

FY 2013 Faculty Development Grant Program (12 awards)

University	Amount	Title
Clemson University	\$450,000	Probabilistic Risk Assessment Faculty Development in the Nuclear Environmental Engineering and Science Program at Clemson University
Massachusetts Institute of Technology (MIT)	\$450,000	MIT Nuclear Education Faculty Development Program
Ohio State University	\$450,000	Ohio State University Nuclear Engineering Faculty Development Program
Pennsylvania State University	\$450,000	Pennsylvania State University's Faculty Development Grant For Sensor Development and Control Methods in Nuclear Power Plants
Texas A&M University - Kingsville	\$313,000	Texas A&M University-Kingsville, Mechanical Engineering Faculty Development Program
University California – Berkeley	\$319,452	UCB Department of Nuclear Engineering Faculty Development Program
University of Illinois	\$450,000	University of Illinois Nuclear Engineering Faculty Development Program
University of Michigan	\$450,000	Nuclear Engineering Faculty Development Program at the University of Michigan
University of Missouri Science & Technology (S&T)	\$345,559	Missouri S&T Nuclear Engineering Faculty Development Program (2013-2016)
University of Utah	\$300,000	Award For A Prospective Junior Faculty Development In Sustaining Explosive Growth of The University of Utah Nuclear Engineering Program (UNEP)
Utah State University	\$319,452	Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University
Virginia Commonwealth University	\$450,000	VCU Nuclear Engineering Faculty Development Program

Probabilistic Risk Assessment Faculty Development in the Nuclear Environmental Engineering and Science Program at Clemson University

Executive Summary:

This proposal seeks start-up package funds and partial salary for a new tenure-track faculty position in level 3 probabilistic risk assessment (PRA) and/or radioecology within the Nuclear Environmental Engineering and Science (NEES) program at Clemson University. This faculty member would complement existing expertise in environmental radiochemistry and environmental health physics (EHP) while bringing skills that would allow the NEES faculty to tap into research funds that are currently beyond their reach. The ideal faculty candidate will have expertise in level 3 PRA which provides insight regarding the risks and consequences of nuclear related activities such as power plant production, waste disposal, and site remediation. The primary research activities of the ideal candidate will be to examine the transport, effects, and risks from environmental releases of radionuclides to human health and biota. R. A. Fjeld (Emeritus NEES faculty), N. A. Eisenberg (Emeritus NRC employee), and K. L. Compton (Ph.D. EEES (NEES) and current NRC employee) co-authored a textbook entitled: *Quantitative Environmental Risk Analysis for Human Health*, in 2007 which is just one of two textbooks in the field of level 3 PRA. Dr. Fjeld retired in 2009 and we are looking to fill this new faculty position with someone with similar expertise. There is a recognized worldwide need for educational programs focusing on nuclear science and technology due to the aging nuclear workforce and declining nuclear educational programs. European communities have recognized the need for similar research and educational programs and as a result have developed the Strategy for Allied Radioecology (STAR) Alliance (<http://www.star-radioecology.org/>). Similar efforts are underway in the United States through the National Center for Radioecology (NCoRE) managed by the Savannah River National Lab (SRNL) of which Clemson University is a key partner. With this grant the new faculty member will have the tools and support needed to develop a world-class research and educational program given the existing strengths in the current NEES program, the location of NCoRE close to Clemson University, and existing collaborations between current NEES faculty and SRNL scientists.

Principal Investigator: Timothy A. DeVol, devol@clemson.edu

MIT Nuclear Education Faculty Development Program

Executive Summary:

Over the past five years the MIT Department of Nuclear Science and Engineering has hired nine new faculty members, and our strategic plan calls for continued faculty hiring at a rate of roughly two per year for the next several years. The continuing renewal of our faculty is the single most urgent and important challenge the Department faces. The MIT Nuclear Education Faculty Development Program is designed to support each stage of the faculty development process, including searching, recruiting, startup, mentoring, promotion, and retention. As part of this Program, we are specifically requesting NRC resources to support the career development of the two most recent junior faculty members to have been hired into the Department: Assistant Professor Emilio Baglietto, whose work is focused on computational thermal hydraulics; and Assistant Professor Scott Kemp, whose research is concerned with nuclear security and nonproliferation. The NRC support, which will augment resources provided by the Department and other units at MIT, will help these junior faculty members to establish a strong foundation in research, teaching, and service. The NRC funds will be used for summer salary support, new course development, the development of research proposals, travelling and conference attendance, and other startup activities. The Department will also provide a range of other services in support of these young faculty members, including mentoring, performance assessments, administrative support, and general support for their teaching and research activities. The MIT Nuclear Education Faculty Development will thus benefit the junior faculty members themselves, the students in the Department, the Department's ability to continue to recruit and retain outstanding young faculty members, and the country's ability to educate a new generation of nuclear engineering leaders who will shape and implement the future national nuclear agenda.

Principal Investigator: Richard Lester, rklester@mit.edu

Ohio State University Nuclear Engineering Faculty Development Program

Executive Summary:

The goal of this proposed Ohio State University Nuclear Engineering Faculty Development Program is to provide necessary funding, in addition to the regular start-up funding, to attract, recruit, and retain a highly qualified individual to the Nuclear Engineering Program (NEP) at The Ohio State University (OSU). This Program is particularly important because the demand for such individuals across all sectors of the nuclear industry, including nuclear power utilities, national laboratories, vendors, and academia, is very high and still rising, but the supply of such individuals who can effectively fit into an academic setting is very limited. The continuing increase in student enrollment of nuclear engineering graduate students and minor students, and the plan to establish a nuclear engineering major at Ohio State make it essential to recruit high quality faculty into our Program. Consistent with the academic calendar and the anticipated timing of the start of this grant proposal, we plan to initiate a new search for a tenure track junior faculty member in nuclear engineering in the spring of 2013. The focus of the search will be an individual with a specialty area in thermal materials. It is expected that the new hire start at Ohio State in the autumn semester 2013.

The requested funding from the US Nuclear Regulatory Commission will enable the new faculty member to initiate new programs that can contribute significantly to workforce training and first class research primarily in nuclear materials in support of life extension of existing nuclear power reactors and design and construction of advanced reactors. The new faculty will expand OSU NEP's activities in areas of nuclear materials, which will be compatible with on-going activities in areas of advanced instrumentation and control, reactor safety, probabilistic risk assessment, software reliability, reactor thermal hydraulics, and new reactor designs. If this proposal is selected for award, the funding from this grant program will be used to support this new hire and help OSU build a stronger NE program.

Principal Investigator: Tunc Aldemir, aldemir.1@osu.edu

PENNSYLVANIA STATE UNIVERSITY'S FACULTY DEVELOPMENT GRANT FOR SENSOR DEVELOPMENT AND CONTROL METHODS IN NUCLEAR POWER PLANTS

Executive Summary:

Nuclear energy has been shown to be a clean, safe, reliable and cost effective source of energy which will be needed to fulfill the portfolio of energy resources. The Pennsylvania State University is committed to having a prominent Nuclear Engineering Program with a strong emphasis in nuclear power, which is in part a reflection of its history but is primarily because of the industry demand for the nuclear engineers graduating from Penn State's program. The Nuclear Engineering Program is an academic program offering the full range of degrees that is housed within the Department of Mechanical and Nuclear Engineering. The Program has strong support throughout the institution including that of the College of Engineering. Moreover, there is statewide interest given the many nuclear power plants in the Commonwealth and the presence of industries related to the field. The Nuclear Engineering Program has the unique advantage of coexisting in a Department with an equally strong Mechanical Engineering Program, which is critical to the success of this proposal given the strong interdisciplinary nature of the proposed effort.

This proposal seeks start-up funds for a new, junior level, tenure-track faculty member in the Department of Mechanical and Nuclear Engineering (MNE) who has expertise in control methods and sensor development that is relevant to nuclear power plants. The hire will have a significant impact on our ability to conduct research and educate students in areas of nuclear power that are of crucial interest to the Commonwealth and to the nation. Support from the United States Nuclear Regulatory Commission (NRC), which in part is matched by the institution, will provide a platform for the integration of interdisciplinary research, innovation, and teaching in the area of advanced nuclear power technologies. The new faculty member will be a focal point for collaboration of existing faculty in the MNE Department and the College of Engineering who are already working on topics related to nuclear power. Penn State will provide an ideal environment for a junior faculty member to be successful given the academic strength of our programs; the ability to collaborate within the department, College and university; our strong mentoring program; and the quality of students available.

Principal Investigator: Karen A. Thole, kthole@psu.edu

Executive Summary:

This proposal is requesting funds to hire a new faculty member in a tenure track position. The new faculty, who will join the mechanical engineering department, will have a degree in Nuclear Engineering or closely related discipline to teach and conduct research activities to improve and expand the course offering of our newly established nuclear engineering minor within the mechanical engineering department. The new faculty member will collaborate with other faculty members who are teaching Nuclear Engineering minor courses to strength the course offering. The faculty development grant will help in several components including but not limited to teaching, curriculum development, and research. The new faculty will directly contribute to provide an indispensable new expertise (which does not currently exist) to the faculty pool available for teaching Nuclear Engineering courses.

Principal Investigator (PI): Dr. Yousri Elkassabgi, Y-Elkassabgi@tamuk.edu

UCB Department of Nuclear Engineering Faculty Development Program

Executive Summary:

The Department of Nuclear Engineering at the University of California, Berkeley proposes a faculty development program to support the new faculty member to be elected and appointed as a tenure-track, Assistant Professor, as a result of our current faculty search. This funding will ensure that the new faculty member has sufficient funds to begin developing his or her independent research program and new courses, with funded graduate students and summer salary. Furthermore, the Department of Nuclear Engineering will establish a mentoring committee consisting of the P.I. and co-P.I.s as an additional resource to advise the new, junior faculty member on research, teaching and University service matters. The faculty mentoring committee will consist of Professors van Bibber, Vujic and Ahn who have an excellent track record of mentoring junior faculty. However, all funds from this award will be made available to the new Assistant Professor and no administrative or personnel funds have been budgeted for the mentoring committee within this proposal. The new faculty member will be asked to provide a yearly self-assessment that describes the support of graduate students and post-doctoral researchers, research activities, publications and presentations, and service to the University and research community. This yearly self-assessment will be discussed with the mentoring committee, and assist the new faculty member in preparing for his or her merit, mid-career and tenure reviews.

Principal Investigator: Karl van Bibber, karl.van.bibber@nuc.berkeley.edu

University of Illinois Nuclear Engineering Faculty Development Program

Executive Summary:

This program is designed to attract, develop and three recently hired junior faculty member and up to two new junior faculty members (hiring underway for new positions starting August 2013 or earlier) in Nuclear Engineering at the University of Illinois at Urbana-Champaign. The resources from this program will be used to provide the foundation for these new faculty members to establish productive university careers in the nuclear industry. The support and resources will permit the junior faculty members to each establish strong teaching, research and professional service activities. The financial resources from the NRC will be used for (a) faculty release time and summer salary support, (b) acquisition of critical research and teaching equipment and facilities, and (c) travel and conference attendance. Matching support provided by the Department and the University will be used for a graduate students to work with the faculty research and teaching efforts. In addition, the Department will provide other considerations to support the development of the junior faculty members, including mentoring, performance evaluation, teaching support, and research support. These resources will provide the necessary foundation for the successful development of junior faculty members in nuclear engineering at the University of Illinois.

Principal Investigator: James F. Stubbins, jstubbin@illinois.edu

Faculty Development Grant Program

Executive Summary:

The objective of this program is to provide up to three years of financial support to a new junior faculty member, helping him/her to succeed as a faculty member in their academic career at the University of Michigan.

This program will benefit the junior faculty member by providing them critical financial support early in their academic careers, including: (1) summer support to prepare teaching materials and research grants, (2) support for graduate students early in the faculty members' academic careers, (3) support for supplies and research equipment critical for the faculty members' research, and (4) funds to travel to conferences to present papers and interact with colleagues. All of these items will contribute towards the success of the faculty member to obtain tenure in Nuclear Engineering and Radiological Sciences at the University of Michigan.

Principal Investigator: Ronald M. Gilgenbach, rongilg@umich.edu

Missouri S&T Nuclear Engineering Faculty Development Program (2013-2016)

EXECUTIVE SUMMARY

Missouri University of Science & Technology (S&T) is pleased to submit this Faculty Development proposal for a new probationary Nuclear Engineering (NE) tenure-track faculty member to be hired in Fall 2013 to replace a retiring faculty member. The faculty development grant will greatly help in preparing the new faculty member for obtaining promotion and tenure at S&T at the end of his/her six year probationary period. This grant will also help in the retention of the new faculty member by providing him with resources to build his/her research program, including graduate student support, laboratory equipment, travel to professional meetings, and to publish in refereed journals. Additionally, the research expertise of the new faculty member will strengthen the nuclear engineering program at S&T by reinforcing our current research areas in radiochemistry and nuclear materials. In summary, this faculty development grant will help recruit, mentor and retain the new faculty member, thus maintaining our full-time tenured/track faculty strength at 7.

Principal Investigator: Arvind Kumar, kumar@mst.edu

AWARD FOR A PROSPECTIVE JUNIOR FACULTY DEVELOPMENT IN SUSTAINING EXPLOSIVE GROWTH OF THE UNIVERSITY OF UTAH NUCLEAR ENGINEERING PROGRAM (UNEP)

Executive Summary:

The Utah Nuclear Engineering Program (UNEP) has hired in 2009 a senior faculty who also serves as its Director, with the goal to revitalize and advance the program. In January 2011 we have hired assistant tenure track faculty that was supported by the NRC Faculty Development grant. Thanks to this grant, this young faculty was able to secure close to \$1.3 mil in research funding by the fall of 2012. We now have two new openings for junior tenure-track faculty to be hired in 2013. Fully supported by the University, the program is expanding and growing in its research and is advancing its curriculum in targeting the competency gaps in nuclear engineering discipline following the NRC mission and expectations. The Minor in Nuclear Engineering was established in 2010 representing the only one undergraduate nuclear engineering degree education in the State of Utah. As of fall 2012, we have graduated four students from the minor program who all moved into our graduate program. Our graduate program has been revised to cover the areas of interest to NRC, DHS and DoE, in preparing students for national nuclear workforce. We became the fastest growing nuclear engineering program in the country, with 29 graduate students and only two tenured faculty as of fall 2012. This award therefore, will be fulfilling our objectives to sustain our growth and yet expand it beyond our current scopes. This funding will be used to support one of these two incoming young faculty offering a highly competitive start-up package; the funding will be given to that faculty to start with the competitive research (in setting up the laboratory, supporting the graduate students, and writing winning proposals and high quality papers), to contribute in the development of new curriculum (creating new and unique courses in the field broad as nuclear environmental engineering and nuclear fuel cycle), and for travels to conferences, workshops and meetings, as national exposure is very important for a young faculty to learn of the opportunities, develop collaborations and recruit the outstanding students. This award will importantly benefit our program in helping us to create a highly competitive start-up package for newly hired young faculty.

Principal Investigator: Tatjana Jevremovic, Tatjana.Jevremovic@utah.edu

FACULTY DEVELOPMENT PROGRAM TO INTEGRATE NEW FACULTY IN NUCLEAR ENGINEERING RESEARCH AT UTAH STATE UNIVERSITY

Executive Summary:

Utah State University's Faculty Development Program is focused on two newly hired tenure-track assistant professors that will strengthen and expand USU's nuclear research and future workforce contributions. Dr. Aaron Katz has expertise and training for developing new computational tools in Thermohydraulics. Dr. Jason Quinn's expertise is in systems engineering and life-cycle analysis. These two new faculty members complement and expand existing expertise within the Mechanical and Aerospace Engineering Department such that a nuclear engineering emphasis option can be included in its ABET accredited mechanical engineering BS degree. Moreover, their research will be integrated into the newly established Thermohydraulics and Materials Properties (TMP) Research Center. Specifically, the proposed program:

- 1) Expands MAE's nuclear research and education capacity by cultivating research and teaching opportunities for two new highly qualified faculty members with expertise in computational thermohydraulics and life-cycle analyses of energy systems,
- 2) Establishes the new professors' research programs as integral elements of TMP to further enable collaboration within the nuclear research community and sustained research success.

As the previous 2009 USU Faculty Development Program provided essential support that enabled nuclear engineering research and education to achieve critical mass and momentum at USU, this new Faculty Development Program will strengthen and expand USU's nuclear research and future workforce contribution to new levels.

Principal Investigator: Byard D. Wood, byard.wood@usu.edu

VCU Nuclear Engineering Faculty Development Program

Executive Summary:

The primary objective of VCU's Nuclear Engineering Faculty Development Program is to attract, retain and successfully mentor a new highly-qualified tenure track Nuclear Engineering Faculty member and to facilitate their continued success in research, teaching and service at VCU. At the same time, the program seeks to continuously enhance the qualifications and the expertise of our recently hired tenure-track faculty so that they can pursue additional innovative and multidisciplinary research directions and increase the course offerings to areas of nuclear science and technology currently unavailable in VCU's curriculum.

Principal Investigator: Dr. Sama Bilbao y León, sbilbao@vcu.edu