicable for Class 1 piping. As such, flaw evaluation criteria for these other than Class 1 systems need to be developed. The outcomes from this effort will be used to support the development the technical basis for such criteria.

In addition to the financial savings realized through the pooling of resources, and the technical outcomes just described, the cooperative group program concept lends itself to the sharing of ideas. Experience from the IPIRG and BINP programs has clearly demonstrated that the participants benefit greatly from the exchange of information and ideas, which takes place at the TAG meetings, especially through the associated round robin exercises. The practice of holding regular TAG meetings and round-robin exercises will continue as part of the MERIT program.

6.0 PROGRAM COSTS

The estimated costs for the base program and optional program tasks are shown in Table 1. The estimated cost for the NRC's participation as a single member in this 3-year program is \$299,880. This will cover the costs associated with Task 2, Subtask 6e, and Task 10 of the SOW. Cost details are provided in the attached cost proposal. It will take 4 members to fund the base program effort³, i.e., NRC plus 3. Then, as additional members join the program, optional tasks will be funded from the list of potential optional tasks identified in Table 1 and the SOW discussed above. The choice of which tasks from the optional list gets funded will be at the discretion of the TAG. As with the prior Battelle Integrity of Nuclear Piping (BINP) program, the NRC will share in the results with the commercial contract as will the commercial partners will share in the results of the NRC contract.

Table 1. Cost breakdown by task

Task	Base Program Costs, \$	Optional Program Costs, \$
Task 1: PRO-LOCA Code Development	289,948	
Task 2: Non-Piping Component Degradation	152,927	
Task 3: Develop Standard Procedures		195,871
Task 4: Low Cycle Fatigue Procedures		91,760
Task 5: Effect of Weld Residual Stresses on COD Analyses for LBB		134,688
Task 6: Bimetallic Weld Issues and PWSCC Cracking	404,072	306,497
Task 7: Stress Corrosion Cracking and the Impact on Structural Integrity Evaluations of Shroud and Shroud Supports		303,868
Task 8: Fatigue Crack Growth for Class 2 and 3 Materials		47,751
Task 9: Validation of Flaw Evaluation Criteria for Cracks in Welds and Cracks Subjected to Dynamic Loading Rates		718,837
Task 10: Update of Computer Codes and Databases	135,517	
Meetings and Reports (TAG Meetings, Monthly Reports, and Final NUREG Report)	217,404	115,223
Totals	1,199,868	1,914,495

³ The cost for Task 1 (Continued Development of a Probabilistic Code) is based on anticipated PRO-LOCA Code development under the US NRC LB-LOCA program through the end of September 2005. If the PRO-LOCA code is not sufficiently mature to conduct Task 1 activities at the onset of the MERIT program, the scope of other tasks may have to be adjusted slightly to complete the baseline code development.

7.0 SCHEDULE

Once four organizations agree to participate through the signing of the appropriate contracts, the base program can begin. The decision as to which tasks get funded first will be made by the TAG members.

8.0 CLOSURE

Thank you for your consideration of this proposal. If you have any technical questions, please refer them to Mr. Paul Scott at (614) 424-5330 (phone) or via e-mail at scottp@battelle.org. Questions of a contractual nature should be addressed to Mr. Ules Jackson at (614) 424-5447 (phone or fax).

9.0 REFERENCES

- [1] Fredette, L., Brust, F. W., and Scott, P. M., 'The Effect of Weld Induced Residual Stresses on Pipe Crack Opening Areas and Implications on Leak-Before-Break Considerations', Part of Task 8 of the BINP Program, (Contract Number – NRC-04-97-052, Job Code W6775) NRC Report, Sept, 2002.
- [2] Fredette, L., and Brust, F. W., 'Effect of Weld Induced Residual Stresses On Pipe Crack Opening Areas And Implications On Leak-Before-Break Considerations', ASME Pressure Vessels and Piping Conference, 4-8 August, 2002, Vancouver, British Columbia, Canada. In PVP Volume 434, COMPUTATIONAL WELD MECHANICS, CONSTRAINT, AND WELD FRACTURE, American Society of Engineers (ASME) publication, ed. F. W. Brust, August, 2002.
- [3] J. Zhang, P. Dong, F. W. Brust, W. J. Shack, M. Mayfield, M. McNeil, "Modeling of Weld Residual Stresses in Core Shroud Structures", International Journal for Nuclear Engineering and Design, Volume 195, pp. 171-187, 2000.
- [4] Brust, F. W., Yang, Y. P., and Scott, P. M., "Evaluation of Reactor Pressure Vessel (RPV) Nozzle to Hot-Leg Piping Bimetallic Weld Joint Integrity for the V. C. Summer Nuclear Power Plant", Part of Task 8 of the BINP Program, (Contract Number – NRC-04-97-052, Job Code W6775) NRC Report, Sept, 2003.
- [5] Brust, F. W., Scott, P. M., and Yang, Y., *Weld Residual Stresses and Crack Growth in Bimetallic Pipe Welds*, Proceedings of SMIRT 17, Prague, Czech Republic, August, 2003.
- [6] VFT™ (Virtual Fabrication Technology Software), Version 1.3, Developed Jointly by Battelle and Caterpillar (Caterpillar owned), exclusively distributed by Battelle Columbus Ohio, and The Welding Institute (TWI) (via separate contract with Battelle), Cambridge, England.
- [7] FRAC@ALT® (FRacture Analysis Code via ALTernating method), Version 2.0, January, 1999, Battelle Memorial Institute.
- [8] Brust, F. W., and Dong, P., "Welding Residual Stresses and Effects on Fracture in Pressure Vessel and Piping Components: A Millennium Review and Beyond", Transactions of ASME, Journal Of Pressure Vessel Technology, Volume 122, No. 3, August 2000, pp329-339.
- [9] F. W. Brust, P. Dong, J. Zhang, "Influence of Residual Stresses and Weld Repairs on Pipe Fracture", Approximate Methods in the Design and Analysis of Pressure Vessels and Piping Components, W. J. Bees, Ed., PVP-Vol. 347, pp. 173-191, 1997.
- [10] Williams, C., et. al., "The Impact of Fracture Toughness and Weld Residual Stresses on Inconel 82/182 Bimetal Welds on Leak-Before-Break Behavior," ASME PVP Vol. 479, July 2004.

ATTACHMENT 2

BILLING INSTRUCTIONS FOR COST REIMBURSEMENT TYPE CONTRACTS (October 2003)

General: The contractor is responsible during performance and through final payment of this contract for the accuracy and completeness of the data within the Central Contractor Registration (CCR) database, and for any liability resulting from the Government's reliance on inaccurate or incomplete CCR data. The contractor shall prepare vouchers/invoices for reimbursement of costs in the manner and format described herein. **FAILURE TO SUBMIT VOUCHERS/INVOICES IN ACCORDANCE WITH THESE INSTRUCTIONS WILL RESULT IN REJECTION OF THE VOUCHER/INVOICE AS IMPROPER.**

Number of Copies: An original and three copies, including supporting documentation shall be submitted. A copy of all supporting documents must be attached to each copy of your voucher/invoice. Failure to submit all the required copies will result in rejection of the voucher/invoice as improper.

Designated Agency Billing Office: Vouchers/invoices shall be submitted to the following address:

U.S. Nuclear Regulatory Commission
Division of Contracts - T-7-I-2
Washington, DC 20555

HAND DELIVERY OF VOUCHERS/INVOICES IS DISCOURAGED AND WILL NOT EXPEDITE PROCESSING BY NRC. However, should you choose to deliver vouchers/invoices by hand, including delivery by any express mail services or special delivery services which use a courier or other person to deliver the voucher/invoice in person to the NRC, such vouchers/invoices must be addressed to the above Designated Agency Billing Office and will only be accepted at the following location:

U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike - Mail Room
Rockville, MD 20852

HAND-CARRIED SUBMISSIONS WILL NOT BE ACCEPTED AT OTHER THAN THE ABOVE ADDRESS.

Note that the official receipt date for hand-delivered vouchers/invoices will be the date it is received by the official agency billing office in the Division of Contracts.

Agency Payment Office: Payment will continue to be made by the office designated in the contract in Block 12 of SF 26 or Block 25 of SF 33, whichever is applicable.

Frequency: The contractor shall submit claims for reimbursement once each month, unless otherwise authorized by the Contracting Officer.

Format: Claims should be submitted in the format depicted on the attached sample form entitled "Voucher/Invoice for Purchases and Services Other than Personal" (see **Attachment 1**). The sample format is provided for guidance only. The format is not required for submission of a voucher/invoice. Alternate formats are permissible provided all requirements of the billing instructions are addressed. The instructions for preparation and itemization of the voucher/invoice are included with the sample form.

Task Ordering Contracts: If the contractor bills for more than one task order under a voucher/invoice, detailed cost information for each individual task order shall be submitted, together with a cumulative summary of all charges billed on the voucher/invoice. This includes all applicable cost elements discussed in paragraphs (a) through (n) of the attached instructions.

Fee Recovery Billings: Pursuant to the provisions of 10 CFR Part 170 and 171 on license fees, the NRC must recover the cost of work performed. Accordingly, the contractor must provide the total amount of funds billed during the period, fiscal year to date and the cumulative total for each task or task assignment by facility or report. The fee recovery billing reports shall be on a separate page, and shall be in the format provided in **Attachment 2**. The billing period for fee recovery costs should be from the first day of each calendar month to the last day of the same month. Each separate fee billing report must be attached to the monthly invoice and cover the same period as the invoice.

Each report will contain a docket number or other unique identifier. The NRC will provide a unique identifier for all work performed. Costs should be reported as whole number to the nearest cent. For work that involves more than one facility at the same site, each facility should be listed separately and the costs should be split appropriately between the facilities. Common costs, as defined below, shall be identified as a separate line item in the fee recovery billing report each month.

Common costs are those costs that are not licensee unique and associated with the performance of an overall program that benefit all similar licensees covered under that program or that are required to satisfactorily carry out the program. Common costs include costs associated with the following: preparatory or start-up efforts to interpret and reach agreement on methodology, approach, acceptance criteria, regulatory position, or technical reporting requirements; efforts associated with the "lead plant" concept that might be involved during the first one or two plant reviews; meetings and discussions involving the above efforts to provide orientation, background knowledge or guidance during the course of a program; any technical effort applied to a docket or other unique identifier; and project management. Common costs must be reporting monthly for each docket or unique identifier. Common costs must be computed based on the proportion of direct costs incurred against each docket or unique identifier for the billing period.

Billing of Cost After Expiration of Contract: If costs are incurred during the contract period and claimed after the contract has expired, the period during which these costs were incurred must be cited. To be considered a proper expiration voucher/invoice, the contractor shall clearly mark it "EXPIRATION VOUCHER" or "EXPIRATION INVOICE".

Final vouchers/invoices shall be marked "FINAL VOUCHER" or "FINAL INVOICE".

Currency: Billings may be expressed in the currency normally used by the contractor in maintaining his accounting records; payments will be made in that currency. However, the U.S. dollar equivalent for all vouchers/invoices paid under the contract may not exceed the total U.S. dollars authorized in the contract.

Supersession: These instructions supersede any previous billing instructions.

INVOICE/VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL

(SAMPLE FORMAT)

1. Official Agency Billing Office

U.S. Nuclear Regulatory Commission
Division of Contracts MS: T-7-I-2
Washington, DC 20555-0001

2. Voucher Information

- a. **Payee's DUNS Number or DUNS+4.** The Payee shall include the Payee's Data Universal Number (DUNS) or DUNS+4 number that identifies the Payee's name and address. The DUNS+4 number is the DUNS number plus a 4-character suffix that may be assigned at the discretion of the Payee to identify alternative Electronic Funds Transfer (EFT) accounts for the same parent concern.
- b. **Payee's Name and Address.** Show the name of the Payee as it appears in the contract and its correct address. If the Payee assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Payee shall require as a condition of any such assignment, that the assignee shall register separately in the Central Contractor Registration (CCR) database at <http://www.ccr.gov> and shall be paid by EFT in accordance with the terms of this contract. See Federal Acquisition Regulation 52.232-33(g) Payment by Electronic Funds Transfer - Central Contractor Registration (October 2003).
- c. **Contract Number.** Insert the NRC contract number.
Task Order No. Insert the task order number (If Applicable).
- d. **Voucher/Invoice.** The appropriate sequential number of the voucher/invoice, beginning with 001 should be designated. Contractors may also include an individual internal accounting number, if desired, in addition to the 3-digit sequential number.
- e. **Date of Voucher/Invoice.** Insert the date the voucher/invoice is prepared.
- f. **Billing period.** Insert the beginning and ending dates (day, month, year) of the period during which costs were incurred and for which reimbursement is claimed.
- g. **Direct Costs -** Insert the amount billed for the following cost elements, adjustments, suspensions, and total amounts, for both the current billing period and for the cumulative period (from contract inception to end date of this billing period).
- (1) **Direct Labor.** This consists of salaries and wages paid (or accrued) for direct performance of the contract itemized as follows:

<u>Labor</u>	<u>Hrs.</u>			<u>Cumulative</u>
<u>Category</u>	<u>Billed</u>	<u>Rate</u>	<u>Total</u>	<u>Hrs.Billed</u>
 - (2) **Fringe Benefits.** This represents fringe benefits applicable to direct labor and billed as a direct cost. Where a rate is used indicate the rate. Fringe benefits included in direct labor or in other indirect cost pools should not be identified here.
 - (3) **Capitalized Non Expendable Equipment.** List each item costing \$50,000 or more and having a life expectancy of more than one year. List only those items of equipment for which reimbursement is requested. For each such item, list the following (as applicable): (a) the item number for the specific piece of equipment listed in the property schedule of the contract; or (b) the Contracting Officer's approval letter if the equipment is not covered by the property schedule.
 - (4) **Non-capitalized Equipment, Materials, and Supplies.** These are equipment other than that described in (3) above, plus consumable materials, supplies. List by category. List items valued at \$500 or more separately. Provide the item number for each piece of equipment valued at \$500 or more.

- (5) Premium Pay. This enumeration in excess of the basic hourly rate. (Requires written approval of the Contracting Officer.)
- (6) Consultants. The supporting information must include the name, hourly or daily rate of the consultant, and reference the NRC approval (if not specifically approved in the original contract).
- (7) Travel. Total costs associated with each trip must be shown in the following format:

<u>Start Date</u>	<u>Destination</u>	<u>Costs</u>
From To	From To	\$

- (8) Subcontracts. Include separate detailed breakdown of all costs paid to approved subcontractors during the billing period.
 - (9) Other Costs. List all other direct costs by cost element and dollar amount separately.
- h. Indirect Costs (Overhead and General and Administrative Expense). Cite the formula (rate and base) in effect in accordance with the terms of the contract, during the time the costs were incurred and for which reimbursement is claimed.
 - i. Fixed Fee. If the contract provides for a fixed fee, it must be claimed as provided for by the contract. Cite the formula or method of computation. Include this information as it applies to individual task orders as well. The contractor may bill for fixed fee only up to 85% of total fee.
 - j. Total Amount Billed. Insert the total amounts claimed for the current and cumulative periods.
 - k. Adjustments. For cumulative amount, include outstanding suspensions.
 - l. Grand Totals.

Further itemization of vouchers/invoices shall only be required for items having specific limitations set forth in the contract.

3. Sample Voucher Information

This voucher represents reimbursable costs for the billing period for the billing period from ____ through ____.

		<u>Amount Billed</u>	
		<u>Current Period</u>	<u>Cumulative</u>
(a)	<u>Direct Costs</u>		
(1)	Direct labor*.....		
(2)	Fringe benefits		
	(%, if computed as percentage).....		
(3)	Capitalized nonexpendable equipment (\$50,000 or more - see instructions)*.....		
(4)	Non-capitalized equipment, materials, and supplies.....		
(5)	Premium pay (NRC approved overtime).....		
(6)	Consultants*.....		
(7)	Travel*.....		
(8)	Subcontracts*.....		
(9)	Other costs*.....		

Total Direct Costs

(b) Indirect Costs

(A) Overhead ___ % of
_____ (Indicate Base).....

(B) General & Administrative Expense
___ % of Cost Elements Nos.

Total Direct & Indirect Costs

(c) Fixed-Fee (Cite Formula):

(d) Total Amount Billed.....

(e) Adjustments.....

(f) Grand Totals.....

* (Requires Supporting Information -- See Sample below)

SAMPLE SUPPORTING INFORMATION

1) Direct Labor - \$2400

<u>Labor Category</u>	<u>Hours</u>	<u>Billed</u>	<u>Rate</u>	<u>Cumulative</u>	
				<u>Total</u>	<u>Hrs. Billed</u>
Senior Engineer I	100		\$14.00	\$1400	975
Engineer	50		\$10.00	\$500	465
Computer Analyst	100		\$5.00	<u>\$500</u>	320
				<u>\$2400</u>	

3) Capitalized Non-Expendable Equipment

Prototype Spectrometer - item number 1000-01 \$60,000

4) Non-capitalized Equipment, Materials, and Supplies

10 Radon tubes @ \$110.00 = \$1100.00

6 Pairs Electrostatic gloves @ \$150.00 = \$900.00

\$2000.00

5) Premium Pay

Walter Murphy - 10 hours @ \$10.00 Per Hour = \$100
(This was approved by NRC in letter dated 3/6/95).

6) Consultants' Fee

Dr. Carney - 1 hour @ \$100 = \$100

7) Travel

<u>Start Date</u>	<u>Destination</u>	<u>Costs</u>
3/1/89	Wash., DC	\$200

FEE RECOVERY BILLING REPORT

FIN:

Facility Name or Report Title:

TAC or Inspection Report Number:
(or other unique identifier)

Docket Number (if applicable):

Cost Categories	Period Amt.	Period Cost Incurred	Fiscal Year To Date Costs	Total Cumulative Costs
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Labor

Materials

**Subcontractor/
Consultant**

Travel

Other (specify)

Common Costs

Total

Remarks:

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CONTRACTOR SPENDING PLAN - INSTRUCTIONS

ATTACHMENT 3

The Contractor Spending Plan (CSP) is an important tool for projecting and tracking contract costs and progress each task under the contract.

Applicability

The Nuclear Regulatory Commission (NRC) requires that the CSP be completed for cost reimbursement contracts when the award amount is expected to exceed \$100,000 and the period of performance is expected to exceed 6 months. For task order type contracts, a CSP is required when an individual cost reimbursement task order is expected to exceed the above thresholds. When contract or task order modification increases the contract or task order amount of a cost reimbursement contract or task order to over \$100,000 and the period of performance from the effective date of the modification to the contract or task order expiration exceeds 6 months, a CSP is required for all contract work to be performed after the effective date of the modification.

Submission

1. A CSP is required:
 - a. as part of the cost proposal for a cost reimbursement contract or individual task order, or modification to a contract or task order which meets the above thresholds;
 - b. as part of the Best and Final Offer (if requested) as a result of negotiations;
2. Updated CSP information is required on a monthly basis or as approved by the CO as part of the "Financial Status Report" (Ref: Section F.(fillin) , "Financial Status Report").

Format

The attached CSP sample format may be duplicated and used by the Contractor, or modified to permit more accurate reporting or to meet other needs of the contractor. For instance, the sample format provides spaces to report projected costs for 12 months, but the contractor may wish to alter the sample format for shorter or longer contract/task order periods. The contractor may also wish to alter the sample format for ease of typing or automated production. So long as complete information is provided on actual and projected costs or accomplishments, changes to the format to improve relevance to the circumstances are encouraged.

It is up to the discretion of the offeror to determine the appropriate level of cost detail to be presented based on the complexity of the effort. This plan reflects only the minimum requirements for submission of cost details which will be considered for completeness, reasonableness, and as a measure of effective management of the effort. The Contracting Officer reserves the right to request additional cost information, if deemed necessary.

CONTRACTOR SPENDING PLAN (CSP)

(TO BE COMPLETED AS A PART OF THE OFFEROR'S COST PROPOSAL FOR EACH COST REIMBURSEMENT CONTRACT OR INDIVIDUAL TASK ORDER OR FOR ANY CONTRACT OR TASK ORDER MODIFICATION WHICH EXCEEDS \$100,000 AND HAS A PERFORMANCE PERIOD EXCEEDING 6 MONTHS)

Solicitation No. _____
Contract No. _____

Period of Performance: From _____ To _____

Task Order No. _____ Modification No. _____
Offeror/Contractor Name: _____

Total Estimated Costs (including fixed fee, if any) of the Proposed Contract/Task Order/Modification (to a contract or task order) at the time of proposal submission. Does not include options. \$ _____

Provide cost details by month for the total contract/task order/or task order modification

Cost Elements	<u>1st Month</u>	<u>2nd Month</u>	<u>3rd Month</u>	<u>4th Month</u>	<u>5th Month</u>	<u>6th Month</u>
Direct Costs	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Indirect Costs	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Total Estimated Costs including fixed fee if any	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Projected Completion	_____ %	_____ %	_____ %	_____ %	_____ %	_____ %

Cost Elements	<u>7th Month</u>	<u>8th Month</u>	<u>9th Month</u>	<u>10th Month</u>	<u>11th Month</u>	<u>12th Month</u>
Direct Costs	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Indirect Costs	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Total Estimated Costs including fixed fee if any	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

Projected
Completion

_____% _____% _____% _____% _____% _____%

U.S. NUCLEAR REGULATORY COMMISSION

DIRECTIVE TRANSMITTAL

TN: DT-04-12

To: NRC Management Directives Custodians

Subject: Transmittal of Management Directive 3.7, "NUREG-Series Publications"

Purpose: Directive and Handbook 3.7 are being revised in their entirety to—

- consolidate content of existing Management Directives (MDs) 3.7, "Unclassified Staff Publications in the NUREG Series," and 3.8, "Unclassified Contractor and Grantee Publications in the NUREG Series";
- retitle the revision "NUREG-Series Publications";
- establish a new, simplified designator system for NUREG-series publications;
- require that the Office of Public Affairs review and the Director of Communications authorize publication of manuscripts directed toward public outreach;
- clearly identify the responsibilities of NRC managers, staff, and staff project officers and clarify their responsibilities concerning any legal instrument that requires, as a deliverable, a manuscript to be published in the NUREG series with regard to NRC's acquisition regulations and technical editing;
- require that the staff have a technical editor edit manuscripts for public outreach, licensing, and legislative and congressional NUREG-series publications unless otherwise stipulated by the Office of the Executive Director for Operations (OEDO);

OFFICE OF ADMINISTRATION

- require that contractors, grantees, and other holders of a legal instrument requiring a manuscript for publication in the NUREG series have a technical editor edit all manuscripts to be published in the NUREG series unless otherwise stipulated by OEDO;
- add definitions for "book," "classified information," "manuscripts directed toward public outreach," "NUREG-series publication," "peer review," "Project Officer," "sensitive unclassified information," and "technical editing";
- add tips for writing in plain language;
- identify Office of the Chief Information Officer services available in support of the publishing process; and
- consolidate NRC Forms 426 and 426A into a single form for authorizing publication of a manuscript.

MD 3.7 supersedes MD 3.8, which is rescinded.

No change bars have been used in MD 3.7 because of the extent of the revision.

Office and

Division of Origin: Office of the Chief Information Officer
Information and Records Services Division

Contact: Gary Lauffer, 301-415-5638

Date Approved: February 9, 1995 (Revised: August 17, 2004)

Volume: 3 Information Management

Part: 1 Publications, Mail, and Information Disclosure

Directive: 3.7 NUREG-Series Publications

Availability: Rules and Directives Branch
Office of Administration
Michael T. Lesar, 301-415-7163
Christy Moore, 301-415-7086

NUREG-Series Publications

Directive 3.7

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U. S. Nuclear Regulatory Commission

Volume: 3 Information Management

Part: 1 Publications, Mail, and Information
Disclosure

OCIO

NUREG-Series Publications

Directive 3.7

Policy

(3.7-01)

U.S. Nuclear Regulatory Commission policy requires that all manuscripts published in NRC's formal publication series, the NUREG series, (1) undergo review by program technical experts and managers, (2) be authorized for publication by appropriate officials, (3) bear appropriate designators, and (4) comply with agency publishing policy and procedures in this directive and handbook.

Objectives

(3.7-02)

- To ensure the "dissemination to the public of scientific and technical information relating to atomic energy...to provide...free interchange of ideas and criticism...essential to scientific and industrial progress and public understanding and to enlarge the fund of technical information" as mandated by Section 141 of the Atomic Energy Act of 1954, as amended. (021)
- To ensure that no classified or sensitive unclassified information is published in the series (see the Glossary). (022)

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Objectives

(3.7-02) (continued)

- To ensure that manuscripts contain only guidance, that is, neither contain nor imply legally binding regulatory requirements, which are stated only in laws, NRC regulations, licenses (including technical specifications), or orders. (023)
- To require that all manuscripts prepared by the staff or by contractors be consistent with NRC's Plain Language and Editorial Guidelines (NUREG-1379) as part of NRC's commitment to attaining information quality. (024)
- To ensure compliance of the NUREG-series publications program with all documents listed in the References section of this directive. (025)
- To ensure that copyright and patent rights are not compromised. (026)
- To ensure that rights in interagency and international agreements and memoranda of understanding that involve a manuscript to be published in the NUREG series are met. (027)
- To ensure that an agency publication designator system is established and appropriately administered to allow easy identification and retrieval of NUREG-series publications by librarians, the staff, and the public. (028)
- To ensure that designated managers oversee authors' manuscripts for technical accuracy and for consistency with both agency and program policy and goals before authorizing publication of a manuscript. (029)
- To further the agency's openness goal, ensure that each publication is entered in the Agencywide Documents Access and Management System (ADAMS) and declared an official agency record and either posted to the external or the internal Web site. (0210)

Objectives

(3.7-02) (continued)

- To help achieve the agency goal of ensuring openness, make each publication public, except for those publications intended only for staff use, through ADAMS, the U.S. Government Printing Office (GPO), and the National Technical Information Service (NTIS), as required by Federal law, interagency agreements, or NRC policy. (0211)
- To ensure that a manuscript requesting information from stakeholders outside NRC bears an Office of Management and Budget (OMB) approval number. (0212)
- To provide uniform publishing standards and procedures for publications in the NUREG series. (0213)
- To centrally manage publication of all manuscripts in the NUREG series. (0214)

Organizational Responsibilities and Delegations of Authority

(3.7-03)

Executive Director for Operations (EDO)

(031)

- Resolves for publications prepared by the staff, requesting advice from the General Counsel, differences about content issues or other issues that may arise between a regional administrator and an author who prepares a manuscript for publication in the NUREG series. (a)
- Delegates to the Deputy Executive Director for Management Services (DEDM), the Deputy Executive Director for Materials, Research and State Programs (DEDMRS), the Deputy Executive Director for Reactor Programs (DEDR), and the Deputy Executive Director for Homeland Protection and

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**Organizational Responsibilities and
Delegations of Authority**

(3.7-03) (continued)

Executive Director for Operations (EDO)

(031) (continued)

Preparedness (DEDH) the authority to resolve for publications prepared by the staff, requesting advice from the General Counsel, differences about content issues or other issues that may arise between an office director under their purview and an author who prepares a manuscript for publication in the NUREG series. (b)

**Deputy Executive Director for Materials,
Research and State Programs (DEDMRS), the
Deputy Executive Director for Reactor
Programs (DEDR), and the Deputy Executive
Director for Homeland Protection and
Preparedness (DEDH)**

(032)

As delegated by the EDO, resolves for publications prepared by the staff, requesting advice from the General Counsel, differences about content issues or other issues that may arise between an office director under their purview and an author who prepares a manuscript for publication in the NUREG series.

**Deputy Executive Director for
Management Services (DEDM)**

(033)

- As delegated by the EDO, resolves for publications prepared by the staff, requesting advice from the General Counsel, differences about content issues or other issues that may arise between an office director under their purview and an author who prepares a manuscript for publication in the NUREG series. (a)

**Organizational Responsibilities and
Delegations of Authority**

(3.7-03) (continued)

**Deputy Executive Director for
Management Services (DEDM)**

(033) (continued)

- Ensures that any request for a procurement action presented to the Office of Administration (ADM) involving a contract, grant, or other governing legal instrument requiring as a deliverable a manuscript for publication in the NUREG series contains the appropriate terms and conditions governing publications. (b)

Director of Communications

(034)

Authorizes publication of a manuscript directed toward public outreach.

Chief Financial Officer (CFO)

(035)

Ensures that the Office of the Chief Financial Officer (OCFO) staff comply with this management directive and handbook when preparing a manuscript for publication in the NUREG series.

General Counsel (GC)

(036)

Advises the EDO and the DEDOs, if requested, and the Division of Contracts, ADM, in accordance with the requirements in an NRC contract, grant, or other governing legal instrument about any differences between NRC and the holder of the governing legal instrument requiring as a deliverable a manuscript for publication in the NUREG series regarding the following issues—

- copyright, (a)

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**Organizational Responsibilities and
Delegations of Authority**

(3.7-03) (continued)

General Counsel (GC)

(036) (continued)

- proprietary information, (b)
- patent, (c)
- content, or (d)
- other issues that may arise. (e)

Director, Office of Public Affairs (OPA)

(037)

Reviews each manuscript directed toward public outreach to ensure that the content—

- is appropriate for public outreach; (a)
- is consistent with and not redundant of other agency outreach publications available to the public; (b)
- presents a balanced perspective of responsibilities among agency offices and the regions and an appropriate regulatory tone; and (c)
- is written in plain English. (d)

Chief Information Officer (CIO)

(038)

Delegates, as overseer of the NUREG-Series Publications Program, the responsibility for managing the publishing program to the Director of the Information and Records Services Division (IRSD), Office of the Chief Information Officer (OCIO).

**Organizational Responsibilities and
Delegations of Authority**

(3.7-03) (continued)

Director, Office of Administration (ADM)

(039)

Ensures that any request for a procurement action presented to the Division of Contracts (DC) that involves a contract, grant, or other governing legal instrument that requires as a deliverable a manuscript for publication in the NUREG series includes in the statement of work for the governing legal instrument the appropriate terms and conditions governing publications.

**Office Directors and
Regional Administrators**

(0310)

- Delegate to office or regional managers under their purview the responsibility to authorize publication of manuscripts originated by their organization, except those directed toward public outreach, which are authorized by the DEDM. (a)
- Inform the CIO, in writing, of the levels of the officials in their organization delegated this authority. (b)

Applicability

(3.7-04)

All NRC employees shall follow the policy and guidance in this directive and handbook.

Other Publications

(041)

The provisions of this directive and handbook apply to all manuscripts for publication in the NUREG series.

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References

(3.7-05)

Code of Federal Regulations, Nuclear Regulatory Commission Acquisition Regulation (48 CFR Chapter 20).

Office of Management and Budget Circular A-130, "Management of Federal Information Resources," November 28, 2000.

United States Code

Administrative Procedure Act (5 U.S.C. Sec. 552).

Atomic Energy Act of 1954, as amended (42 U.S.C. Sec. 141).

Copyright Law of the United States of America (17 U.S.C.).

Federal Grant and Cooperative Agreement Act (31 U.S.C. 6301-6308).

Government Printing and Binding Regulations, No. 26, February 1999 (44 U.S.C. Sec. 103, 501, and 502).

Public Printing and Documents (44 U.S.C. Sec. 101-3701).

United States Government Printing Office (GPO), U.S. GPO Style Manual, 2000.

United States Nuclear Regulatory Commission

Management Directives¹

2.2, "Capital Planning and Investment Control."

¹Send an e-mail message to "DISTRIBUTION" to request the latest version of an NRC management directive or a NUREG-series publication or access the document in the Agencywide Documents Access and Management System (ADAMS) using the number given after the title.

References

(3.7-05) (continued)

3.11, "Conferences and Conference Proceedings."

3.13, "Printing."

11.6, "Financial Assistance Program."

11.7, "NRC Procedures for Placement and Monitoring of Work With the U.S. Department of Energy (DOE)."

12.2, "NRC Classified Information Security Program."

12.6, "NRC Sensitive Unclassified Information Security Program."

Memoranda of Agreement

Between the Institute of Nuclear Power Operations and the U.S. Nuclear Regulatory Commission, as amended, November 27, 1996.

Between the Department of Energy and the U.S. Nuclear Regulatory Commission, November 24, 1998.

NUREG-Series Publications

NUREG-0544, Revision 4, "NRC Collection of Abbreviations" (ML041050544).

NUREG-0650, Revision 2, "Publishing Documents in the NUREG Series" (ML041050294).

NUREG-1379, "NRC Editorial Style Guide" (ML041050307).

NUREG/BR-0075, Revision 4, "NRC Field Policy Manual," March 1999 (ML041170225), and Change Notice 00-01, March 2000 (ML041050736).

NUREG-Series Publications

Handbook

3.7

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Purpose

This handbook presents roles and responsibilities and specifies procedures for preparing manuscripts to be published in the NUREG series. Part 1 presents procedural roles and responsibilities for NRC staff other than those specified in Directive 3.7. Part 2 presents general procedures common to manuscripts either prepared by the NRC staff or NRC contractors, grantees, or other holders of a legal instrument that requires as a deliverable a manuscript for publication in the NUREG series. Part 3 presents procedures applicable only to manuscripts prepared by the staff. Part 4 presents procedures applicable only to manuscripts prepared by holders of a legal instrument requiring a manuscript. Although financial assistance instruments (grants and cooperative agreements) do not usually anticipate the development of manuscripts for publication in the NUREG series, they may include such development. See also Management Directive 11.6, "Financial Assistance Program," for additional information affecting grantees and cooperative agreement recipients.

Part 1
Procedural Roles and
Responsibilities for NRC Staff

The procedural roles and responsibilities in this part are related to responsibilities that office directors (ODs) and regional administrators (RAs) oversee and exercise, which are generally addressed in Directive 3.7.

Office Directors and Regional Administrators

ODs and RAs perform the following functions:

- Ensure that those staff who write the following manuscripts for publication in the NUREG series see that they receive technical editing unless otherwise directed by the Office of the Executive Director for Operations (OEDO):
 - Overviews of information directed toward public outreach (e.g., "Regulating Nuclear Fuel," "Public Involvement in the Nuclear Regulatory Process," and "Nuclear Research Programs To Ensure Public Health and Safety")
 - Standard review plans
 - Safety evaluation reports
 - Environmental impact statements
 - Regulatory analyses
 - Legislative and congressional reports (e.g., "Abnormal Occurrence Report")
- Ensure that Project Officers under their purview responsible for a contract, grant, or other governing legal instrument that requires as a deliverable a manuscript to be published in the NUREG series works with the Division of Contracts, Office of Administration, to include in the statement of work for the governing legal instrument the appropriate terms and conditions governing publications.

**Director, Division of Contracts (DC),
Office of Administration (ADM)**

Ensures that any request for a procurement action presented to DC that involves a contract, grant, or other governing legal instrument that requires as a deliverable a manuscript for publication in the NUREG series includes the following in the statement of work:

- The appropriate terms and conditions governing publications, including the technical editing of each manuscript submitted to NRC for publication, and
- A requirement to comply with this directive and handbook and the following documents to be found in the Agencywide Documents Access and Management System (ADAMS) or furnished by the NRC Project Officer overseeing the governing legal instrument;
 - Management Directive (MD) 3.11, "Conference Proceedings";
 - MD 3.13, "Printing";
 - NUREG-1379, "NRC Editorial Style Guide"; and
 - NUREG-0650, "Publishing Documents in the NUREG Series."

**Director, Information and Records
Services Division (IRSD), Office of the
Chief Information Officer (OCIO)**

Manages the NUREG-Series Publications Program and does the following:

- Centrally manages publication of all manuscripts in the NUREG series, consulting with the CIO, OEDO, RAs, ODs, and division directors.
- Produces all publications consistent with the agency's mission and the Government Printing and Binding Regulations issued by the Joint Committee on Printing of the Congress of the United States (see also MD 3.13, "Printing").

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- Establishes and appropriately administers an agency publication designator system, placing on each manuscript a registered agency designator in the NUREG series when preparing the cover, title page, and spine.
- Responds to questions about the publication process from office and regional staff and Project Officers responsible for writing a manuscript or for overseeing a manuscript prepared by a contractor, a grantee, or other nonprofit organization or another agency, DOE national laboratory, or foreign country.
- Ensures that IRSD staff identify any manuscript requesting information from a stakeholder outside NRC and that it bears an appropriate OMB approval number.
- Provides technical editing services that are begun in an intake interview with the author to jointly determine the extent of the technical edit and are followed by collaboration with the author to improve the quality, clarity, and consistency of manuscripts by applying any or all of the following techniques:
 - Organizing the message into a coherent and logical flow of ideas;
 - Correcting syntax, grammar, spelling, and punctuation;
 - Ensuring consistent use of terms, acronyms, abbreviations, and symbols;
 - Simplifying overly complex sentences (sentences that contain too many ideas);
 - Correcting disagreement of the subject and verb and faulty parallelisms;
 - Eliminating ambiguities, redundancy (wordiness), and overuse of the passive voice;
 - Verifying the consistency of equations;
 - Verifying the consistency and clarity of tables and figures and redesigning them (as required) to improve their visual effectiveness; and
 - Verifying the accuracy of references and cross-references and the consistency of text, figure, and table headings with the table of contents.
- Performs a quality assurance review of the final copy of a manuscript to ensure that—

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- It contains no classified or sensitive unclassified information and is consistent with COMSECY-02-0015, "Withholding Sensitive Homeland Security Information From the Public," dated April 2, 2002.
- It contains no information that would violate copyright or patent rights.
- It complies with the publishing guidance in the latest revision of NUREG-0650.
- It lists only references available to the public.
- The requested distribution for the publication includes—
 - up to 50 copies for a contractor, a grantee, or other nonprofit organization that prepared a manuscript;
 - the number of copies specified in the agreement for an organization (such as the Government Printing Office (GPO), the National Technical Information Service (NTIS), the DOE, or a foreign state or organization with which NRC has an interagency or international agreement or a memorandum of understanding) and other recipients as appropriate.
- The form authorizing publication of a manuscript (NRC Form 426; available on NRC's internal and external Web sites) is complete and bears the signatures of—
 - a member of the Records and FOIA/Privacy Services Branch (RF/PSB), IRSD, OCIO, to ensure that any manuscript requesting information from a stakeholder outside NRC has received review and approval by the Office of Management and Budget (OMB) (Line 5.1);
 - the NRC patent counsel, if applicable (Line 5.2);
 - a contractor, a grantee, or other nonprofit organization, if applicable (Line 5.3);
 - the Project Officer (Line 5.4);
 - a member of the Office of Public Affairs (OPA) if the manuscript is directed toward public outreach (Line 5.5); and

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Handbook 3.7 Part 1

- the appropriate official authorizing publication (Line 5.6).
- The form containing bibliographic information (NRC Form 335; available on NRC's internal and external Web sites) is complete and complies with instructions for completion.
- Manuscripts for books receive peer review (defined in the Glossary) before their publication.
- Submits each publication to the OCIO's Document Processing Center for entry as an official agency record in the Agencywide Documents Access and Management System (ADAMS).
- Ensures that each publication, except those publications intended only for staff use, is made public through ADAMS, the external or internal Web site, GPO, and NTIS, as required by Federal law, interagency agreements, memoranda of understanding, international agreements, or NRC policy.
- Ensures that no classified or sensitive unclassified information is published.
- Ensures that manuscripts contain only guidance, that is, neither contain nor imply, legally binding regulatory requirements, which are stated only in laws, NRC regulations, licenses (including technical specifications), or orders.

**Office or Regional Publishing
Authorizing Officials**

Office or regional publishing authorizing officials conduct the following activities before authorizing a manuscript to be published:

- Assess the need for any proposed publication with other offices and regions that may have an interest or a program responsibility for any activity or topic discussed in the draft to avoid duplication of any existing material.
- Ensure that any manuscript containing content specified herein under Part 1, "Procedural Roles and Responsibilities for NRC Staff," "Office Directors and Regional Administrators," received technical editing as specified herein and complies with NUREG-1379 (see also Section 2.6.1 of Part 2 of this handbook).

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- Ensure that the manuscript contains no classified or sensitive unclassified information and is consistent with COMSECY-02-0015, "Withholding Sensitive Homeland Security Information From the Public," dated April 2, 2002.
- Ensure that the manuscript contains only guidance, that is, neither contains nor implies, legally binding regulatory requirements, which are stated only in laws, NRC regulations, licenses (including technical specifications), or orders.
- Ensure that each manuscript is technically accurate and contains current organizational policy, positions, and information.
- Ensure that the manuscript is consistent with both agency and program policy and goals.
- Ensure that the manuscript violates no copyright or patent rights, consulting first with the IRSD staff, and then with OGC, if necessary.
- Ensure that the manuscript does not compromise any rights in an interagency or international agreement or memorandum of understanding.
- Ensure that the manuscript complies with NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1 of Part 2.
- Ensure that the manuscript complies with all applicable documents in the reference section of this MD.
- Ensure that a manuscript requesting information from stakeholders outside the NRC bears an OMB approval number.
- Ensure that if their office originates a manuscript directed toward public outreach, the staff has the OPA review the manuscript before submitting it to the Director of Communications for authorization to publish.
- Evaluate merits of book proposals from NRC staff to ensure that the proposed book has a unique technical purpose, serves an industry-wide need, and that its contents will be broadly valid and applicable for at least 5 years after publication.
- Ensure that the Project Officer completed the requisite forms (NRC Forms 426 and 335) before submitting the manuscript to the IRSD staff for publication.

Part 2
General Procedures

2.1 Information Published in the NUREG Series

No classified or sensitive unclassified information is published in the series, and the information published in the series is not legally binding. The NRC staff may suggest a course of action in a publication, but the regulated community may use other approaches to satisfy a regulatory requirement. No regulatory requirements may be stated or implied in a NUREG-series publication. Requirements are stated only in laws, NRC regulations, licenses (including technical specifications), or orders.

Appropriate content for a publication in the NUREG series includes—

- Public outreach information
- Support for regulatory and licensing decisions
- Results of technical analyses and research
- Action plans and guidance for meeting NRC requirements
- Resolution of generic technical issues
- A team report on a specific topic
- Proceedings of a conference or a workshop
- Managerial, budgetary, and administrative plans and analyses
- General programmatic information
- Guidance and instructions for employees

2.2 Identifying Publications

2.2.1 Formulating Designators

NRC uses a system consistent with American National Standards Institute/National Information Standards Organization (ANSI/NISO) Z39.23-1997, "Standard Technical Report Number Format and Creation," that governs formation of designators for technical reports. The standard recommends two essential elements:

1. The **Report Code** designates the issuing organization or corporate entity.
2. The **Sequential Group** in a designator may contain three parts:
 - The four digits of the year of publication

- A sequential Arabic number
- Uppercase alphabetic characters and Arabic numbers pertaining to volumes, supplements, revision, drafts, and so on.

The central authority that coordinates and monitors the **alpha part** of the alphanumeric designator for use on an organization's technical reports is currently the National Technical Information Service. Because the obvious "NRC" was used by another organization, NRC registered "NUREG," stemming from NUClear REGulatory.

NRC now designates its formal publications using the format NUREG-x-year, where x is a sequential Arabic number. For example, a designator for the first NRC publication issued in 2005 would be NUREG-1-2005, while a designator for the twelfth publication issued in the same year would be NUREG-12-2005.

NUREG plus its sequential number are the permanent parts of the designator, giving it a permanence that would not change. Using this system, reports issued annually would retain their original sequential number, while only the year would change. For example, an annual report once assigned NUREG-1, would retain that designator for each subsequent year it was issued, making a volume number unnecessary.

Volumes would now refer to a single publication issued in two or more parts and would be identified, for example, as NUREG-15-2005, Vol. 1 or Vol. 2.

The Information and Records Services Division (IRSD), Office of the Chief Information Officer (OCIO), assigns the designators at the end of the preparation process (see Section 2.2.2 of this part).

2.2.2 Assigning Designators

NRC assigns a unique designator to a manuscript when it is ready for printing, that is, at the end of the preparation process. When OCIO's IRSD staff receives a manuscript authorized for publication, the staff performs a quality assurance review to ensure that it meets NRC's minimum publishing standards (see the latest version of NUREG-0650 and MDs 3.11 and 3.13). After completing this review, the IRSD staff assigns it a NUREG-series designator, placing it on the cover, title page, and spine, as the staff prepares the document for printing.

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At this point, the IRSD staff sends the preparer the designator for the publication. While a manuscript is being developed, simply refer to the manuscript by its draft title when referencing it in other documents.

2.3 Availability Notices and Disclaimers

The IRSD Publishing and Distribution Services Branch (PDSB) staff inserts and publishes on the inside front cover of its publications an availability notice containing information about obtaining publications in the NUREG series. The staff also inserts and publishes on the inside front cover an appropriate disclaimer approved by the Office of the General Counsel for any publication that is prepared by a holder of a legal instrument requiring as a deliverable a manuscript for publication in the NUREG series or in accordance with an international agreement.

See also Section 2.6.2.2 herein concerning nonprofit organizations as publishers of books funded by the NRC.

2.4 Dates

On each publication, the IRSD staff places the month and year a manuscript is published on the spine and the following two dates on the title page:

1. The month and year the manuscript is completed and
2. The month and year it is published.

2.5 Publications as Official Agency Records

When a publication has been released for distribution, the IRSD staff submits a printed copy of the publication to the OCIO's Document Processing Center for entry as an official agency record in the Agencywide Documents Access and Management System (ADAMS). All publications are made publicly available in ADAMS except those intended only for staff use, such as "Renting Smart: Car Rental Facts for the NRC Traveler." However, all NUREG-series publications are available to the public if requested by the public.

2.6 Manuscripts

The staff follows the procedures specified in Part 1 of this handbook, if applicable, and in Parts 2 and 3, while a contractor, a grantee, or other holder of a legal instrument

requiring as a deliverable a manuscript for publication in the series follows the procedures in Part 4. All manuscripts must meet the NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1. The information in Sections 2.6.2 through 2.6.5 applies to manuscripts for books, conference proceedings, international agreement reports, and manuscripts prepared under a grant.

2.6.1 NRC'S Plain Language and Editorial Guidelines

2.6.1.1 Plain Language

Numerous sources of information for complying with Federal Guidelines for Plain Language are available at <http://www.plainlanguage.gov/>. See especially the Security and Exchange Commission's (SEC's) "A Plain English Handbook: How to Create Clear SEC Disclosure Documents" in the Reference Library at the SEC's Web site. (See also NRC's Plain Language Plan at <http://www.internal.nrc.gov/NRC/PLAIN/>.) The following tips may prove useful for attaining plain language in a manuscript.

To achieve consistency with **NRC's Plain Language Guidelines** for NUREG-series manuscripts—

- Present complex information clearly in lay terms.
- Eliminate jargon.
- Limit use of defined technical terms.
- Use as few acronyms as possible.
- Plan the scope of the publication, presenting only information needed for the stated purpose.
- Use words economically to achieve conciseness.
- Eliminate any redundancy.
- Present general information before specific information.
- Use the active voice whenever possible (e.g., "NRC conducts inspections" rather than "Inspections are conducted by the NRC").
- Use verbs rather than hiding verbs in nouns (e.g., "The staff will implement the directive by August 30" rather than "The staff is to complete implementation of the directive by August 30.").

To make each page more appealing and easier to understand, a part of Plain Language, do the following—

- Intersperse dense text with headings.
- Use lots of white space on a page.

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2.6.1.2 Technical Editing

Make your publication manuscripts consistent with the guidelines in the latest version of the "NRC Editorial Style Guide" (NUREG-1379). Ensure that those manuscripts edited receive the type of technical editing specified in Part 1. The editorial requirements for a holder of a legal instrument requiring as a deliverable a manuscript for publication are specified under the responsibilities of the DC, ADM, in Part 1 and in Part 4 of this handbook. Those for the NRC staff are specified under Part 1, "Procedural Roles and Responsibilities for NRC Staff," "Office Directors and Regional Administrators," and Part 3, "Procedures for Manuscripts Prepared by the Staff," of this handbook.

2.6.2 Book Manuscripts

Books are usually published in a 6- by 9-inch format of more durable materials than other publications in the NUREG series (i.e., case-bound or a hardback) but may also be issued in paperback. Consult the IRSD staff before beginning a book (defined in the Glossary).

A nonprofit organization or NRC may publish a book. All books funded by NRC undergo stringent peer review.

2.6.2.1 NRC as Publisher

If NRC both prepares and publishes a book, it bears a NUREG-series designator. The staff must not only follow all the guidelines given for other publications in preparing the manuscript but must also arrange for peer review. (See Section 2.6.2.3 of this part.)

2.6.2.2 Nonprofit Organization as Publisher

NRC may arrange to have a book manuscript published by a nonprofit organization even though NRC funds the time to write and edit the book manuscript. However, the Joint Committee on Printing has to authorize such an arrangement.

If a nonprofit organization publishes the NRC-funded book, it may not bear an NRC NUREG-series designator. The publisher assumes all costs for publishing, marketing, and distributing the book. Any royalties for the book are returned to the Treasury of the United States through NRC. As with other NRC publications, copies are sent to the GPO for optional selection by the Depository Library Program.

2.6.2.3 Peer Review

A reviewer is an expert in the subject matter covered by a book manuscript but independent of the work leading to the manuscript. Reviewers critically evaluate the technical content of a manuscript to judge whether the author successfully accomplished the intended purpose and the facts are accurate to the best of the reviewer's knowledge. Reviewers may be from within or outside NRC. They may come from academia, national laboratories, professional societies, corporations, or other Federal agencies. The NRC office sponsoring the book selects the reviewers and may select only one reviewer per organization.

When selecting reviewers, screen them for demonstrated competence and achievement in a specific discipline, such as the quality of research accomplished, published articles in journals, and honors received. Select reviewers having no appearance of or real conflict of interest, that is, those who could not profit financially by influencing whether the information is published. In the case of NRC, selecting a licensee, a licensee consultant, or an expert from an intervenor group as a peer reviewer would not be appropriate.

2.6.3 Conference Proceedings Manuscripts

For information about preparing a proceedings for a conference or workshop, refer to the latest version of MD 3.11, "Conferences and Conference Proceedings."

2.6.4 Grants

NRC sometimes funds grants for educational and nonprofit institutions, State, and local governments, and professional societies for the expansion, exchange, and transfer of knowledge and ideas. The U.S. Congress characterizes the relationship between a Federal agency and a grant recipient as one in which "the recipient can expect to run the project without agency collaboration, participation, or intervention as long as it is run in accordance with the terms of the grant."

2.6.4.1 Publications

NRC or the grantee may publish the results of the award. Each grant specifies any publication requirements of the award.

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If the grantee publishes the results, the grantee grants to the Government a royalty-free, nonexclusive, irrevocable license to reproduce, translate, publish, and use the published results. The grantee also must dispose of all material for which a copyright could be obtained that the grantee produced or composed under the grant.

2.6.4.2 Journal Articles

If the grantee prepares an article to be published in a journal under the grant, the grantee follows the procedures in MD 3.9, "NRC Staff and Contractor Speeches, Papers, and Journal Articles on Regulatory and Technical Subjects."

2.6.5 International Agreement Publication Manuscripts

NRC has cooperative nuclear safety research programs governed by agreements with foreign governments and organizations. These agreements include monetary contributions, exchange of information, and comments on program plans and results. The agreements allow for transmitting technical information that is not classified or sensitive unclassified from foreign participants to NRC for publication in the NUREG series. The interests of all international program participants are best served by formal dissemination of information acquired or developed in these programs as publications. Prepare these reports consistent with the general procedures for other manuscripts indicated in Parts 2 and 3 of this handbook.

Part 3
Procedures for Manuscripts Prepared by the Staff

The organization and components of NRC publications will vary, depending on their purpose and scope. Before beginning a manuscript, the author needs to answer the following questions (see also Section 3, "Planning Your Document," and Section 4, "General Format and Content," of NUREG-0650 and Part 2, "General Procedures," of this handbook):

- Who is my primary audience?
- What is the purpose of the manuscript?
- What is its scope?
- Will it become a draft publication issued for public comment?
- Are all the references available to the public?
- Will it include information that is copyrighted or patented?
- Has it been reviewed to ensure that it contains no classified or sensitive unclassified information?
- Has a Records and FOIA/Privacy Services Branch Reviewer reviewed the manuscript for Information Collections from stakeholders outside NRC (in accordance with the Paperwork Reduction Act) and signed Block 5.1 on NRC Form 426 (available on NRC's internal and external Web sites) attesting to the completed review?
- Will it contain a glossary?
- Does my manuscript comply with NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1 of this handbook?
- Will it contain measurement and weight values?
- Will it require the services of the Information and Records Services Division (IRSD), such as editing or graphics support?
- Will it require or be enhanced by the use of color photographs or figures?
- Will it require a specially designed cover rather than the standard NRC cover?
- Will this publication be one in a series of publications?
- In what media will my publication be distributed? Paper? Compact disk?
- How long will printing and distribution take?
- Does publication of my manuscript require completed forms?
- Is my schedule for producing and publishing the manuscript realistic?
- How can I disseminate sensitive unclassified information?
- What are the criteria for posting a publication to the external or internal Web site?

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Who is my primary audience? What is the purpose of the manuscript? What is its scope?

Consider whether your publication will have to be understood by a technical expert, a technician, a nontechnical audience, or a combination of these. The way in which you present your topic depends on whether you are presenting analyses and results of research, general information, instructions, and so forth. Decide what measure of available information should be included (the scope of your manuscript). One good way to accomplish this goal is to begin with an outline of all possible ideas you may want to include and then refine the outline.

Will it become a draft publication issued for public comment?

NRC frequently issues draft publications for comment. Some types of draft publications include licensing documents, such as standard review plans, environmental impact statements, safety evaluation reports, technical evaluation reports, and standard technical specifications. After the staff considers the comments received, they usually revise the draft, as deemed appropriate, and publish a final version. See **Public Involvement, Documents for Comment**, on NRC's external Web site.

Are all the references available to the public?

The public must be able to access all references listed in a publication. Do not discuss in the text or include in the list of references an Institute of Nuclear Power Operations (INPO) document without prior approval from INPO. Attach any such INPO approval to NRC Form 426, the authorization to publish a manuscript. Authors may create a separate list of references for proprietary versions of a document if the public can obtain a nonproprietary version (see Section 4.2.4 of NUREG-0650). Proprietary versions may contain trade secrets or confidential research; or development, commercial, or financial information.

Will it include information that is copyrighted or patented?

The staff preparing a manuscript determines whether it contains information that may be copyrighted or patented. Contact the Office of the General Counsel if you have a copyright or patent question. Obtain permission from the copyright holder before using copyrighted material in a manuscript and attach such permission to NRC Form 426 (see also Section 3.8 of NUREG-0650).

Has it been reviewed to ensure that it contains no classified or sensitive unclassified information?

The staff preparing a manuscript ensures by signing NRC Form 426 that it contains no classified or sensitive unclassified information and, if uncertain about the sensitivity of any content, contacts the Office of Nuclear Security and Incident Response. The staff also ensures by its signature on this form that the manuscript is consistent with COMSECY-02-0015, "Withholding Sensitive Homeland Security Information From the Public," dated April 2, 2002, available at <http://www.nrc.gov/reading-rm/doc-collections/commission/comm-secy/2002/>.

Will it contain a glossary?

Glossary terms in a publication must be consistent with those in the glossary on NRC's external Web site. If you create a glossary for the manuscript, use the definitions in NRC's external Web site Glossary unless you disagree with them. Send any conflicting definition for a term to the Web Staff Editor to resolve with the Glossary Team. The editor will include you in the resolution process. In addition, send any terms in your glossary not found in the Web Glossary to the Web Staff Editor to add to the Web Glossary.

Does my manuscript comply with NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1?

Review your manuscript to ensure that it is consistent with the guidelines in Section 2.6.1 of this handbook. See also Part 1, "Procedural Roles and Responsibilities for NRC Staff," "Office Directors and Regional Administrators," of this handbook to ensure that the publication manuscripts listed received technical editing as specified in Part 1.

Will it contain measurement and weight values?

If "Yes," according to NRC's Policy Statement "Conversion to the Metric System" (57 FR 46202, 10/07/92), ensure that measurement and weight values are converted to the International System of Units, followed by the English units in brackets except that "documents specific to a licensee...will be in the system of units employed by the licensee."

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Will it require IRSD services such as editing or graphics support?

Contact the Chief of the Publishing and Distribution Services Branch (PDSB), IRSD, for complete information about publishing services and service levels (i.e., what support the staff can offer in a given amount of time). See service levels, available at <http://www.internal.nrc.gov/OCIO/PSB/SERVICE/editorial.pdf>. After preliminary reviews within the author's office are complete, the author initiates an intake interview with an editor if the manuscript is the type of manuscript listed in the first bullet under "Office Directors and Regional Administrators" of Part 1. Work with the editor to decide on the figures you will be using and request graphics support. Sometimes the graphics staff can produce figures while the document is being edited. If the graphics staff will be laying out the entire manuscript, have any editing completed before they begin in order to expedite overall publication production. See also Part 1, "Procedural Roles and Responsibilities for NRC Staff," "Office Directors and Regional Administrators," Section 2.6.1.2 of this handbook, and the response to "Is my schedule for producing and publishing this manuscript realistic?" in this part.

Will it require or be enhanced by the use of color photographs or figures? Will it require a specially designed cover rather than the standard NRC cover?

Although printing in color is sometimes necessary (e.g., to show rust or degradation of a reactor component) or desirable (e.g., to promote the agency goal of ensuring openness in our regulatory mission), printing in color is considerably more expensive than printing in black and white. Printing in color is often appropriate for public outreach publications. Publishing color documents on compact disks is less expensive than printing paper documents in color. Request permission to use color in the planning stage from the Chief of PDSB, IRSD, to see if funds are available or if another option could serve the same purpose. (See also Management Directive (MD) 3.13, "Printing," for more specific information.)

Has a Records and FOIA/Privacy Services Branch Reviewer reviewed the manuscript for Information Collections from stakeholders outside NRC (in accordance with the Paperwork Reduction Act) and signed Block 5.1 on NRC Form 426 attesting to the completed review?

Submit a copy of your manuscript to the Records and FOIA/Privacy Services Branch for review and approval before submitting the final manuscript to IRSD for publishing. This review and approval ensures that either NRC has obtained Office of Management and Budget (OMB) approval to request information from stakeholders outside NRC or

that the manuscript contains no information collections. Ask the reviewer to sign Block 5.1 on NRC Form 426 attesting to the results of the completed review.

Will this publication be one in a series of publications?

If the manuscript is one in a series of ongoing publications, prepare a list of all previous publications in the series, including each publication's designator and issuance date. The list can span more than a single page and would be placed after the title page (see Table 4.1 in NUREG-0650). An example of such a series is the NUREG-1556 series concerning materials licensees (see on the external Web site the **Electronic Reading Room, Collections of Documents by Type**, then **NUREG-Series Publications**).

In what media will my publication be distributed? Paper? Compact disk?

Discuss printing and distribution of your publication with the Chief of PDSB before you begin. After a manuscript is printed in paper, compact disk, or a combination of these media, NRC enters each NUREG-series publication in the Agencywide Documents Access and Management System (ADAMS) and declares it an official record. All publications are made publicly available in ADAMS, except those intended only for staff use. However, all NUREG-series publications are available to the public and are posted to either the internal or the external Web site.

How long will printing and distribution take?

After a manuscript has undergone a quality assurance review by the IRSD staff, printing and distribution of an average size (i.e., 150 to 200 pages) and black-and-white or two-color (e.g., blue and white) manuscript typically takes 10 to 12 workdays. Printing of color manuscripts varies. Consult the Chief of PDSB for more specific information and see the PDSB printing staff service levels.

Does publication of my manuscript require completed forms?

Yes. NRC requires two completed forms to publish a manuscript: NRC Form 426, "Authorization To Publish a Manuscript in the NUREG Series," and NRC Form 335, "Bibliographic Data Sheet." Both forms are available on NRC's internal and external Web sites.

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- **NRC Form 426.** Answer the questions and obtain the signatures required to authorize publication of your manuscript. Instructions for completing the form are on page 2 of the form.
- **NRC Form 335.** Place an abstract of 200 or fewer words in Block 11 of the form and complete all other blocks except 13 through 16 (see NUREG-0650). Concisely summarize the contents of your manuscript in the abstract so that a reader can determine whether to read the entire report. Omit details and numerical references in the abstract to the extent possible.

Is my schedule for producing and publishing the manuscript realistic?

The author should factor into the schedule for publishing a manuscript the time needed to—

- write and revise;
- resolve and incorporate comments from reviewers;
- obtain any IRSD services;
- complete forms; and
- obtain review and signatures authorizing publication.

IRSD, OCIO, offers services to help in preparing a manuscript:

- Professional technical editing
- Graphics services
- Quality assurance review of manuscripts
- Reproduction and distribution
- Publishing: printing and posting on the Intranet or Internet
- Declaring the publication an official agency record in ADAMS

For each service offered, OCIO has service levels to help you plan the production and publication of your manuscript. These levels are available on the internal Web site at <http://www.internal.nrc.gov/OCIO/PSB/SERVICE/index.html>.

How can I disseminate sensitive unclassified information?

IRSD can design appropriate first pages for or reproduce for the staff appropriately marked sensitive unclassified information for dissemination to those with a "need to know" but does not publish such information in the NUREG series. To disseminate such

material to those with a "need to know," contact the Office of Nuclear Security and Incident Response, and consult MDs 12.2 and 12.6.

Contact the Chief of PDSB to obtain one or more of these services or to be directed to the Web staff for Intranet or Internet publishing. If the originator is preparing the manuscript without using IRSD editing, composition, or graphics services, simply submit the manuscript with a signed authorization to print (NRC Form 426) and bibliographic data sheet (NRC Form 335) to the Chief of PDSB for review and publication.

What are the criteria for posting a publication to the external or the internal Web site?

After each publication is entered into ADAMS, IRSD posts it to either the internal or the external Web site. Generally, a publication is posted to the internal Web site if it serves a staff need. All others are posted to the external Web site (see also MD 3.14, "U.S. Nuclear Regulatory Commission External Web Site," concerning the external Web site). However, all NUREG-series publications are available to the public upon request.

Part 4

**Procedures for Manuscripts Prepared by a Contractor,
A Grantee, or Other Holder of a Legal Instrument Governing
Manuscripts for Publication in the NUREG Series**

A contractor, a grantee, or other holder of a governing legal instrument requiring as a deliverable a manuscript for publication in the NUREG series must meet the conditions and terms of the legal instrument and work with the NRC Project Officer to deliver the manuscript in accordance with the policy and procedures in this directive and handbook.

4.1 Project Officer Responsibilities

The NRC Project Officer overseeing a publication manuscript prepared by a contractor, a grantee, or other holder of a legal instrument performs the following tasks:

- Works with the Contracting Officer, Division of Contracts, ADM, to specify applicable publication requirements in the proposed statement of work for the governing legal instrument consistent with Section (3.7-038);
- Acts as liaison between the contractor, grantee or other holder of a legal instrument and the staff of the Publishing and Distribution Services Branch (PDSB), Information and Records Services Division (IRSD), OCIO;
- Submits any manuscript for publication in the NUREG series prepared by the holder of a legal instrument that requires a manuscript as a deliverable to the NRC Records and FOIA/Privacy Services Branch for review to ensure either that NRC has obtained an Office of Management and Budget (OMB) number authorizing NRC to request information from a stakeholder outside NRC or that the manuscript contains no such request and requests that the reviewer sign Block 5.1 on NRC Form 426 (available on NRC's internal and external Web sites) attesting to the results of the completed review.
- Responds to any questions from the organization preparing the publication, consulting with the Chief of PDSB or the PDSB staff as necessary;
- Assists the preparing organization in identifying who should receive copies of the publication;

- Ensures that the contractor, grantee, or nonprofit organization receives 50 free copies of each publication produced in accordance with the Joint Committee on Printing's regulations, unless the preparer requests fewer copies;
- Approves the final manuscript before instructing the contractor, grantee, or other holder of a legal instrument to send the final manuscript to the PDSB staff for review and publication; and
- Works with the PDSB staff to have the manuscript published (i.e., reviewed; revised, as necessary; printed; and distributed).

4.2 Responsibilities of Contractor, Grantee, or Other Holder of a Legal Instrument Governing Manuscripts for Publication in the NUREG Series

4.2.1 General Responsibilities

When the procurement requires that a deliverable be developed as a manuscript for publication in the NUREG series, the contractor, grantee, or other holder of a legal instrument performs the following tasks:

- As specified in the governing legal instrument, prepares by the due date the number of manuscripts required as deliverables until the NRC deems a manuscript publishable;
- Revises each manuscript as necessary until NRC deems it publishable by the date due;
- Ensures that the final manuscript receives technical editing as specified in the statement of work in the governing legal instrument;
- Prepares manuscripts in accordance with the policy and guidance in this directive and handbook;
- Sends only a manuscript approved by the Project Officer to the PDSB staff for review and publishing;
- Refers all questions to the Project Officer, who may, in turn, contact the PDSB staff for information;

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- Prepares stick-on address labels for individuals designated to receive a copy of a publication who does not appear on one of NRC's automated distribution mailing lists;
- As discussed with the Project Officer, considers the guidance of Section 4.2.2 of this part when preparing a manuscript.

4.2.2 Preparing the Manuscript

The organization and components of NRC publications will vary, depending on their purpose and scope. Before beginning a manuscript, the author should answer the following questions (see also Section 3, "Planning Your Document," and Section 4, "General Format and Content," of NUREG-0650).

- Who is my primary audience?
- What is the purpose of the manuscript?
- What is its scope?
- Will it become a draft publication issued for public comment?
- Are all the references available to the public?
- Will it include information that is copyrighted or patented?
- Has it been reviewed to ensure that it contains no classified or sensitive unclassified information?
- Will it contain measurement and weight values?
- Will it contain a glossary?
- Does my manuscript comply with NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1 of this handbook?
- Will it require or be enhanced by the use of color photographs or figures?
- Will it require a specially designed cover rather than the standard NRC cover?
- Will this publication be one in a series of publications?
- Is it consistent with all applicable NRC guidance furnished?
- Does publication of my manuscript require completed forms?

Who is my primary audience? What is the purpose of the manuscript? What is its scope?

Consider whether your publication will have to be understood by a technical expert, a technician, a nontechnical audience, or a combination of these. The way in which you present your topic depends on whether you are presenting analyses and results of research, general information, instructions, and so forth. Decide what measure of

available information should be included (the scope of your manuscript). One good way to accomplish this goal is to begin with an outline of all possible ideas you may want to include and then refine the outline with your Project Officer.

Will it become a draft publication issued for public comment?

NRC frequently issues draft publications for comment. Some types of draft publications include licensing documents, such as environmental impact statements, or technical evaluation reports. After the preparer considers the comments received, and revises the draft, as deemed appropriate, NRC publishes a final version. See **Public Involvement, Documents for Comment**, on NRC's external Web site.

Are all the references available to the public?

The public must be able to access all references listed in a publication. Do not discuss in the text or include in the list of references an Institute of Nuclear Power Operations (INPO) document without prior approval from INPO. Attach any such INPO approval to NRC Form 426, the authorization to publish a manuscript. Authors may create a separate list of references for proprietary versions of a document if the public can obtain a nonproprietary version (see Section 4.2.4 of NUREG-0650). Proprietary versions may contain trade secrets or confidential research; or development, commercial, or financial information.

Will it include information that is copyrighted or patented?

If the preparer is uncertain whether the manuscript contains information that may be copyrighted or patented, consult the NRC Project Officer who may, in turn, contact NRC's Office of the General Counsel about copyright or patent questions. Obtain permission from the copyright holder before using copyrighted material in a manuscript and attach such permission to NRC Form 426 (see also Section 3.8 of NUREG-0650).

Has it been reviewed to ensure that it contains no classified or sensitive unclassified information?

The NRC Project Officer attests by signing NRC Form 426 that it contains no classified or sensitive unclassified information and, if uncertain about the sensitivity of any content, contacts the Office of Nuclear Security and Incident Response. The staff also ensures by its signature on this form that the manuscript is consistent with COMSECY-02-0015, "Withholding Sensitive Homeland Security Information From the

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Public," dated April 2, 2002, at <http://www.nrc.gov/reading-rm/doc-collections/commission/comm-secy/2002/>.

Will it contain a glossary?

Glossary terms in a publication must be consistent with those in the glossary on NRC's external Web site. If you create a glossary for the manuscript, use the definitions in NRC's external Web site Glossary unless you disagree with them. Send any conflicting definition for a term to the Project Officer who, in turn, will send the conflicting terms to the Web Staff Editor to resolve with the Glossary Team. The editor will include the Project Officer in the resolution process. In addition, send any terms in your glossary not found in the Web Glossary to the Project Officer, who, in turn, will send them to the Web Staff Editor to add to the Web Glossary.

Does my manuscript comply with NRC's Plain Language and Editorial Guidelines specified in Section 2.6.1?

Review your document to ensure that it is consistent with the guidelines in Section 2.6.1 of this handbook. Ensure that your manuscript received technical editing as specified in Part 1 of this handbook under responsibilities of the Director of DC, ADM.

Will it require or be enhanced by the use of color photographs or figures? Will it require a specially designed cover rather than the standard NRC cover?

Although printing in color is sometimes necessary (e.g., to show rust or degradation of a reactor component) or desirable (e.g., to promote the agency goal of ensuring openness about our regulatory mission), printing in color is considerably more expensive than printing in black and white. Publishing color documents electronically or on compact disks is less expensive than printing paper documents in color. Request permission to use color through your Project Officer in the planning stage to see if funds are available or if another option could serve the same purpose (see also Management Directive (MD) 3.13, "Printing").

Will it contain measurement and weight values?

If "Yes," according to NRC's Policy Statement "Conversion to the Metric System" (57 FR 46202, 10/07/92), ensure that measurement and weight values are converted to the International System of Units, followed by the English units in brackets except

that "documents specific to a licensee...will be in the system of units employed by the licensee."

Will this publication be one in a series of publications?

If the manuscript is one in a series of ongoing publications, prepare a list of all previous publications in the series, including each publication's designator and issuance date. The list can span more than a single page and would be placed after the title page (see Table 4.1 in NUREG-0650). An example of such a series is the NUREG-1556 series concerning materials licensees (see on the external Web site the **Electronic Reading Room, Collections of Documents by Type**, then **NUREG-Series Publications**).

Is it consistent with all applicable NRC guidance furnished?

Before submitting your final manuscript to the Project Officer, ensure that it complies with this directive and handbook; NUREG-1379, "NRC Editorial Style Guide"; NUREG-0650, "Publishing Documents in the NUREG Series"; and, if applicable, MD 3.11, "Conferences and Conference Proceedings."

Does publication of my manuscript require completed forms?

Yes. NRC requires two completed forms to publish a manuscript, both available on NRC's internal and external Web sites: NRC Form 426, "Authorization To Publish a Manuscript in the NUREG Series," and NRC Form 335, "Bibliographic Data Sheet." Consult your NRC Project Officer about using these forms.

- **NRC Form 426.** Answer the questions, have your authorizing official sign, and send the completed form to your Project Officer to obtain the signatures required to authorize publication of your manuscript.
- **NRC Form 335.** Place an abstract of 200 or fewer words in Block 11 of the form and complete all other blocks except 13 through 16 (see NUREG-0650). Concisely summarize the contents of your manuscript in the abstract so that a reader can determine whether to read the entire report. Omit details and numerical references to the extent possible.

Glossary

Book. A publication intended as a permanent reference (a textbook) or as a major critical review of a technical or regulatory topic. Its content should be applicable for at least 5 years after publication and may meet an industry-wide need.

Classified information. At NRC, material that meets the requirements for designation as Confidential, Secret, or Top Secret in accordance with an Executive Order (currently E.O. 12958, "Classified National Security Information," as amended, or the Atomic Energy Act of 1954, as amended. (See MD 12.2, "NRC Classified Information Security Program," for more information.)

Manuscripts directed toward public outreach. Manuscripts that contain general regulatory information about NRC or general technical information about a specific topic, which are often prepared by the Office of Public Affairs (e.g., "NRC: Regulator of Nuclear Safety" (NUREG/BR-0164), the "Public Petition Process" (NUREG/BR-0200), the "Citizen's Guide to U.S. Nuclear Regulatory Commission Information" (NUREG/BR-0010), and "Regulating Nuclear Fuel" (NUREG/BR-0280).

NUREG-series publication. Nonsensitive information related to NRC's mission that does not contain regulatory requirements and is published in a formal agency series to ensure the "dissemination to the public of scientific and technical information relating to atomic energy...." as mandated by the Atomic Energy Act of 1954, as amended. Each publication bears an agency designator (NUREG-number-year).

Peer review. Critical evaluation of the technical content of a book manuscript by independent experts to judge whether the author successfully accomplished the intended purpose. The independent experts must not be able to profit financially by influencing whether the information is published and could have no appearance of conflict of interest, such as, in the case of NRC, a licensee.

Glossary (continued)

Project Officer. The member of the NRC staff responsible for overseeing the legal instrument that requires as a deliverable a manuscript to be published in the NUREG series.

Sensitive unclassified information. This information includes unclassified Safeguards Information (SGI), Official Use Only information, and Proprietary information. It also includes unclassified information from other Government agencies and sources outside of NRC and its contractors and licensees that requires special protective measures. Markings used by these agencies and sources include, for example, For Official Use Only, Company Confidential, and Private. (See MD 12.4, "NRC Telecommunications Systems Security Program," and Volume 12, "Glossary," for a complete definition of "sensitive unclassified information.")

Technical editing. Collaboration between a technical editor and an author to improve the quality, clarity, and consistency of a manuscript.

NRCAR Subpart 2009.5 Organizational Conflicts of Interest

1. §2009.500 Scope of subpart.

In accordance with 42 U.S.C. 2210a., NRC acquisitions are processed in accordance with §2009.570, which takes precedence over FAR 9.5 with respect to organizational conflicts of interest. Where non-conflicting guidance appears in FAR 9.5, that guidance must be followed.

§2009.570 NRC organizational conflicts of interest.

§2009.570-1 Scope of policy.

(a) It is the policy of NRC to avoid, eliminate, or neutralize contractor organizational conflicts of interest. The NRC achieves this objective by requiring all prospective contractors to submit information describing relationships, if any, with organizations or persons (including those regulated by the NRC) which may give rise to actual or potential conflicts of interest in the event of contract award.

(b) Contractor conflict of interest determinations cannot be made automatically or routinely. The application of sound judgment on virtually a case-by-case basis is necessary if the policy is to be applied to satisfy the overall public interest. It is not possible to prescribe in advance a specific method or set of criteria which would serve to identify and resolve all of the contractor conflict of interest situations that might arise. However, examples are provided in these regulations to guide application of this policy guidance. The ultimate test is as follows: Might the contractor, if awarded the contract, be placed in a position where its judgment may be biased, or where it may have an unfair competitive advantage?

(c) The conflict of interest rule contained in this subpart applies to contractors and offerors only. Individuals or firms who have other relationships with the NRC (e.g., parties to a licensing proceeding) are not covered by this regulation. This rule does not apply to the acquisition of consulting services through the personnel appointment process, NRC agreements with other Government agencies, international organizations, or state, local, or foreign Governments. Separate procedures for avoiding conflicts of interest will be employed in these agreements, as appropriate.

§2009.570-2 Definitions.

Affiliates means business concerns which are affiliates of each other when either directly or indirectly one concern or individual controls or has the power to control another, or when a third party controls or has the power to control both.

Contract means any contractual agreement or other arrangement with the NRC except as provided in §2009.570-1(c).

Contractor means any person, firm, unincorporated association, joint venture, co-sponsor, partnership, corporation, affiliates thereof, or their successors in interest, including their chief executives, directors, key personnel (identified in the contract), proposed consultants or subcontractors, which are a party to a contract with the NRC.

Evaluation activities means any effort involving the appraisal of a technology, process, product, or policy.

Offeror or prospective contractor means any person, firm, unincorporated association, joint venture, co-sponsor, partnership, corporation, or their affiliates or successors in interest, including their chief executives, directors, key personnel, proposed consultants, or subcontractors, submitting a bid or proposal, solicited or unsolicited, to the NRC to obtain a contract.

Organizational conflicts of interest means that a relationship exists whereby a contractor or prospective contractor has present or planned interests related to the work to be performed under an NRC contract which:

- (1) May diminish its capacity to give impartial, technically sound, objective assistance and advice, or may otherwise result in a biased work product; or
- (2) May result in its being given an unfair competitive advantage.

Potential conflict of interest means that a factual situation exists that suggests that an actual conflict of interest may arise from award of a proposed contract. The term potential conflict of interest is used to signify those situations that

- (1) Merit investigation before contract award to ascertain whether award would give rise to an actual conflict; or
- (2) Must be reported to the contracting officer for investigation if they arise during contract performance.

Research means any scientific or technical work involving theoretical analysis, exploration, or experimentation.

Subcontractor means any subcontractor of any tier who performs work under a contract with the NRC except subcontracts for supplies and subcontracts in amounts not exceeding \$10,000.

Technical consulting and management support services means internal assistance to a component of the NRC in the formulation or administration of its programs, projects, or policies which normally require that the contractor be given access to proprietary information or to information that has not been made available to the public. These services typically include assistance in the preparation of program plans, preliminary designs, specifications, or statements of work.

§2009.570-3 Criteria for recognizing contractor organizational conflicts of interest.

(a) General.

(1) Two questions will be asked in determining whether actual or potential organizational conflicts of interest exist:

- (i) Are there conflicting roles which might bias an offeror's or contractor's judgment in relation to its work for the NRC?

(ii) May the offeror or contractor be given an unfair competitive advantage based on the performance of the contract?

(2) NRC's ultimate determination that organizational conflicts of interest exist will be made in light of common sense and good business judgment based upon the relevant facts. While it is difficult to identify and to prescribe in advance a specific method for avoiding all of the various situations or relationships that might involve potential organizational conflicts of interest, NRC personnel will pay particular attention to proposed contractual requirements that call for the rendering of advice, consultation or evaluation activities, or similar activities that directly lay the groundwork for the NRC's decisions on regulatory activities, future procurements, and research programs. Any work performed at an applicant or licensee site will also be closely scrutinized by the NRC staff.

(b) Situations or relationships. The following situations or relationships may give rise to organizational conflicts of interest:

(1) The offeror or contractor shall disclose information that may give rise to organizational conflicts of interest under the following circumstances. The information may include the scope of work or specification for the requirement being performed, the period of performance, and the name and telephone number for a point of contact at the organization knowledgeable about the commercial contract.

(i) Where the offeror or contractor provides advice and recommendations to the NRC in the same technical area where it is also providing consulting assistance to any organization regulated by the NRC.

(ii) Where the offeror or contractor provides advice to the NRC on the same or similar matter on which it is also providing assistance to any organization regulated by the NRC.

(iii) Where the offeror or contractor evaluates its own products or services, or has been substantially involved in the development or marketing of the products or services of another entity.

(iv) Where the award of a contract would result in placing the offeror or contractor in a conflicting role in which its judgment may be biased in relation to its work for the NRC, or would result in an unfair competitive advantage for the offeror or contractor.

(v) Where the offeror or contractor solicits or performs work at an applicant or licensee site while performing work in the same technical area for the NRC at the same site.

(2) The contracting officer may request specific information from an offeror or contractor or may require special contract clauses such as provided in §2009.570-5(b) in the following circumstances:

(i) Where the offeror or contractor prepares specifications that are to be used in competitive procurements of products or services covered by the specifications.

(ii) Where the offeror or contractor prepares plans for specific approaches or methodologies that are to be incorporated into competitive procurements using the approaches or methodologies.

(iii) Where the offeror or contractor is granted access to information not available to the public concerning NRC plans, policies, or programs that could form the basis for a later procurement action.

(iv) Where the offeror or contractor is granted access to proprietary information of its competitors.

(v) Where the award of a contract might result in placing the offeror or contractor in a conflicting role in which its judgment may be biased in relation to its work for the NRC or might result in an unfair competitive advantage for the offeror or contractor.

(c) Policy application guidance. The following examples are illustrative only and are not intended to identify and resolve all contractor organizational conflict of interest situations.

(1)(i) Example. The ABC Corp., in response to a Request For Proposal (RFP), proposes to undertake certain analyses of a reactor component as called for in the RFP. The ABC Corp. is one of several companies considered to be technically well qualified. In response to the inquiry in the RFP, the ABC Corp. advises that it is currently performing similar analyses for the reactor manufacturer.

(ii) Guidance. An NRC contract for that particular work normally would not be awarded to the ABC Corp. because the company would be placed in a position in which its judgment could be biased in relationship to its work for the NRC. Because there are other well-qualified companies available, there would be no reason for considering a waiver of the policy.

(2)(i) Example. The ABC Corp., in response to an RFP, proposes to perform certain analyses of a reactor component that is unique to one type of advanced reactor. As is the case with other technically qualified companies responding to the RFP, the ABC Corp. is performing various projects for several different utility clients. None of the ABC Corp. projects have any relationship to the work called for in the RFP. Based on the NRC evaluation, the ABC Corp. is considered to be the best qualified company to perform the work outlined in the RFP.

(ii) Guidance. An NRC contract normally could be awarded to the ABC Corp. because no conflict of interest exists which could motivate bias with respect to the work. An appropriate clause would be included in the contract to preclude the ABC Corp. from subsequently contracting for work with the private sector that could create a conflict during the performance of the NRC contract. For example, ABC Corp. would be precluded from the performance of similar work for the company developing the advanced reactor mentioned in the example.

(3)(i) Example. The ABC Corp., in response to a competitive RFP, submits a proposal to assist the NRC in revising NRC's guidance documents on the respiratory protection requirements of 10 CFR Part 20. ABC Corp. is the only firm determined to be technically acceptable. ABC Corp. has performed substantial work for regulated utilities in the past and is expected to continue similar efforts in the future. The work has and will cover the writing, implementation, and administration of compliance respiratory protection programs for nuclear power plants.

(ii) Guidance. This situation would place the firm in a role where its judgment could be biased in relationship to its work for the NRC. Because the nature of the required work is vitally important in

terms of the NRC's responsibilities and no reasonable alternative exists, a waiver of the policy, in accordance with §2009.570-9 may be warranted. Any waiver must be fully documented in accordance with the waiver provisions of this policy with particular attention to the establishment of protective mechanisms to guard against bias.

(4)(i) Example. The ABC Corp. submits a proposal for a new system to evaluate a specific reactor component's performance for the purpose of developing standards that are important to the NRC program. The ABC Corp. has advised the NRC that it intends to sell the new system to industry once its practicability has been demonstrated. Other companies in this business are using older systems for evaluation of the specific reactor component.

(ii) Guidance. A contract could be awarded to the ABC Corp. if the contract stipulates that no information produced under the contract will be used in the contractor's private activities unless this information has been reported to the NRC. Data on how the reactor component performs, which is reported to the NRC by contractors, will normally be disseminated by the NRC to others to preclude an unfair competitive advantage. When the NRC furnishes information about the reactor component to the contractor for the performance of contracted work, the information may not be used in the contractor's private activities unless the information is generally available to others. Further, the contract will stipulate that the contractor will inform the NRC contracting officer of all situations in which the information, developed about the performance of the reactor component under the contract, is proposed to be used.

(5)(i) Example. The ABC Corp., in response to a RFP, proposes to assemble a map showing certain seismological features of the Appalachian fold belt. In accordance with the representation in the RFP and §2009.570-3(b)(1)(i), ABC Corp. informs the NRC that it is presently doing seismological studies for several utilities in the eastern United States, but none of the sites are within the geographic area contemplated by the NRC study.

(ii) Guidance. The contracting officer would normally conclude that award of a contract would not place ABC Corp. in a conflicting role where its judgment might be biased. Section 2052.209-72(c) Work for Others, would preclude ABC Corp. from accepting work which could create a conflict of interest during the term of the NRC contract.

(6)(i) Example. AD Division of ABC Corp., in response to a RFP, submits a proposal to assist the NRC in the safety and environmental review of applications for licenses for the construction, operation, and decommissioning of fuel cycle facilities. ABC Corp. is divided into two separate and distinct divisions, AD and BC. The BC Division performs the same or similar services for industry. The BC Division is currently providing the same or similar services required under the NRC's contract for an applicant or licensee.

(ii) Guidance. An NRC contract for that particular work would not be awarded to the ABC Corp. The AD Division could be placed in a position to pass judgment on work performed by the BC Division, which could bias its work for NRC. Further, the Conflict of Interest provisions apply to ABC Corp. and not to separate or distinct divisions within the company. If no reasonable alternative exists, a waiver of the policy could be sought in accordance with §2009.570-9.

(7)(i) Example. The ABC Corp. completes an analysis for NRC of steam generator tube leaks at one of a utility's six sites. Three months later, ABC Corp. is asked by this utility to perform the same analysis at another of its sites.

(ii) Guidance. Section 2052.290-72(c)(3) would prohibit the contractor from beginning this work for the utility until one year after completion of the NRC work at the first site.

(8)(i) Example. ABC Corp. is assisting NRC in a major on-site analysis of a utility's redesign of the common areas between its twin reactors. The contract is for two years with an estimated value of \$5 million. Near the completion of the NRC work, ABC Corp. requests authority to solicit for a \$100K contract with the same utility to transport spent fuel to a disposal site. ABC Corp. is performing no other work for the utility.

(ii) Guidance. The Contracting Officer would allow the contractor to proceed with the solicitation because it is not in the same technical area as the NRC work; and the potential for technical bias by the contractor because of financial ties to the utility is slight due to the relative value of the two contracts.

(9)(i) Example. The ABC Corp. is constructing a turbine building and installing new turbines at a reactor site. The contract with the utility is for five years and has a total value of \$100 million. ABC Corp. has responded to an NRC Request For Proposal requiring the contractor to participate in a major team inspection unrelated to the turbine work at the same site. The estimated value of the contract is \$75K.

(ii) Guidance. An NRC contract would not normally be awarded to ABC Corp. because these factors create the potential for financial loyalty to the utility that may bias the technical judgment of the contractor.

(d) Other considerations.

(1) The fact that the NRC can identify and later avoid, eliminate, or neutralize any potential organizational conflicts arising from the performance of a contract is not relevant to a determination of the existence of conflicts prior to the award of a contract.

(2) It is not relevant that the contractor has the professional reputation of being able to resist temptations which arise from organizational conflicts of interest, or that a follow-on procurement is not involved, or that a contract is awarded on a competitive or a sole source basis.

§2009.570-4 Representation.

(a) The following procedures are designed to assist the NRC contracting officer in determining whether situations or relationships exist which may constitute organizational conflicts of interest with respect to a particular offeror or contractor. The procedures apply to small purchases meeting the criteria stated in the following paragraph (b) of this section.

(b) The organizational conflicts of interest representation provision at §2052.209-71 must be included in solicitations and contracts resulting from unsolicited proposals. The contracting officer

must also include this provision for task orders and contract modifications for new work for:

(1) Evaluation services or activities;

(2) Technical consulting and management support services;

(3) Research; and

(4) Other contractual situations where special organizational conflicts of interest provisions are noted in the solicitation and would be included in the resulting contract. This representation requirement also applies to all modifications for additional effort under the contract except those issued under the "Changes" clause. Where, however, a statement of the type required by the organizational conflicts of interest representation provisions has previously been submitted with regard to the contract being modified, only an updating of the statement is required.

(c) The offeror may, because of actual or potential organizational conflicts of interest, propose to exclude specific kinds of work contained in a RFP unless the RFP specifically prohibits the exclusion. Any such proposed exclusion by an offeror will be considered by the NRC in the evaluation of proposals. If the NRC considers the proposed excluded work to be an essential or integral part of the required work and its exclusion would be to the detriment of the competitive posture of the other offerors, the NRC shall reject the proposal as unacceptable.

(d) The offeror's failure to execute the representation required by paragraph (b) of this section with respect to an invitation for bids is considered to be a minor informality. The offeror will be permitted to correct the omission.

§2009.570-5 Contract clauses.

(a) General contract clause. All contracts and simplified acquisitions of the types set forth in §2009.570-4(b) must include the clause entitled, "Contractor Organizational Conflicts of Interest," set forth in §2052.209-72.

(b) Other special contract clauses. If it is determined from the nature of the proposed contract that an organizational conflict of interest exists, the contracting officer may determine that the conflict can be avoided, or, after obtaining a waiver in accordance with §2009.570-9, neutralized through the use of an appropriate special contract clause. If appropriate, the offeror may negotiate the terms and conditions of these clauses, including the extent and time period of any restriction. These clauses include but are not limited to:

(1) Hardware exclusion clauses which prohibit the acceptance of production contracts following a related non-production contract previously performed by the contractor;

(2) Software exclusion clauses;

(3) Clauses which require the contractor (and certain of its key personnel) to avoid certain organizational conflicts of interest; and

(4) Clauses which provide for protection of confidential data and guard against its unauthorized

use.

§2009.570-6 Evaluation, findings, and contract award.

The contracting officer shall evaluate all relevant facts submitted by an offeror and other relevant information. After evaluating this information against the criteria of §2009.570-3, the contracting officer shall make a finding of whether organizational conflicts of interest exist with respect to a particular offeror. If it has been determined that real or potential conflicts of interest exist, the contracting officer shall:

- (a) Disqualify the offeror from award;
- (b) Avoid or eliminate such conflicts by appropriate measures; or
- (c) Award the contract under the waiver provision of §2009.570-9.

§2009.570-7 Conflicts identified after award.

If potential organizational conflicts of interest are identified after award with respect to a particular contractor and the contracting officer determines that conflicts do exist and that it would not be in the best interest of the Government to terminate the contract, as provided in the clauses required by §2009.570-5, the contracting officer shall take every reasonable action to avoid, eliminate, or, after obtaining a waiver in accordance with §2009.570-9, neutralize the effects of the identified conflict.

§2009.570-8 Subcontracts.

The contracting officer shall require offerors and contractors to submit a representation statement from all subcontractors (other than a supply subcontractor) and consultants performing services in excess of \$10,000 in accordance with §2009.570-4(b). The contracting officer shall require the contractor to include contract clauses in accordance with §2009.570-5 in consultant agreements or subcontracts involving performance of work under a prime contract.

§2009.570-9 Waiver.

- (a) The contracting officer determines the need to seek a waiver for specific contract awards with the advice and concurrence of the program office director and legal counsel. Upon the recommendation of the Senior Procurement Executive, and after consultation with legal counsel, the Executive Director for Operations may waive the policy in specific cases if he determines that it is in the best interest of the United States to do so.
- (b) Waiver action is strictly limited to those situations in which:
 - (1) The work to be performed under contract is vital to the NRC program;
 - (2) The work cannot be satisfactorily performed except by a contractor whose interests give rise to a question of conflict of interest.
 - (3) Contractual and/or technical review and surveillance methods can be employed by the NRC to

neutralize the conflict.

(c) The justification and approval documents for any waivers must be placed in the NRC Public Document Room.

§2009.570-10 Remedies.

In addition to other remedies permitted by law or contract for a breach of the restrictions in this subpart or for any intentional misrepresentation or intentional nondisclosure of any relevant interest required to be provided for this section, the NRC may debar the contractor from subsequent NRC contracts.