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

1. GRANT/AGREEMENT NO.	2. MODIFICATION NO.	3. PERIOD OF PERFORMANCE	4. AUTHORITY
NRC-38-10-971		FROM: 7/1/2010 TO: 6/30/2011	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: 041064767	University of Cincinnati 51 Goodman Hall Suite 530 Cincinnati, OH 45221

8. PROJECT TITLE:

Development of a Nuclear Engineering Track For Undergraduate students in Mechanical Engineering Technology

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)	University of Cincinnati Attn:Henry Spitz Email: henry.spitz@uc.edu 513-556-2003

12. NRC PROGRAM OFFICE (NAME and ADDRESS)	13. ACCOUNTING and APPROPRIATION DATA	14. METHOD OF PAYMENT
NRC Attn: Randi Neff Office of Human Resources MS: GW5A6 (301) 492-2301 11545 Rockville Pike Rockville, Maryland 20852	APPN. NO: 31X0200 B&R NO: 0-8415-5C1116 JOB CODE: T8453 BOC NO: 4110 OFFICE ID NO: RFPA: HR-10-971	[ ] 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	$118,342	NRC	$118,342	This action provides funds for Fiscal Year in the amount of See Page Two
PREVIOUS OBLIGATION		RECIPIENT		
TOTAL	$118,342	TOTAL	$118,342	

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

U.S. Nuclear Regulatory Commission
Div. of Contracts
Attn: Sheila Bumpass
Mail Stop: TWB-01-B10M
Rockville MD 20852

18.	19. NRC CONTRACTING OFFICER
Signature Not Required	Sheila Bumpass 7/1/2010 (Signature) (Date) NAME (TYPED) Sheila Bumpass TITLE Contracting Officer TELEPHONE NO. 301-492-3484

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

ADM002

ATTACHMENT A - SCHEDULE

A.1 PURPOSE OF GRANT

The purpose of this Grant is to provide support to the "Development of a Nuclear Engineering Track For Undergraduate students in Mechanical Engineering Technology" as described in Attachment B entitled "Program Description."

A.2 PERIOD OF GRANT

1. The effective date of this Grant is July 1, 2010. The estimated completion date of this Grant is June 30, 2011.

2. Funds obligated hereunder are available for program expenditures for the estimated period: July 1, 2010 – June 30, 2011.

A. GENERAL

1. Total Estimated NRC Amount:	$118,342
2. Total Obligated Amount:	$118,342
3. Cost-Sharing Amount:	$0
4. Activity Title:	Development of a Nuclear Engineering Track For Undergraduate students in Mechanical Engineering Technology
5. NRC Project Officer:	Randi Neff
6. DUNS No.:	041064767

B. SPECIFIC

RFPA No.:	HR-10-971
FFS:	N/A
Job Code:	T8453
BOC:	4110
B&R Number:	0-8415-5C1116
Appropriation #:	31X0200
Amount Obligated:	$118,342

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
Direct Participant Cost	$75,378.00
Indirect Cost	$42,964.00
Yearly Total	**$118,342.00**

All travel must be in accordance with the University of Cincinnati 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 $118,342 for one year period.

2. NRC hereby obligates the amount of $118,342for 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

Development of a Nuclear Engineering Track For Undergraduate students in Mechanical Engineering Technology

Objective

The recent merger of the University of Cincinnati (UC) College of Engineering with the UC College of Applied Sciences has created a unique opportunity to develop a series of nuclear engineering technical elective courses for a track in nuclear engineering for undergraduate students in the Mechanical Engineering Technology (MET) Program. The existing MET curriculum focuses on design, manufacturing and energy technologies with greater emphasis on application than theory. Students select six technical elective courses to fulfill academic requirements for the MET baccalaureate degree. We propose developing a new track in nuclear engineering involving a set of nuclear engineering courses that will fulfill the MET technical elective requirement and prepare students participating in the NE Track for co-op assignments and eventual employment opportunities in the nuclear power industry.

The UC Nuclear and Radiological Engineering (UCNRE) program is responding to the increased demand for new nuclear engineers brought upon by the nuclear renaissance by obtaining approval to offer an academic track in nuclear engineering for any student enrolled in the new UC College of Engineering and Applied Sciences (CEAS). The objective of this proposal is to develop a unique series of undergraduate nuclear engineering courses especially targeted towards students in Mechanical Engineering Technology who desire to seek professional employment in the nuclear power industry. A baccalaureate degree combining Mechanical and Nuclear Engineering courses represents the technical basis for understanding the workings of a nuclear power plant. Graduates of the UC MET program who complete the nuclear engineering track will be well prepared to begin a productive career in the commercial nuclear power industry.

The track in Nuclear Engineering will be compatible with the UC academic engineering curriculum that includes a period of required co-op employment. Some of the courses in the NE track will be designed for delivery in the traditional classroom setting or involve elements that can be delivered via the internet using pod casting and/or streaming video both to accommodate students who are away from campus on a co-op assignment

and students who are on-campus but have conflicting class schedules. A special emphasis will be directed towards the use of pod casts in the lab portion of the radiation measurement course, which will expand resources available to students by use of a new mode of information delivery to significantly enhance learning opportunities for the MET students.

Background and Current Status of the UCNRE Pn:>gram

A brief review of the history and current status of the UC Nuclear and Radiological Engineering Program (UCNRE) is helpful to the understanding of the background and motivation for this

proposal.

The University of Cincinnati (UC) is classified as a Research University by the Carnegie Commission and is ranked as one of America's Top 25 public research universities. Since 1957, UC has offered a graduate NE academic program and conducted externally-funded research in Nuclear and Radiological Engineering. The graduate program has been emphasizing fission reactor engineering, radiological engineering, environmental radioactivity, health physics and medical physics. A new, multi-disciplinary research focus has recently been initiated in Nuclear Forensics that involves collaboration with Chemistry and Physics.

As a result of declining enrollment in the late 1990s because of a lack of public and governmental support for nuclear power, the UCNRE Program (like several; other nuclear engineering programs across the country) phased out its undergraduate program and dedicated resources to graduate education and research. During the 25 years the undergraduate, ABET-accredited NE program was active, over 400 graduates were produced and was ranked 10th nationally in the 1996 Gourman Report. Many graduates from the UC NE program are key participants in the US nuclear industry.

Fortunately, the nuclear renaissance created an increased demand for nuclear engineers to address an aging workforce and the relicensing of existing nuclear power plants for extended lifetimes and power upgrades. In response to this renaissance, in 2003 the University of Cincinnati initiated the MNE ACCEND (mechanical-nuclear engineering accelerated engineering degree) Program, which offered a combined bachelor's degree in Mechanical Engineering and a master's degree in Nuclear Engineering plus 5 quarters of co-op at nuclear power facilities. This 5-year program was the first of its kind in the US and its co-op students were in high demand throughout the nuclear industry. Admission to the MNE-ACCEND program was competitive and limited to highly motivated students who are willing to undertake extra work necessary to complete two degree programs along with a mandatory, 5 quarter coop assignment in only five years.

Scope of the Proposed Work

The recent merger of the College of Engineering with the College of Applied Sciences in 2009 introduced a unique opportunity to address manpower needs expressed by the nuclear power industry for new employees who had training at the baccalaureate level in mechanical and nuclear engineering rather than an advanced M.S. or Ph.D. degree. The UC NRE program has been approved by the UC College of Engineering and Applied Sciences (CEAS) to offer a new track in nuclear engineering for undergraduate students in Mechanical Engineering Technology. The UCNRE faculty proposes to create new classes for the NE track by developing new courses strategically targeted towards MET students by modifying existing course content originally established for the UC undergraduate minor in NE. The strategic design of these new courses includes emphasizing practical applications and design rather than theory.

This proposal requests funds to develop courses and digital delivery media for the new track in nuclear engineering for undergraduate students in Mechanical Engineering Technology. Approximately 20 MET students per year will enter the nuclear engineering track and begin taking designated NRE courses to fulfill the academic requirement for technical electives. CEAS and the NRE faculty are committed to sustaining the nuclear engineering track since MET students are seeking courses that will prepare them for high quality nuclear-related co-op assignments and improve their opportunities to seek employment in the nuclear power industry.

The merger of the two colleges has already been accomplished with the formation of the UC College of Engineering and Applied Sciences. It is proposed to offer the first course of the Nuclear Engineering Tract, Fundamentals of Nuclear Engineering, in the spring of 2011. Materials for this course, including digital files, will be developed as described in the schedule given below. One additional course in the Nuclear Engineering Track will be implemented in

each succeeding quarter so that all classes will be completed within approximately 24 months. Existing technical elective courses in the MET program include Power Plant Technology (MET420) and Energy Systems (MET 421), and Fundamentals of Nuclear Energy (MET426).

Although the undergraduate track in nuclear engineering is available to any student in the College of Engineering and Applied Sciences (CEAS), the NE track is especially designed to fulfill the required sequence of technical elective courses for students in Mechanical Engineering Technology (MET). Core academic course requirements for students in the MET program include Thermodynamics, Heat Transfer, and Fluid Mechanics, all of which are included in the traditional nuclear engineering curriculum. Likewise, courses in the NE Track combined with existing courses in Power Plant Technology, Energy Systems, and Nuclear Energy will provide a graduate of the MET program with a strong engineering knowledge base for a career in the nuclear power industry.

Resources identified in this project will be used to develop the following six new courses for the undergraduate track in NE that will satisfy all the technical elective requirements for MET students:

1. *Fundamentals of Nuclear and Radiological Engineering*
2. *Nuclear Reactor Theory*
3. *Nuclear Reactor Engineering and Safety*
4. *L WR Power Plant Systems and Operations*
5. *Radiation Measurements*
6. *Radiological Engineering and Nuclear Environmental Protection*

Students may also seek approval to take one or more of the dual-level (i.e., undergraduate-graduate) courses regularly offered in the UCNRE graduate program to expand their academic program.

Examples of proposed course descriptions and content are provided in the Appendix.

The proposed design and content of the UC NE Track will satisfy the technical elective requirements for the baccalaureate degree in Mechanical Engineering Technology. Included in the MET program are many of the elements of the Nuclear Uniform Curriculum Program developed by the Nuclear Energy Institute for a two-year associate degree. The academic content of the UC NE track will focus on the fundamental knowledge of nuclear processes and the special engineering requirements necessary for power generation using nuclear sources of energy. Students in the MET program completing the NE track will obtain the knowledge and skills necessary to qualify for entry-level jobs in the nuclear industry. Although the nuclear utilities and other nuclear energy companies hire workers across a broad range of disciplines, students taking a combination of mechanical and nuclear engineering courses will be especially

well prepared for

a career in the nuclear industry. In addition, students who successfully complete a nuclear-related co-op assignment will have also have completed plant-specific training and have in-plant experience, which prepares them to start productive employment when hired.

Several core courses in the existing MET curriculum are already integrated with extensive laboratory assignments. We propose to adopt this practice in the proposed nuclear engineering course sequence. As a minimum, streaming video will be available for all lectures. The more typical offering will be enhanced demonstrations and supplementary materials provided to the students using podcasts, which involve describing a topic in a three to five minute video clip that can be downloaded to a ipod, smart phone, or computer. The radiation measurement class will make extensive use of podcasts to prepare students for laboratory experiments.

Modifications to traditional undergraduate Nuclear Engineering courses are required to accommodate the experiential, hands-on activities that are an integral part of the core MET curriculum. These accommodations will be achieved by producing supplementary course materials in Nuclear Engineering for the MET students using digital technology, such as pod casting and streaming video that can be downloaded to the student's PC or other portable digital devices so students can take advantage of a variety of learning modes to enhance their knowledge uptake. Relevant field trips and site visits will be incorporated into the LWR Power Plant Systems and Operations course.

The new NE technical elective courses represent the formal academic basis for the NE track. The tasks used to develop each of the courses include:

- Design learning objectives & outcomes,
- Create syllabus,
- Assemble and develop technical materials, and
- Produce traditional and digital resources.

Once the course has been delivered, the following tasks will be used to assess the outcomes:

- Measure outcomes vis-a-vis learning objectives,
- Evaluate student and faculty performance,
- Document results,
- Implement findings from evaluations,
- Update course content, traditional, and digital media.

Although the CEAS conducts course evaluations at the end of each quarter, it is proposed that the NE graduate students and the UC student chapter of the American Nuclear Society will assist in completing more detailed additional evaluation of each new course in order to obtain a more specific, content-oriented evaluation of the course, especially focus on the efficacy and value of the digital media for the students. Support for a graduate student provided in the proposal will be used to collect and evaluate the efficacy of the digital media that is provided to the students.

Most engineering students take mandatory fundamental engineering courses in thermodynamics, heat transfer, and fluid mechanics (or their equivalents) during their regular undergraduate curricula. The UC College of Engineering and Applied Sciences (CEAS) adds a mandatory co-op employment requirement to the curriculum that presents a challenge in scheduling courses for the track. Therefore, it is proposed that, where possible, parts of courses included in the NE track will be developed for delivery in either a traditional classroom setting or via distance learning using pod casting or streaming video. ***Blackboard*** is used as an internet-based portal for all courses throughout the university and fully supports distance learning with resources for pod casting and streaming video. Since Blackboard is easily accessible wherever

there is an internet connection, students who want to participate in the NE track can take an NE course at any time of the day at their own pace no matter whether they are on campus studying or away from campus working on a co-op assignment.

In addition to developing academic materials for the NE track courses, a recruitment program, marketing materials and a web site will be developed to assist in promoting the academic objectives of the track for new and continuing students in the CEAS. The graduate student support the program will be scheduled to be present during student orientations and for college tours to describe the opportunities available to students interested in nuclear energy.

Work Plan and Schedule

The project to develop new courses for the new track in nuclear is designed for implementation over a two-year period. All the full-time UCNRE faculty members will work collectively on the project during the first summer. The schedule for design, development and implementation of courses is shown below and includes a comprehensive effort during the first summer to develop marketing materials and course outlines and materials. The first courses in the NE track will be offered in summer and fall of September 2011 and the remaining courses offered beginning in summer 2012. The academic year includes the summer session to accommodate the required co-op employment. Therefore, NE track courses will always be offered in the summer.

Develop marketing materials describing the NE Track

A program brochure and web site will be developed for recruiting to announce availability of the new academic track to continuing students in the CEAS and for distribution to potential applicants and their families during campus visits. Beyond recruitment, the web site will also be designed as a resource for students to learn about co-op and employment opportunities as well as a link to research being performed in the graduate Nuclear and Radiological Engineering Program. Recruitment will also be directed to freshmen attending the summer orientation program and other students who may wish to participate in the NE track. A graduate student will be dedicated to the recruitment program who will be responsible to meet with prospective students during college tours and summer orientation meetings for new students

Course Development

The learning objectives and syllabus for each of the six courses will be created and the first three courses of the NE track will be developed during the summer recess. Although one individual will assume lead responsibility for each course, the entire nuclear faculty will have opportunities to contribute to the development of each course.

It is planned that at least one of the six courses would be introduced during the first academic year and the remaining courses offered beginning on a rotation basis during the second year. Because of the co-op employment schedule, the same course may be offered more than once a year. Radiation Measurement & Lab and Radiological Engineering & Environmental Safety, which are the last courses to be developed, will be offered beginning the summer of 2012. All courses will be offered on a schedule that enables students to complete the NE tract within a normal 4-year academic period that includes mandatory co-op employment.

Identification of innovative instructional approaches to enhance student learning

Distance learning is a field of education that focuses on the teaching methods, technology, and instructional systems that are effectively incorporated in delivering education to students who are not physically "on site" to receive their education. The UCNRE faculty has access to exceptional resources for completing the proposed project. The Faculty

Technology Resources Center (FTRC) provides assistance in using technology to enhance the classroom experience. In addition there is an instructional design team that will provide the NRE faculty with support in design, development, deployment and testing of multimedia based face-to-face, hybrid and distance learning courses, and to meet the students' instructional needs using systematic instructional design methodologies and state-of-the-art technologies. Multimedia course components will be developed as course building blocks or reusable templates. The presentation of material formally delivered in lectures will be produced as podcasts. Podcasting is delivering audio and video content to iPods and other portable media players on demand, so that it can be students can receive the content any time at their convenience. The main benefit of podcasting is that listeners can sync content to their media player and take it with them to use whenever they want to. Pod casts can also be downloaded to personal computers or smart phones. The NRE faculty also has access to an advanced computer lab to experiment with instructional technologies and develop additional digital audio and video course content.

One graduate student will be assigned to assist the faculty in producing, editing, maintaining the digital resources created for each class. The graduate student will also help students who may encounter problems gaining access to the media and track its utilization by the students.

Quantifiable criteria for demonstrating that the project is successful

The initial success of the project can be quantitatively evaluated by the number of undergraduate students that formally enroll in the NE track. The University assigns a unique code for each academic program which can be tracked as students progress towards graduation. The number of hits and inquiries on the NE track website will also document the success of the marketing materials. It is expected that at least 20 students will initially be in the NE Track. The ultimate success of the project will be determined the number of students

who complete the NE Track and obtain professional success in the nuclear industry.

The UCNRE program's capability and long-term ability to sustain the project

In the midst of a global nuclear renaissance combined with documented track record of the UCNRE faculty team who are all committed to supporting the proposed project, the prospects for the long-term sustainability of the NE Track are excellent.

The foregoing assessment is reinforced by support of the College Administration for the NE Track especially because of the desirability to create digital capabilities that are available on a 24/7 basis. The maintenance of the digital media will draw on the support of graduate students and post-docs in the NE graduate program.

Impacts of the Project

The principle goal of this proposal is to establish and sustain an undergraduate nuclear engineering track in the College of Engineering and Applied Sciences at the University of Cincinnati. Development of new courses utilizing distance learning is crucial to successfully achieving the goal. This proposed undergraduate NE Track will have several positive impacts for the College and the University

- The undergraduate nuclear engineering track will address a growing national need and enhance the reputation of the college locally, regionally and nationally
- The basic infrastructure of the College will be strengthened
- Graduates completing the NE Track will provide the nuclear industry with a cadre of professionals having cross-disciplinary backgrounds involving a variety of fundamental engineering principles and practices critical to the needs of the nuclear industry and

regulatory agencies.
- The Nuclear Engineering Track will also identify those talented and motivated students who may be interested in continuing towards a graduate degree in nuclear engineering.

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 (now 2CFR 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 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.

As part of the FY 2010 HR curriculum development grant awards, in addition to the customary performance progress report requested on the SF-PPR, SF-PPR-B, and SF-PPR-E forms, HR *requires the following metrics to be reported on by the awardees as follows:*

1. Overall number of new courses developed in NRC designated STEM areas;
2. Number of students enrolled in new STEM courses;
3. Number of these enrolled students retained in STEM major.

§ 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.

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."