



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 1, 2016

Konstantinos Kavallieratos, Ph.D.  
Florida International University Board of Trustees  
11200 SW 8th Street  
MARC 430  
Miami, FL 33199-0001

VIA Electronic Mail  
[kavallie@fiu.edu](mailto:kavallie@fiu.edu)

SUBJECT: Grant No.: NRC-HQ-84-15-G-0038: Modification No. M0001 (Program B)

Dear Dr. Kavallieratos:

Pursuant to the authority contained in the Federal Grant and Cooperative Agreement Act of 1977, as amended, and the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission (NRC) hereby modifies the above referenced award to Florida International University Board of Trustees (hereinafter referred to as the "Grantee" or "Recipient"), the additional sum of \$399,914.00 to provide continued support for the "FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track" entitled "Program Description – Program B."

This modification is effective July 1, 2016 and shall apply to expenditures made by the Recipient furtherance of program objectives during the period beginning with the effective date of July 1, 2016 and ending June 30, 2020.

This award is made to the Recipient on condition that the funds will be administered in accordance with the terms and conditions as set forth in Attachment A (the Schedule); Attachment B (the Program Description); and Attachment C (the Standard Terms & Conditions); all of which have been agreed to by your organization. In addition your grant application proposes \$279,667.95 in cost share. Please ensure your cost share conforms to the provisions in 2 CFR 200, and is reported on the semi-annual Federal Financial Report.

Based on the pre-award compliance review conducted by NRC's Small Business and Civil Rights Office (SBCR), your institution is placed in a periodic status pending resolution of concerns raised during the review. Within 60 days, SBCR will conduct a periodic review to ensure compliance with applicable Civil Rights statutes. Your cooperation with SBCR is essential. The continued eligibility of Federal financial assistance is conditioned upon compliance with anti-discrimination regulations.

Please ensure individuals selected as beneficiaries of support under this grant meet the legal requirements consistent with Supreme Court Decisions including *Fisher*, *Gratz*, and *Grutter*.

Please sign the enclosed grant to acknowledge your receipt of the award, and return as a pdf file to M'Lita Carr by email at [MLita.Carr@nrc.gov](mailto:MLita.Carr@nrc.gov).

Sincerely yours,

*Erika Eam*

Erika Eam  
Grants Officer  
Research & Grants Team  
Acquisition Management Division

Attachments:  
Attachment A – Schedule  
Attachment B – Program Description  
Attachment C – Standard Terms and Conditions

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

JUL 25 2016

ADM002

# Grant and Cooperative Agreement

CHOOSE ONE:

- ☐ COOPERATIVE AGREEMENT
- ☒ GRANT

CHOOSE ONE:

☒ EDUCATION☐ FACILITIES☐ RESEARCH☐ SDCR☐ TRAINING

1. GRANT/COOPERATIVE AGREEMENT NUMBER NRC-HQ-84-15-G-0038		2. SUPPLEMENT NUMBER M0001		3. EFFECTIVE DATE 07/01/2016		4. COMPLETION DATE	
5. ISSUED TO NAME/ADDRESS OF RECIPIENT (No., Street, City/County, State, Zip) FLORIDA INTERNATIONAL UNIVERSITY 11200 SW 8TH ST PC 140 MIAMI FL 331992516				6. ISSUED BY U.S. NRC - HQ Mailing Address: Acquisition Management Division Mail Stop: TWFN-5E03 Washington DC 20555-0001			
7. TAXPAYER IDENTIFICATION NO. (TIN)				9. PRINCIPAL INVESTIGATOR/ORGANIZATION'S PROJECT OR PROGRAM MGR. (Name & Phone) Program A & B: Dr. Konstantinos Kavallieratos kavallie@fiu.edu; 305-348-6034			
8. COMMERCIAL & GOVERNMENT ENTITY (CAGE) NO.							
10. RESEARCH, PROJECT OR PROGRAM TITLE See Schedule							
11. PURPOSE See Schedule							
12. PERIOD OF PERFORMANCE (Approximately) 09/30/2015 through 06/30/2020							
13A.		AWARD HISTORY		13B.		FUNDING HISTORY	
PREVIOUS		\$283,385.00		PREVIOUS		\$283,385.00	
THIS ACTION		\$399,914.00		THIS ACTION		\$399,914.00	
CASH SHARE		\$0.00		TOTAL		\$683,299.00	
NON-CASH SHARE		\$0.00					
RECIPIENT SHARE		\$423,230.95					
TOTAL		\$683,299.00					
14. ACCOUNTING AND APPROPRIATION DATA 2016-X0200-IUPMRU-84-84D002-52-S-164-T8458-4110							
PURCHASE REQUEST NO.		JOB ORDER NO.		AMOUNT		STATUS	
OCHCO-16-0187							
15. POINTS OF CONTACT							
	NAME	MAIL STOP	TELEPHONE	E-MAIL ADDRESS			
TECHNICAL OFFICER	NANCY V. HEBRON-ISREAL		301-287-0718	Nancy.Hebron-Isreal@nrc.gov			
NEGOTIATOR							
ADMINISTRATOR	M'LITA R. CARR		(301) 415-6869	MLITA.CARR@nrc.gov			
PAYMENTS							
16. THIS AWARD IS MADE UNDER THE AUTHORITY OF: PURSUANT TO SECTION 31B AND 141B OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED.							
17. APPLICABLE STATEMENT(S), IF CHECKED: <input type="checkbox"/> NO CHANGE IS MADE TO EXISTING PROVISIONS <input type="checkbox"/> FDP TERMS AND CONDITIONS AND THE AGENCY-SPECIFIC REQUIREMENTS APPLY TO THIS GRANT				18. APPLICABLE ENCLOSURE(S), IF CHECKED: <input type="checkbox"/> PROVISIONS <input type="checkbox"/> SPECIAL CONDITIONS <input type="checkbox"/> REQUIRED PUBLICATIONS AND REPORTS			
UNITED STATES OF AMERICA				COOPERATIVE AGREEMENT RECIPIENT			
CONTRACTING/GRANT OFFICER ERIKA EAM		DATE		AUTHORIZED REPRESENTATIVE Robert Gutierrez		DATE 7/7/16	

## Grant and Cooperative Agreement

ITEM NO. (A)	ITEM OR SERVICE (Include Specifications and Special Instructions) (B)	QUANTITY (C)	UNIT (D)	ESTIMATED COST	
				UNIT PRICE (E)	AMOUNT (F)
	<p>CFDA Number: 77.008 DUNS Number: 071298814 OCHCO-16-0187</p> <p>The purpose of this modification is to revise the grant in it's entirety:</p> <p>1) Add an additional program to the existing grant: Program B: entitled "FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track";</p> <p>2) Update the Terms and Conditions;</p> <p>3) Provide funding for Program B;</p> <p>4) Extend the grant's period of performance to incorporate Program B.</p> <p>As a result of this modification:</p> <p>1: Block 9, delete in its entirety and replace with the following: "Program A: Dr. Konstantinos Kavallieratos Program B: Dr. Konstantinos Kavallieratos"</p> <p>2. Block 10. RESEARCH, PROJECT OR PROGRAM TITLE, delete in its entirety and replace with the following: "1.Program A: FIU Nuclear Research Fellowships - Growing the Opportunities. 2.Program B: FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track."</p> <p>3. Attachments A,B and C, delete in its entirety and replace with the following, see attached beginning on page 3.</p> <p>LIST OF CHANGES:</p> <p>Payment:</p> <p style="padding-left: 40px;">ASAP GRANT FUNDS REIMBURSEMENT SYS US TREASURY</p> <p>Period of Performance: 09/30/2015 to 06/30/2020</p>				

## **ATTACHMENT A - SCHEDULE**

### **A.1 PURPOSE OF GRANT**

The purpose of this Grant is to provide support to two distinct programs with Florida International University Board of Trustee, as described in Attachment B entitled "Program Description."

1. Program A: FIU Nuclear Research Fellowships – Growing the Opportunities.
2. Program B: FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track.

### **A.2 PERIOD OF GRANT**

The effective date of the grant programs is:

**Program A:** FIU Nuclear Research Fellowships – Growing the Opportunities. The effective date of this program is September 30, 2015. The estimated completion date of this program is September 29, 2019. Funds obligated hereunder are available for program expenditures for the estimated period: September 30, 2015 through September 29, 2019.

**Program B:** FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track. The effective date of this program is July 1, 2016. The estimated completion date of this program is June 30, 2020. Funds obligated hereunder are available for program expenditures for the estimated period: July 1, 2016 through June 30, 2020.

### **A.3 BUDGET**

Revisions to the budget shall be made in accordance with revisions of Grant Budget in accordance with 2 CFR § 200.308. All travel must be in accordance with Florida International University Board of Trustee travel regulations or the U.S. Government Travel Policy absent Recipient's travel regulations.

#### **Program A:**

- |                                |  |
|--------------------------------|--|
| 1. Total Estimated NRC Amount: | \$283,385.00   |
| 2. Total Obligated Amount:     | \$283,385.00   |
| 3. Cost-Sharing Amount:        | \$279,667.00   |
| 4. Activity Title:             | FIU Nuclear Research Fellowships – Growing the Opportunities |
| 5. NRC Project Officer:        | Nancy Hebron-Isreal  |
| 6. DUNS No.:                   | 071298814  |
| 7. Principal Investigator:     | Dr. Konstantinos Kavallieratos                               |

	Year 1	Year 2	Year 3	Year 4
Personnel	\$53,900.00	\$55,517.00	\$57,183.00	\$58,898.00
Fringe Benefits	\$2,905.00	\$2,992.00	\$3,082.00	\$3,174.00
Travel	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00
Supplies	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00
Total Direct Cost	<u>\$62,805.00</u>	<u>\$64,509.00</u>	<u>\$66,265.00</u>	<u>\$68,072.00</u>
Indirect Cost	<u>\$5,313.00</u>	<u>\$5,392.00</u>	<u>\$5,472.00</u>	<u>\$5,556.00</u>
Total Cost	\$68,118.00	\$69,901.00	\$71,737.00	\$73,628.00

**Program B:**

1. Total Estimated NRC Amount: \$399,914.00
2. Total Obligated Amount: \$399,914.00
3. Cost-Sharing Amount: \$279,667.95
4. Activity Title: FIU Nuclear Fellowship Program:  
Supporting The New FIU  
Radiochemistry Ph.D. Track
5. NRC Project Officer: Nancy Hebron-Isreal
6. DUNS No.: 071298814
7. Principal Investigator: Dr. Konstantinos Kavallieratos

	Year 1	Year 2	Year 3	Year 4
Personnel	\$59,033.00	\$60,804.00	\$91,679.00	\$94,429.00
Fringe Benefits	\$6,332.00	\$6,522.00	\$6,336.00	\$9,617.00
Travel	\$3,000.00	\$3,000.00	\$4,500.00	\$4,500.00
Supplies	<u>\$2,400.00</u>	<u>\$2,400.00</u>	<u>\$3,600.00</u>	<u>\$3,600.00</u>
Total Direct Cost	\$70,765.00	\$72,726.00	\$106,115.00	\$112,146.00
Indirect Cost	<u>\$7,326.00</u>	<u>\$7,473.00</u>	<u>\$10,085.00</u>	<u>\$10,278.00</u>
Total	\$78,091.00	\$80,199.00	\$116,200.00	\$122,424.00

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

1. Program A: The total estimated amount of this Award is \$426,948.00, inclusive of cost sharing. NRC hereby obligates the amount of \$283,385.00 expenditures during the period set forth above and in support of the Budget above. NRC is not obligated to reimburse the Grantee for the expenditure of amounts in excess of the total obligated amount.
2. Program B: The total estimated amount of this Award is \$679,581.00, inclusive of cost sharing. NRC hereby obligates the amount of \$399,914.00 expenditures during the period set forth above and in support of the Budget above. 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 A:** FIU Nuclear Research Fellowships – Growing the Opportunities

**Principal Investigator:** Dr. Konstantinos Kavallieratos

### PROGRAM DESCRIPTION

This FIU Nuclear Fellowships (FNF) grant will complement FIU's current NRC grants for fellowships and scholarships. It provides funding for 2 additional PhD students in the new Radiochemistry track for 4 years at a cost of \$283,385. FIU has provided a cost match of \$143,563 for this grant. A total of 8 additional fellowships (2/yr) will be funded on this grant to train students for nuclear careers in industry, government, national labs and academia. Together with our existing program the total number of supported Nuclear Research Fellows will grow to 6 per year. Specifically, this grant will support 2 FIU PhD students/yr with \$23,660 as stipend and provide them with nuclear & radiochemistry research opportunities. Additional support for materials and supplies and conference/collaboration travel is also provided by the grant. The FNF Program supports students who have elected to pursue nuclear and radiochemistry careers and facilitates their research progress and professional growth and hiring into the nuclear workforce of tomorrow. All supported students will be Ph.D. students with research projects directly related to nuclear energy, nuclear safety, nuclear separations, radiation detection, radiation damage, or nuclear environmental management, supervised closely by dedicated FIU faculty that hold Dissertation Advisor status. In accordance with our existing NRC-FNF grant recruiting policies, we will primarily aim to support: 1) Ph.D. Chemistry & Physics students beginning their second year of study, with a solid science background, who already have chosen their research mentors, from our nuclear faculty cohort, and their dissertation committees; 2) Incoming Ph.D students directly recruited into our new radiochemistry Ph.D. track (begins Fall 2015). The PI and the FIU Nuclear Scholars and Fellows Committee will closely monitor the progress of students in their curricular studies and research, and will mentor and advise them of future career options, and support publications and presentations of the students' work. Stipend support for FIU Nuclear Fellows will normally be provided for two years, in order to satisfy the 1-year teaching requirement for all our graduate students, and also provide additional opportunities for more students joining the program, and thus broadening participation and increasing the program's impact. It is expected that by their last year students will be supported through Research Assistantships offered by Principal Investigator's research grants, or by FIU support through the Dissertation Year Fellowship (DYF) and Doctoral Evidence Acquisition (DEA) programs. The table below outlines support for the two categories of student supported. Since the FNF fellows will only teach for 1 year they are expected to complete their Ph.D. timely within 4 years.

**Table 1: Typical Student support throughout their years on the Ph.D Radiochem Track:**

	Year 1	Year 2	Year 3	Year 4
Academic Progress	-Select advisor -Initiate research -Coursework	-Complete coursework - Qualifying/Cumes -Present research	-Advance to candidacy -Collaboration with DOE lab+ partners -Present& Publish	-Complete Research -Publish -Dissertation Defense

Support (Type 1)	Teaching Assistantship(TA)	FNF support	FNF support	Research Assistantship or Dissertation Year Fellowship (DYF)
Support (Type 2)	FNF support	FNF support	TA	RA or DYF
Support (Type 2- Alternative)	FNF support	FNF support	DEA-FIU Fellowship	TA

FIU will continue to expand and sustain this program with partnerships with DOE national labs, government agencies, and nuclear companies offering career opportunities for Radiochemistry Ph.D graduates. FIU's growing nuclear program is currently supported with FIU cost share funding, FIU's student programs, two NRC grants for fellowships and scholarships, funding from Florida Power & Light (FPL) for the "FPL Distinguished Nuclear Speaker Series" and several individual grants, cooperative agreements, and contracts in excess of \$4.5M (including funding of investigators in Table 2, and team grants managed through our applied research center (ARC). In addition, grants for > \$2.5M for support of nuclear faculty are currently pending.

**Recruitment Activities and Marketing Strategies for Increasing Diversity:**

Students will be recruited internally (e.g., from FIU Nuclear Scholarship Program) and externally through extensive Chemistry & Biochemistry Department, and FIU recruiting efforts. FIU has a large and very effective recruitment program that reaches out to all high schools in Miami Dade and Broward counties and to Miami Dade College, as well to several colleges and universities across the nation, including ties with specific HBCUs and Minority Serving Institutions in the U.S. Southeast and Puerto Rico. FIU's current FIU Nuclear Scholarship Program, supported by the US NRC and our "Sensing, Monitoring and Detection" Research Experience for Undergraduates (REU) program supported by the National Science Foundation (both directed by the proposal PI) offer two very valuable recruiting resources for FIU Nuclear Fellows genuinely interested in pursuing a career in nuclear research and development and application. Specifically, FIU's highly successful Chemistry Research Experiences for Undergraduates Program, supported by a \$300K NSF grant (>65% women, > 60% underrepresented minority participation) is a valuable resource for recruiting outstanding external underrepresented minority and women students who have experienced the unique, diverse, and productive FIU research environment to our existing FNF and graduate programs. Our first externally recruited Radiochemistry Track Ph.D. student, and Fall 2015 FNF fellow was a prior successful FIU REU participant. FIU has several programs geared toward directing minority undergraduate students into careers in research and technology application, and thus are instrumental to our recruiting efforts for our FNF program. Additional recruiting sources include: 1) the DOE Undergraduate Fellows program supported by the DOE EM Office of Environmental Management; 2) the Minority Biomedical Research Scholars (MBRS), MARC and RISE programs; 3) the Ronald E. McNair Program; and 4) the Florida-Georgia Lewis Stokes Alliance for Minority Participation in Research Program. All these programs have established ties with Primarily Undergraduate Institutions (PUI) and specific HBCUs and MSIs in the US Southeast and Puerto Rico, The PI has been extensively involved in mentoring undergraduate and graduate students with all these programs. Many of the

undergraduate students involved have publications in prestigious journals and publications in national and international scientific meetings and conferences.

FIU Nuclear Fellow Selection Process:

The 5-member Student Mentoring Committee for the FNF program selects Fellows and it includes the PI, co-PI, a chemistry professor, a physics professor, members of the corresponding departmental graduate selection committees, and the Executive Director of the Applied Research Center (ARC), Dr. Ines Triay. An NRC representative will be consulted during the selection process to ensure that the Fellows research interests adhere to the NRC mission and meet the approval of NRC. The selection process consists of 3 steps: (1) nomination and candidate screening by the graduate committee of each department to assure candidate has 3.3+ GPA and is either: (i) a continuing Ph.D. graduate student working with one of the Nuclear Mentors, and is in good standing and has completed a graduate school application; or (ii) a graduate school Ph.D. applicant who meets the highest standard for admission as an FIU Presidential Fellow, or fully supported student, with demonstrated interest to work with one of the Nuclear Mentors; (2) a personal interview with the Nuclear Selection Committee; and (3) selection by the committee based upon several key criteria. Selection will be via the highest average grade of the committee. Grading will be based upon a specific set of objective and subjective weighted criteria regarding the applicant's written application and verbal responses to interview questions. Students with similar committee grades will also be reviewed for diversity considerations. Awards to women, minorities are expected to reflect the high diversity in the community. We will encourage application to students with disabilities and facilitate their participation in the program to the maximum extent possible. The number of applications is expected to be high, because of vigorous advertising and outreach activities. Each year the committee will evaluate the progress of each fellow and support will only be continued if the GPA is maintained > 3.3 and if the progress evaluation by both the department Graduate Program Director and the research mentor show satisfactory student progress. In addition to the standard student obligations in their department, (such as graduate seminar attendance, and research mentor lab meetings) FNF fellows will also be obligated to: 1) Attend biweekly meetings jointly with our Undergraduate Nuclear Scholars in which they are expected to present their work at least once each semester; and 2) Attend FIU's monthly "*Florida Power and Light's Distinguished Nuclear Speaker*" seminars. This series will broaden their interdisciplinary background and provide them with valuable networking opportunities for future careers in Nuclear Industry and National Laboratories.

All selected FIU Nuclear Fellows are required to accept the NRC service agreement.

FIU Tuition Structure: FIU currently has one of the lowest cost and highest value tuition and fee structures nationally among recognized high-quality education and high research funded universities. FIU has been ranked for several years as among the top 10 of best-value universities across the nation (e.g., U.S. News and World Report). In-state graduate tuition rate is \$379.95 per credit hour for continuing graduate students. The estimated full-time total annual cost per student (24 credit hours) is \$9,118.80 for an in-state Ph.D. student. All tuition costs in this proposal are cost-shared by FIU.

These fellowships will not be an element of State of Florida's or FIU's strategic plan during the first 2 years of NRC funding. The program will be expanded to involve some distance learning aspects, such as dissemination/webcasting of our FP&L distinguished nuclear speaker seminar component. FIU has existing workforce development programs with the



local nuclear utility, Florida Power and Light and looks to replicate this with other nuclear companies.

Capability and ability of FIU to conduct the recruitment, marketing and other program elements

Since it opened its classes in 1972, FIU has maintained the goal of providing high quality education to the South Florida community and now has established itself as the Miami metropolitan area public research university, with a new Medical School since 2008, and having achieved Carnegie "Research Intensive" classification status. FIU offers >200 Bachelor's, Master's and Doctoral programs and is ranked first in the nation among four-year colleges and universities for awarding bachelor's and master's degrees to Hispanic students (according to a 2008 survey conducted by *Hispanic Outlook in Higher Education* magazine). FIU is the youngest university to have been awarded a chapter of *Phi Beta Kappa*, the nation's oldest and most distinguished academic honor society. Admission standards have also increased with acceptance rates dropping from 47% for Fall 2005 to 33% for Fall 2008, making FIU one of the most selective universities in Florida. For Fall 2008, the average incoming freshmen had an average SAT score of 1161, a 25 ACT score and a 3.8 high school GPA. Several interdisciplinary research centers underpin the research priorities, which through the faculty teaching and mentoring efforts reach the students both in the research lab and in the classroom. The library includes all the latest collection of widely accessible electronic journals and databases (such as SciFinder Scholar and ISI-Citation Index), and computer facilities, to which all students and visitors have free access.

FIU's Chemistry and Biochemistry Dept. is one of the most successful departments in terms of research and funding. In the past seven years alone, the number of chemistry majors has increased by 51%; Bachelor's Degrees awarded by 215%. Graduate chemistry majors have increased by 85% and Ph.D. degrees awarded by 157%. In the last three years, the Department has generated over 320 publications in peer reviewed journals and over 700 papers presented at local, national and international conferences. Grant funding is at its highest; an average of \$5.7 p/y have been generated over the last 3 years. Our educational programs are expanding and evolving at both the graduate and undergraduate levels. The undergraduate and grad. student majors and externally funded grad. students have more than doubled since 2002. FIU has >200 research labs. The Department has >32 labs with state-of-the-art instrumentation. Interdisciplinary centers and institutes provide collaboration opportunities.

The Department offers B.S., B.A., M.S. and Ph.D. degrees, including one of the first Ph.D. degrees with a forensic track in the nation. With 36 faculty members (28 research active), over 750 undergraduate majors, and over 165 graduate students (most in the Ph.D. program) the Dept. of Chemistry and Biochemistry, together with related disciplines (Physics, Biological Sciences, and the School of Medicine) occupies space in a complex of four interconnected buildings: the Chemistry & Physics building, the Owa Ehan Science Building, and the two new Health and Life Sciences buildings. The department awarded 99 Bachelor's, 18 Ph.D. and 13 M.S. degrees in 2014. Of the 659 enrolled students in the department >55% are women, > 65% were Hispanic, and >12% were African American, reflecting the diversity of the FIU community, and the Miami area. The majority of our faculty and all the mentors of the Nuclear Fellowship Program have current major external support. The faculty is diverse in terms of gender, race and national origin, with 6 women and 3 Hispanic-Latino. Many chemistry undergraduate students are involved in nuclear-related research for as long as two years with combined support from faculty grants and

programs, such as MBRS, McNair, and the FIU Nuclear Scholarship Program. Several of our students have received prestigious nationally competitive awards such as summer research scholarships at Dow-Corning and Procter and Gamble; and Ford Foundation Doctoral Fellowships to attend graduate school.

#### Participating Nuclear Fellowships Faculty:

The FIU Nuclear Fellows will obtain their Ph.D. or M.S. degrees under the guidance of one (or teams of) the following participating Chemistry and Physics faculty mentors:

<b>Table 2: FIU Nuclear Fellowship Mentoring Faculty in the College of Arts &amp; Sciences</b>	
<b>José Almirall</b> - Professor	Nuclear Forensics: Trace Evidence Analysis
<b>Werner Boeglin</b> Professor	Nuclear Physics –Strong Nuclear Forces
<b>Yong Cai</b> - Professor, and Graduate Program Director	Environmental and Bioanalytical Chemistry
<b>Francisco A. Fernandez-Lima</b> -Assistant Professor	Analytical: Advanced MS Characterization methods
<b>Piero Gardinali</b> - Assoc. Professor	Analytical-Environmental: Contaminants and Pollutants
<b>Konstantinos Kavallieratos</b> <sup>§</sup> - Assoc. Professor	Inorganic Chemistry: Sensors & Nuclear Separations
<b>Yuan Liu</b> - Assistant Professor	Biochemistry – DNA radiation damage and repair
<b>Alexander Mebel</b> <sup>§</sup> - Prof. & Grad. Program Dir.	Theoretical and Physical Chemistry- Actinides
<b>Bruce McCord</b> - Professor	Analytical: Liquid-based separation methods for radionuclides
<b>Joong-ho Moon</b> – Asst. Prof.	Organic and Polymer: Nanostructures for biomedical applications
<b>Raphael Raptis</b> <sup>§</sup> -Professor	Inorganic Chemistry – Ligands for Positron Emission Tomography
<b>Jorg Reinhold</b> <sup>§</sup> - Associate Professor	Nuclear Physics and Quantum Chromodynamics (QCD)
<b>Kevin O'Shea</b> - Professor	Organic & Environmental: OH· radical and singlet oxidations
<b>Yuk-Ching Tse-Dinh</b> – Professor	Biochemistry- Biological effects of radiation
<b>Stanislaw Wnuk</b> – Prof.	Organic: Application of Nucleosides and Nucleotides in Nuclear Medicine
<b>§ Current members of Nuclear Fellows and Scholars Selection Committee</b>	

#### Evaluation Plan to Measure Program Effectiveness / Follow-Up with Fellows

The PI & co-PI will work closely with the FIU Office of Institutional Research to define metrics and assess our program through application data, surveys and participant productivity, as outlined below. Our evaluation plan will address a number of groups: i) applicant pools, ii) fellowships awardees, and iii) mentors involved. Evaluation data will be collected as follows:

(i) *The Application Form.* The application for the program will include questions regarding how the applicant first heard about our program. The aim of these questions is to determine the effectiveness of our advertising and recruiting efforts. Additional questions on initial career goals will determine if the applicants' career goals were altered or reinforced after their participation.

(ii) *Exit Surveys.* All participants will be interviewed by co-directors and will have a separate interview with the program evaluator in addition to their annually scheduled meeting with the department's graduate program director. This will ensure FNF are aware of future career opportunities and that the program tracks their fulfillment of their Service Agreement.

(iii) *Post-Program Surveys.* A follow-up survey will be conducted with a) the participants and b) the faculty involved in training the students six months after completion of the program to track students' plans and post-graduation nuclear employment and assess how their FNF participation influenced those plans. It will also solicit feedback from students' mentors and supervisors views of the FNF program.

(iv) *Other.* In addition to the primary tools above, additional evaluation data will be collected from surveys of activities throughout the program. These include the entrance interview of the students with the PIs, matrix-type survey evaluations of seminars, workshops, and activities, and evaluation of the meetings of the participants with the program directors.

We specifically aim to achieve the following tangible goals in our program:

- *High level of participation by women.* During the award period, >50% of the participants will be women. 2/3 Nuclear Fellows in our current program are women.
- *High level of participation by underrepresented minority students.* We aim to have at least 50% participation by underrepresented minorities in our program. 2/3 Nuclear Fellows in our current program are underrepresented minorities. We will specifically aim to maintain high minority representation, and increase participation of African American and Native American students through our HBCU connections we have established as part of our REU program.
- *Research performed by the participants is expected to appear in high-quality peer-reviewed journals and will be presented at regional, national, and international conferences.* Our goal is for at least 50% of the participants to have two or more peer-reviewed publications after two years of support, and 100% of them a presentation at a national meeting within 1 year.
- *A high level of enhancing students' positive view of nuclear industry and nuclear research careers, as will be evidenced by the number of students who will pursue academic, industrial, or government careers in the nuclear field, including postdoctoral appointments.*
- *Faculty satisfaction with the dedication of participants and their experience with the program. An annual advisor survey will document this.*

FIU will also track the **STEM metrics** required by the US government (e.g., # and % of graduates who take a job in a STEM-related field; # and % of students who participate in scientific activities or research experiences in industry, government, or not-for-profit sector.)

#### Recruitment and Synergism with Existing and Proposed Programs

While this proposal will grow our FNF total support from 4 to 6 students per year, FIU envisions that the overall number of students doing research in the nuclear field will more than double in 5 years with our new Ph.D track in Radiochemistry, support from the DOE fellows program, and increased external funding anticipated from the newly developed Nuclear Advisory Board and other grants from the US DOE and other sources that support the Nuclear Mentors' research. The university has grown > 50% in the past 4 years to over 54,000 students while maintaining quality and a student body with 74% minority, more diverse than any other large, research institution in the USA except in Puerto Rico. The

PI and co-PI will be instrumental in continuing the strong synergism of FNF with the existing FIU Nuclear Scholarship (FNS) program. FIU has directly and with cost-matched monies funded the FIU Nuclear Research Interdisciplinary Program (NRIP) which brings together nuclear researchers from multiple academic and research units to work together to expand FIU's programs and research funding through multi-disciplinary efforts. NRIP has 48 members from 9 FIU units, meets monthly, and jointly works toward enhancing nuclear research and leveraging academic courses, equipment and facilities. The external FIU Nuclear Board of Advisors for Science, Engineering and Medicine (NBASEM) has 16 world class nuclear experts from industry, national laboratories, and academia. It is chaired by Dr. Nils Diaz, former chairman of the US NRC.

**Program B:** FIU Nuclear Fellowship Program: Supporting The New FIU Radiochemistry Ph.D. Track

**Principal Investigator:** Dr. Konstantinos Kavallieratos

#### **PROGRAM DESCRIPTION**

This FIU Nuclear Fellowships (FNF) grant will complement FIU's current NRC grants for fellowships, scholarships and faculty development. It provides funding for 3 additional PhD students in the new Radiochemistry Ph.D track for 4 years at a cost of \$399,914. FIU has provided a cost match of \$279,668 for this grant. This grant will expand our FNF program by 10 additional fellowships (2/yr for years 1 & 2 and 3/yr for years 3 & 4) to train students for nuclear careers in industry, government, national labs and academia. Together with our existing program the total number of supported Nuclear Fellows will grow to 9 per year. Specifically, this grant will support 3 Ph.D. students/yr with \$25,417 as stipend and provide them with nuclear & radiochemistry research opportunities. Additional support for materials and supplies and conference/collaboration travel is also provided by the grant. The FNF Program supports students who have elected to pursue nuclear and radiochemistry careers and facilitates their research progress and professional growth and hiring into the nuclear workforce of tomorrow. All supported students will be Ph.D. students with research projects directly related to nuclear energy, nuclear safety, nuclear separations, radiation detection, radiation damage, or nuclear environmental management, supervised closely by dedicated FIU faculty that hold Dissertation Advisor status. In accordance with our existing NRC-FNF recruiting policies, and because of our new Ph.D. track in radiochemistry we will primarily aim to support: 1) Ph.D. Chemistry students beginning their second year of study, with a solid science background, who already have chosen their research mentors, from our nuclear faculty cohort, and their dissertation committees and have been elected to pursue a Ph.D. in our new Radiochemistry Track; 2) Incoming Ph.D students directly recruited into our new radiochemistry Ph.D. track that began on Fall 2015. The PI and the FNF Committee will closely monitor the progress of students in their academics and research, and will advise them of future career options, and support publications and presentations of their work. Stipend support for Nuclear Fellows will normally be provided for two years, in order to satisfy the 1-year teaching requirement for all graduate students, and also provide additional opportunities for more students joining the program, and thus broadening participation and increasing the program's impact. It is expected that by their last year students will be supported through Research Assistantships offered by the mentors' research grants, or by FIU support through the Dissertation Year Fellowship (DYF) and Doctoral Evidence Acquisition (DEA) programs. Table 1 outlines support mechanisms.

Since the FNF fellows will only teach for 1 year they are expected to complete their Ph.D. timely, within 4 years.

**Table 1:** Typical Student support throughout their years on the Ph.D Radiochem Track:

	Year 1	Year 2	Year 3	Year 4
Academic Progress	-Select advisor -Initiate research -Coursework	-Complete Radiochemistry track coursework - Qualifying/Cumes -Present research	-Advance to candidacy -Collaboration with DOE lab+ partners -Present& Publish	-Complete Research -Publish -Dissertation Defense
Support (Type 1)	Teaching Assistantship(TA)	FNF support	FNF support	Research Assistantship or Dissertation Year Fellowship (DYF)
Support (Type 2)	FNF support	FNF support	TA	RA or DYF
Support (Type 2- Alternative)	FNF support	FNF support	DEA-FIU Fellowship	TA

FIU will continue to expand and sustain this program with partnerships with DOE national labs, government agencies, and nuclear companies offering career opportunities for Radiochemistry Ph.D graduates. FIU's growing nuclear program is currently supported with FIU cost share funding, FIU's student programs, four NRC grants for fellowships, scholarships, and faculty development, funding from Florida Power & Light (FP&L) for the "FPL Distinguished Nuclear Speaker Series" and several individual R&D grants, cooperative agreements, and contracts in excess of \$5.5M (including funding of investigators in Table 2, and team grants managed through our applied research center (ARC). In addition, grants for > \$3.0M for support of nuclear faculty are currently pending. FIU has also recently become eligible to award to its students Fellowships and Scholarships from the US-DOE office of Nuclear Energy, Nuclear Energy University Programs (NEUP) through a \$3M/7y cooperative agreement (PI. K. Kavallieratos)

**Recruitment Activities and Marketing Strategies for Increasing Diversity:**

Students will be recruited internally (e.g. from FIU Nuclear Scholarship Program) and externally through the extensive recruiting efforts of the Chemistry & Biochemistry Department. FIU has a large and very effective recruitment program that reaches out to all high schools in Miami Dade and Broward counties and to Miami Dade College, as well to several colleges and universities across the nation, including ties with specific HBCUs and Minority Serving Institutions in the U.S. Southeast and Puerto Rico. The current FIU Nuclear Scholarship Program, supported by the US NRC and our "Sensing, Monitoring and Detection" Research Experience for Undergraduates (REU) program supported by the National Science Foundation (both directed by the proposal PI) offer two valuable recruiting resources for FIU Nuclear Fellows genuinely interested in pursuing a career in nuclear research and development and application. Specifically, FIU's highly successful and recently renewed Chemistry Research Experiences for Undergraduates Program, supported by a \$300K NSF grant (>65% women, > 70% underrepresented minority

participation) is a valuable resource for recruiting outstanding students to our existing FNF and graduate programs. Our first externally recruited Radiochemistry Track Ph.D. student, and Fall 2015 FNF fellow was a prior successful FIU REU participant. FIU has several programs geared toward directing minority undergraduate students into careers in research and technology application, and thus are instrumental to our recruiting efforts for our FNF program. Additional recruiting sources are: 1) The DOE Undergraduate Fellows program supported by the DOE Office of Environmental Management; 2) The Minority Biomedical Research Scholars (MBRS), MARC and RISE programs; 3) the Ronald E. McNair Program; and 4) The Florida-Georgia Lewis Stokes Alliance for Minority Participation in Research Program and 5) The recently established NEUP Scholarships and Fellowships program. All these programs have established ties with Primarily Undergraduate Institutions (PUI) and specific HBCUs and MSIs in the US Southeast and Puerto Rico, The PI has been extensively involved in mentoring undergraduate and graduate students with these programs. Many of the undergraduate students involved have publications in prestigious journals and publications in national and international scientific meetings and conferences.

#### FIU Nuclear Fellow Selection Process:

The 5-member Student Mentoring Committee for the FNF program selects Fellows and it includes the PI, Co-PI, a chemistry professor, a physics professor, members of the corresponding departmental graduate selection committees, and the Executive Director of the Applied Research Center (ARC), Dr. Ines Triay. An NRC representative will be consulted during the selection process to ensure that the Fellows research interests adhere to the NRC mission and meet NRC approval. The selection process consists of 3 steps: (1) nomination and candidate screening by the graduate committee of each department to assure candidate has 3.3+ GPA and is either: (i) a continuing Ph.D. graduate student working with one of the Nuclear Mentors, and is in good standing and has selected the Radiochemistry Ph.D. track; or (ii) a Radiochemistry Ph.D. track applicant who meets the highest standard for admission with a demonstrated interest to work with one of the Nuclear Mentors. (2) a personal interview with the Nuclear Selection Committee; and (3) selection by the committee based upon several key criteria. Selection will be via the highest average grade of the committee. Grading will be based upon a specific set of objective and subjective weighted criteria regarding the applicant's written application and verbal responses to interview questions. We will encourage application to students with disabilities and facilitate their participation in the program to the maximum extent possible. All qualified applicants will receive consideration for selection without regard to race, color, religion, sex, national origin, disability status, protected veteran status, or any other characteristic protected by law. The number of applications is expected to be high, because of vigorous advertising and outreach activities. Each year the committee will evaluate the progress of each fellow and support will only be continued if the GPA is maintained > 3.3 and if the progress evaluation by both the department Graduate Program Director and the research mentor show satisfactory student progress. All 6 of our current Nuclear Fellows have maintained this minimum GPA requirement throughout their graduate studies. In addition to the standard student obligations in their department, (such as graduate seminar attendance, and research mentor lab meetings) FNF fellows will also be obligated to: 1) Attend biweekly meetings jointly with our Undergraduate Nuclear Scholars in which they are expected to present their work at least once each semester; and 2) Attend FIU's monthly "Florida Power and Light's Distinguished Nuclear Speaker" seminars. This series, which has funded 12 speakers within the past 2 years, will broaden their interdisciplinary background and provide them

with valuable networking opportunities for future careers in Nuclear Industry and National Laboratories.

All selected FIU Nuclear Fellows are required to accept the NRC fellowship service agreement.

FIU Tuition Structure: FIU currently has one of the lowest cost and highest value tuition and fee structures nationally among recognized high-quality education and high research funded universities. FIU has been ranked for several years as among the top 10 of best-value universities across the nation (e.g., U.S. News and World Report). In-state graduate tuition rate is \$398.95 per credit hour for continuing graduate students. The estimated full-time total annual cost per student (24 credit hours) is \$9,574.80 for an in-state Ph.D. student. All tuition costs in this proposal are cost-shared by FIU.

These fellowships will not be an element of State of Florida's or FIU's strategic plan during the first 2 years of NRC funding. The program will be expanded to involve some distance learning aspects, such as dissemination/webcasting of our FP&L distinguished nuclear speaker seminar component. FIU has existing workforce development programs with the local nuclear utility, Florida Power and Light and looks to replicate this with other nuclear companies.

Capability and ability of FIU to conduct the recruitment, marketing and other program elements

Since it opened its classes in 1972, FIU has maintained the goal of providing high quality education to the South Florida community and now has established itself as the Miami metropolitan area public research university, with a new Medical School since 2008, and having achieved Carnegie "Research Intensive" classification status. FIU offers >200 Bachelor's, Master's and Doctoral programs and is ranked first in the nation among four-year colleges and universities for awarding bachelor's and master's degrees to Hispanic students (according to a 2008 survey conducted by *Hispanic Outlook in Higher Education* magazine). FIU is the youngest university to have been awarded a chapter of *Phi Beta Kappa*, the nation's oldest and most distinguished academic honor society. Several interdisciplinary research centers underpin the research priorities, which through the faculty teaching and mentoring efforts reach the students both in the research lab and in the classroom. The library includes the latest collections of widely accessible electronic journals and databases (such as SciFinder Scholar and ISI-Citation Index), and computer facilities, to which all students and visitors have free access.

FIU's Chemistry and Biochemistry Dept. is one of the most successful departments in terms of research and funding. For the 2008-15 period, the number of chemistry majors has increased by 51%; Bachelor's Degrees awarded by 215%. Graduate chemistry majors have increased by 85% and Ph.D. degrees awarded by 157%. In the last three years, the Department has generated over 325 publications in peer reviewed journals and over 700 papers presented at local, national and international conferences. Grant funding is at its highest; an average of \$5.8 p/y have been generated over the last 3 years. Our educational programs are expanding and evolving at both the graduate and undergraduate levels. The undergraduate and graduate student majors and externally funded graduate students have more than doubled since 2002. FIU has >200 research labs. The Department has >34 labs with state-of-the-art instrumentation. Interdisciplinary centers and institutes provide collaboration opportunities.

The Department offers B.S., B.A., M.S. and Ph.D. degrees, including one of the first Ph.D. degrees with a forensic track in the nation. With 37 faculty members (29 research active), over 780 undergraduate majors, and over 170 graduate students (most in the Ph.D. program) the Dept. of Chemistry and Biochemistry, together with related disciplines (Physics, Biological Sciences, and the School of Medicine) occupies space in a complex of five interconnected buildings: the Chemistry & Physics building, the Owa Ehan Science Building, and 3 new Health and Life Sciences buildings. The department awarded 99 Bachelor's, 18 Ph.D. and 13 M.S. degrees in 2014. Of the 659 enrolled students in the department in 2015 >55% are women, > 65% were Hispanic, and >12% were African American, reflecting the diversity of FIU, and the Miami area. The majority of our faculty and all the FNF mentors have current major external support. The faculty is diverse in terms of gender, race and national origin, with 7 women and 5 Hispanic-Latino. *We expect two new world-class Radiochemists to be joining our faculty by Fall 2016 (one of which is an Associate Professor funded by an NRC Faculty Development Grant.* Many chemistry undergraduate students are involved in nuclear-related research for as long as two years with combined support from faculty grants and programs, such as MBRS, McNair, and the FIU Nuclear Scholarship Program. Several of our students have received prestigious nationally competitive awards such as summer research scholarships at Dow-Corning and P&G; and Ford Foundation Doctoral Fellowships to attend graduate school. An *American Nuclear Society* Student Chapter was recently established.

#### Participating Nuclear Fellowships Faculty:

The FIU Nuclear Fellows will obtain their Ph.D. degrees under the guidance of one (or teams of) the following participating Chemistry faculty mentors:

<b>Table 2: FIU Nuclear Fellowship Mentoring Faculty in the College of Arts &amp; Sciences</b>	
<b>José Almíral</b> - Professor	Nuclear Forensics: Trace Evidence Analysis
<b>Yong Cai</b> - Professor, and Graduate Program Director	Environmental and Bioanalytical Chemistry
<b>Francisco A. Fernandez-Lima</b> -Assistant Professor	Analytical: Advanced MS Characterization methods
<b>Piero Gardinali</b> - Assoc. Professor	Analytical-Environmental: Contaminants and Pollutants
<b>Konstantinos Kavallieratos</b> <sup>s</sup> - Assoc. Professor	Inorganic Chemistry: Sensors & Nuclear Separations
<b>Yuan Liu</b> - Assistant Professor	Biochemistry – DNA radiation damage and repair
<b>Alexander Mebel</b> <sup>s</sup> - Prof. & Grad. Program Dir.	Theoretical and Physical Chemistry- Actinides
<b>Jaroslava Mlksovska</b> – Assoc.Professor	Biochemistry, Cages for Lanthanide and Actinide complexation
<b>Bruce McCord</b> - Professor	Analytical: Liquid-based separation methods for radionuclides
<b>Joong-ho Moon</b> – Asst. Prof.	Organic and Polymer: Nanostructures for biomedical applications
<b>Raphael Raptis</b> <sup>s</sup> -Professor	Inorganic Chemistry – Ligands for Positron Emission Tomography
<b>Kevin O'Shea</b> - Professor	Organic & Environmental: OH· radical and singlet oxidations
<b>Yuk-Ching Tse-Dinh</b> – Professor	Biochemistry- Biological effects of radiation
<b>Stanislaw Wnuk</b> – Prof.	Organic: Application of Nucleosides and Nucleotides in Nuclear Medicine



§ Current members of Nuclear Fellows Selection Committee: Current fellow mentors are underlined

#### Evaluation Plan to Measure Program Effectiveness / Follow-Up with Fellows

The PI & co-PI will work closely with the FIU Office of Institutional Research to define metrics and assess our program through application data, surveys and participant productivity, as outlined below. Our evaluation plan will address a number of groups: i) applicant pools, ii) fellowships awardees, and iii) mentors involved. Evaluation data will be collected as follows:

(i) *The Application Form.* The application for the program will include questions regarding how the applicant first heard about our program. The aim of these questions is to determine the effectiveness of our advertising and recruiting efforts. Additional questions on initial career goals will determine if the applicants' career goals were altered or reinforced after their participation.

(ii) *Exit Surveys.* All participants will be interviewed by co-directors and will have a separate interview with the program evaluator in addition to their annually scheduled meeting with the department's graduate program director. This will ensure FNF directors are aware of future career opportunities and that the program tracks their fulfillment of NRC Service Agreement.

(iii) *Post-Program Surveys.* A follow-up survey will be conducted with a) the participants and b) the faculty involved in training the students six months after completion of the program to track students' plans and post-graduation nuclear employment and assess how their FNF participation influenced those plans. It will also solicit feedback from students' mentors and supervisors views of the FNF program.

(iv) *Other.* Additional evaluation data will be collected from surveys of activities throughout the program. These include an entrance interview of the students with the PIs, and matrix-type survey evaluations of seminars, workshops, and activities.

We specifically aim to achieve the following tangible goals in our program:

- *Research performed by the participants is expected to appear in high-quality peer-reviewed journals and will be presented at regional, national, and international conferences. Our goal is for at least 50% of the participants to have two or more peer-reviewed publications after two years of support, and 100% of them a presentation at a national meeting within 1 year. 3 of our current Nuclear Fellows have --already after only 1 semester of support- accepted poster abstracts in prestigious national meetings (such as the National meeting of the American Chemical Society) and one has a manuscript in preparation.*
- *A high level of enhancing students' positive view of nuclear industry and nuclear research careers, as will be evidenced by the number of students who will pursue academic, industrial, or government careers in the nuclear field, including postdoctoral appointments.*
- *Faculty satisfaction with the dedication of participants and their experience with the program. An annual advisor survey will document this.*

FIU will also track the **STEM metrics** required by the US government (e.g., # and % of graduates who take a job in a STEM-related field; # and % of students who participate in scientific activities or research experiences in industry, government, or not-for-profit sector.)

**Recruitment and Synergism with Existing and Proposed Programs**

While this proposal will grow our FNF total support from 6 to 9 students per year, FIU envisions that the number of students doing nuclear & radiochemistry research will more than double in 5y with our new Radiochemistry Ph.D track, support from the DOE fellows program, and increased external funding from the US DOE and other sources that support the mentor research. The university has grown > 50% in the past 4 years to over 55,000 students while maintaining quality and a student body with 85% minority, more diverse than any other large, research institution in the continental US. The PIs will be instrumental in continuing the strong synergism of FNF with the FIU Nuclear Scholarship (FNS) program. The FIU Nuclear Research Interdisciplinary Program (NRIP) brings together nuclear researchers to work together to expand FIU programs and research through multi-disciplinary efforts. With 55 members from 9 FIU units, it works toward enhancing nuclear research and leveraging academic courses, equipment and facilities. The external FIU Nuclear Board of Advisors for Science, Engineering and Medicine (NBASEM) has 16 world class nuclear experts from industry, national laboratories, and academia. It is chaired by Dr. Nils Diaz, former chairman of the US NRC.

**Leveraged Funding and Cost Match Funding:** FIU offers a 69.9%, \$279,668 cost match.

**Attachment C - Standard Terms and Conditions**

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

**Preface**

This award is based on the application submitted to, and as approved by, the Nuclear Regulatory Commission (NRC) under the authorization 42 U.S.C. § 2051(b), pursuant to section 31b and 141b of the Atomic Energy Act of 1954, as amended, and is subject to the terms and conditions incorporated either directly or by reference in the grant or cooperative agreement. The following also apply:

- Restrictions on the expenditure of Federal funds in appropriation acts, to the extent those restrictions are pertinent to the award.
- Code of Federal Regulations/Regulatory Requirements – 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

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

**Certifications and Representations:** These terms incorporate the certifications and representations required by statute, executive order, or regulation that were submitted with the SF424B application through GRANTS.GOV.

**I. Mandatory General Requirements**

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

**1. Applicability of 2 CFR Part 200**

All provisions of 2 CFR Part 200 and all Standard Provisions attached to this grant/cooperative agreement are applicable to the Recipient and to sub-recipients which meet the definition of "Recipient" in 2 Part §200.86, unless a section specifically excludes a sub-recipient from coverage. The Recipient and any sub-recipients must, in addition to the assurances made as part of the application, comply and require each of its sub-awardees employed in the completion of the project to comply with Subpart D of 2 CFR Part 200 and include this term in lower-tier (sub-award) covered transactions.

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

**2. Award Package**

The Recipient is obligated to conduct project oversight as may be appropriate, to manage the funds with prudence, and to comply with the provisions outlined in 2 CFR Part 200. Within this framework, the Principal Investigator (PI) named on the award face page, is responsible for the scientific or technical direction of the project and for preparation of the project performance reports. This award is funded on a cost-reimbursement basis, not to exceed the amount awarded as indicated on the face page, and is subject to a refund of unexpended grant funds to the NRC.

The non-Federal entity alone must be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements related to its grant award. These issues include, but are not limited to, source evaluation, protests, disputes, and claims. These standards do not relieve the non-Federal entity of any financial or fiduciary responsibilities or obligations arising under its grant, including sub-contracts and sub-awards, or any other contractual or financial obligation. The Federal awarding agency will not substitute its judgment for that of the non-Federal entity unless the matter is primarily a Federal concern. Violations of law will be referred to the local, State, or Federal authority having proper jurisdiction. See 2 CFR § 200.318(k), General Procurement Standards.

**Subawards**

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

Sub-recipients, sub-awardees, and contractors have no relationship with NRC under the terms of this grant/cooperative agreement. All required NRC approvals must be directed through the Recipient to NRC. See 2 CFR § 200.318.

**Nondiscrimination**

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

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

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

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

#### **Modifications/Prior Approval**

NRC's prior written approval may be required before a Recipient makes certain budget modifications or undertakes particular activities. If NRC approval is required for changes in the grant or cooperative agreement, it must be requested and obtained from the NRC Grants Officer in advance of the change or obligation of funds. All requests for NRC prior approval, including requests for extensions to the period of performance, must be made, in writing (which includes submission by e-mail), to the designated Grants Officer at least 30 days before the proposed change. The request must be signed by the authorized organizational official. Failure to obtain prior approval, when required, from

the NRC Grants Officer, may result in the disallowance of costs, or other enforcement action within NRC's authority.

**Lobbying Restrictions**

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

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

The Recipient shall submit a completed "Certification Regarding Lobbying" form, regardless of dollar value.

If applicable, the Recipient receiving in excess of \$100,000.00 in Federal funding shall submit a completed Standard Form (SF-LLL), "Disclosure of Lobbying Activities" for any persons engaged in lobbying activities, as discussed at 31 U.S. Code § 1352 – Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions. The form concerns the use of non-Federal funds for lobbying within 30 days following the end of the calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed. If the Recipient must submit the SF-LLL, including those received from sub-recipients, contractors, and subcontractors, to the Grants Officer.

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

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

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

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

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

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

**Debarment, Suspension, Ineligibility, and Voluntary Exclusion**

The Recipient certifies that neither it nor its principals is presently excluded or disqualified from participation in this transaction by any Federal department or agency. The policies and procedures applicable to debarment, suspension, and ineligibility under NRC-financed transactions are set forth 2 CFR Part 180 and 2 CFR Part 200.

**Drug-Free Workplace**

The Recipient must be in compliance with The Federal Drug Free Workplace Act of 1988. The policies and procedures applicable to violations of these requirements are set forth in 41 U.S.C. §§ 8101-8106.

**Implementation of E.O.13224 – Executive Order on Terrorist Financing**

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

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

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

**Procurement Standards - 2 CFR §§ 200.318-200.326**

Sections 200.318 - 200.326 set forth standards for use by Recipients in establishing procedures for the procurement of supplies and other expendable property, equipment, real property and other services with Federal funds. These standards are furnished to ensure that such materials and services are obtained in an effective manner and in compliance with the provisions of applicable Federal statutes and executive orders. No additional procurement standards or requirements will be imposed by the Federal awarding agencies upon Recipients, unless specifically required by Federal statute, executive order, or approved by OMB.

**Travel and Transportation**

Travel must be in accordance with the Recipient's Travel Regulations or the U.S. Government Travel Policy and Regulations at: <http://www.gsa.gov/portal/category/21222> and the per diem rates set forth at: <http://www.gsa.gov/portal/content/104877>, absent

Recipient's travel regulations. Travel and transportation costs for the grant must be consistent with provisions as established in 2 CFR § 200.473-474.

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

**Domestic Travel:**

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

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

**International Travel:**

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

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

**Property Standards**

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

**Intangible Property**

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

**Inventions Report** - The Bayh-Dole Act (P.L. 96-517) affords Recipients the right to elect and retain title to inventions they develop with funding under an NRC grant award ("subject inventions"). In accepting an award, the Recipient agrees to comply with applicable NRC policies, the Bayh-Dole Act, and its Government-wide implementing regulations found at Title 37, Code of Federal Regulations (CFR) Part 401. A significant part of the regulations require that the Recipient report all subject inventions to the awarding agency (NRC) as well as include an acknowledgement of federal support in any patents.

**Patent Notification Procedures** - If the NRC or its Recipients, without making a patent search, knows (or has demonstrable reasonable grounds to know) that technology covered by a valid United States patent has been or will be used without a license from the owner, E.O.12889 requires NRC to notify the owner. If the Recipient uses or has used patented technology under this award without license or permission from the owner, the Recipient must notify the Grants Officer. This notice does not imply that the Government authorizes and consents to any copyright or patent infringement occurring under the financial assistance.

**Data, Databases, and Software** - The rights to any work produced or purchased under a NRC federal financial assistance award, such as data, databases or software are determined by Subpart D of 2 CFR Part 200. The Recipient owns any work produced or purchased under a NRC federal financial assistance award subject to NRC's right to obtain, reproduce, publish or otherwise use the work or authorize others to receive, reproduce, publish or otherwise use the data for Government purposes.

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

**Record Retention and Access**

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

**Conflict Of Interest**

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

**Dispute Review Procedures**

- a. Any request for review of a notice of termination or other adverse decision should be addressed to the Grants Officer. It must be postmarked or transmitted electronically no later than 30 days after the postmarked date of such termination or adverse decision from the Grants Officer.
- b. The request for review must contain a full statement of the Recipient's position and the pertinent facts and reasons in support of such position.
- c. The Grants Officer will promptly acknowledge receipt of the request for review and shall forward it to the Director, Office of Acquisition Management Division, unless otherwise delegated, who shall appoint an intra-agency Appeal Board to review a recipient appeal of an agency action, if required, which will consist of the program office director, the Deputy Director of Office of Administration, and the Office of General Counsel.
- d. Pending resolution of the request for review, the NRC may withhold or defer payments under the award during the review proceedings.
- e. The review committee will request the Grants Officer who issued the notice of termination or adverse action to provide copies of all relevant background materials and documents. The committee may, at its discretion, invite representatives of the Recipient and the NRC program office to discuss pertinent issues and to submit such additional



information as it deems appropriate. The chairman of the review committee will insure that all review activities or proceedings are adequately documented.

f. Based on its review, the committee will prepare its recommendation to the Director, Office of Administration, who will advise the parties concerned of his/her decision.

#### **Remedies for Noncompliance**

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

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

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

- Payment – 2 CFR § 200.305
- Cost Share or Matching – 2 CFR § 200.306
  - Recipients are to be careful with providing excessive cost share or match since at the end of the grant, if the identified match has not been provided, then a portion of the federal share may be required to be returned to the Government.
- Program Income – 2 CFR § 200.307
  - Earned program income, if any, will be added to funds committed to the project by the NRC and Recipient and used to further eligible project or program objectives or be deducted from the total project cost for the grant, as directed by the Grants Officer or indicated in the terms and conditions of the award.
- Revision of Budget and Program Plans – 2 CFR § 200.308
  - The Recipient is required to report deviations from the approved budget and program descriptions in accordance with – 2 CFR § 200.308(b) and request prior written approval from the Project Officer and the Grants Officer.
  - The Recipient is not authorized to re-budget between direct costs and indirect costs without written prior approval of the Grants Officer.
  - The Recipient is authorized to transfer funds among direct cost categories up to a cumulative 10 percent of the total approved budget. The Recipient is not allowed to transfer funds if the transfer would cause any Federal appropriation to be used for purposes other than those consistent with the original intent of the appropriation.
  - Allowable Costs – 2 CFR §§ 200.403
- See section 2 CFR §§ 200.330-332 for Subrecipient Monitoring and Management.

#### **FEDERAL FINANCIAL REPORTS**

Federal Financial Reports (SF-425) are semi-annually, for the periods ending March 31 and September 30. Reports are due within 30 calendar days following the end of the reporting period and must be emailed to the Project Officer at the

email addressed indicated in the Notice of Award, and to the Grants Officer at: Grants FFR.Resource@nrc.gov. (NOTE: *There is an underscore between Grants and FFR in the email address.*) The SF-425 form and instructions are available at the following URL: [http://www.whitehouse.gov/omb/grants\\_forms/](http://www.whitehouse.gov/omb/grants_forms/).

### **PERFORMANCE PROGRESS REPORTS**

The performance (technical) reports indicated below are subject to 2 CFR §200.328.

#### **Scholarship and Fellowship Programs**

Performance Progress reports must be submitted annually, for the period ending September 30, or any portion thereof, regardless of the award date. Reports are due within 30 days following the end of each reporting period and must be emailed to the Project Officer at the email addressed indicated in the Notice of Award, and to the Grants Officer at: Grants PPR.Resource@nrc.gov. (NOTE: *There is an underscore between Grants and PPR in the email address.*)

**Final Reports** - The Recipient is required to submit final reports, both Financial (SF-425) and Performance (SF-PPR, SF-PPR-B, SF-PPR-E) within 90 days of the grant expiration. In addition to these reports, a final SF-428, Tangible property report, is also required, if applicable. The final PPR (for Scholarship, Fellowship, and Trade School and Community College Scholarship awards) must include the names of all students with up to date contact information (mailing address, telephone/cell phone, email address). The reports must be emailed to the Project Officer at the email addressed indicated in the Notice of Award, and to the Grants Officer at: Grants FFR.Resource@nrc.gov and Grants PPR.Resource@nrc.gov. (NOTE: *There is an underscore between Grants and FFR and Grants and PPR in the email addresses.*)

#### **Period of Performance – 2 CFR § 200.309**

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

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

The NRC Grant Officer may authorize a no cost extension of the period of performance. The recipient must submit a no cost extension request no less than 30 days prior to the award end date. Any request for a no cost extension after the grant has expired will not be approved. However, the NRC has no obligation to provide any additional prospective or incremental funding. Any modification of the award to increase funding and/or to extend the period of performance is at the sole discretion of the NRC.

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

Unless otherwise stated, Recipient payments are made using the Department of Treasury's Automated Standard Application for Payment (ASAP) system, ASAP.gov, through preauthorized electronic funds transfers. To receive payments, Recipients are required to enroll with the Department of Treasury, Financial Management Service, and

Regional Financial Centers, which allows them to use the on-line method of withdrawing funds from their ASAP established accounts. The following information is required to make ASAP withdrawals: (1) ASAP account number – the award number found on the cover sheet of the award; (2) Agency Location Code (ALC) – 31000001; and Region Code. Recipients enrolled in the ASAP system do not need to submit a "Request for Advance or Reimbursement" (SF-270).

## **II. Audit Requirements**

### **Audits**

Organization-wide or program-specific audits are performed in accordance with the Single Audit Act of 1996, as amended, and as implemented by 2 CFR Part 200, Subpart F—AUDIT REQUIREMENTS. Recipients are subject to the provisions of this subpart if they expend \$750,000 or more in a year in Federal awards. See 2 CFR 200.501.

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

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

Organizations expending less than \$750,000 a year are not required to have an annual audit for that year but must make their grant-related records available to NRC or other designated officials for review or audit.

## **III. Programmatic Requirements**

The recipient is responsible for providing documentation to the NRC that tracks each student's progress in achievement of the academic program for which federal funds were provided. This includes: (1) ensuring the service agreement is signed by the student prior to providing support; (2) providing the NRC with student contact information upon student entry into the program, upon completion or withdrawal from the program, and upon request by the NRC; and (3) monitoring the student's fulfillment of the service agreement for the duration of the award. The NRC shall be notified immediately if a student is not fulfilling the academic program or the service agreement.

### **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 OMB requirements indicated above (for metric reporting), the recipient shall address the following questions and submit responses with the required progress reports:

**Fellowship Metrics:**

1. How many graduate students have been sponsored by NRC funding?
  - a. Response is the number of students, for this reporting period and cumulative to the grant.
2. How many students, supported by NRC funding, have received M.S. or equivalent degrees?
  - a. Response is the number of students, for this reporting period and cumulative to the grant.
3. How many students, supported by NRC funding, have received Ph.D. or equivalent degrees?
  - a. Response is the number of students, for this reporting period and cumulative to the grant.
4. How many students, supported by NRC funding, have accepted a job and are employed in the nuclear industry?
  - a. Response is the number of students, for this reporting period and cumulative to the grant.
5. How many items have students produced, for example, Professional Journal articles, publications, patents, or conference reports?
  - a. Response is the type and number of items, for this reporting period and cumulative to the grant.

As part of the PPR, include the following information for each student support under this award:

1. Student Name
2. Years of Support
3. Cumulative Support in Dollars
4. Estimated Graduation Date
5. Status
6. Up to date student contact information (mailing address, telephone/cell phone, email address) for students no longer participating in the program, i.e. transferred programs, graduated, withdrew, etc.
7. Up to date student contract information, for all students at time of grant expiration, i.e. Final PPR.

Examples of status could be:

"Employed in Nuclear Industry", if so, where;  
"Looking for employment", if so, how long;  
"Deferred due to continuing education", if so, what degree;  
"Employed by Non-Nuclear", if so, where; and  
"Dropped out of program"

**Unsatisfactory Performance**

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

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

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

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

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

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

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

#### **Site Visits**

The NRC, through authorized representatives, has the right to make site visits to review project accomplishments and management control systems and to provide technical assistance as required. If any site visit is made by the NRC on the premises of the Recipient or contractor under an award, the Recipient shall provide and shall require his/her contractors to provide reasonable access to all facilities and provide necessary assistance for the safety and convenience of the Government representative in the performance of his/her official duties.

### **IV. Additional Requirements**

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

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

False statements (18 U.S.C. § 287), provides that whoever makes or presents any false, fictitious, or fraudulent statements, representations, or claims against the United States shall be subject to imprisonment of not more than five years and shall be subject to a fine in the amount provided by 18 USC §287.

False Claims Act (31 U.S.C. § 3729 et seq.), provides that suits under this Act can be brought by the government, or a person on behalf of the government, for false claims under federal assistance programs.

Copeland "Anti-Kickback" Act (18 U.S.C. § 874), prohibits a person or organization engaged in a federally supported project from enticing an employee working on the project from giving up a part of his compensation under an employment contract.

#### **American-Made Equipment and Products**

Recipients are encouraged to purchase American-made equipment and products with funding provided under this award.

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

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

**Federal Leadership of Reducing Text Messaging While Driving**

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

**Federal Employee Expenses**

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

**Minority Serving Institutions (MSIs) Initiative**

Pursuant to E.O.s 13230 and 13270, amended by E.O. 13316 and 13385, 13532, 13592, 13555, 13515, and 13621, NRC is strongly committed to broadening the participation of MSIs in its financial assistance program. NRC's goals include achieving full participation of MSIs in order to advance the development of human potential, strengthen the Nation's capacity to provide high-quality education, and increase opportunities for MSIs to participate in and benefit from Federal financial assistance programs. NRC encourages all applicants and Recipients to include meaningful participations of MSIs. Institutions eligible to be considered MSIs are listed on the Department of Education website: <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>

**Research Misconduct**

Scientific or research misconduct refers to the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. It does not include honest errors or differences of opinions. The Recipient organization has the primary responsibility to investigate allegations and provide reports to the Federal Government. Funds expended on an activity that is determined to be invalid or unreliable because of scientific misconduct may result in a disallowance of costs for which the institution may be liable for repayment to the awarding agency. The Office of Science and Technology Policy at the White House published in the Federal Register on December 6, 2000, a final policy that addressed research misconduct. The policy was developed by the National Science and Technology Council (65 FR 76260). The NRC requires that any allegation be submitted to the Grants Officer, who will also notify the OIG of such allegation. Generally, the Recipient organization shall investigate the allegation and submit its findings to the Grants Officer. The NRC may accept the

Recipient's findings or proceed with its own investigation. The Grants Officer shall inform the Recipient of the NRC's final determination.

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

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

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

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

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

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

**EXECUTIVE COMPENSATION REPORTING**

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

Reporting Subawards and Executive Compensation.

*a. Reporting of first-tier subawards.*

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

2. *Where and when to report.*

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

*b. Reporting Total Compensation of Recipient Executives.*

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

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

ii. in the preceding fiscal year, you received—

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

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

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

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

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

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

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

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



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

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

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

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

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

i. To the recipient.

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

d. *Exemptions*

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

i. Subawards,

and

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

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

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

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

ii. A foreign public entity;

iii. A domestic or foreign nonprofit organization;

iv. A domestic or foreign for-profit organization;

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

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

3. *Subaward*:

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

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

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

4. *Subrecipient* means an entity that:

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

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

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

i. *Salary and bonus*.

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

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

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

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

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