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

1. GRANT/AGREEMENT NO.	2. MODIFICATION NO.	3. PERIOD OF PERFORMANCE	4. AUTHORITY
NRC-HQ-11-G-38-0035		FROM: 08/4/2011 TO: 08/3/2014	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:153890272 NAICS:611310	The Curators of the University of Missouri University of Missouri - Columbia Office of Sponsored Programs 310 Jesse Hall Columbia, MO 65211-1230

8. PROJECT TITLE:
University of Missouri – Columbia Radiochemistry Faculty Development Program

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 Missouri-Columbia Attn: Dr. Jose Colucci Department of Chemistry and Research Reactor Email: RobertsonJo@missouri.edu 573-882-2240

12. NRC PROGRAM OFFICE (NAME and ADDRESS)	13. ACCOUNTING and APPROPRIATION DATA	14. METHOD OF PAYMENT
NRC Attn: Nancy Hebron-Isreal Office of Human Resources MS: GW5A6 (301) 492-2231 11545 Rockville Pike Rockville, Maryland 20852	APPN. NO: 31X0200 B&R NO: 2011-84-51-K-164 JOB CODE: T8460 BOC NO: 4110 OFFICE ID NO: RFPA: HR-11-141 FAIMIS GR0074	[ ] 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	$298.377	NRC	$298.377	This action provides funds for Fiscal Year in the amount of See Page Two
PREVIOUS OBLIGATION		RECIPIENT		
TOTAL	$298.377	TOTAL	$298.377	

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

U.S. Nuclear Regulatory Commission
Div. of Contracts
Attn: Mark Lohrmann email: Mark.Lohrmann@NRC.GOV
Mail Stop: TWB-01-B10M
Rockville MD 20852

18.	19. NRC CONTRACTING OFFICER
Signature Not Required	Sheila Bumpass 8/4/11 (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 AUG 09 2011

ADM002

ATTACHMENT A - SCHEDULE

A.1 PURPOSE OF GRANT

The purpose of this Grant is to provide support to the "University of Missouri-Columbia *Radiochemistry Faculty Development Program in Antinide Chemistry*" as described in Attachment B entitled "Program Description."

A.2 PERIOD OF GRANT

1. The effective date of this Grant is August 4, 2011. The estimated completion date of this Grant is August 3, 2014.

2. Funds obligated hereunder are available for program expenditures for the estimated period: August 4, 2011 – August 3, 2014.

A. GENERAL

1. Total Estimated NRC Amount:	$298,377.00
2. Total Obligated Amount:	$298,377.00
3. Cost-Sharing Amount:	$0
4. Activity Title:	*UMC Radiochemistry Faculty Development Program in Antinide Chemistry*
5. NRC Project Officer:	Nancy Hebron-Isreal
6. DUNS No.:	153890272

B. SPECIFIC

RFPA No.:	HR-11-141
FFS:	N/A
Job Code:	T8460
BOC:	4110
B&R Number:	2011-84-51-K-164
Appropriation #:	31X0200
Amount Obligated:	$298,377.00

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
Justin Walensky Summer	$ 7,777.00	$ 8,010.31	$ 8,250.62
PostDoc	$35,000.00		
FRINGE	$10,373.42	$ 2,505.62	$ 2,657.52
Graduate Student		$21,000.00	$21,000.00
Medical Insurance		$ 2,246.00	$ 2,313.38
Materials and Supplies	$10,000.00	$ 7,500.00	$7,500.00
XANES supplies and sample prep		$ 3,250.00	$3,250.00
Travel for national meetings	$ 2,813.00	$ 4,265.00	$ 4,265.00
Travel for XANES measurements		$ 7,564.00	$ 7,564.00
Travel for Outside review of program		$ 4,264.00	$ 4,264.00
MDTC	$65,963.42	$60,604.93	$61,064.52
F&A (51.5%)	$33,971.16	$31,211.54	$31,448.23
Tuition and Fees		$ 6,952.00	$ 7,160.56
TOTAL PROJECT PER YEAR	$99,934.59	$98,768.48	$99,673.31

A.4 AMOUNT OF AWARD AND PAYMENT PROCEDURES

1. The total estimated amount of this Award is $298,377.00 for the three year period.
2. NRC hereby obligates the amount of $298,377.00 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

PROGRAM DESCRIPTION

Project Summary

While the Department of Chemistry at the University of Missouri-Columbia has one of the largest graduate radiochemistry programs in the country, the program currently lacks expertise in actinide chemistry. Because actinide chemistry is fundamental to the field of radiochemistry and to the development of the nuclear fuel cycle and nuclear non-proliferation, the Department has recently hired an assistant professor with strong synthetic and theoretical experience in the chemistry of the actinides. Funds are requested from the NRC to aid in the development of the research and education program of this junior faculty member's research and education program. The advantage of investing in a young faculty member at MU is that this individual will

be able to draw upon one of the largest, interdisciplinary radiochemistry programs in the country and the large pool of outstanding graduate students that regularly apply to the program.

I. Background

The education of trained professionals in nuclear chemistry and radiochemistry has been a matter of concern for many years. In June 2008, a report from the American Physical Society (APS) Panel on Public Affairs Committee on Energy and Environment published a document entitled: "Readiness of the U.S. Nuclear Workforce for 21st Century Challenges."[1] An excerpt from the executive summary states "If nuclear chemistry and radiochemistry education programs are not reinvigorated, the U.S. will lack the expertise required to pursue promising advanced research and development (R&D) in a myriad of disciplines." This trend and dire conclusion is highlighted for the United States in a survey performed by Dr. Sue Clark, Washington State University.[2]

As of today, there are approximately only 20 chemistry departments (graduate and undergraduate institutions combined) in the U.S. with nuclear and radiochemistry faculty members. Even worse is the fact that there is now, on average, only one radiochemistry faculty member in each of these departments.

II. Capacity and ability of MU to effectively conduct the program

In sharp contrast to the current national trend in radiochemistry research and education, the Department of Chemistry at the University of Missouri at Columbia has expanded from one (Dr. Jurisson) to three radiochemistry faculty members. Drs. Lever and Robertson joined the Chemistry faculty in 2000 and they both hold joint appointments at the University of Missouri Research Reactor (MURR). This investment by the Department in radiochemistry is already reaping benefits through increases in the number of students (at both the undergraduate and graduate levels) being trained in radiochemistry, new radiochemistry courses being offered in Chemistry, an NIH NIBIB T32 training grant for "Graduate Training in Radiopharmaceutical Chemistry", a DOE training grant for "Research Projects for Interrogations of Biological Systems: Training for the Development of Novel Radiotracers," and the creation of an NSF Research Experience for Undergraduates program in radiochemistry.

The presence of three radiochemistry faculty members in the Chemistry Department provides "critical mass" for addressing multi-disciplinary projects and gives students an opportunity to be exposed to many facets of radiochemistry research. The Chemistry Department currently has 115 graduate students, of which 19 are pursuing advanced degrees in radiochemistry. ***Yet, with this critical mass of faculty and students, the radiochemistry program at the University of Missouri currently lacks the expertise in actinide chemistry to fully contribute to the training and education of individuals in actinide chemistry.*** Dr. Robertson's research emphasis is the development of radiochemical analysis methods and isotope production chemistry. Dr. Jurisson's research focuses on the utilization of gamma and beta emitting radiometals in the development of potential diagnostic and therapeutic radiopharmaceuticals and the detection and separation of radiometals, in particular ^{99}Tc, for minimization and safe storage of radioactive waste. Dr. Lever's research program is centered on the design and synthesis of radiotracers for biomedical applications, primarily ^{125}I, ^{99m}Tc and ^{186}Re; synthesis of chelate-peptide constructs for diagnostic imaging and radiotherapy.

The aforementioned investment in nuclear and radiochemistry has enabled the University of Missouri-Columbia (MU) to build one of the largest research and education programs in the country and the University is committed to fostering a thriving environment for radiochemistry and nuclear science education and research. The MU Research Reactor (MURR) Center, a 10 MW light-water moderated reactor that is the highest-power university research reactor in the nation, serves as cornerstone to campus initiatives in this area. The presence of this unique facility was critical to persuading campus to make the initial radiochemistry faculty investments

described above. Continued institutional support at the campus level for nuclear science research and education is evidenced by the opening of the new MURR Center building addition completed in August 2007, providing space for expanded research, educational and service programs. The addition's footprint is 25,000 ft2 of space that connects directly with the original building. The addition accommodates office, classroom and lab space for an increase in MURR-based researchers and personnel, including 9,000 ft2 that houses the MURR Center's new 17 MeV external beam GE PetTrace cyclotron.

The quality of the radiochemistry program at MU and the need for an actinide chemist in one of the nation's largest graduate radiochemistry programs was recently recognized by a grant from the Nuclear Forensics Education Award Program (NFEAP). The application was aided by the commitment of a faculty position by the MU College of Arts and Science. This grant provided initial startup funds for a successful search for an assistant professor in Chemistry. Dr. Justin Walensky, an actinide chemist who trained with Professor William Evans at UC Irvine, will be joining the Department in July, 2011. The participant in the NRC Faculty Development Award will be Dr. Justin Walensky. ***The advantage of NRC investing in a young faculty member at MU is that this individual will be able to draw upon one of the largest, interdisciplinary radiochemistry programs in the country and the large pool of outstanding graduate students that regularly apply to the program.*** The Department of Chemistry currently has two Nuclear Forensic Graduate Fellows and one DOE Nuclear Engineering Graduate Fellow in the graduate radiochemistry program. The NFEAP funding provided the resources needed to install the infrastructure to safely manipulate and synthesize actinide compounds including a doubleuser inert atmosphere glove box and a single user inert atmosphere glove box interfaced to a specially designed chemical fume hood for transuranic chemistry. The NRC grant will be used to aid Dr. Walensky in establishing his research laboratory with support for a postdoctoral fellow and graduate students and funds for performing critical spectroscopic characterization (XANES) measurements at the Lawrence Berkeley Laboratory. With support from the Faculty Development program, Dr. Walensky will be able to "hit the ground running" in his first three years instead of waiting for his first round of proposal submissions to be reviewed and funded.

III. Faculty Participant

The faculty participant in the MU Radiochemistry Faculty Development Program will be Dr. Justin Walensky. Dr. Walensky has accepted our offer (no marketing or recruitment is necessary) and will begin as an Assistant Professor in Chemistry in July, 2011. He is currently building upon his strong synthetic chemistry background and deepening his understanding of theory as a postdoctoral fellow in Professor Michael Hall's group at Texas A&M. As a graduate student, Dr. Walensky made significant contributions to the field of organoactinide chemistry. He was one of the key contributors to the development of the concept of steric oversaturation leading to ligand elimination; a powerful and clever synthetic approach to increasing the reactivity of lanthanide and actinide complexes toward ligand coupling and addition reactions. Since completion of his Ph.D., Justin has planned out his research experiences to give himself a strong, diverse technical background. Prior to his postdoctoral fellowship, Dr. Walensky spent six months at LANL as a Glenn T. Seaborg Institute Fellow, where he focused on learning state of- the-art density functional methods and applied those methods to understanding the electronic structure in organoactinide complexes, including some of those he synthesized as a graduate student. The wisdom of expanding his synthetic actinide chemistry training with a careful grounding in theory was highlighted by Rich Martin from LANL. "Computational chemistry has matured to the point that it is now possible to do some very informative and helpful calculations. It is also straightforward to do very inappropriate and misleading calculations. I admire Justin's resolve to become experienced in the proper use of these tools by pursuing a postdoctoral with Mike Hall (Texas A&M). I understand his responsibilities there will also expose him to a number of other important modeling techniques. ***This background in both synthesis and computation will give him a very rare viewpoint and set of skills, and***

one I think will serve him well." The following is a brief description of Dr. Walensky's research plan at MU. The proposed research involves careful manipulation of small quantities of radioactive material which will allow graduates from his laboratory to further their career in a number of nuclear science and chemical fields. His lab will train a new generation of students to be able to safely handle and manipulate actinide compounds in order to allow for their full characterization.

Walensky Research Prospectus

The United States is currently experiencing a renaissance in nuclear power production. However, the number of qualified professionals with nuclear science experience is limited due to the small number of academic programs that engage students in the safe handling and use of radioactive material. The research program in my laboratory seeks to develop students' knowledge of the properties of the actinide elements by allowing them to study molecular examples of actinide containing compounds which they will characterize using techniques employed by nuclear forensics and synthetic chemists, thus building a foundational knowledge of nuclear and actinide chemistry.

To do this, not only will tradition spectroscopic techniques be used at the University of Missouri, but more sensitive approaches will be used to assess how different coordination environments change with small perturbations in different actinide compounds. For example, X-ray Absorption Near-Edge Spectroscopy (XANES) and Extended X-ray Absorption Fine Structure (EXAFS) spectroscopy will be used in collaboration with both Dr. Stosh Kozimor at Los Alamos National Laboratory and Dr. David Shuh at Lawrence Berkeley National Laboratory in order to describe the extent to which the valence 5f orbitals of the actinide participate in bonding to the ligand orbitals.[3] By a systematic exchange of the metal and ligand a better description of metal-ligand bonding can be observed based on the XANES and EXAFS spectra. This has recently been demonstrated with metallocene dichloride complexes, $(C_5Me_5)_2AnCl_2$, M = Zr, Hf, Th, U, of the actinides and compared with the corresponding transition metal complexes.[4] Of particular interest are compounds that can be related to species found in the nuclear fuel cycle. For example, uranium carbides and oxides are used as nuclear fuels and are derived from uranium hexafluoride, however there are very few compounds known with U-F bonds. [5] Because uranium fluorides are likely to be used in the isotope separation of nuclear fuel, our understanding of the possible compounds and unique processes would benefit from knowledge of the structure and bonding of complexes baring U-F bonds. In fact, during precipitation methods, fluoride precipitation is done in order to produce plutonium fluorides which can be separated from uranyl byproducts, eq 1.[6]

The study of uranium, neptunium, and plutonium fluoride complexes could lead to unique signatures for the production and handling of fissile materials.

Tetravalent actinide complexes will be synthesized by reaction of the actinide metal with two equivalents of HgX_2 in THF to produce $AnX_4(THF)_x$, X = F, Cl, Br, I. An = Th, U, Np, Pu. This will then be reacted with an oxidizing agent to produce the pentavalent actinide species with the tetrahalide coordination environment still intact (eq 2). The oxidant of choice in this example is a triphenylamine radical species which to my knowledge has not been used in f element chemistry. Further oxidation to produce the hexavalent actinide complex will also be attempted. This would be a new and effective method for synthesizing actinide complexes in three different oxidation states without a change in the coordination sphere and has not been studied to date.

These complexes have importance for several reasons. First, the synthesis of $[UX_4(THF)_x][PF_6]_2$ would provide access to new diamagnetic derivatives of uranium halides without the uranyl moiety. Further, the fluoride complex is an analog to UF_6,

whose chemistry is hindered by its volatile nature. Since UF_4 and UF_6 are part of the isotope enrichment process,[7]
The study of molecular models for hard to understand issues in the nuclear fuel cycle will be expanded to actinyl compounds. UO_3 is used as a nuclear fuel, but as is the case for UF_6, very little is known about the chemical and physical properties of UO_3. By designing an analog, we hope to mimic these properties and be able to study them using an isolable complex. To do this, $[UO_2(OPPh_3)_4][OSO_2CF_3]_2$
molecular chemistry can make strides in learning more
about this important process and the unique signatures that might arise under different conditions. Moreover, the synthesis of PuF_x complexes will further our understanding of plutonium fluorides that are part of the spent fuel cycle.
[8] will be reacted with
$MgNPh_9$ to produce $UO_2(NPh)(OPPh_3)_x$, eq 3.
This complex is interesting in several respects as well. The complex is a synthon for UO_3 and thus can be used to spectroscopically identify markers associated with the nuclear fuel. Since UO_3 is in equilibrium with U_3O_8 which is converted to UF_6 in the nuclear fuel cycle, then identifying fast and effective methods for characterizing unique and discriminating steps of the fuel cycle is of interest. Additionally, the synthesis of complexes with actinide-ligand multiple bonding will contribute to our understanding of actinide-ligand bonding and will make an excellent molecule to study with XANES spectroscopy since these complexes have not yet been studied.

III. Faculty Development Plan

Success as a junior faculty requires the correct blend of independent research, teaching acumen, and active service in order to attain tenure. This proposal will assist an exceptional tenure-track individual with funding to help Dr. Walensky develop these areas. The proposed program will provide financial support to Dr. Walensky to assist with innovative, enabling research that will directly contribute to research proposals and program building. This will include funds for summer salaries, a post-doctoral fellow in year one and graduate student assistantships in years two and three, travel to present results at national and international conferences, travel support for established actinide chemists to visit MU, and support for his research laboratory.
Developing a unique research program in the area of actinide chemistry, especially of the lesser studied actinides such as neptunium, will bring special attention to the University of Missouri. In fact, only a handful of academic institutions work with transuranic elements and very few of them work with molecular compounds, hence the novelty of Dr. Walensky's research will be attractive to graduate students and continue to set MU apart as one of the premier radiochemistry programs in the nation.
During the actinide chemistry course, Dr. Walensky will have invited lecturers in different areas of actinide and radiochemistry come to the University to give students a broader perspective on the challenges and cutting-edge research that is conducted in this area. Funds from the Faculty Development Award will be used to offset the travel costs. The University of Missouri has been dedicated to the advancement of radiochemistry for decades and the actinides are the only major area of radiochemistry that is not covered by the faculty currently. One faculty member cannot do research in all aspects of the actinides, so this invited speaker series in years two and three of the program will provide Dr. Walensky and his students access to a range of interests and unique opportunities to network. This program will also play a critical role in fostering relationships between Dr. Walensky's new program, the national laboratories, and established researchers in the field.
The management of the Faculty Development program will be the responsibility of the Drs.

Robertson and Jurisson and will consist of oversight of the allocation of funds to support the faculty development of Dr. Walensky. A yearly review of the program's budget and Dr. Walensky's accomplishments will be made to determine the impact of the award on his career. Faculty accomplishments can include proposal submissions, follow-on funding, external awards, publications, and educational enhancements to the field of radiochemistry. Drs. Robertson and Jurisson will compile a yearly report to the NRC summarizing these outcomes. This report will show how the investment was successful in terms of scholarly production and educational enhancements specific to the field of radiochemistry. Dr. Robertson and Dr. Jurisson will assist Dr. Walensky in generating research ideas and in developing collaborations in nuclear science across campus. In addition, Drs. Robertson and Jurisson will meet with each of the guest lecturers in actinide chemistry as they visit campus to obtain their advice and feedback on Dr. Walensky's program.

IV. Institutional support for the program and plans for sustainability.

The MU faculty and administration are continuing and growing the commitment to academic programs in radiochemistry and nuclear science. Strong evidence of this commitment is the funding for the tenure track actinide chemistry faculty position in these times of rapidly declining state budgets for higher education. In addition to the salary and benefits, the Chemistry Department set aside three research laboratories (~2000 ft_2 of space) and graduate student office space (233 ft_2) for the actinide chemistry position. These labs contain one 8 ft. fume hood, one 4 ft. fume hood, two 5 ft. fume hoods, two 3 ft. fume hoods and one 8 ft. inert atmosphere glove box. In addition, the Chemistry Department houses an NMR facility (250 MHz, 300 MHz, 500 MHz and 600 MHz Bruker NMR instruments), a mass spectrometry facility (with LCelectrospray,
CI and MALDI capabilities), FT-IR instruments, a Hewlett-Packard diode array UVvisible spectrophotometer, and an X-ray diffraction facility (equipped for small molecule and powder diffraction analysis).

Institutional support at the campus level for nuclear science education is evidenced by the opening of the new MURR Center 25,000 ft_2 building addition in August 2007, providing space for expanded research, educational and service programs. MURR's analytical instrumentation for radiochemistry includes a high-resolution inductively-coupled plasma mass spectrometer (ICP-MS), two quadrupole ICP-MS instruments, and an inductively coupled plasma atomic emission spectrometer (ICP-AES). Radioactive samples can be analyzed on the collision-cell quadrupole ICP-MS and the ICP-AES. Also available at MURR are multiple HPGe detector systems for high-resolution gamma analysis and two liquid scintillation systems.

Four graduate radiochemistry courses are routinely offered at the University of Missouri. Introduction to Radiochemistry (with lab) is offered annually and has a regular enrollment of more than 40 students from chemistry, engineering, and nuclear medicine. Advanced Radiochemistry and Radiopharmaceutical Chemistry are offered every other year and routinely enroll eight to ten chemistry graduate students. Nuclear Chemistry is typically offered once every three years. ***Clearly missing from this list of courses is a graduate course in actinide chemistry.*** Dr. Walensky will fill this gap in our graduate radiochemistry program. In addition, we propose that Dr. Robertson and Dr. Walensky will create an undergraduate/graduate level "Nuclear Analysis" chemistry course that would be cross listed in Electrical, Mechanical, Chemical, and Nuclear Engineering. This course would introduce students to separation science, nuclear and atomic spectroscopy, and mass spectrometry needed for the nuclear power fuel cycle and nuclear forensics applications. The laboratory portion of the Nuclear Analysis class would be conducted at MURR and provide students with hands on experience in handling and separation of radioisotopes; high-resolution alpha and gamma spectrometry; and inductively-coupled plasma atomic emission and mass spectrometry.

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 this URL to the Office of Management and Budget Cost Circulars is included for reference to:
A-21 (now 2 CFR 220)
A-87 (now 2 CFR 225)
A-122 (now 2 CFR 230
A-102:

http://www.whitehouse.gov/omb/circulars_index-ffm

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.

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 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

§ 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 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 VI 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 VI, 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's 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 should 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, 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. § 215.40-48
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 must be in accordance with the Grantee's Travel Regulations or the US Government Travel Policy and Regulations at: www.gsa.gov/federaltravelregulation and the per diem rates set forth at: www.gsa.gov/perdiem, absent Grantee's travel regulation. Travel costs for the grant must be consistent with provisions as established in Appendix A to 2 CFR 220 (J.53). All other travel, domestic or international, must not increase the total estimated award amount.

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

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

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

The Grantee shall comply with the provisions of the Fly American Act (49 USC 40118) as implemented through 41 CFR 301-10.131 through 301-10.143.

Property and Equipment Management Standards
Property and equipment standards of this award shall follow provisions as established in 2 CFR 215.30-37.

Procurement Standards
Procurement standards of this award shall follow provisions as established in 2 CFR 215.40-48

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 and retain title 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 for this award shall follow OCOI requirements set forth in Section 170A of the Atomic Energy Act of 1954, as amended, and provisions set forth at 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 an intra-agency Appeal Board to review a grantee appeal of an agency action, if required, which will consist of the program office director, the Deputy Director of Office of Administration, and the Office of General Counsel.

d. Pending resolution of the request for review, the NRC may withhold or defer payments under the award during the review proceedings.

e. The review committee will request the Grants Officer who issued the notice of termination or adverse action to provide copies of all relevant background materials and documents. The committee may, at its discretion, invite representatives of the 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 215.60-62,

Monitoring and Reporting § 215.50-53

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 or deducted from the total project cost allowable cost as directed by the Grants Officer or the terms and conditions of award.
- Budget Revision – 2 CFR 215.25

- The Grantee is required to report deviations from the approved budget and program descriptions in accordance with 2 CFR 215.25,and request prior written approval from the Program Officer and the Grants Officer.
- The Grantee is not authorized to rebudget between direct costs and indirect costs without written approval of the Grants Officer.
- The Grantee is authorized to transfer funds among direct cost categories up to a cumulative 10 percent of the total approved budget. The Grantee is not allowed to transfer funds if the transfer would cause any Federal appropriation to be used for purposes other than those consistent with the original intent of the appropriation.
- Allowable Costs – 2 CFR 215.27

b. **Federal Financial Reports**

The Grantee shall submit a "Federal Financial Report" (SF-425) on a quarterly basis for the periods ending March 31, June 30, September 30, and December 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 is due within 90 days after expiration of the award. The report should be submitted electronically to: Grants_FFR@NRC.GOV. ***(NOTE: There is an underscore between Grants and FFR).***

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 should 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 may 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 on a semi-annual basis unless otherwise authorized by the Grants Officer. Performance reports should be sent to the Program Officer at the email address indicated in Block 12 of the Notice of Award, and to Grants Officer at: Grants_PPR.Resource@NRC.GOV. ***(NOTE: There is an underscore between Grants and PPR).***

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, or any portion thereof. The submission for the six month period ending September 30th is due by October 31st or any portion thereof.

d. 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.

As part of the FY 2010 HR 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:

Faculty Development Awards

1. Number of new faculty hired and currently eligible faculty supported in NRC designated STEM areas.

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 Leadership of Reducing Text Messaging While Driving
Pursuant to EO 13513, Grantees should encourage employees, sub-awardees, and contractors to adopt and enforce policies that ban text messaging while driving company-owned, rented vehicles or privately owned vehicles when on official Government business or when performing any work for or on behalf of the Federal Government.

Federal Employee Expenses
Federal agencies are 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."

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

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

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

Award Term

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

Reporting Subawards and Executive Compensation.

a. *Reporting of first-tier subawards.*

1. *Applicability.* Unless you are exempt as provided in paragraph d. of this award term, you must report each action that obligates $25,000 or more in Federal funds that does not include Recovery funds (as defined in section 1512(a)(2) of the American Recovery and Reinvestment Act of 2009, Pub. L. 111–5) for a subaward to an entity (see definitions in paragraph e. of this award term).

2. *Where and when to report.*

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

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

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

b. *Reporting Total Compensation of Recipient Executives.*

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

i. the total Federal funding authorized to date under this award is $25,000 or more;

ii. in the preceding fiscal year, you received—

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

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

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

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

i. As part of your registration profile at *http://www.ccr.gov.*

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

c. *Reporting of Total Compensation of Subrecipient Executives.*

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

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

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

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

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

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

i. To the recipient.

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

d. *Exemptions*

If, in the previous tax year, you had gross income, from all sources, under $300,000, you are exempt from the requirements to report:

i. Subawards,

and

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

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

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

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

ii. A foreign public entity;

iii. A domestic or foreign nonprofit organization;

iv. A domestic or foreign for-profit organization;

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

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

3. *Subaward:*

i. This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.

ii. The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see Sec. __ .210 of the attachment to OMB Circular A–133, "Audits of States, Local Governments, and Non-Profit Organizations").

iii. A subaward may be provided through any legal agreement, including an agreement that you or a subrecipient considers a contract.

4. *Subrecipient* means an entity that:

i. Receives a subaward from you (the recipient) under this award; and

ii. Is accountable to you for the use of the Federal funds provided by the subaward.

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

i. *Salary and bonus.*

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

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

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

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

vi. Other compensation, if the aggregate value of all such other compensation (e.g. severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds $10,000.