

Grant and Cooperative Agreement

CHOOSE ONE:

- ☐ COOPERATIVE AGREEMENT
- ☒ GRANT

CHOOSE ONE: ☒ EDUCATION ☐ FACILITIES ☐ RESEARCH ☐ SDCR ☐ TRAINING

| | | | | | | | |
|---|------------------|----------------------|--------------|---|--|--------------------|--|
| 1. GRANT/COOPERATIVE AGREEMENT NUMBER NRC-HQ-7P-15-G-0002 | | 2. SUPPLEMENT NUMBER | | 3. EFFECTIVE DATE 06/30/2015 | | 4. COMPLETION DATE | |
| 5. ISSUED TO NAME/ADDRESS OF RECIPIENT (No., Street, City/County, State, Zip) California State University Dominguez Hills Foundation Attn: Rita Darcy 1000 E. VICTORIA STREET CARSON CA 907470005 | | | | 6. ISSUED BY U.S. NRC - HQ Mailing Address: Acquisition Management Division Mail Stop: 3WFN-05-C64MP Washington DC 20555-0001 | | | |
| 7. TAXPAYER IDENTIFICATION NO. (TIN) 95-2543028 | | | | 9. PRINCIPAL INVESTIGATOR/ORGANIZATION'S PROJECT OR PROGRAM MGR. (Name & Phone) Dr. Antonia Boadi Phone: 310-243-2682 Email: aboadi@csudh.edu | | | |
| 8. COMMERCIAL & GOVERNMENT ENTITY (CAGE) NO. | | | | | | | |
| 10. RESEARCH, PROJECT OR PROGRAM TITLE Probabilistic Risk Assessment of Robots Used in Nuclear Safety Applications | | | | | | | |
| 11. PURPOSE See Schedule | | | | | | | |
| 12. PERIOD OF PERFORMANCE (Approximately) 06/30/2015 through 06/29/2020 | | | | | | | |
| 13A. | | AWARD HISTORY | | 13B. | | FUNDING HISTORY | |
| PREVIOUS | | \$0.00 | | PREVIOUS | | \$0.00 | |
| THIS ACTION | | \$499,334.00 | | THIS ACTION | | \$100,000.00 | |
| CASH SHARE | | \$0.00 | | TOTAL | | \$100,000.00 | |
| NON-CASH SHARE | | \$0.00 | | | | | |
| RECIPIENT SHARE | | \$0.00 | | | | | |
| TOTAL | | \$499,334.00 | | | | | |
| 14. ACCOUNTING AND APPROPRIATION DATA 2015-X0200-FEEBASED-7P-7PD001-51-K-214-1041-4110 | | | | | | | |
| PURCHASE REQUEST NO. | | JOB ORDER NO. | | AMOUNT | | STATUS | |
| SBCR-15-0010 | | | | | | | |
| | | | | | | | |
| 15. POINTS OF CONTACT | | | | | | | |
| | NAME | MAIL STOP | TELEPHONE | E-MAIL ADDRESS | | | |
| TECHNICAL OFFICER | TUWANDA M. SMITH | | 301-415-7394 | Tuwanda.Smith@nrc.gov | | | |
| NEGOTIATOR | | | | | | | |
| ADMINISTRATOR | GORDANA ZUBER | | 301-415-5002 | gordana.zuber@nrc.gov | | | |
| PAYMENTS | | | | | | | |
| 16. THIS AWARD IS MADE UNDER THE AUTHORITY OF : Pursuant to Section 31b and 141b of the Atomic Energy Act of 1954, as amended | | | | | | | |
| 17. APPLICABLE STATEMENT(S), IF CHECKED: <input type="checkbox"/> NO CHANGE IS MADE TO EXISTING PROVISIONS <input type="checkbox"/> FDP TERMS AND CONDITIONS AND THE AGENCY-SPECIFIC REQUIREMENTS APPLY TO THIS GRANT | | | | 18. APPLICABLE ENCLOSURE(S), IF CHECKED: <input type="checkbox"/> PROVISIONS <input type="checkbox"/> SPECIAL CONDITIONS <input type="checkbox"/> REQUIRED PUBLICATIONS AND REPORTS | | | |
| UNITED STATES OF AMERICA | | | | COOPERATIVE AGREEMENT RECIPIENT | | | |
| CONTRACTING/GRANT OFFICER M'LITA R. CARR | | DATE 06/30/2015 | | AUTHORIZED REPRESENTATIVE | | DATE | |

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

JUL 02 2015

ADM002

Grant and Cooperative Agreement

| ITEM NO. (A) | ITEM OR SERVICE (Include Specifications and Special Instructions) (B) | QUANTITY (C) | UNIT (D) | ESTIMATED COST | |
|-----------------|---|-----------------|-------------|-------------------|---------------|
| | | | | UNIT PRICE (E) | AMOUNT (F) |
| | <p>CFDA Number: 77.007</p> <p>Payment will be made through the Automated Standard Application for Payment (ASAP.gov) unless the recipient has failed to comply with the program objectives, award conditions, Federal reporting requirements or other conditions specified in 2 CFR 215 (OMB Circular A110</p> <p>Payment will be made through the Automated Standard Application for Payment (ASAP.gov) unless the recipient has failed to comply with the program objectives, award conditions, Federal reporting requirements or other conditions specified in 2 CFR 215 (OMB Circular A110).</p> <p>Payment:</p> <p style="padding-left: 40px;">ASAP GRANT FUNDS REIMBURSEMENT SYS</p> <p style="padding-left: 40px;">US TREASURY</p> <p>Period of Performance: 06/30/2015 to 06/29/2020</p> <p>NRC-HQ-7P-14-FOA-0001</p> | | | | |

ATTACHMENT A – SCHEDULE**A.1 PURPOSE OF GRANT**

The purpose of this Grant is to provide support to the "Probabilistic Risk Assessment of Robots Used in Nuclear Safety Applications."

A.2 PERIOD OF GRANT

1. The effective date of this Grant is June 30, 2015. The estimated completion date of this Grant is June 29, 2020.
2. Funds obligated hereunder are available for program expenditures for the estimated period: June 30, 2015 – June 29, 2020.

A. GENERAL

1. Total Estimated NRC Amount: \$499,334.00
2. Total Obligated Amount: \$100,000.00
3. Cost-Sharing Amount: \$0.00
4. Activity Title: Probabilistic Risk Assessment of Robots Used in Nuclear Safety Applications
5. NRC Project Officer: Tuwanda Smith
6. DUNS No.: 103895579

A.3 BUDGET

Revisions to the budget shall be made in accordance with Revision of Grant Budget in accordance with 2 CFR § 200.308.

| Category | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Personnel | \$43,820.00 | \$43,820.00 | \$43,820.00 | \$43,820.00 | \$43,820.00 |
| Fringe Benefits | \$10,199.00 | \$10,199.00 | \$10,199.00 | \$10,199.00 | \$10,199.00 |
| Other | \$21,000.00 | \$21,000.00 | \$21,000.00 | \$21,000.00 | \$21,000.00 |
| Indirect Charges 46% | <u>\$24,848.00</u> | <u>\$24,848.00</u> | <u>\$24,848.00</u> | <u>\$24,848.00</u> | <u>\$24,848.00</u> |
| Total | \$99,867.00 | \$99,867.00 | \$99,867.00 | \$99,867.00 | \$99,867.00 |

A.4 AMOUNT OF AWARD AND PAYMENT PROCEDURES

1. The total estimated amount of this Award is \$449,334.00 for the five year period.
2. NRC hereby obligates the amount of \$100,000.00 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 Grants 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.

ATTACHMENT B - PROJECT DESCRIPTION

I. OVERVIEW

California State University, Dominguez Hills (CSUDH) supports the Nuclear Regulatory Commission's mission by developing the knowledge and skillsets of its students relevant to nuclear safety and security. The proposed project trains students to integrate *Probabilistic Risk Assessment (PRA)* into the design of robots used in nuclear safety applications.

The use of robots, both autonomous and remotely-operated units, has broad application in the nuclear power industry. Highly specialized robots can perform maintenance and inspection tasks within nuclear plants where high radiation levels, humidity or heat create conditions that are unsafe for human workers. Concomitant with the use of robots in the nuclear energy domain is the potential for accidents, the inadvertent creation of hazards, and the possibility of low-probability, high consequence events.

The proposed project introduces students to methodologies that quantify and mitigate the risk associated with accidents and hazards through the integration of Probabilistic Risk Assessment (PRA) into the design process.

Relationship of Proposed Project to NRC MSIP Program Goals

The proposed project is *highly aligned with NRC's MSIP initiative*. CSUDH is among the most ethnically-diverse universities in the United States with a student population that is 54.5 percent Hispanic/Latino; 17.7 percent Black/African American, 12.9 percent White, 11.4 percent Asian or Pacific Islander, 0.3 percent American Indian, and 3.2 percent two or more races. Moreover, Dr. Boadi, the proposed Principal Investigator, is both a product of this 'minority-majority' institution and an African-American woman.

Aims and Objectives

The *principal aim* of this initiative is to expand the pipeline of STEM graduates whose research and training experiences qualify them for employment within the nuclear energy industry. The specific objectives of the project are to:

Objective 1: Increase the number of students engaged in research related to nuclear energy applications (as compared to the Spring 2014 baseline) by 25%.

Objective 2: Increase (measured from the Spring 2014 baseline), the number of students applying for jobs within the NRC, NRC-related laboratories, or to related government agency or university research laboratories by 20%.

Objective 3: Attract and expose undergraduate students (at least 40% shall be under-represented minorities) to nuclear energy applications of robotics by offering at least 4 outreach activities per year.

These objectives will be accomplished through (1) research skill development workshops; (2) faculty and peer mentoring activities; (3) collaborative learning experiences; (4) scientific and technical writing training; and (5) leadership development activities.

II. METHODOLOGY

2.1 Program Approach

The proposed project builds upon the success of a previously funded MSIP award. The previous project, entitled '*Nuclear Safety Applications of Autonomous Robots*', addressed the design of ground-based, aerial and underwater robots for nuclear energy applications. It leveraged partnerships with the Naval Postgraduate School (NPS) and the University of Southern California (USC) to train students to apply design methodologies, virtual reality simulation tools, and algorithms originally developed for the use of robotic agents in homeland defense and security applications, to problems in the nuclear energy domain.

A multi-pronged approach will be used to accomplish the project objectives. An augmented version of the highly effective Affinity Research Group (ARG) model will be adopted to establish research teams. The ARG model has a documented record of success for ensuring student engagement. Through a structured team approach, students learn how to conduct scholarly research, lead effective team discussions, execute a research project, and much more. Program activities include: (1) research skill development workshops; (2) faculty and peer mentoring activities; (3) collaborative learning experiences; (4) scientific and technical writing training; (5) leadership development activities; (6) participation in professional technical meetings; (7) on/off campus research experiences; and (8) career preparation seminars.

2.2 Recruitment

Graduate and undergraduate STEM majors who have the requisite programming and mathematical background will be recruited from all STEM disciplines. Each year Dr. Boadi will present a series of presentations on introductory topics related to nuclear energy applications of robotics. At the end of each presentation, interested students will be given a small research project that includes the software tools; data and journal articles. The project will be small but will be of sufficient difficulty to serve as a semester project in a STEM course. Upon completion of the project, interested students will be allowed to apply for a research position in one of the NRC research clusters and become eligible for a research stipend.

A robotics thematic cluster will be formed for Computer Science (graduate and undergraduate) and Computer Technology students enrolled in Senior Capstone and Graduate Theses courses. The opportunity will also be presented to STEM students enrolled in the U.S. Department of Education McNair Program and the NSF-funded Louis Stokes Alliance for Minority Professionals. The latter programs, which have been historically undersubscribed, provide stipends to students engaged in STEM research projects. The project will sponsor annual symposia that showcase student projects and serve as recruitment vehicles for the next year's cohort.

2.3 Research Plan

2.3.1 Nuclear Energy Applications of Robotics

The research initiative will be implemented incrementally so that at the end of the project, the research team will have developed a portfolio of projects, toolsets, data and presentations that encompass a broad array of nuclear energy and power industry research areas. Students will design robots used in a variety of nuclear energy related applications. Students will be

introduced Probabilistic Risk Assessment (PRA) and four techniques used to perform Safety/Hazard Analysis. Students will learn to select the appropriate method(s) for their application domain. Students will present an analysis and justification of their design choices and system safety considerations for review by other members of the Nuclear Energy PRA Research Cluster. Candidate scenarios include:

- Underwater Robots used for the inspection, maintenance and repair of underwater structures.
- Flying Robots: Project will model the performance of an helicopter-like Unmanned Aerial Vehicle (UAV) in the inspection of power lines
- Ground Based, Special-Purpose Robots:
 - mobile robot used for de-icing of overhead transmission lines.
 - train-like miniature climbing robot that inspects ferromagnetic tubes
 - robot capable of performing direct plant measurement and performing in-situ repairs.
 - applications of robots in the removal and replacement of a section of pipe within a *boiling water reactor* (BWR).
 - application of a robotic arm used for remote controlled visual inspection and operations inside a nuclear reactor.

2.3.2 Application of Probability Risk Assessment to Robot Design

Students will integrate principles of Probability Risk Assessment within the design of their robots. Their training will include the following topics:

- a. Introduction to Risk Assessment
- b. Risk Aversion Methods
- c. Developing Safety Goals
- d. Accident Mechanisms and Risk Management
- e. Probabilistic Risk Assessment
- f. Initiating Event Search
- g. PRA Levels I, II and III
- h. Risk Calculations

2.3.3 Application of Safety and Hazard Analysis Techniques to Robot Design

2.3.3.1 Fault Tree Analysis (FTA) is used to prevent as well as prevent accidents. The analysis is graphically represented using logic symbols. The process begins with the identification of an undesirable event; all possible paths to this event are traced backwards chronologically. The design engineer strives to eliminate the activation of any of the triggering events from the design.

2.3.3.2 Failure Mode and Effect Analysis (FMEA) is used to evaluate a design from the perspective of safety and reliability. For every system component, the design engineer identifies all potential failure modes and how the failure impacts the unit and its environment. A failure rate or probability of occurrence is assigned to each failure mode. The design engineer then identifies corrective measures for each critical failure mode. It is important that the definition of critical failure mode and its impact ranking be agreed upon by all stakeholders prior to the initiation of the analysis.

2.3.3.3 Nuclear Safety Cross-Check Analysis (NSCCA) was originally developed by the Department of Defense for certification of nuclear weapon system software. The analyst assumes an adversarial role to ensure that safety-related requirements are thoroughly tested. This analysis may be performed in conjunction with FMEA to develop a matrix that cross-references critical components and failure modes with influence/impact rankings.

2.3.3.4 Hazard and Operability Analysis (HAZOP), which was originally developed in the chemical industry, assists in the identification of problems before all data regarding a system or product is available. HAZOP is a team-based approach in which each member is an expert in some facet or component of the system. The team collaborates in the identification of system hazards and uses risk analysis to eliminate or mitigate the risk associated with each hazard.

III. PLAN OF OPERATION

3.1 Program Management

Dr. Antonia Boadi will serve as Principal Investigator will oversee the day-to-day programmatic aspects of the project. The policies and procedures governing the program will be established and reviewed by an **Advisory Board** consisting of the PI, Directors of the McNair and Louis Stokes Alliance for Minority Participation (LS-AMP) programs and the Chair of the Computer Science Department. The **Student Selection Committee** will select students for stipends and will review student academic progress. The committee will consist of the PI and representatives from STEM departments. The group will convene once each semester, or more frequently if required, to review program status and student progress. They will support the PI and in the generation of required Performance Reports and work plans required by the MSIP Program Officer.

3.2 Financial Management

The CSUDH Foundation is the institution's fiscal agent. The Foundation will be responsible for administering and distributing stipends as well as for generating monthly budget reports. Administrative controls will be established to prevent students whose academic performance has fallen below a specified threshold from collecting stipends. The following records will be maintained:

- Evidence or documentation that there are adequate controls over grant funds
- Evidence that demonstrates that the programmatic activities described in the grant application are actually being carried out.
- Evidence that the results, goals and objectives described in the grant application are being achieved
- Evidence that the performance report data are accurate and reliable
- A trail from drawdown to purchase order, receipt, and payment
- Documentation of time and effort
- Evidence that services have been provided, a description of the type of service, to whom, by whom, where, and when

3.3 Project Timeline

| YEAR 1 | |
|------------------------|---|
| TERM | ACTIVITIES |
| Fall 2014 (pending) | Develop Recruitment, Information Packages Research Tea, Recruitment sessions |

| | |
|---------------------|---|
| award notification) | Recruitment sessions for NRC Summer Cooperative Internship Program Convene Advisory Board to develop policies and student selection criteria Begin Workshop Development Develop Assessment Instruments Request IRB Approval of Evaluation Plan – this could be an iterative process |
| Spring 2015 | Obtain IRB Approval of Evaluation Plan Recruitment and Information Sessions Advisory Board meeting Introductory Workshops Generate required NRC reports. |
| YEARS 2-5 | |
| TERM | ACTIVITIES |
| Fall Term | Recruitment sessions to support student applications to NRC Summer Program (Sept – Dec) Recruitment sessions for NRC Cooperative Internship Program ARG Research Training Activities Faculty and peer mentoring activities Recruitment and Information Sessions Career Preparation Workshops – Student Development Office Outreach Activities Advisory Board meeting Generate required NRC reports. |
| Spring Term | ARG Research Training Activities Recruitment and Information Sessions Career Preparation Workshops – Student Development Office Student project presentations at Student Research Day Competition Faculty and peer mentoring activities Advisory Board Meeting Generate required NRC reports. |

IV. EXPECTED PRODUCTS AND RESULTS

The project is in alignment with the NRC MSIP Initiative by increasing the *pool* of scientists (as well as a faculty member) from **under-represented minority groups** who are qualified to work in NRC and NRC-supported laboratories. As the ***most diverse institution on the West Coast***, CSUDH is the ideal venue for advancing MSIP goals. Students may support research projects for 1 or 2 terms, with an average of 4 students per term. The proposed project will generate new research capabilities in Probability Risk Assessment and enhance existing research capabilities in nuclear safety applications of robotics.

The ***success of the project is bolstered*** by existing mentor-protégée partnerships with the **Naval Postgraduate School (NPS)** and the **University of Southern California**, both of which are internationally recognized for their excellence in the area of autonomous robotic agents; both institutions partnered in CSUDH's previously funded MSIP grant. Moreover, the project's research component is based upon the Affinity Research Group, a model whose ***success at developing minority research teams has been documented***. In order to ***avoid the pitfalls***

sometimes associated with projects perceived as intellectually intimidating, the program was **strategically designed** to support student class projects, senior capstone and graduate theses. Should **unanticipated challenges** arise, the Advisory Board, in conjunction with the Dean, will convene to discuss the development of **alternative tactics that achieve the project's goals**.

V. EVALUATION AND DISSEMINATION PLANS

5.1 Evaluation Plan

The Evaluation Plan will measure the program's success at achieving the program objectives identified in Section I. Survey instruments that collect formative and summative data relative to the following metrics will be administered to program participants as well as to a control group consisting of students who have not been exposed to the grant's programmatic activities. Data and trends regarding student **attitudinal, qualitative** and the following **quantitative metrics** will be presented to the Advisory Board for review and to take **corrective action** if necessary.

Objective 1: Increase the number of students engaged in research related to nuclear energy applications (as compared to the Spring 2014 baseline) by 25%.

- *The number and percentage of students who participate in scientific activities or research experiences in industry, government, or the not-for-profit sector.*
- *The number and percentage of students that present research findings at scientific meetings or student science exchange events.*
- *The number of students who engage in research experiences in an academic, government, or not-for-profit industry*
- *The number of students who participate in inter disciplinary research or educational experiences.*

Objective 2: Increase (measured from the Spring 2014 baseline), the number of students applying for jobs within the NRC, NRC-related laboratories, or to related government agency or university research laboratories by 20%.

- *The number and percentage of STEM graduates who take a job in a STEM or STEM related Field*
- *The number and percentage of program completers who are employed in a STEM or STEM-related field.*

Objective 3: Attract and expose undergraduate students (at least 40% shall be under-represented minorities) to nuclear energy applications of robotics by offering at least 4 outreach activities per year.

- *The number of students participating in or attending outreach activities.*

5.2 Dissemination Plan

Project results will be disseminated through a variety of channels. An Annual Report will be developed to publicize the project. Students will be required to identify and submit an article to at least one peer-reviewed journal each academic year. Students will be encouraged to avail themselves of research travel awards sponsored by SACNAS, the Society for Advancement of Chicanos and Native Americans in Science, the Grace Hopper Celebration of Women in Computing's annual conference, as well as of discipline-specific conferences. Student teams will be encouraged to present their research in similar venues at nearby colleges.

VI. CAPACITY OF ORGANIZATION TO EXECUTE PROJECT

This project builds upon **research** and **curricular infrastructure** established by grants from the U.S. Department of Education; **Office of the Director of National Intelligence**; **U.S. Department of Homeland Security** and the **Nuclear Regulatory Commission**, on which Dr. Boadi served as Principal Investigator. The proposed program will be **critical** to CSUDH's commitment to **increase enrollment in STEM disciplines, shorten the time to degree, and increase the participation of women and minorities** in STEM majors. Moreover, the grant **broadens and deepens** the impact of a **previously-funded NRC MSIP** award which was implemented in collaboration with the **Naval Postgraduate School** and the **University of Southern California**.

VII. QUALIFICATIONS OF PRINCIPAL INVESTIGATOR

Dr. Antonia Boadi will oversee the day-to-day activities of this project. She began her career in the defense industry where she performed **Nuclear Safety Cross Check Analysis (NSCCA)** on Ground and Sea Launched Cruise Missile Programs. Prior to joining CSUDH, she worked at Northrop Grumman Corporation, The Aerospace Corporation and The RAND Corporation, where she supported a variety of software and electronic communication programs.

Dr. Boadi is a product of her academic unit, where she completed a double major in Mathematics and Computer Science. She is the founding Director of CSUDH's **Intelligence Community Center of Academic Excellence**, which was established by the Office of the Director of National Intelligence. In 2001, Dr. Boadi founded a **STEM gender initiative: PROWESS, the PaRtnership of Women Excelling as Scientists and Scholars**. She was named 'Woman of the Year' for her contributions to her profession and to her community.

Dr. Boadi has completed Master's degrees in Computer Engineering and Electrical Engineering as well as a Ph.D. in the latter, all from the University of Southern California. Her support of projects related to **homeland security** and **nuclear energy technologies**, led Dr. Boadi to pursue a **second doctorate** in Policy, Planning and Development, with an emphasis in **Homeland Security Risk Analysis**. Her studies are sponsored by a **Career Development Grant** awarded by the Department of Homeland Security's Center for Research on the Economic Impact of Terrorist Events (CREATE). Her thesis project is in support of a DHS **Domestic Nuclear Detection Office (DNDO)** grant that proposes a **framework** for comparing and evaluating **nuclear detection equipment** and **software algorithms** deployed at commercial container ports.

ATTACHMENT C – STANDARD TERMS AND CONDITIONS

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

Preface

This award is based on the application submitted to, and as approved by, the Nuclear Regulatory Commission (NRC) under the authorization 42 U.S.C. § 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 Grant and Cooperative Agreement.
- 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 Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

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 (E.O.), Office of Management and Budget (OMB) Circulars, the NRC's Mandatory Standard Provisions, special award conditions, and standard award conditions.

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 200

All provisions of 2 CFR Part 200 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 2 Part §200.86, 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 D of 2 CFR Part 200 and include this term in lower-tier (sub-award) covered transactions.

Recipients must comply with monitoring procedures and audit requirements in accordance with 2 CFR Part 200, Subpart F—AUDIT REQUIREMENTS.

2. Award Package

The Recipient is obligated to conduct project oversight as may be appropriate, to manage the funds with prudence, and to comply with the provisions outlined in 2 CFR Part 200. Within this framework, the Principal Investigator (PI) named on the award face page, 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, and is subject to a refund of unexpended grant funds to the NRC.

The non-Federal entity alone must be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements related to its grant award. These issues include, but are not limited to, source evaluation, protests, disputes, and claims. These standards do not relieve the non-Federal entity of any financial or fiduciary responsibilities or obligations arising under its grant, including sub-contracts and sub-awards, or any other contractual or financial obligation. The Federal awarding agency will not substitute its judgment for that of the non-Federal entity

unless the matter is primarily a Federal concern. Violations of law will be referred to the local, State, or Federal authority having proper jurisdiction. See 2 CFR § 200.318(k), General Procurement Standards.

Subawards

Appendix II to Part 200 Contract Provisions for Non-Federal Entity Contracts Under Federal Awards

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 § 200.318.

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.

The Recipient agrees to comply with the non-discrimination requirements below:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.), which prohibits discrimination on the grounds of race, color, or national origin in any program or activity receiving federal financial assistance.
- Title IX of the Education Amendments of 1972 (20 U.S.C. §§ 1681 et seq.), which prohibits discrimination on the basis of sex in any education program or activity receiving federal financial assistance.
- Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability in any program or activity receiving federal financial assistance.
- The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 et seq.), which prohibits discrimination on the basis of age in any program receiving federal financial assistance.
- The Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12101 et seq.), which prohibits recipients from discriminating on the basis of disability in employment (Title I); State and local government services (Title II); and places of public accommodation and commercial facilities (Title III).
- Parts II and III of E.O. 11246, as amended by E.O. 11375, 11478, 12086, 12107, 13279, 13665, and 13672, which prohibits federal contractors and federally assisted construction contractors and subcontractors, who do over \$10,000 in Government business in one year, from discriminating in employment decisions on the basis of race, color, religion, sex, or national origin and requires that government contractors take affirmative action to ensure that equal opportunity is provided in all aspects of their employment.
- E.O. 13166, "Improving Access to Services for Persons with Limited English Proficiency," which clarifies that national origin discrimination under Title VI includes discrimination on the basis of limited English proficiency (LEP) and requires that the recipient take reasonable steps to ensure that LEP persons have meaningful access to programs and activities.
- Any other applicable non-discrimination law(s).

Generally, Title VII of the Civil Rights Act of 1964, 42 U.S.C. § 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 U.S.C. § 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's 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 and obtained from the NRC Grants Officer in advance of the change or obligation of funds. All requests for NRC prior approval, including requests for extensions to the period of performance, must be made, in writing (which includes submission by e-mail), to the designated Grants Officer at least 30 days before the proposed change. The request must be signed by the authorized organizational official. Failure to obtain prior approval, when required, from the NRC Grants Officer, may result in the disallowance of costs, 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 limits the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

The Recipient will comply with provisions of 31 U.S.C § 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 \$100,000.00 in Federal funding shall submit a completed Standard Form (SF-LLL), "Disclosure of Lobbying Activities." The form concerns 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.

Debarment And Suspension – (See 2 CFR Part 180; 2 CFR § 200.205; 2 CFR § 200.113; and 2 CFR Part 200, Appendix II.)

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); or

(4) Have had one or more public transactions (Federal, State, or local) terminated for cause or default within the preceding three years.

(5) The Recipient agrees that, unless authorized by the Grants Officer, it will not knowingly enter into any subaward or contracts under this grant/cooperative agreement with a person or entity that is not included on the System for Award Management (SAM) (<https://www.sam.gov>).

The Recipient further agrees to include the following provision in any subaward 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 2 CFR Part 180 and 2 CFR Part 200.

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 U.S.C. §§ 8101-8106.

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.

The Recipient must comply with E.O. 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:

Implementation of Executive Order 13224 Blocking Property and Prohibiting Transactions With Persons Who Commit, Threaten To Commit, or Support Terrorism , amended by E.O. 13268, 13284, and 13372.

Procurement Standards - 2 CFR §§ 200.318-200.326

Sections 200.318 - 200.326 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 will be imposed by the Federal awarding agencies upon Recipients, unless specifically required by Federal statute, executive order, or approved by OMB.

Travel and Transportation

Travel must be in accordance with the Recipient's Travel Regulations or the U.S. Government Travel Policy and Regulations at: www.gsa.gov/federaltravelregulation and the per diem rates set forth at: www.gsa.gov/perdiem, absent Recipient's travel regulations. Travel and transportation costs for the grant must be consistent with provisions as established in 2 CFR § 200.473-474.

All other travel, domestic or international, must not increase the total estimated award amount for the grant.

Domestic Travel:

Domestic travel is an appropriate charge to this award and prior authorization for specific trips are not required, if the trip is identified in the Recipient's approved program description and approved budget. Domestic trips not stated in the approved budget require the written prior approval of the Grants Officer, and must not increase the total estimated award amount for the grant.

All common carrier travel reimbursable hereunder shall be via the least expensive class rates consistent with achieving the objective of the travel and in accordance with the Recipient's policies and practices. Travel by first-class travel is not authorized unless prior approval is obtained, in writing, from the Grants Officer.

International Travel:

International travel requires **PRIOR** written approval by the Project Officer and the Grants Officer, even if the international travel is stated in the approved program description and the approved budget.

The Recipient will comply with the provisions of the Fly America Act (49 U.S.C 40118), as implemented at 41 CFR §§ 301-10.131 through 301-10.143.

Property Standards

Property standards of this award shall follow provisions as established 2 CFR §§ 200.310-200.316.

Intangible Property

Intangible and intellectual property of this award shall generally follow provisions established in 2 CFR § 200.315.

Inventions Report - The Bayh-Dole Act (P.L. 96-517) affords Recipients the right to elect and retain title 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.

Patent Notification Procedures - If the NRC or its 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, E.O.12889 requires NRC to notify the owner. 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 imply 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, such as data, databases or software are determined by Subpart D of 2 CFR Part 200. 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 U.S.C. § 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 U.S.C. § 105.

Record Retention and Access

Recipient shall follow established provisions in 2 CFR §§ 200.333-337.

Conflict Of Interest

Conflict of Interest standards for this award will follow the Organizational Conflict of Interest (OCOI) requirements set forth in Section 170A of the Atomic Energy Act of 1954, as amended, and provisions set forth at 2 CFR § 200.112, Conflict of Interest.

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 Acquisition Management Division, unless otherwise delegated, who shall appoint an intra-agency Appeal Board to review a recipient appeal of an agency action, if required, which will consist of the program office director, the Deputy Director of Office of Administration, and the Office of General Counsel.

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.

Remedies for Noncompliance

Termination of this award will follow provisions as established and described above in "Dispute Review Process" in 2 CFR §§ 200.338-342.

Performance and Financial Monitoring and Reporting - 2 CFR §§ 200.327-329

Recipient Financial Management systems must comply with the provisions in 2 CFR § 200.302.

- Payment – 2 CFR § 200.305
- Cost Share or Matching – 2 CFR § 200.306
 - Recipients are to be careful with providing excessive cost share or match since at the end of the grant, if the identified match has not been provided, then a portion of the federal share may be required to be returned to the Government.
- Program Income – 2 CFR § 200.307
 - Earned program income, if any, will be added to funds committed to the project by the NRC and Recipient and used to further eligible project or program objectives or be deducted from the total project cost for the grant, as directed by the Grants Officer or indicated in the terms and conditions of the award.
- Revision of Budget and Program Plans – 2 CFR § 200.308
 - The Recipient is required to report deviations from the approved budget and program descriptions in accordance with – 2 CFR § 200.308(b) and request prior written approval from the Project Officer and the Grants Officer.
 - The Recipient is not authorized to re-budget between direct costs and indirect costs without written prior approval of the Grants Officer.
 - The Recipient is authorized to transfer funds among direct cost categories up to a cumulative 10 percent of the total approved budget. The Recipient is not allowed to transfer funds if the transfer would cause any Federal appropriation to be used for purposes other than those consistent with the original intent of the appropriation.
 - Allowable Costs – 2 CFR §§ 200.401-403
- See section 2 CFR §§ 200.330-332 for Subrecipient Monitoring and Management.

Federal Financial Reports - In accordance with 2 CFR § 200.327, the Recipient will 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 authorized

by the Grants Officer. Reports are due no later than 30 days following the end of each reporting period. A final SF-425 is due within 90 days after expiration of the award. The report should be submitted electronically to: Grants_FFR.Resource@NRC.GOV.

(NOTE: There is an underscore between Grants and FFR).

Performance Progress Reports - In accordance with 2 CFR § 200.328, the Recipient will submit Performance Progress Reports (SF-PPR, SF-PPR-B, and the SF-PPR-E) on a semi-annual basis for the periods ending March 31, and September 30, or any portion thereof, unless otherwise authorized by the Grants Officer. Reports are due no later than 30 days following the end of the reporting period. Performance reports are sent to the Program Officer at the email address indicated in the Notice of Award, and to Grants Officer at: Grants_PPR.Resource@NRC.GOV. **(NOTE: There is an underscore between Grants and PPR).**

Final Reports - The Recipient is required to submit final reports, both Financial (SF-425) and Performance (SF-PPR, SF-PPR-B, SF-PPR-E) within 90 days of the grant expiration. In addition to these reports, a final SF-428, Tangible property report, is also required, if applicable.

Period of Performance – 2 CFR § 200.309

The recipient may charge to the Federal award only allowable costs incurred during the period of performance and any costs incurred before the NRC or pass-through entity made the Federal award that was authorized by the NRC or pass through entity.

Unless otherwise authorized in 2 CFR Part 200 or by special award condition, any extension of the award period can only be authorized by the Grants Officer in writing. Assurances of funding from other than the Grants Officer shall not constitute authority to obligate funds for programmatic activities beyond the expiration date.

The NRC Grant Officer may authorize a no cost extension of the period of performance. However, 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.

Automated Standard Application For Payments (ASAP) Procedures

Unless otherwise stated, Recipient payments are made using the Department of Treasury's Automated Standard Application for Payment (ASAP) system, ASAP.gov, through preauthorized electronic funds transfers. To receive payments, 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 is required to make ASAP withdrawals: (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).

II. Audit Requirements

Audits

Organization-wide or program-specific audits are performed in accordance with the Single Audit Act of 1996, as amended, and as implemented by 2 CFR Part 200, Subpart F—AUDIT

REQUIREMENTS. Recipients are subject to the provisions of this subpart if they expend \$750,000 or more in a year in Federal awards. See 2 CFR 200.501.

The Form SF-SAC and the Single Audit Reporting packages for fiscal periods ending on or after January 1, 2008 are submitted online, as follows:

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; and
5. Click "Submit."

Organizations expending less than \$750,000 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

Grant Performance Metrics

The Office of Management and Budget requires all Federal Agencies providing funding for educational scholarships and fellowships as well as other educational related funding to report on specific metrics. These metrics are part of the Academic Competitiveness Council's (ACC) 2007 report and specifically relates to Science, Technology, Engineering, and Mathematics (STEM) curricula.

The performance (technical) reports will contain brief information as prescribed in the applicable uniform administrative requirements 2 CFR §200.328. In addition to the customary performance progress report requested on the SF-PPR, SF-PPR-B, and SF-PPR-E forms, SBCR requires the following metrics to be reported on by the awardees as follows:

1. The number and percentage of STEM graduates who take a job in a STEM or STEM related Field
2. The number and percentage of students who participate in scientific activities or research experiences in industry, government, or the not-for-profit sector.
3. The number and percentage of students that present research findings at scientific meetings or student science exchange events.
4. The number of students who participate in inter disciplinary research or educational experiences.
5. The number of students who engage in research experiences in an academic, government, or not-for-profit industry
6. The number and percentage of graduate and post-doctoral fellowships who complete a STEM graduate or post-doctoral program
7. The number and percentage of program completers who are employed in a STEM or STEM-related field.
8. The number and percentage of students who participate in scientific activities or research experiences in industry, government, or the not-for-profit sector. This metric will include internships.

Unsatisfactory Performance

Failure to perform the work in accordance with the terms of the award and maintain at least a satisfactory performance rating may result in designation of the Recipient as high risk and the

assignment of special award conditions. Further action may be required as specified in the standard term and condition entitled "Remedies for Noncompliance."

Failure to comply with the award provisions may result in a negative impact on future NRC funding. In addition, the Grants Officer may withhold payments; change the method of payment from advance to reimbursement; impose special award conditions; suspend or terminate the grant.

Other Federal Awards With Similar Programmatic Activities

The Recipient will immediately notify the Project Officer and the Grants Officer in writing if after award, other financial assistance is received to support or fund any portion of the program description stated in the NRC award. NRC will not pay for costs that are funded by other sources.

Prohibition Against Assignment By The Recipient

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

Site Visits

The NRC, through authorized representatives, has the right to make site visits to review project accomplishments and management control systems and to provide technical assistance as 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 reasonable access to all facilities and provide necessary assistance for the safety and convenience of the Government representative in the performance of his/her official duties.

IV. Miscellaneous Requirements

Criminal and Prohibited Activities

The Program Fraud Civil Remedies Act (31 U.S.C. §§ 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).

False statements (18 U.S.C. § 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.

False Claims Act (31 U.S.C. § 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.

Copeland "Anti-Kickback" Act (18 U.S.C. § 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 encouraged to purchase American-made equipment and products with funding provided under this award.

Increasing Seat Belt Use in the United States

E.O. 13043, amended by E.O. 13652, requires Recipients to encourage employees and contractors to enforce on-the-job seat belt policies and programs when operating company-owned, rented or personally-owned vehicle.

Federal Leadership of Reducing Text Messaging While Driving

E.O. 13513 requires Recipients to encourage employees, sub-awardees, and contractors to adopt and enforce policies that ban text messaging while driving company-owned, rented vehicles or privately owned vehicles when on official Government business or when performing any work for or on behalf of the Federal Government.

Federal Employee Expenses

Federal agencies are 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 E.O.s 13230 and 13270, amended by E.O. 13316 and 13385, 13532, 13592, 13555, 13515, and 13621, 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."

Trafficking In Victims Protection Act Of 2000 (as amended by the Trafficking Victims Protection Reauthorization Act of 2003)

Section 106(g) of the Trafficking In Victims Protection Act Of 2000 (as amended as amended, directs on a government-wide basis that:

"...any grant, contract, or cooperative agreement provided or entered into by a Federal department or agency under which funds are to be provided to a private entity, in whole or in part, shall include a condition that authorizes the department or agency to terminate the grant, contract, or cooperative agreement, without penalty, if the recipient or any subrecipient, or the contractor or any subcontractor (i) engages in severe forms of trafficking in persons or has procured a commercial sex act during the period of time that the grant, contract, or cooperative agreement is in effect, or (ii) uses forced labor in the performance of the grant, contract, or cooperative agreement." (See 22 U.S.C. §7104(g).)

EXECUTIVE COMPENSATION REPORTING

2 CFR § 170.220 directs agencies to include the following text to each grant award to a non-federal entity if the total funding is \$25,000 or more in Federal funding.

Reporting Subawards and Executive Compensation.

a. Reporting of first-tier subawards.

1. *Applicability.* Unless you are exempt as provided in paragraph d. of this award term, you must report each action that obligates \$25,000.00 or more in Federal funds that does not include Recovery funds (as defined in section 1512(a)(2) of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5) for a subaward to an entity (see definitions in paragraph e. of this award term).

2. *Where and when to report.*

i. You must report each obligating action described in paragraph a.1. of this award term to <http://www.fsrs.gov>.

ii. For subaward information, report no later than the end of the month following the month in which the obligation was made. (For example, if the obligation was made on November 7, 2010, the obligation must be reported by no later than December 31, 2010.)

3. *What to report.* You must report the information about each obligating action that the submission instructions posted at <http://www.fsrs.gov> specify.

b. Reporting Total Compensation of Recipient Executives.

1. *Applicability and what to report.* You must report total compensation for each of your five most highly compensated executives for the preceding completed fiscal year, if—

i. the total Federal funding authorized to date under this award is \$25,000.00 or more;

ii. in the preceding fiscal year, you received—

(A) 80 percent or more of your annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR § 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR § 170.320 (and subawards); and

iii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>.)

2. *Where and when to report.* You must report executive total compensation described in paragraph b.1. of this award term:

i. As part of your registration profile at <http://www.sam.gov>.

ii. By the end of the month following the month in which this award is made, and annually thereafter.

c. Reporting of Total Compensation of Subrecipient Executives.

1. *Applicability and what to report.* Unless you are exempt as provided in paragraph d. of this award term, for each first-tier subrecipient under this award, you shall report the names and total compensation of each of the subrecipient's five most highly compensated executives for the subrecipient's preceding completed fiscal year, if—

i. in the subrecipient's preceding fiscal year, the subrecipient received—

(A) 80 percent or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR § 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts), and Federal financial assistance subject to the Transparency Act (and subawards); and

ii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>.)

2. *Where and when to report.* You must report subrecipient executive total compensation described in paragraph c.1. of this award term:

i. To the recipient.

ii. By the end of the month following the month during which you make the subaward. For example, if a subaward is obligated on any date during the month of October of a given year (*i.e.*, between October 1 and 31), you must report any required compensation information of the subrecipient by November 30 of that year.

d. *Exemptions*

If, in the previous tax year, you had gross income, from all sources, under \$300,000.00, you are exempt from the requirements to report:

i. Subawards,

and

ii. The total compensation of the five most highly compensated executives of any subrecipient.

e. *Definitions.* For purposes of this award term:

1. *Entity* means all of the following, as defined in 2 CFR Part 25:

i. A Governmental organization, which is a State, local government, or Indian tribe;

ii. A foreign public entity;

iii. A domestic or foreign nonprofit organization;

iv. A domestic or foreign for-profit organization;

v. A Federal agency, but only as a subrecipient under an award or subaward to a non-Federal entity.

2. *Executive* means officers, managing partners, or any other employees in management positions.

3. *Subaward*:

- i. This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.
- ii. The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see Sec. ____ .210 of the attachment to OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations")
- iii. A subaward may be provided through any legal agreement, including an agreement that you or a subrecipient considers a contract.

4. *Subrecipient* means an entity that:

- i. Receives a subaward from you (the recipient) under this award; and
- ii. Is accountable to you for the use of the Federal funds provided by the subaward.

5. *Total compensation* means the cash and noncash dollar value earned by the executive during the recipient's or subrecipient's preceding fiscal year and includes the following (for more information see 17 CFR § 229.402(c)(2)):

i. *Salary and bonus*.

ii. *Awards of stock, stock options, and stock appreciation rights*. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2004) (FAS 123R), Shared Based Payments.

iii. *Earnings for services under non-equity incentive plans*. This does not include group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.

iv. *Change in pension value*. This is the change in present value of defined benefit and actuarial pension plans.

v. *Above-market earnings on deferred compensation which is not tax-qualified*.

vi. Other compensation, if the aggregate value of all such other compensation (e.g., severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds \$10,000.00.

**SUMMARY TO FILE
NRC-HQ-11-C-04-0054
Energy Research, Inc. (ERI)**

The contract is being modified to accept the contractor's provisional rates as final rates for FY 2011 through FY 2013. NRC has determined these rates to be fair and reasonable based on the following rationale.

- In prior year audits, DCAA has found Energy Research's (ERI) proposed final rates, which are based on actual costs, to be acceptable as submitted. DCAA has found ERI's financial system of records to be in accordance with Cost Accounting Standards
- The Acquisition Management Division (AMD) has completed a comparison of the rates of the initial award of the contract and found the overall rate increase to the contract to be 1.34% for FY 2011 through FY 2013. AMD has determined that the following rate increases were acceptable.
 - a. Overhead - The average rate increase over the three (3) year period was 0.35%. The net increase for final costs was \$5,214.10 for this category. The net effect to the contract was less than 1% due to the amount of direct costs charged under this category.
 - b. The remaining G&A had a net increase of approximately 0.03%.
- The Acquisition Management Division has determined that additional funding is required to process final payment, and accepts these rates as final. There is a need to increase the ceiling in the amount of \$7,864.06 as a result of this modification.

Based on past history of DCAA audits on ERI's contracts and minimal difference in the rates from ERI's provisional to their final unaudited actual rates, NRC is at no risk at accepting the and to accept provisional indirect cost rates as final rates for FY 2011 through FY 2013.

| DATA ANALYSIS | | | | | | | |
|------------------------|------------------|----------------|--------|--------|--------|---------|------------|
| Indirect Cost Category | Application Base | Contract Rates | FY2011 | FY2012 | FY2013 | Average | Difference |
| Overhead | Direct Labor | 54.24% | 55.20% | 54.28% | 54.28% | 54.59% | 0.35% |
| G&A | Total Cost Input | 8.68% | 8.76% | 8.69% | 8.69% | 8.71% | 0.03% |
| | | | | | | | |

Based on the information, above, the NRC accepts the following changes as fair and reasonable to the contract.

Joyce Williams, Lead Contract Specialist

Date

Erika Eam, Contracting Officer

Date