



## ATTACHMENT A - SCHEDULE

### A.1 PURPOSE OF COOPERATIVE AGREEMENT

The purpose of this Cooperative Agreement is to provide support ASME Standards Technical Support for Updating Codes and Standards for Advance reactor High-Temperature Metallic Materials, Phase as described in Attachment B entitled "Program Description."

### A.2 PERIOD OF COOPERATIVE AGREEMENT

1. The effective date of this Cooperative Agreement is September 28, 2009 the estimated completion date of this Cooperative Agreement is September 30, 2010.
2. Funds obligated hereunder are available for program expenditures for the estimated period: September 28, 2009 – September 30, 2010.

### A. GENERAL

- |                                |  |
|--------------------------------|--|
| 1. Total Estimated NRC Amount: | \$173,831.38   |
| 2. Total Obligated Amount:     | \$30,000   |
| 3. Cost-Sharing Amount:        | \$0  |
| 4. Activity Title:             | Support to ASME Standards<br>Technical Support for Updating<br>Codes and Standards |
| 5. NRC Project Officer:        | Amy Hull   |
| 6. DUNS No.:                   | 193326464  |

### B. SPECIFIC

- |                   |              |
|-------------------|--------------|
| RFPA No.:         | RES-09-172   |
| FFS:              | RES-C-09-810 |
| Job Code:         | K6885        |
| BOC:              | 4110         |
| B&R Number:       | 96015171277  |
| Appropriation #:  | 31X0200.960  |
| Amount Obligated: | \$30,000     |

### A.3 BUDGET

The following is the Cooperative Agreement Budget. Revisions to this budget shall be made in accordance with Revision of Cooperative Agreement Budget in accordance with 2 CFR 215.25.

	Year 1
Labor	\$140,936.92
Travel	<u>\$ 14,725.84</u>
Total Direct	\$155,662.76
G&A	\$ 18,168.62
Total Estimate	\$173,831.38

All travel must be in accordance with the ASME Travel Regulations or the US Government Travel Policy absent Recipient travel regulation.

### A.4 AMOUNT OF AWARD AND PAYMENT PROCEDURES

1. The total estimated amount of this Award is \$173,381.38.
2. NRC hereby obligates the amount of \$30,000 for program expenditures during the period set forth above and in support of the Budget above. The Recipient will be given

written notice by the Contracting Officer when additional funds will be added. NRC is not obligated to reimburse the recipient for the expenditure of amounts in excess of the total obligated amount.

3. Payment shall be made to the Recipient in accordance with procedures set forth in the Automated Standard Application For Payments (ASAP) Procedures set forth below.

4. Additional funds up to the total amount of the Cooperative Agreement shown above may be obligated by NRC subject to the availability of funds and satisfactory progress of the project.

## **Attachment B – Program Description**

### **PROGRAM DESCRIPTION**

#### **SUMMARY**

The objective of this unsolicited proposal is to complete the work started under Grant Agreement NRC-04-08-142 of the US Nuclear Regulatory Commission (USNRC) in developing scientific information to establish independent technical bases for regulatory safety decisions on (1) revising ASME Subsection NH "Class 1 Components in Elevated Temperature Service" and (2) inservice inspection and monitoring for use in high temperature gas reactors (HTGRs) and very high temperature reactors (VHTRs). The NRC staff will work with ASME Standards Technology, LLC (ASME ST-LLC) and the American Society of Mechanical Engineers (ASME) Code Committees to enable update materials specifications, codes, and standards and to provide technical safety information for evaluating HTGR and VHTR applications.

#### **Overview**

The current ASME Section III requirements supporting high temperature reactors are based on light-water-cooled reactor (LWR) designs. They do not fully address the needs of next-generation high-temperature gas-cooled reactor (HTGR) designs.

The next-generation nuclear power plant (NGNP) designs will include high-temperature and very-high-temperature gas reactors (HTGR & VHTGR), which will use helium gas as the heat transfer medium. These reactors will have very different system design philosophies and different needs for materials from LWR designs. In addition, because of their higher operating temperatures, negative reactivity coefficients, and lack of concern for pressurized thermal shock, HTGRs will have different needs for materials, design, testing, and classification, in addition to entirely different needs for inservice inspection (ISI).

The requirements of ASME Section III are currently not entirely suitable for HTGR or VHTGR designs. New requirements are needed for these new applications. One of the deliverables of this unsolicited proposal in Task 1 is to evaluate and publish existing information on the effects of HTGR environments on degradation of metallic components that are typical candidates for pressure vessel and other reactor internals. Task 1 deliverables is to publish a project plan (roadmap) to identify the path forward for development of ASME code rules to fully support HTGR and VHTGR systems and applications. A deliverable from Task 2 will be a report on available nondestructive evaluation (NDE) methods for new construction, preservice, and inservice inspection and recommendations about designing for inspection.

## **Objective**

A main objective in Task 1 is to develop a roadmap clearly identifying the scope of the HTGR code, related research and development needs, and order of priorities with a timeline indicating by when ASME code rules can be developed and made available to all end users including regulators, government, and industry. The scope of work is extensive and requires coordination to align properly the needs with the appropriate resources, financial and labor hours, required to deliver ASME code rules in a timely manner to support NRC licensing of HTGRs.

HTGRs are designed to operate for much longer periods of time between ISI and scheduled short-duration shutdowns vs. LWRs. The effectiveness of various ISI programs should be assessed as a function of both the frequency of inspections and the number and types of components inspected. A main objective in Task 2 is to evaluate nondestructive testing and continuous monitoring techniques for HTGR materials, environments, and degradation mechanisms.

## **Problem Statement and Background**

The nuclear industry is poised for the introduction of new reactors. Some of the Very High Temperature Reactor (VHTR) designs, such as the Next Generation Nuclear Plant (NGNP), are expected to be completed by 2021. The priority driver for completion of the HTGR/VHTR R&D activities is support for the NGNP combined construction and conditional operating license (COL) application review. The NGNP COL review is projected to begin in 2013 and will take about 4 years to complete. As such the HTGR R&D plans will generally need to be completed by 2013. Thus the 2021 date means that all of the information required to license, build, and maintain these types of reactors needs to be available years in advance. Some would argue that the United States has already fallen behind in the development of such information which includes materials, design guidelines, inspection processes, accessibility restrictions, etc. Code rules are part of the requirements that need to be developed. ASME rules have been adopted by the U.S. NRC into the licensing basis for commercial nuclear power plants. Developing a roadmap will assist in identifying the code rule gaps but most importantly it will highlight the areas that stakeholders need to focus on. Current HTGR system designers are struggling with issues of how to adapt current ASME Code requirements to new gas reactor designs. Some of the issues result from lack of sufficient operating experience with these new designs and lack of sufficient information regarding behavior of desired materials in the high-temperature helium environment. Issues have also arisen with the fact that existing ASME Codes and Standards are difficult to apply to certain aspects of these new designs. Much developmental work is needed to adapt existing Codes and Standards to these applications, which require different materials and design from those required for LWRs. The availability and acceptability of national codes and standards for the design and fabrication of metallic components for service in HTGRs is a key issue. Background studies and activities for development of codes and standards were conducted in the 1980's for application to the liquid metal fast breeder reactor (LMFBR). The Pressure Vessel Research Council (PVRC) prepared several technical reports that provided the basis for development of high temperature ASME design code. These reports give background and procedures for designing components to resist fatigue and creep failures. The information contained in these reports were incorporated in ASME Section III, Division 1 - Subsection NH, "Class 1

Components in Elevated Temperature Service," and Code Cases N-201 and N-499. NRC supported preliminary work from 2003-2004 to update codes and standards beyond the previously applicable temperature ranges. Work was begun to review and evaluate worldwide data correlation and methods applicable to high-temperature design of metallic components. The compilation, review, and evaluation of the state-of-technology in existing codes and procedures still need to be completed. The effects of the helium environment, including impurities such as oxygen, were not addressed. Small levels of impurities, such as less than 1 part per million of oxygen in the high purity water coolant of LWRs, can greatly decrease the fatigue life and resistance to stress corrosion cracking of metallic components. These effects were not originally addressed in the ASME Code. In addition, improved correlations for creep and creep-fatigue have been developed from research of the 1990s. The ASME Code needs to be updated to incorporate new sources of data and knowledge. A number of potential issues are related to inservice inspection (ISI) of safety-significant HTGR components. Compared with LWRs, HTGRs are designed to operate for much longer periods of time between ISI and scheduled short-duration shutdowns for maintenance or refueling. Accordingly, the time interval between ISIs will be longer, and the time available for these inspections might be limited. Therefore, the effectiveness of various ISI programs should be assessed as a function of both the frequency of inspections and the number and types of components inspected. In addition, many internal components are not easily accessible for ISI, and the safety impact of not inspecting these components should be assessed. An alternative to conducting more ISIs during reactor shutdowns is to continuously monitor online during operation for any leakage of the pressure boundary, thus assessing the structural integrity of the entire reactor and reactor components during operation. Continuous monitoring techniques have been developed, validated, and codified for use in LWRs. If HTGR ISIs cannot be conducted on a sufficiently frequent basis and certain components cannot be inspected, then continuous online monitoring might be needed. The continuous monitoring techniques should be evaluated and validated for HTGR materials, environments, and degradation mechanisms. There will need to be some interaction in development with PRA considerations. The plant PRA that will be provided in an application is expected to be developed during the design phase and to evolve as the design matures. That is, the PRA, as it is developed, will influence the plant design development decisions, and as the plant design development decisions are made, the plant PRA is updated. Fabrication and construction errors associated with passive systems can invalidate safety analysis and PRA assumptions. Therefore, the identification of adverse latent conditions that could occur during fabrication and construction will be critical to ensuring safety.

Accordingly, risk-informed inspection procedures will be needed to help focus the effectiveness of various ISI programs. Procedures should be assessed as a function of both the frequency of inspections and the number and types of components inspected.

### **Scope of Work**

#### **Task 1 - High Temperature Metallic Materials**

(1) Develop published project plan (roadmap) to identify the path forward for development of ASME code rules to fully support HTGR and VHTGR systems and applications, including possible need for further activities as noted below, and suggesting relative roles of NRC, DOE, and industry:

## **Materials**

- Develop elevated-temperature properties
- Characterize and understand effects of long-term environmental degradation in HTGR materials and fuels, including failure mechanisms and effects of environment (e.g., thermal aging, corrosion, oxygen and other impurities in helium)
- Develop properties for emissivity of HTGR materials and coatings
- Characterize and understand effects of diffusion in HTGR fuels
- Develop mechanistic source term requirements for HTGR fuels

## **Design**

- Develop new BPV Code Section or expand existing Code Cases for construction of HTGRs
  - o Address construction of components for which Section III is not used in LWRs (e.g., turbine and compressor and casings, graphite core structures)
  - o Allow choice of design methodologies irrespective of safety classification
  - o Extend upper temperature limits to 850°C
  - o Evaluate need for requirements for managing emissivity
- Obtain NRC endorsement of Subsection NH and Section III elevated-temperature Code Cases (e.g., N-201-5, N-253-14, and N-499-2)
- Broaden current PRA standards beyond LWR applications
- Develop probabilistic (reliability-based or risk-informed) design methods for Section III applications for HTGRs
  - Develop probabilistic (reliability-based) design methods for graphite
  - Improve methodology for analysis of fatigue at elevated temperatures
  - Develop grading of quality assurance requirements based on risk significance
- Examination and Reliability Integrity Management
  - Develop reliability integrity management and examination requirements necessary to ensure structural integrity, including consideration for longer operating cycles
  - Develop requirements for nondestructive examination, pressure or leak testing, and additional surveillance or monitoring
  - Develop new nondestructive examination techniques for use in HTGRs (construction and inservice reliability integrity management)
  - Develop new nondestructive examination techniques to detect creep and creep-fatigue
  - Develop new nondestructive examination techniques for new design configurations
  - Develop new nondestructive examination techniques for graphite, composite materials, and ceramics
  - Develop new standard for management of reliability of active functions (pumps, valves, snubbers, diesel generators, etc.)

## **Management, Training, Manpower**

- Facilitate communication among industry, government, researchers and ASME Code Committees
- Develop additional manpower, especially from regulatory agencies, for new or expansion standards development
- Train young engineers in HTGR development (e.g., PRA, elevated-temperature design, RIM program development)

**Deliverable and Deliverable Due Date:**

(1) Report containing roadmap, available for implementation, within 180 days from contract start date.

**Task 2 - NDE & ISI Technology**

(1) Conduct technology assessment for advanced monitoring, diagnostics, and prognostics. A key part of the review would involve an assessment of what technology and capabilities can be leveraged from past advanced and test reactor experience, laboratory studies and migration from current nuclear LWR industry experience. The technology assessment will provide guidelines for designers and developers of codes and standards and assist in defining where and what upgrades are needed. It will assist in identifying technology that can be used to support regulatory needs, identifying technology gaps and providing a technical foundation for defining a research agenda.

**Deliverable and Deliverable Due Date:**

(1) Report containing technical information and background to address concerns and assist codes & standards committees and jurisdictional authorities in adopting improved NDE methods into codes and standards, within 180 days from contract start date.

**Project Management**

ASME Standards Technology, LLC (ASME ST-LLC), acting as the Contract and Project Management office for ASME Codes and Standards, will manage the research development project including contracting with the subject matter experts who will perform the technical investigation, assist with review, and provide technical advise. ASME ST-LLC is currently managing other similar projects including the Gen IV Materials project for the U.S. Department of Energy with a total project funding of \$3 MM (over \$1.5 MM funding committed to date).

The NDE and ISI investigation will be conducted by subcontracting specialists in this field. The project organization will include a Steering Committee comprised of volunteer leadership representing key stakeholders, including the NRC.

Key ASME staff personnel include:

- ASME ST-LLC: Jim Ramirez and Anthony Amato
- ASME Codes & Standards: John Koehr and John Bendo
- ASME Code Committee Experts

The travel required if for project management and for subject matter experts working on the project. The trips are based on one (1) subject matter expert traveling three (3) trips at an estimated rate of \$1860.96 per trip and (2) staff traveling at three (3) times to support the meetings at an estimated rate of \$1523.83 per trip. Travel is required for project meetings at General Atomics in San Diego CA, at ASME Code week meeting in Memphis Tenn., and ASME Code Week Meeting in St. Louis, MO. A possible meeting could also take place in San Antonio Texas, should it be required.

## Attachment C – Standard Terms and Conditions

### The Nuclear Regulatory Commission's Standard Terms and Conditions for U.S. Nongovernmental Recipients

#### Preface

This award is based on the application submitted to, and as approved by, the Nuclear Regulatory Commission (NRC) under the authorization 42 USC 2051(b) pursuant to section 31b and 141b of the Atomic Energy Act of 1954, as amended, and is subject to the terms and conditions incorporated either directly or by reference in the following:

- Grant program legislation and program regulation cited in this Notice of Grant Award.
- Restrictions on the expenditure of Federal funds in appropriation acts, to the extent those restrictions are pertinent to the award.
- Code of Federal Regulations/Regulatory Requirements - 2 CFR 215 Uniform Administrative Requirements For Grants And Agreements With Institutions Of Higher Education, Hospitals, And Other Non-Profit Organizations (OMB Circulars), as applicable.

To assist with finding additional guidance for selected items of cost as required in 2 CFR 220, 2 CFR 225, and 2 CFR 230 these URLs to the Office of Management and Budget Cost Circulars are included for reference:

A-21: <http://www.whitehouse.gov/omb/circulars/a021/print/a021.html>

A-87: <http://www.whitehouse.gov/omb/circulars/a087/print/a087-all.html>

A-122: <http://www.whitehouse.gov/omb/circulars/a122/print/a122.html>

A-102, SF 424: <http://www.whitehouse.gov/omb/circulars/a102/print/a102.html>

Form 990: <http://www.irs.gov/pub/irs-pdf/i990-ez.pdf>

Any inconsistency or conflict in terms and conditions specified in the award will be resolved according to the following order of precedence: public laws, regulations, applicable notices published in the Federal Register, Executive Orders (EOs), Office of Management and Budget (OMB) Circulars, the Nuclear Regulatory Commission's (NRC) Mandatory Standard Provisions, special award conditions, and standard award conditions.

By drawing funds from the Automated Standard Application for Payment system (ASAP), the recipient agrees to the terms and conditions of an award.

Certifications and representations. These terms incorporate the certifications and representations required by statute, executive order, or regulation that were submitted with the SF424B application through Grants.gov.

#### **I. Mandatory General Requirements**

The order of these requirements does not make one requirement more important than any other requirement.

##### **1. Applicability of 2 CFR Part 215**

a. All provisions of 2 CFR Part 215 and all Standard Provisions attached to this grant/cooperative agreement are applicable to the Recipient and to sub-recipients which

meet the definition of "Recipient" in Part 215, unless a section specifically excludes a sub-recipient from coverage. The Recipient and any sub-recipients must, in addition to the assurances made as part of the application, comply and require each of its sub-awardees employed in the completion of the project to comply with Subpart C of 2 CFR 215 Part 180 and include this term in lower-tier (subaward) covered transactions.

b. Recipients must comply with monitoring procedures and audit requirements in accordance with OMB Circular A-133. <  
[http://www.whitehouse.gov/omb/circulars/a133\\_compliance/08/08toc.aspx](http://www.whitehouse.gov/omb/circulars/a133_compliance/08/08toc.aspx) >

## **2. Award Package**

This award is composed of an award face page, which incorporates the recipient's proposal by reference, and the NRC Standard Provisions for U.S. Nongovernmental Recipients. This award constitutes acceptance by the NRC of the Recipient's proposal and budget unless otherwise indicated on the face page, Block 9.

### **Substantial Involvement**

This award is issued as a Cooperative Agreement, a financial assistance mechanism in which substantial NRC programmatic involvement is anticipated in the performance of the activity. Under the cooperative agreement, the NRC purpose is to support and stimulate the recipients' activities by involvement in and otherwise working jointly with the award recipients in a partnership role; it is not to assume direction, prime responsibility, or a dominant role in the activities. Consistent with this concept, the dominant role and prime responsibility resides with the awardees for the project as a whole, although specific tasks and activities may be shared among the awardees and the NRC as defined below.

#### **1. Recipient Responsibility.**

a. The Recipient will bear primary responsibility for the conduct of the research and will exercise judgment towards attaining the stated research objectives within the limits of the Cooperative Agreement's terms and conditions.

b. The principal investigator(s) specified in the Cooperative Agreement will be continuously responsible for the conduct of the research project and will be closely involved with the research effort. The principal investigator, operating within the policies of the Recipient, is in the best position to determine the means by which the research may be conducted most effectively.

c. The principal investigator has primary authorities and responsibilities to define objectives and approaches, and to plan, conduct, analyze, and publish results, interpretations, and conclusions of their research and other activities. The Principal Investigator should be prepared to work collaboratively with the NRC to achieve the goals of this cooperative agreement and agree to accept the participatory and cooperative nature of the group process. The Principal Investigator is required to submit annual progress reports to NRC, as appropriate, and to provide site performance information as stipulated by NRC

#### **2. NRC Responsibilities**

a. The NRC Project Officer (PO) will have substantial involvement above and beyond the normal program stewardship of the award. The NRC PO partners with the recipient's research team representing the government's interest in the substantive work of the research team. The primary role of the NRC PO is to facilitate the work of the recipient. The NRC PO will have overall responsibility for monitoring the conduct and progress of Recipient Sites, including conducting site visits. The PO will provide substantial input, in collaboration with the Recipients, both in the planning and implementation of the program and in evaluation activities, and will make recommendations regarding program continuance. Likewise, Federal Project Officers will participate in the publication of results and packaging and dissemination of products and materials in order to make the findings available to the field, where appropriate. The Nuclear Regulatory Commission staff will receive authorship/co-authorship credit on all publications to which they have made substantial contribution

b. Additionally, The NRC Project Officer (PO) will have substantial involvement above and beyond the normal program stewardship of the award. The NRC PO will insert substantial involvement by collaboratively enable update materials specifications, codes, and standards and to provide technical safety information for evaluating HTGR and VHTR applications.

c. Role of the NRC Grants Officer:

The NRC Grants Officer (GO) is responsible for all business management aspects of negotiation, award, financial and administrative aspects of the cooperative agreement. The GO utilizes information from site visits, reviews of expenditure and audit reports and other appropriate means to assure that the project is operated in compliance with all applicable Federal laws, regulations, guidelines and the terms and conditions of award. Questions concerning the applicability of regulations and policies to this cooperative agreement and all requests for required prior approvals such as requests for permission to expend funds for certain items should be directed to the GO. Required approvals must be provided in writing and the GO is the only person who may grant such required approvals. Written approvals granted by other officials are not binding on the government. All changes in the terms of the cooperative agreement award must be issued in writing by the GO.

**§ 215.41 Recipient responsibilities.**

The Recipient is obligated to conduct such project oversight as may be appropriate, to manage the funds with prudence, and to comply with the provisions outlined in 2 CFR 215.41. Within this framework, the Principal Investigator (PI) named on the award face page, Block 11, is responsible for the scientific or technical direction of the project and for preparation of the project performance reports. This award is funded on a cost reimbursement basis not to exceed the amount awarded as indicated on the face page, Block 16., and is subject to a refund of unexpended funds to NRC.

The standards contained in this section do not relieve the recipient of the contractual responsibilities arising under its contract(s). The recipient is the responsible authority, without recourse to the NRC, regarding the settlement and satisfaction of all contractual and administrative issues arising out of procurements entered into in support of an award or other agreement. This includes disputes, claims, protests of award, source evaluation or other matters of a contractual nature. Matters concerning violation of

statute are to be referred to such Federal, State or local authority as may have proper jurisdiction.

### **Subgrants**

#### **Appendix A to Part 215—Contract Provisions**

Sub-recipients, sub-awardees, and contractors have no relationship with NRC under the terms of this grant/cooperative agreement. All required NRC approvals must be directed through the Recipient to NRC. See 2 CFR 215.180 and 215.41.

### **Nondiscrimination**

(This provision is applicable when work under the grant/cooperative agreement is performed in the U.S. or when employees are recruited in the U.S.)

No U.S. citizen or legal resident shall be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity funded by this award on the basis of race, color, national origin, age, religion, handicap, or sex. The Recipient agrees to comply with the non-discrimination requirements below:

Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d et seq)  
Title IX of the Education Amendments of 1972 (20 USC §§ 1681 et seq)  
Section 504 of the Rehabilitation Act of 1973, as amended (29 USC § 794)  
The Age Discrimination Act of 1975, as amended (42 USC §§ 6101 et seq)  
The Americans with Disabilities Act of 1990 (42 USC §§ 12101 et seq)  
Parts II and III of EO 11246 as amended by EO 11375 and 12086.  
EO 13166, "Improving Access to Services for Persons with Limited English Proficiency."  
Any other applicable non-discrimination law(s).

Generally, Title VII of the Civil Rights Act of 1964, 42 USC § 2000e et seq, provides that it shall be an unlawful employment practice for an employer to discharge any individual or otherwise to discriminate against an individual with respect to compensation, terms, conditions, or privileges of employment because of such individual's race, color, religion, sex, or national origin. However, Title VII, 42 USC § 2000e-1(a), expressly exempts from the prohibition against discrimination on the basis of religion, a religious corporation, association, educational institution, or society with respect to the employment of individuals of a particular religion to perform work connected with the carrying on by such corporation, association, educational institution, or society of its activities.

### **Modifications/Prior Approval**

NRC prior written approval may be required before a recipient makes certain budget modifications or undertakes particular activities. If NRC approval is required for changes in the grant or cooperative agreement, it must be requested of, and obtained from, the NRC Grants Officer in advance of the change or obligation of funds. All requests for NRC prior approval must be made, in writing (which includes submission by e-mail), to the designated Grants Specialist and Program Office no later than 30 days before the proposed change. The request must be signed by both the PI and the authorized organizational official. Failure to obtain prior approval, when required, from the NRC Grants Officer may result in the disallowance of costs, termination of the award, or other enforcement action within NRC's authority.

### **Lobbying Restrictions**

The Recipient will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

The Recipient shall comply with provisions of 31 USC § 1352. This provision generally prohibits the use of Federal funds for lobbying in the Executive or Legislative Branches of the Federal Government in connection with the award, and requires disclosure of the use of non-Federal funds for lobbying.

The Recipient receiving in excess of \$100,000 in Federal funding shall submit a completed Standard Form (SF) LLL, "Disclosure of Lobbying Activities," regarding the use of non-Federal funds for lobbying within 30 days following the end of the calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed. The Recipient must submit the SF-LLL, including those received from sub-recipients, contractors, and subcontractors, to the Grants Officer.

### **§ 215.13 Debarment And Suspension.**

The Recipient agrees to notify the Grants Officer immediately upon learning that it or any of its principals:

- (1) Are presently excluded or disqualified from covered transactions by any Federal department or agency;
- (2) Have been convicted within the preceding three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, receiving stolen property, making false claims, or obstruction of justice; commission of any other offense indicating a lack of business integrity or business honesty that seriously and directly affects your present responsibility;
- (3) Are presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b); and
- (4) Have had one or more public transactions (Federal, State, or local) terminated for cause or default within the preceding three years.

b. The Recipient agrees that, unless authorized by the Grants Officer, it will not knowingly enter into any subgrant or contracts under this grant/cooperative agreement with a person or entity that is included on the Excluded Parties List System (<http://epls.arnet.gov>).

The Recipient further agrees to include the following provision in any subgrant or contracts entered into under this award:

'Debarment, Suspension, Ineligibility, and Voluntary Exclusion

The Recipient certifies that neither it nor its principals is presently excluded or disqualified from participation in this transaction by any Federal department or agency. The policies and procedures applicable to debarment, suspension, and ineligibility under NRC-financed transactions are set forth in 2 CFR Part 180.

**Drug-Free Workplace**

The Recipient must be in compliance with The Federal Drug Free Workplace Act of 1988. The policies and procedures applicable to violations of these requirements are set forth in 41 USC 702.

**Implementation of E.O. 13224 -- Executive Order On Terrorist Financing**

The Recipient is reminded that U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the legal responsibility of the Recipient to ensure compliance with these Executive Orders and laws. This provision must be included in all contracts/sub-awards issued under this grant/cooperative agreement.

Award recipients must comply with Executive Order 13224, Blocking Property and Prohibiting Transactions with Persons who Commit, Threaten to Commit, or Support Terrorism. Information about this Executive Order can be found at:

[www.fas.org/irp/offdocs/eo/eo-13224.htm](http://www.fas.org/irp/offdocs/eo/eo-13224.htm).

**Procurement Standards. § 215.40**

Sections 215.41 through 215.48 set forth standards for use by recipients in establishing procedures for the procurement of supplies and other expendable property, equipment, real property and other services with Federal funds. These standards are furnished to ensure that such materials and services are obtained in an effective manner and in compliance with the provisions of applicable Federal statutes and executive orders. No additional procurement standards or requirements shall be imposed by the Federal awarding agencies upon recipients, unless specifically required by Federal statute or executive order or approved by OMB.

**Travel**

Travel is an appropriate charge to this award and prior authorization for specific trips are not required, as long as the trip is identified in the recipient's original program description and original budget. All other travel, domestic or international, must not increase the total estimated award amount. Trips that have not been identified in the approved budget require the written prior approval of the Grants Officer.

Travel will be in accordance with the US Government Travel Regulations at:

[www.gsa.gov/federaltravelregulation](http://www.gsa.gov/federaltravelregulation) and the per diem rates set forth at:

[www.gsa.gov/perdiem](http://www.gsa.gov/perdiem).

Travel costs to the grant must be consistent with provisions as established in Appendix A to 2 CFR 220 (J.53)

**Property Management Standards**

Property standards of this award shall follow provisions as established in 2 CFR 215.30.

**Equipment** procedures shall follow provision established in 2 CFR 215.34.

### **Procurement Standards**

Procurement standards of this award shall follow provisions as established in 2 CFR 215.40.

### **Intangible and Intellectual Property**

Intangible and intellectual property of this award shall generally follow provisions established in 2 CFR 215.36.

**Inventions Report** - The Bayh-Dole Act (P.L. 96-517) affords recipients the right to elect title and retain ownership to inventions they develop with funding under an NRC grant award ("subject inventions"). In accepting an award, the recipient agrees to comply with applicable NRC policies, the Bayh-Dole Act, and its Government-wide implementing regulations found at Title 37, Code of Federal Regulations (CFR) Part 401. A significant part of the regulations require that the recipient report all subject inventions to the awarding agency (NRC) as well as include an acknowledgement of federal support in any patents. NRC participates in the trans-government Interagency Edison system (<http://www.iedison.gov>) and expects NRC funding recipients to use this system to comply with Bayh-Dole and related intellectual property reporting requirements. The system allows for recipients to submit reports electronically via the Internet. In addition, the invention must be reported in continuation applications (competing or non-competing).

**Patent Notification Procedures**- Pursuant to EO 12889, NRC is required to notify the owner of any valid patent covering technology whenever the NRC or its financial assistance Recipients, without making a patent search, knows (or has demonstrable reasonable grounds to know) that technology covered by a valid United States patent has been or will be used without a license from the owner. To ensure proper notification, if the Recipient uses or has used patented technology under this award without license or permission from the owner, the Recipient must notify the Grants Officer. This notice does not necessarily mean that the Government authorizes and consents to any copyright or patent infringement occurring under the financial assistance.

**Data, Databases, and Software** - The rights to any work produced or purchased under a NRC federal financial assistance award are determined by 2 CFR 215.36. Such works may include data, databases or software. The Recipient owns any work produced or purchased under a NRC federal financial assistance award subject to NRC's right to obtain, reproduce, publish or otherwise use the work or authorize others to receive, reproduce, publish or otherwise use the data for Government purposes.

**Copyright** - The Recipient may copyright any work produced under a NRC federal financial assistance award subject to NRC's royalty-free nonexclusive and irrevocable right to reproduce, publish or otherwise use the work or authorize others to do so for Government purposes. Works jointly authored by NRC and Recipient employees may be copyrighted but only the part authored by the Recipient is protected because, under 17 USC § 105, works produced by Government employees are not copyrightable in the United States. On occasion, NRC may ask the Recipient to transfer to NRC its copyright in a particular work when NRC is undertaking the primary dissemination of the work. Ownership of copyright by the Government through assignment is permitted under 17 USC § 105.

**Records retention and access requirements** for records of the Recipient shall follow established provisions in 2 CFR 215.53.

**Organizational Prior Approval System**

In order to carry out its responsibilities for monitoring project performance and for adhering to award terms and conditions, each recipient organization shall have a system to ensure that appropriate authorized officials provide necessary organizational reviews and approvals in advance of any action that would result in either the performance or modification of an NRC supported activity where prior approvals are required, including the obligation or expenditure of funds where the governing cost principles either prescribe conditions or require approvals.

The recipient shall designate an appropriate official or officials to review and approve the actions requiring NRC prior approval. Preferably, the authorized official(s) should be the same official(s) who sign(s) or countersign(s) those types of requests that require prior approval by NRC. The authorized organization official(s) shall not be the principal investigator or any official having direct responsibility for the actual conduct of the project, or a subordinate of such individual.

**Conflict Of Interest Standards** of this award shall follow provisions as established in 2 CFR 215.42 Codes of Conduct.

**Dispute Review Procedures**

- a. Any request for review of a notice of termination or other adverse decision should be addressed to the Grants Officer. It must be postmarked or transmitted electronically no later than 30 days after the postmarked date of such termination or adverse decision from the Grants Officer.
- b. The request for review must contain a full statement of the recipient's position and the pertinent facts and reasons in support of such position.
- c. The Grants Officer will promptly acknowledge receipt of the request for review and shall forward it to the Director, Office of Administration, who shall appoint a review committee consisting of a minimum of three persons.
- d. Pending resolution of the request for review, the NRC may withhold or defer payments under the award during the review proceedings.
- e. The review committee will request the Grants Officer who issued the notice of termination or adverse action to provide copies of all relevant background materials and documents. The committee may, at its discretion, invite representatives of the recipient and the NRC program office to discuss pertinent issues and to submit such additional information as it deems appropriate. The chairman of the review committee will insure that all review activities or proceedings are adequately documented.
- f. Based on its review, the committee will prepare its recommendation to the Director, Office of Administration, who will advise the parties concerned of his/her decision.

**Termination and Enforcement.** Termination of this award by default or by mutual consent shall follow provisions as established in 2 CFR 215.60.

## **Monitoring and Reporting § 215.51**

a. Recipient Financial Management systems must comply with the established provisions in 2 CFR 215.21.

- Payment – 2 CFR 215.22
- Cost Share – 2 CFR 215.23
- Program Income – 2 CFR 215.24
  - Earned program income, if any, shall be added to funds committed to the project by the NRC and Recipient and used to further eligible project or program objectives.
- Budget Revision – 2 CFR 215.25
  - In accordance with 2 CFR 215.25(e), the NRC waives the prior approval requirement for items identified in sub-part (e)(1-4).
  - The Recipient is not authorized to rebudget between direct costs and indirect costs without written approval of the Grants Officer.
  - Allowable Costs – 2 CFR 215.27

### **b. Federal Financial Reports**

Effective October 1, 2008, NRC transitioned from the SF-269, SF-269A, SF-272, and SF-272A to the Federal Financial Report (SF-425) as required by OMB:

[http://www.whitehouse.gov/omb/fedreg/2008/081308\\_ffr.pdf](http://www.whitehouse.gov/omb/fedreg/2008/081308_ffr.pdf)

[http://www.whitehouse.gov/omb/grants/standard\\_forms/ffr.pdf](http://www.whitehouse.gov/omb/grants/standard_forms/ffr.pdf)

[http://www.whitehouse.gov/omb/grants/standard\\_forms/ffr\\_instructions.pdf](http://www.whitehouse.gov/omb/grants/standard_forms/ffr_instructions.pdf)

The Recipient shall submit a "Federal Financial Report" (SF-425) on a semi-annual basis for the periods ending March 31 and September 30, or any portion thereof, unless otherwise specified in a special award condition. Reports are due no later than 30 days following the end of each reporting period. A final SF-425 shall be submitted within 90 days after expiration of the award.

### **Period of Availability of Funds 2 CFR § 215.28**

a. Where a funding period is specified, a recipient may charge to the grant only allowable costs resulting from obligations incurred during the funding period and any pre-award costs authorized by the NRC.

b. Unless otherwise authorized in 2 CFR 215.25(e)(2) or a special award condition, any extension of the award period can only be authorized by the Grants Officer in writing. Verbal or written assurances of funding from other than the Grants Officer shall not constitute authority to obligate funds for programmatic activities beyond the expiration date.

c. The NRC has no obligation to provide any additional prospective or incremental funding. Any modification of the award to increase funding and to extend the period of performance is at the sole discretion of the NRC.

d. Requests for extensions to the period of performance shall be sent to the Grants Officer at least 30 days prior to the grant/cooperative agreement expiration date. Any request for extension after the expiration date shall not be honored.

#### **Automated Standard Application For Payments (ASAP) Procedures**

Unless otherwise provided for in the award document, payments under this award will be made using the Department of Treasury's Automated Standard Application for Payment (ASAP) system < <http://www.fms.treas.gov/asap/> >. Under the ASAP system, payments are made through preauthorized electronic funds transfers, in accordance with the requirements of the Debt Collection Improvement Act of 1996. In order to receive payments under ASAP, Recipients are required to enroll with the Department of Treasury, Financial Management Service, and Regional Financial Centers, which allows them to use the on-line method of withdrawing funds from their ASAP established accounts. The following information will be required to make withdrawals under ASAP: (1) ASAP account number – the award number found on the cover sheet of the award; (2) Agency Location Code (ALC) – 31000001; and Region Code. Recipients enrolled in the ASAP system do not need to submit a "Request for Advance or Reimbursement" (SF-270), for payments relating to their award.

#### **Audit Requirements**

Organization-wide or program-specific audits shall be performed in accordance with the Single Audit Act Amendments of 1996, as implemented by OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

<http://www.whitehouse.gov/omb/circulars/a133/a133.html> Recipients are subject to the provisions of OMB Circular A-133 if they expend \$500,000 or more in a year in Federal awards.

The Form SF-SAC and the Single Audit Reporting packages for fiscal periods ending on or after January 1, 2008 must be submitted online.

1. Create your online report ID at  
<http://harvester.census.gov/fac/collect/ddeindex.html>
2. Complete the Form SF-SAC
3. Upload the Single Audit
4. Certify the Submission
5. Click "Submit."

Organizations expending less than \$500,000 a year are not required to have an annual audit for that year but must make their grant-related records available to NRC or other designated officials for review or audit.

### **III. Programmatic Requirements**

#### **Performance (Technical) Reports**

a. The Recipient shall submit performance (technical) reports electronically to the NRC Project Officer and Grants Officer as specified in the special award conditions in the same frequency as the Federal Financial Report unless otherwise authorized by the Grants Officer.

b. Unless otherwise specified in the award provisions, performance (technical) reports shall contain brief information as prescribed in the applicable uniform administrative requirements 2 CFR §215.51 which are incorporated in the award.

#### **Unsatisfactory Performance**

Failure to perform the work in accordance with the terms of the award and maintain at least a satisfactory performance rating or equivalent evaluation may result in designation of the Recipient as high risk and assignment of special award conditions or other further action as specified in the standard term and condition entitled "Termination".

Failure to comply with any or all of the provisions of the award may have a negative impact on future funding by NRC and may be considered grounds for any or all of the following actions: establishment of an accounts receivable, withholding of payments under any NRC award, changing the method of payment from advance to reimbursement only, or the imposition of other special award conditions, suspension of any NRC active awards, and termination of any NRC award.

#### **Other Federal Awards With Similar Programmatic Activities**

The Recipient shall immediately provide written notification to the NRC Project Officer and the Grants Officer in the event that, subsequent to receipt of the NRC award, other financial assistance is received to support or fund any portion of the program description incorporated into the NRC award. NRC will not pay for costs that are funded by other sources.

#### **Prohibition Against Assignment By The Recipient**

The Recipient shall not transfer, pledge, mortgage, or otherwise assign the award, or any interest therein, or any claim arising thereunder, to any party or parties, banks, trust companies, or other financing or financial institutions without the express written approval of the Grants Officer.

#### **Site Visits**

The NRC, through authorized representatives, has the right, at all reasonable times, to make site visits to review project accomplishments and management control systems and to provide such technical assistance as may be required. If any site visit is made by the NRC on the premises of the Recipient or contractor under an award, the Recipient shall provide and shall require his/her contractors to provide all reasonable facilities and assistance for the safety and convenience of the Government representative in the performance of their duties. All site visits and evaluations shall be performed in such a manner as will not unduly delay the work.

### **IV. Miscellaneous Requirements**

#### **Criminal and Prohibited Activities**

a. The Program Fraud Civil Remedies Act (31 USC §§ 3801-3812), provides for the imposition of civil penalties against persons who make false, fictitious, or fraudulent claims to the Federal government for money (including money representing grant/cooperative agreements, loans, or other benefits.)

- b. False statements (18 USC § 287), provides that whoever makes or presents any false, fictitious, or fraudulent statements, representations, or claims against the United States shall be subject to imprisonment of not more than five years and shall be subject to a fine in the amount provided by 18 USC § 287.
- c. False Claims Act (31 USC 3729 et seq), provides that suits under this Act can be brought by the government, or a person on behalf of the government, for false claims under federal assistance programs.
- d. Copeland "Anti-Kickback" Act (18 USC § 874), prohibits a person or organization engaged in a federally supported project from enticing an employee working on the project from giving up a part of his compensation under an employment contract.

#### **American-Made Equipment And Products**

Recipients are hereby notified that they are encouraged, to the greatest extent practicable, to purchase American-made equipment and products with funding provided under this award.

#### **Increasing Seat Belt Use in the United States**

Pursuant to EO 13043, Recipients should encourage employees and contractors to enforce on-the-job seat belt policies and programs when operating company-owned, rented or personally-owned vehicle.

#### **Federal Employee Expenses**

Federal agencies are generally barred from accepting funds from a Recipient to pay transportation, travel, or other expenses for any Federal employee unless specifically approved in the terms of the award. Use of award funds (Federal or non-Federal) or the Recipient's provision of in-kind goods or services, for the purposes of transportation, travel, or any other expenses for any Federal employee may raise appropriation augmentation issues. In addition, NRC policy prohibits the acceptance of gifts, including travel payments for Federal employees, from Recipients or applicants regardless of the source.

#### **Minority Serving Institutions (MSIs) Initiative**

Pursuant to EOs 13256, 13230, and 13270, NRC is strongly committed to broadening the participation of MSIs in its financial assistance program. NRC's goals include achieving full participation of MSIs in order to advance the development of human potential, strengthen the Nation's capacity to provide high-quality education, and increase opportunities for MSIs to participate in and benefit from Federal financial assistance programs. NRC encourages all applicants and Recipients to include meaningful participations of MSIs. Institutions eligible to be considered MSIs are listed on the Department of Education website: <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>

#### **Research Misconduct**

Scientific or research misconduct refers to the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. It does not include honest errors or differences of opinions. The Recipient organization has the primary responsibility to investigate allegations and provide reports to the Federal Government. Funds expended on an activity that is determined to be invalid or unreliable because of scientific misconduct may result in a disallowance of costs for

which the institution may be liable for repayment to the awarding agency. The Office of Science and Technology Policy at the White House published in the Federal Register on December 6, 2000, a final policy that addressed research misconduct. The policy was developed by the National Science and Technology Council (65 FR 76260). The NRC requires that any allegation be submitted to the Grants Officer, who will also notify the OIG of such allegation. Generally, the Recipient organization shall investigate the allegation and submit its findings to the Grants Officer. The NRC may accept the Recipient's findings or proceed with its own investigation. The Grants Officer shall inform the Recipient of the NRC's final determination.

**Publications, Videos, and Acknowledgment of Sponsorship**

Publication of the results or findings of a research project in appropriate professional journals and production of video or other media is encouraged as an important method of recording and reporting scientific information. It is also a constructive means to expand access to federally funded research. The Recipient is required to submit a copy to the NRC and when releasing information related to a funded project include a statement that the project or effort undertaken was or is sponsored by the NRC. The Recipient is also responsible for assuring that every publication of material (including Internet sites and videos) based on or developed under an award, except scientific articles or papers appearing in scientific, technical or professional journals, contains the following disclaimer:

"This [report/video] was prepared by [Recipient name] under award [number] from [name of operating unit], Nuclear Regulatory Commission. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the view of the [name of operating unit] or the US Nuclear Regulatory Commission."

