U.S. NUCLEAR REGULATORY COMMISSION
NOTICE OF GRANT/ASSISTANCE AWARD

1. GRANT/AGREEMENT NO.	2. MODIFICATION NO.	3. PERIOD OF PERFORMANCE	4. AUTHORITY
NRC-27-10-514		FROM: 09/30/2010 TO: 9/30/2014	Pursuant to Section 31b and 141b of the Atomic Energy Act of 1954, as amended

5. TYPE OF AWARD	6. ORGANIZATION TYPE	7. RECIPIENT NAME, ADDRESS, and EMAIL ADDRESS
[X] GRANT [ ] COOPERATIVE AGREEMENT	Public State-Controlled Institution of Higher ED DUNS: 079121448	Alabama Agriculture and Mechanical University 4900 Meridian Street Huntsville, AL 35762

8. PROJECT TITLE:
Project NERVE-Nuclear Education and Research Vertical Enhancement

9. PROJECT WILL BE CONDUCTED	10. TECHNICAL REPORTS ARE REQUIRED	11. PRINCIPAL INVESTIGATOR(S) NAME, ADDRESS and EMAIL ADDRESS
PER GOVERNMENT'S/RECIPIENT'S PROPOSAL(S) DATED See Program Description AND APPENDIX A-PROJECT GRANT PROVISIONS	[X] PROGRESS AND FINAL [ ] FINAL ONLY [ ] OTHER (Conference Proceedings)	Alabama Agriculture and Mechanical University Attn: Dr. Stephen Egarievwe Email: Stephen.Egarievwe@aamu.edu (256) 372-8952

12. NRC PROGRAM OFFICE (NAME and ADDRESS)	13. ACCOUNTING and APPROPRIATION DATA	14. METHOD OF PAYMENT
NRC Attn: Tuwanda Smith Office of Small Business & Civil Rights MS: O-3H8 (301) 415-7394 11545 Rockville Pike Rockville, Maryland 20852 tuwanda.smith@nrc.gov	APPN. NO: 31X0200 B&R NO: 07P-15-5C1-161 JOB CODE: L2284 BOC NO: 4110 OFFICE ID NO: RFPA: SDB-27-10-514 FSS: SBC10333	[ ] ADVANCE BY TREASURY CHECK [ ] REIMBURSEMENT BY TREASURY CHECK [ ] LETTER OF CREDIT [X] OTHER (SPECIFY) Electronic ASAP.gov (See Remarks in Item #20 "Payment Information")

15. NRC OBLIGATION FUNDS		16. TOTAL FUNDING AGREEMENT		
THIS ACTION	$90.000	NRC	$360.000	This action provides funds for Fiscal Year in the amount of See Page Two
PREVIOUS OBLIGATION		RECIPIENT		
TOTAL	$90.000	TOTAL	$360.000	

17. NRC ISSUING OFFICE (NAME, ADDRESS and EMAIL ADDRESS)

U.S. Nuclear Regulatory Commission
Div. of Contracts
Attn: M`Lita Carr
Mail Stop: TWB-01-B10M
Rockville MD 20852
MLita.Carr@nrc.gov

18.	19. NRC CONTRACTING OFFICER
Signature Not Required	Sheila Bumpass 9/29/2010 (Signature) (Date) NAME (TYPED) Sheila Bumpass TITLE Contracting Officer TELEPHONE NO. 301-492-3484 Sheila.Bumpass@nrc.gov

20. PAYMENT INFORMATION

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).

21. Attached is a copy of the "NRC General Provisions for Grants and Cooperative Agreements Awarded to Non-Government Recipients.
Acceptance of these terms and conditions is acknowledged when Federal funds are used on this project.

22. ORDER OF PRECEDENCE
In the event of a conflict between the recipient's proposal and this award, the terms of the Award shall prevail.

23. By this award, the Recipient certifies that payment of any audit-related debt will not reduce the level of performance of any Federal Program.

TEMPLATE - ADM001 SUNSI REVIEW COMPLETE ADM001

ATTACHMENT A - SCHEDULE

A.1 PURPOSE OF GRANT

The purpose of this Grant is to provide support to the "Alabama Agriculture and Mechanical University."

A.2 PERIOD OF GRANT

1. The effective date of this Grant is September 30, 2010. The estimated completion date of this Grant is September 30, 2014.

2. Funds obligated hereunder are available for program expenditures for the estimated period: September 30, 2010 – September 30, 2014.

A. GENERAL

1. Total Estimated NRC Amount:	$360,000.00
2. Total Obligated Amount:	$90,000.00
3. Cost-Sharing Amount:	$0
4. Activity Title:	Alabama Agriculture and Mechanical University
5. NRC Project Officer:	Tuwanda Smith, Esq.
6. DUNS No.:	079121448

B. SPECIFIC

RFPA No.:	SDB-27-10-514
FFS:	SBC10333
Job Code:	L2284
BOC:	4110
B&R Number:	07-15-5C1-161
Appropriation #:	31X0200
Amount Obligated:	$90,000.00

A.3 BUDGET

Revisions to the budget shall be made in accordance with Revision of Grant Budget in accordance with 2 CFR 215.25.

	Year 1	Year 2	Year 3	Year 4
Direct Cost	$81,117.24	$81,117.24	$81,117.24	$81,117.24
Indirect Cost	$ 8,882.76	$ 8,882.76	$ 8,882.76	$ 8,882.76
Yearly Total	**$90,000.00**	**$90,000.00**	**$90,000.00**	**$90,000.00**

All travel must be in accordance with the Alabama Agriculture and Mechanical University Travel Regulations or the US Government Travel Policy absent Grantee's travel regulation.

A.4 AMOUNT OF AWARD AND PAYMENT PROCEDURES

1. The total estimated amount of this Award is $360,000.00 for the four year period.

2. NRC hereby obligates the amount of $360,000.00 for program expenditures during the period set forth above and in support of the Budget above. The Grantee will be given written notice by

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

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

Attachment B – Program Description

PROJECT DESCRIPTION

B.1. Soundness and Relevance of the Proposed Project and Activities

The U.S. Nuclear Regulatory Commission (NRC) co-sponsored a Minority Serving Institutions (MSI) Technical Assistance Workshop last September (2009) in Dallas, Texas. The special sessions provided information on how to apply for the NRC's competitive and non-competitive grants, compliance with civil rights statutes and NRC regulations, as well as an in-depth look at the agency's minority serving institutions program. The major key issues identified are:

1. Workforce development is now very crucial as 45% of workers in the nuclear industry will retire in the next five year, and 59% in the next ten years.
2. Minority serving institutions need to participate in workforce development through strong undergraduate research activities that expose students to early hands-on and the mastering of science, engineering and technology principles.
3. Emphasis on research and industrial engagement.
4. Recruitment campaigns, retention initiatives, and job placement drives.
5. Learning communities among students.

It was also observed that several minority serving institutions have started addressing these issues at the undergraduate level, which also include the participation of students in summer internships at U.S. Department of Energy (DOE) laboratories. One of the conclusions however, is that training activities at the graduate school and postdoctoral levels are lacking in minority serving institutions; and this need to be addressed in future grants/projects proposals/efforts.

As a direct solution that integrates the above five critical issues and also incorporates graduate level and postdoctoral training activities, we propose Project-NERVE (Nuclear Education and Research Vertical Enhancement). The NERVE project is a novel education-to-workforce practical approach that uses multi-track training activities that vertically cuts across several education domains. It is very productive, cost effective, and scalable to meet available funds. The principal investigation, Dr. Stephen Egarievwe, previously implemented a similar model that successfully moved many women and underrepresented minorities through undergraduate and graduate schools (including M.S., M.D., and Ph.D.) degrees in STEM (Science, Technology, Engineering and Mathematics) areas into the workforce in related industries [1].

B.2. The Approach: Aims and Objectives, Methodology, Plan of Operation, and Timetable

B.2.1. Approach

The structure of project NERVE is shown in Figure 1 (next page). It is an *education-to-work* approach comprising of well integrated multi-track interdisciplinary education and research

activities that cut vertically across middle/high schools, two-year colleges, undergraduate and graduate education, and postdoctoral training. It has a solid infrastructure supported with training resources/facilities from Alabama A&M University, DOE's Brookhaven National Laboratory, Tennessee Valley Authority nuclear plants, and ICX Radiation technologies.

8.2.2. Aims and Objectives of the Proposed Program

The goal of the proposed program is to increase the number of students and faculty from underrepresented groups in fields related to the nuclear industry using the Project NERVE model. The specific objectives are:

1. Develop *nuclear engineering technology* concentrations at the undergraduate and graduate school levels, which will serve as direct *education-to-workforce* pipelines for the nuclear industry. The concentrations will train students who are developing careers in nuclear power plants, nuclear waste management, and other nuclear fields.
2. Recruit women and *underrepresented minorities* into the nuclear concentrations each year; and maintain a retention rate greater than 75 percent. The program will also place more than 60 percent of the graduates into the *nuclear industry workforce* or graduate schools to pursue advanced degrees in nuclear related fields.
3. Enhance faculty research participation in the areas of i) advanced nuclear radiation detectors, and ii) nuclear regulatory/control issues and nuclear risk assessment/management. Results from the research components will be integrated into the education component by developing capstone/senior projects for students in the undergraduate nuclear concentration.

8.2.3. Methodology

The methodology for each component is described below according to the project objectives and expected outcomes and deliverables.

8.2.3.1. Development of Nuclear Engineering Technology Concentrations

The methodology for developing the nuclear engineering technology (NET) concentrations at the undergraduate and graduate levels is shown in Figure 2. The NET concentrations will be offered in *mechanical engineering technology* and *electrical engineering technology* programs. The curriculum and courses will be adapted from universities and colleges that already have nuclear science and engineering programs. New courses will also be developed in the meet current trends in the nuclear industry. This component will be fully funded by this NRC grant.

8.2.3.2. Recruiting, Retention and Students Training through Participation in other Research Activities

Recruiting - Students will be recruited into the nuclear concentration, from high schools and two-year colleges. The recruiting activities will include the use of recruiting brochures, flyers and posters. We will also participate in recruiting events on campus and travels to other recruiting events/workshops.

Retention - Our retention strategy is to provide mentoring, academic assessment, advising and tutoring to students in the nuclear engineering technology concentrations. Progress record will be kept on each student.

Student Training through Participation in other Research Activities - Students will be mentored

by faculty members and research associates in research projects that are relevant to developing a career in the nuclear industry. Some of these research areas are:

1. Development of advanced radiation detectors for nonproliferation and national security applications.
2. Modeling and simulation of the next generation nuclear reactors for reactor safety and efficiency.
3. Research in nuclear regulation/control and risk assessment/management.

Students will also be placed in summer research internships at DOE laboratories, ICX radiation, Tennessee Valley Authority (TV A) nuclear facilities, and other nuclear industries.

8.2.3.3. Enhance Faculty Research and Develop Capstone Projects in Nuclear Areas

There are two research components: 1) study of bulk properties of advanced nuclear radiation detectors that could operate at ambient-temperature without cryogenic cooling; and 2) nuclear regulatory/control issues and nuclear risk assessment/management.

Bulk Properties of Advanced Nuclear Radiation Detectors - Cadmium Zinc Telluride (CZT) and Cadmium Manganese Telluride (CMT) crystals have emerged as promising advanced materials for X-ray and gamma-ray detection at ambient temperature. As ionizing radiation detectors, these materials have the advantages of operating at room/ambient temperature and can be made into hand-held portable devices. The understanding of the bulk properties in relation to energy resolution and device performance will lead to the development of CZT and CMT into commercial devices.

The key detectors attributes are large band gap energy (about 1.6 eV, tunable by Zn or Mn concentration) for room-temperature operation, high atomic number (of constituent elements) for photoelectric absorption up to high energies, and high density (about 6 g/cm3) for good stopping power. The techniques to be used for the study of the bulk properties will include infrared transmission microscopy for defects and Te inclusions; synchrotron X-ray diffraction topography and micro-scale mapping of X-ray detection for direct measurement of the cumulative effect of different size distributions of Te inclusions on spectral responses; and Pockels effect for electric field distribution. We will explore new modeling and 3D visualization techniques for these bulk properties.

Nuclear Regulatory/Control Issues and Nuclear Risk Assessment/Management - With the likelihood that more nuclear power plants and nuclear fuel processing facilities will be built and commissioned in the very near future, it is important to enhance regulation/control procedures and have a robust risk assessment and management that is acceptable to the nuclear industry and stakeholders. This research will study existing procedures and indentify ways of improving them. This research will also seek ways to improve the levels of involvement of all stakeholders in the planning and implementation stages of nuclear environmental impact evaluations.

Capstone/Senior Projects in Nuclear Fields - The results from the above two research activities will be used to develop 'three capstone/senior projects for undergraduate hands-on training in their senior-year of the nuclear engineering concentration.

8.2.4. Plan of Operation

Table 1: Plan of operation

Objectives, Outcomes, and/or Deliverables	Activity and implementation process	Duration and/or dates	Evaluation plans or parameters	Persons responsible
1.1. Nuclear Engineering Technology B.S. and M.S. concentrations	Develop concentrations and courses to meet ABET requirements	4 years	Relevant ABET outcomes	Dr. Egarievwe, Dr. Ayokanmbi, & instructors
1.2. Nuclear content for new courses	Develop contents for new courses in nuclear regulatory and control issues, and risk assessment and managernent.	3 years	number of new courses	Dr. Egarievwe, Mr. Toje
2.1. Recruit minority students into the nuclear	Recruiting events and campus visits	3 years, and after the grant	number of minority students recruited	Dr. Ayokanmbi, Mr. Julius Jow, Mr. Toje
2.2. Have a retention rate greater than 75%	Mentoring, advising, tutoring, and progress assessment	3 years, and after the grant	Retention rate	Dr. Ayokanmbi, Mr. Toje, Administrative assistant
2.3. Place more than 60% nuclear concentration graduates into nuclear workforce	Mentoring, job search & application support, job recruiting events	Every graduat-ion year	%age of graduates getting jobs or going to graduate school	Mr. Toje. Dr. Ayokanmbi. Dr. Egarievwe. Administrative assistant.
2.4. Practical training for students in nuclear concentrations	Participation in other research activities, and internships at DOE labs and nuclear industries	Every year	Number of participants	Dr. Egarievwe. Dr. Muntele. Dr. Babalola. Dr. Zhao. Mr. Toje.
3.1. Enhance faculty research in nuclear detectors	Study of bulk properties of CMT and CZT detectors	4 years	Number of published papers	Dr. Egarievwe
3.2. Enhance faculty research regulation and risk assessment	Study existing procedures and indentify ways of improving them	4 years	Number of published papers	Mr. Toje
3.3. Capstone/Senior projects in nuclear fields	Develop one capstone project in radiation detection and two projects in nuclear regulation and risk	2112 years	Retention rate	Mr. Toje. Dr. Egarievwe

	assessment			

B.2.5. Timetable

The timetable for the project is shown in Table 2.

Table 2: Timetable. F = fall semester, S = spring semester, M = summer semester

Objectives, Outcomes, and/or Deliverables	Year 1			Year 2			Year 3			Year 4		
	F	S	M	F	S	M	F	S	M	F	S	M
1.1. Nuclear engineering technology concentrations												
1.2. Nuclear content for new courses												
2.1. Recruit students into the nuclear concentrations												
2.2. Students retention activities (mentoring/tutoring)												
2.3. Place graduates nuclear workforce/grad-school												
2.4. Practical training for students in nuclear fields												
3.1. Faculty research in nuclear detectors												
3.2. Faculty research regulation and risk assessment												
3.3. Capstone/Senior projects in nuclear fields												
Assessment, evaluation, and advisory board meetings												
Dissemination of results												
Quarterly, annual and final reports												

B.3. Expected Products and/or Results, Potential Problem Areas and Alternative Tactics to Achieve Results

B.3.1. Expected Products and/or Results

The expected products and results are explicitly listed in column one of Tables 1 and 2 above as outcomes and deliverable.

B.3.2. Potential Problem Areas and Alternative Tactics to Achieve Results

There are two areas that we expect problems. First, we may have more students committed to developing careers in the nuclear industry than we can support with available funds for scholarships. The alternative tactics to solve the problem is to sort for support from National Science Foundation (NSF) and other scholarship programs, to support these students.

The second problem area is in the summer research experience and practical training for our students, where we may again have more students than available funds. The alternative tactics will be to work with offices of education programs at DOE laboratories, including Oak Ridge Associated Universities (ORAU), to support these students in summer internships.

B.4. Evaluation, Dissemination and Management Plans

B.4.1. Evaluation Plan

The proposed project will use an advisory board that will consist of members independent of the project, and our collaborators from Brookhaven National Laboratory and lex Radiation technologies, to be in charge of analyzing assessment and evaluation data and results to provide advice and feedback to the principal investigator and other investigators for improvement. The advisory team will also work with the principal investigator to monitor the progress and results of the project, and also check if objectives and outcomes are being met. The evaluation parameters are shown in column 4 of Table 1 above and evaluation steps are:

2.

3. Monitor the status of activities as stipulated in the project plan.
4. Document the initial implementation of project activities, the successes and challenges.
5. Collect and document evidence of project success.
6. Provide periodic formative feedback to facilitate project refinement.
7. Document project outcomes and their local, national and broad impacts.
8. Advise on institutionalization and continuity beyond the NRC funding.

B.4.2. **Dissemination Plan**

The results from this project will be disseminated through oral and poster presentations at professional scientifiC meetings. Other dissemination media include scientific journals and websites of our university and those of our collaborators. The curricula materials and seminar materials developed will also be widely disseminated through the web, and it will be made available for students to access and download as needed.

B.4.3. **Management Plan**

Dr. Stephen Egarievwe is the PI and Project Director. He will direct the implementation of all activities, coordinate all reporting activities, faculty research components, nuclear concentrations development, and training students. Dr. Michael Ayokanmbi (Investigator) will coordinate the recruiting, retention and workforce pipeline activities.

B.S. **Applicant Organization's Ability to Perform and Support the Project or Activity**

At Alabama A&M University, we have exceptional abilities to perform and support the proposed project activities. In addition to excellent institutional resources, we have state-of-the-art research facilities at the School of Engineering and Technology clean room (Figure 3), at the physics department, and at the center for irradiation of materials (CIM). We also have research facilities and support at our collaborating organization (Brookhaven National Laboratory and ICX Radiation).

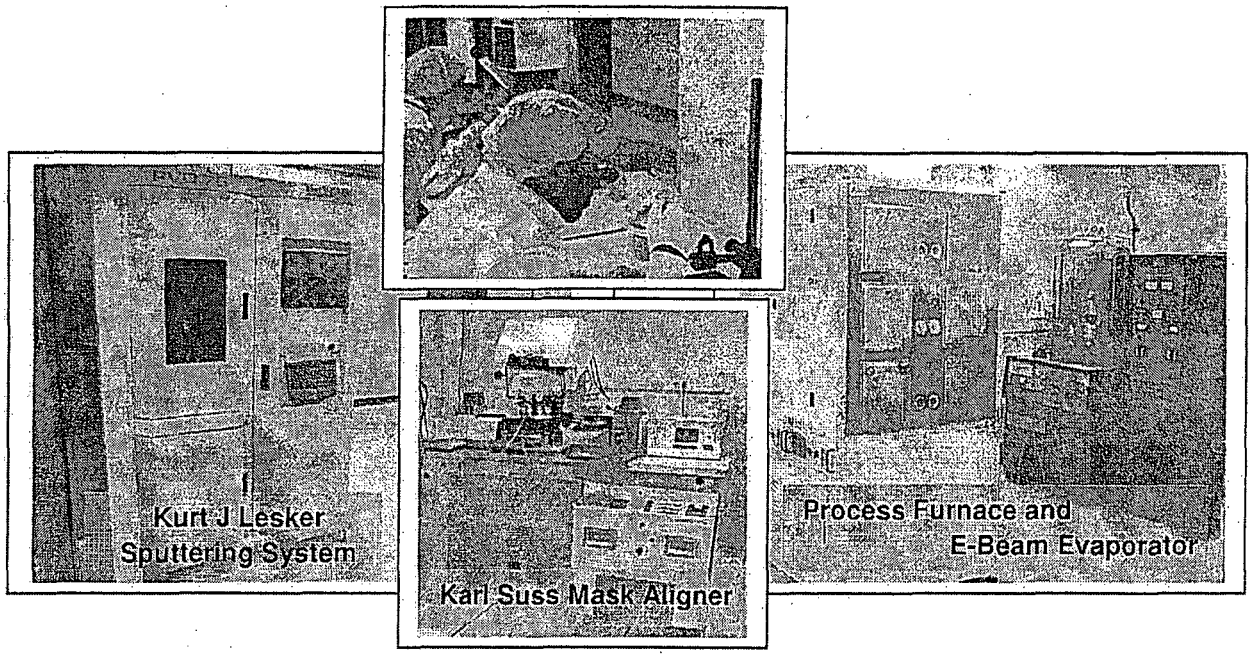

Figure 3: Nuclear detectors processing and fabrication equipment in our clean-room facility

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 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 CRF 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 (now 2CFR 220):	http://www.whitehouse.gov/omb/circulars/a021/print/a021.html
A-87 (now 2CFR 225):	http://www.whitehouse.gov/omb/circulars/a087/print/a087-all.html
A-122:(now2 CFR 230)	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 Grantee and to sub-recipients which meet the definition of "Grantee" in Part 215, unless a section specifically excludes a sub-recipient from coverage. The Grantee 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. Grantees 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 >

2. Award Package

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.

§ 215.41 Grantee responsibilities.
The Grantee 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 Grantee of the contractual responsibilities arising under its contract(s). The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee must submit the SF-LLL, including those received from sub-recipients, contractors, and subcontractors, to the Grants Officer.

§ 215.13 Debarment And Suspension.

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

'Debarment, Suspension, Ineligibility, and Voluntary Exclusion

The Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantees 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.

Procurement Standards. § 215.40

Sections 215.41 through 215.48 set forth standards for use by Grantees 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 Grantees, 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 Grantee'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 and the per diem rates set forth at: 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 Grantees 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 Grantee 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 Grantee 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 Grantees to use this system to comply with Bayh-Dole and related intellectual property reporting requirements. The system allows for Grantees 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 Grantees, 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 Grantee uses or has used patented

technology under this award without license or permission from the owner, the Grantee 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 Grantee 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 Grantee 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 Grantee employees may be copyrighted but only the part authored by the Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee 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 Grantee'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 Grantee 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. Grantee 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 Grantee 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 Grantee 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/grants/standard_forms/ffr.pdf
http://www.whitehouse.gov/omb/grants/standard_forms/ffr_instructions.pdf

The Grantee shall submit a "Federal Financial Report" (SF-425) on a quarterly basis, for the periods ending 3/31, 6/30, 9/30 and 12/31, 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 Grantee 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, Grantees 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. Grantees 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 Grantees 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 Grantee 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.

c. The Office of Human Resources requires the submission of the semi-annual progress report on the SF-PPR, SF-PPR-B, and the SF-PPR-E forms. The submission for the six month period ending March 31st is due by April 30th. The submission for the six month period ending September 30th is due by October 31st.

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 Grantee 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 Grantee 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 Grantee

The Grantee 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 Grantee or contractor under an award, the Grantee 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

Grantees are herby 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, Grantees 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 Grantee 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 Grantee'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 Grantees 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 form Federal financial assistance programs. NRC encourages all applicants and Grantees 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 Grantee 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 Grantee organization shall investigate the allegation and submit its findings to the Grants Officer. The NRC may accept the Grantee's findings or proceed with its own investigation. The Grants Officer shall inform the Grantee 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 Grantee 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 Grantee 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 [Grantee 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."