

# DOE-FIU SCIENCE & TECHNOLOGY WORKFORCE DEVELOPMENT PROGRAM

## STUDENT SUMMER INTERNSHIP TECHNICAL REPORT

June 6, 2011 to August 12, 2011

### **Office of Environmental Management International Program**

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#### Prepared for:

U.S. Department of Energy  
Office of Environmental Management  
Under Grant No. DE-EM0000598

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## **ABSTRACT**

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During summer 2011, DOE Fellow Heidi Henderson was given the opportunity to intern for the Office of Environmental Management (EM) Office of Technology Innovation and Development (EM-30) at DOE Headquarters in Washington, DC. During this time, Ms. Henderson assisted Ms. Ana Han, Lead Foreign Affairs Specialist for EM's International Program. EM's International Program supports EM's mission of reducing the nuclear waste footprint from the Cold War Era by seeking international opportunities for collaborative research in the areas of waste management, soil and groundwater, decontamination and decommissioning (D&D), and spent nuclear fuel/spent nuclear material (SNF/SNM). This report provides an overview of the tasks that Ms. Henderson completed in support of the EM International Program.

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# 1. INTRODUCTION

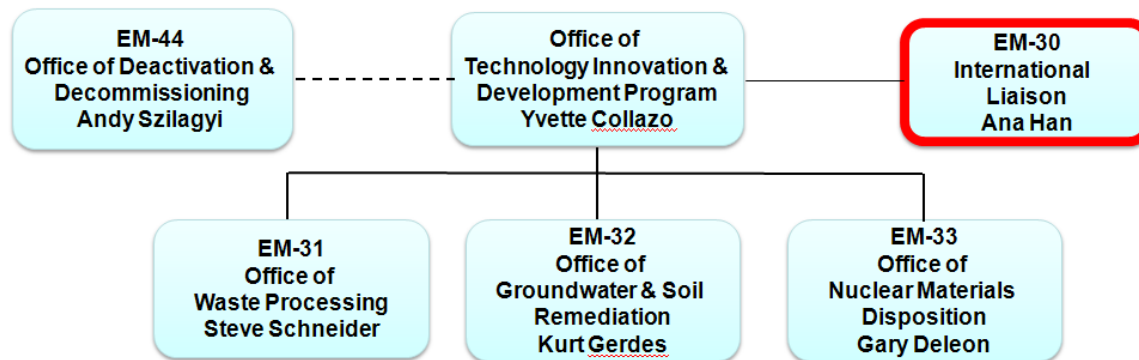
In 1989, the Department of Energy's (DOE) Office of Environmental Management (EM) program was reorganized in order to refocus its commitment to the environmental clean-up. The environmental clean-up refers to the waste left behind from the Cold War Era when the United States' main priority was to produce nuclear weapons. Nuclear weapons were produced by placing uranium into a nuclear reactor. This process produced a large amount of toxic waste that was placed in unreliable containers and stored underground. Over time, these containers have begun to leak, and have contaminated the soil and groundwater. Thus, EM has dedicated themselves to "completing the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and government-sponsored nuclear energy research (EM 2011)."

To assist in accomplishing EM's goals, EM's Office of Technology Innovation and Development has established an International Program in order to reach out to other countries for possible areas of collaboration where innovative techniques are desired. The areas of collaboration pursued through the program are consistent with the Office of Technology Innovation and Development divisions:

- EM-31 Office of Waste Processing
- EM-32 Office of Groundwater and Soil Remediation
- EM-33 Office of Nuclear Materials Disposition
- EM-44 Office of Decontamination and Decommissioning.

The EM Leadership Pyramid is included in Appendix A.

A schematic of the Office of Technology Innovation and Development is shown below.



**Figure 1. Organizational flow chart of the Office of Technology Innovation and Development.**

More specifically, EM's International Program promotes the sharing of lessons learned by leveraging national and international expertise and experience that have the potential to reduce the cost and timeline of the EM cleanup mission. In addition, it is aligned with the EM Technology Roadmap and Multi-year Program Plan, increases key international collaborative relationships, and establishes and maintains strong international cooperative ties with international organizations (i.e. IAEA, NEA). For instance, EM has been invited

and will attend the following conferences in the next few months: Migration Conference in Beijing, China; the ICEM Conference in Reims, France; and the AtomEco in Moscow, Russia.

EM has been collaborating with Russia and the UK since 2004 and is currently under contract with both of these countries. Their current proposals serve as an example of how advanced these proposals are. Russia and EM-31 are collaborating on an investigation of the next generation melter technologies, emphasizing the cold crucible induction melters (CCIM). The nuclear waste is categorized into three levels: high level, intermediate level, and low level radioactive waste. In order to dispose of the highly radioactive wastes, it is converted into glass for final disposal; this process is done within the CCIM (Gombert and Richardson 2001). In addition, Russia and EM-32 are investigating mercury remediation technology development.

Currently, UK and EM-31 are in the process of evaluating the cryograb technology for sludge removal. 'Cryograb' is a concept which uses cryogenics (freezing) technology to retrieve waste (i.e., spent fuel) with the benefit of reducing the amount of effluent during recovery of the waste (Banford 2011). The second proposal with the UK is in collaboration with EM-33 in the area of nuclear materials management and disposition. To clean up the nuclear waste is to provide a cleaner, safer environment for the next generation.

## **2. EXECUTIVE SUMMARY**

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This research work has been supported by the DOE-FIU Science & Technology Workforce Initiative, an innovative program developed by the US Department of Energy's Environmental Management (DOE EM) and Florida International University's Applied Research Center (FIU-ARC). During the summer of 2011, a DOE Fellow (Ms. Heidi Henderson) spent 10 weeks doing a summer internship at DOE Headquarters for the Office of Environmental Management International Program under the supervision and guidance of Ana Han, Lead Foreign Affairs Specialist. The intern's project was initiated on June 6, 2011, and continued through August 12, 2011, with the objective of assisting EM's International Program.

The International Program is an effective mechanism in coordinating national laboratory, university, and industry activity at an international level that produces tangible results in the cleanup efforts by identifying challenges of mutual concern with foreign countries in the areas of waste management, soil and groundwater, decontamination and decommissioning (D&D), and spent nuclear fuel/spent nuclear material (SNF/SNM).

Ms. Henderson assisted in the preparation of speeches, presentations, and position papers for senior management which communicated EM program goals and initiatives; assisted in the coordination of EM's participation in international conferences; assisted in the preparation of foreign visits; and facilitated in the preparation of the government-to-government agreements for radioactive waste research and development cooperation that advance EM program goals.



### **3. EM INTERNATIONAL PROGRAM CONTRIBUTIONS**

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This section provides insight to the major tasks Ms. Henderson completed during her internship under the supervision of Ms. Han.

#### **3.1 EM International Cooperative Program Action Table**

The EM International Cooperative Program Action Table is a running document that provides basic information to persons interested in recent or forthcoming foreign travel or visits as well as conferences and actions pertaining to EM. The spreadsheet contains the following information: EM division responsible for the event, the foreign country involved, where and when the event will take place, and the status of the event. Ms. Henderson would keep track of daily exchanges between Ms. Han and respective countries via emails and ensure that the spreadsheet was current. At the end of the month, Ms. Henderson would forward it on to the EM Directors for their concurrence then onto EM's upper management for their files. A copy of the Action Table for July has been included in Appendix B.

#### **3.2 EM International Program Highlights**

The EM International Program Highlights is a reference document that provides pertinent information on executed government-to-government agreements and collaborative research with foreign countries as well as international conferences. Ms. Henderson maintained its accuracy throughout the summer.

#### **3.3 International Conference on Environmental Remediation and Radioactive Waste Management**

The International Conference on Environmental Remediation and Radioactive Waste Management (ICEM) promotes a broad global exchange of information on technologies, operations, management approaches, economics and public policies in the critical areas of environmental remediation and radioactive waste management (ASME 2011). DOE EM's Assistant Secretary has been invited as plenary speaker at the conference and representatives from DOE EM and national laboratories are hosting a number of sessions in the conference. Ms. Henderson was designated as the point of contact and was responsible for bi-weekly conference calls to coordinate EM's efforts in the conference. In addition, Ms. Henderson was also assigned to review professional papers submitted to the conference.

#### **3.4 UK Nuclear Decommissioning Agency Visit**

On June 8<sup>th</sup>, the UK Nuclear Decommissioning Agency (NDA) met with Ines Triay, former DOE EM Assistant Secretary, to discuss objectives and goals of environmental clean-up. Both sides provided an overview of the main areas of work that is being conducted. For the U.S., tank waste retrieval and immobilization, groundwater and soil remediation, deactivation and decommissioning, and spent nuclear materials management were specified. The U.K. subjects included reprocessing of waste, vitrification, spent fuel management (including handling of degraded fuel and sludges in the storage ponds), plutonium

management, and decommissioning. The majority of the meeting was focused on contract types and strategies. Ms. Henderson attended the meeting and prepared the meeting minutes. The UK NDA and EM have created a pamphlet titled “Across the Pond” to portray their ongoing relationship. Ms. Henderson provided an article based on their meeting. A copy of the article is included in Appendix C.

### **3.5 President Suh of Korea Advanced Institute of Science and Technology Visit**

On July 8<sup>th</sup>, the President of Korea Advance Institute of Science and Technology (KAIST) met with Deputy Secretary Poneman in hopes of identifying possible future collaborations in KAIST’s main focus areas (energy, environment, water, and sustainability - EEWS). More specifically, Dr. Suh was interested in discussing KAIST’s recent accomplishments with the On-Line Electric Vehicle (OLEV) and the Mobile Harbor (MH), and to address the participation of KAIST in Oak Ridge’s National Nuclear Energy Hub. In preparation for the meeting, Ms. Henderson prepared the briefing memorandum for Deputy Secretary Poneman by collecting data on KAIST and coordinating efforts with the Office of Nuclear Energy (NE), the Office of Energy Efficiency and Renewable Energy (EERE), and the Office of Science (SC). Each office provided input for the briefing memorandum to Mr. Poneman. Ms. Henderson attended the meeting and prepared the meeting minutes. A copy of the briefing memorandum has been included in Appendix D.

### **3.6 Russian Rosatom Visit**

On August 8th, Mr. Vyacheslav Pershukov (Rosatom) and a Russian delegation met with NE and EM to discuss possible areas of collaboration. In preparation for the meeting, Ms. Henderson researched the Rosatom to understand if their goals were consistent with EM’s. Mr. Pershukov’s main focus is not on nuclear waste remediation; however, Mr. Bolshov, a Russian delegate, was interested in meeting with Ms. Han to discuss a proposal from the Institute of Nuclear Safety Energy (IBRAE) to continue collaboration with the Advanced Simulation Capability for Environmental Management (ASCEM). Thus, Ms. Henderson prepared an introductory presentation on EM’s International Program for the remaining delegates that included previous and present collaborations with Russia. She also prepared an informative paragraph for the EM Weekly that focused on key departmental news. A copy of the EM Weekly for August 12<sup>th</sup> is included in Appendix E.

### **3.7 EM-30 Quarterly Period Review**

EM-30 is required to present their accomplishments on a quarterly basis throughout the year. Ms. Henderson developed 2 slides for Ms. Han on the proposals chosen for FY11 and the international conferences they will be attending in the near future. A copy of the Quarterly Period Review is included in Appendix F.

## 4. CONCLUSION

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In order to achieve EM's goal of reducing the footprint left behind by the Cold War, it is imperative that the DOE EM International Program continue to collaborate with countries around the world as they are facing similar adverse environmental effects. The International Program has developed and maintained relationships with countries across the globe and continues to expand collaborative technology development with international partners. Without the International Program, we would not have the advantage of working with Russia and the UK in transformational solutions. This work allows for the advancement of technologies and sharing of lessons learned in hopes of reducing the cost and time of the mission. The tasks completed by Ms. Henderson as well as all those involved in the United States and around the world in EM's mission are providing a cleaner, safer environment for the next generation.

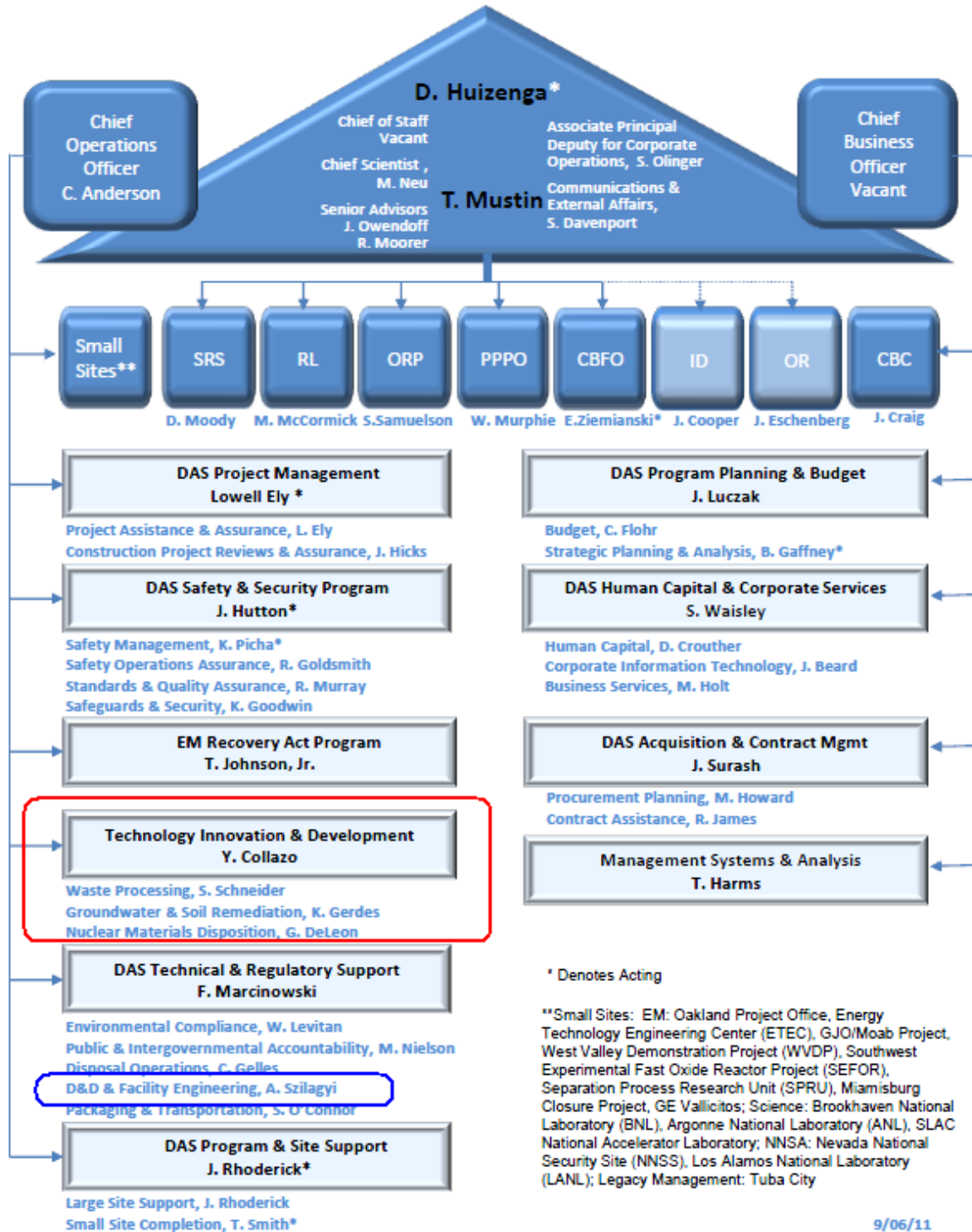
## 5. REFERENCES

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1. *Office of Environmental Management (EM)*. U.S. Department of Energy. August 18, 2011. September 12, 2011. <http://www.em.doe.gov/Pages/EMHome.aspx>
2. Dirk Gombert and John G. Richardson. *Cold Crucible Induction Melter Technology: Results of Laboratory Directed Research and Development*. Idaho National Engineering and Environmental Laboratory. Pg 1. September 2001. September 15, 2011. <http://www.inl.gov/technicalpublications/Documents/3024978.pdf>
3. Anthony Banford. *Approach to Technology - Signature Research on Legacy Waste and Decommissioning at the UK's National Nuclear Presentation to the Nuclear Decommissioning Conference Manchester, UK*. National Nuclear Laboratory. April 5, 2011. September 15, 2011. <http://www.nuclearenergyinsider.com/decom/presentations/Day1/ANTHONY-BANFORD.pdf>
4. *14<sup>th</sup> International Conference on Environmental Remediation and Radioactive Waste Management*. ASME. 1996-2011. September 8, 2011. <http://www.asmeconferences.org/icem2011/>

# APPENDIX A

## The EM Leadership Pyramid



## **APPENDIX B**

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### **EM International Cooperative Program Action Table**

**ACTION TABLE****Technology Innovation & Development  
(EM-30)**

<b>Subject</b>	<b>Lead Office</b>	<b>International Meeting (yes or no)</b>	<b>Date of Event</b>	<b>Location</b>	<b>Purpose</b>	<b>Status</b>
<b>Canada's AECL Canadian Nuclear Legacy Liabilities Program</b>	J. Marra EM-30 Han, EM-30	Yes	June 13-18, 2011	Canada	Meeting took place to identify areas of potential future collaboration b/w AECL and EM.	Draft document highlighting potential areas of collaboration with AECL sent to Directors for input/review on July 15 <sup>th</sup> . Future telecon planned to discuss path forward.
<b>Visit from President Suh of Korea Advanced Institution of Science and Technology (KAIST)</b>	Han, EM-30	No	July 8 <sup>th</sup> at 3:30 pm	WDC	Poneman met with President Suh of KAIST to discuss potential energy cooperation in the areas of Energy, Environment, Water, and Sustainability.	President Suh extended an invitation to Poneman and Secretary Chu to visit KAIST in Daejeon, Korea.
<b>Argentina JSCNEC</b>	Han, EM-30; Szilagyi, EM-44	No	July 25-28, 2011	Carlsbad, NM	Annual Meeting led by State Dept to discuss Nuclear Energy Cooperation with Argentina.	Disapproved due to travel budget restrictions. EM provided a paper on Decommissioning.
<b>Visit from Mr. Vyacheslav Pershukov,</b>	Han, EM-30	No	August 8, 2011	WDC	Visit from Mr. Vyacheslav Pershukov, Rosatom	EM will make a presentation and discuss the

<b>Rosatom Deputy Director General and Director of Scientific and Technical Complex</b>						and Russian Delegation to discuss R&D with NE and EM; tour national laboratories.	IBRAE/ASCEM proposal.
<b>International Commission on Glass Technical Committee</b>	Marra, EM-30	Yes	September 3-10, 2011	UK		Int'l Committee examines the chemistry of glass and glass forming melts.	Disapproved due to travel budget restrictions.
<b>German Delegation Visit</b>	Han, EM-30	No	September 8 <sup>th</sup> or 9 <sup>th</sup> (TBD)	WDC		Visit from the BMWi, Federal Ministry of Economics and Technology; sign MoU with NE & Sandia/WIPP; visit Sandia/WIPP.	EM is to participate; coordinating with NE.
<b>UK'NNL (National Nuclear Laboratory) Visit</b>	Han, EM-30	No	September 13 <sup>th</sup> and 14 <sup>th</sup>	WDC, Room 8E-090 (13 <sup>th</sup> ); Room GH-035 (14 <sup>th</sup> )		Visit from UK'NNL to discuss potential areas of collaboration.	EM-30 is coordinating the meeting.
<b>Migration Conference and Engagement with Chinese Nuclear Leaders</b>	Han, EM-30	Yes	September 15-23, 2011	China		Mary Neu invited.	EM-30 is arranging side meetings with government and nuclear industry officials to discuss topics of mutual interest.
<b>International Conference on Environmental</b>	Marra, EM 30 and Han, EM-30, Szilagyi,	Yes	September 25-29, 2011	France		The 14 <sup>th</sup> ICEM Conference on Environmental	Collazo received ICEM invitation. Han/Marra org track and panels.



<b>Remediation and Radioactive Waste Management (ICEM) 2011</b>	EM-44				Remediation and Radioactive Waste Management	EM participated in telecon to discuss status on July 20. Need to confirm EM-1 participation.
<b>International Atomic Energy Agency Contact Expert Group (IAEA CEG)</b>	DeLeon, EM-33	Yes	October 6-7, 2011	Stockholm, Sweden	IAEA CEG meeting and workshop on SNF processing and disposal to assist Russia and support DOE-Rosatom Joint Statement on Nuclear Cooperation.	Invitation from State Dept and IAEA for EM participation forthcoming. IAEA may sponsor EM travel for this meeting.
<b>Korea Joint Standing Committee on Nuclear Energy Cooperation (JSCNEC)</b>	Han, EM-30	Yes	October 17, 2011 (week of)	Korea	State Dept leads meeting on joint nuclear energy cooperation	EM invited.
<b>AtomEco 2011</b>	Han, EM-30	Yes	October 31 – November 1, 2011	Moscow, Russia	V International Conference and Exhibition	EM invited.
<b>International Symposium on Radiation Safety Management (ISRSM)</b>	Han, EM-30	Yes	November 2-4, 2011	Gyeongju, Korea	To explore issues in advancement and deployment of radiation safety mgt techs and to build strong collaborative relationships.	EM-2 invited.
<b>Taiwan JSCNEC</b>	Han, EM-30	Yes	December 5-9 2011	Taiwan	State Dept leads meeting on joint nuclear energy cooperation.	EM invited.

<b>Public Limited Company for Radioactive Waste Management (PURAM) MOU</b>	DeLeon, EM-33 Yes	TBD in FY2012	Hungary	Fulfill MOU commitments to exchange information on dry storage facilities.	Proposed team identified. Visit deferred to FY12.
<b>Joint Convention 4<sup>th</sup> Review Meeting</b>	Nigam, EM-33 Yes	May 2012	Vienna, Austria	Joint Convention on the Safety of Spent Fuel Mgmt and on the Safety of Radioactive Waste Mgmt.	US National Report in preparation by Interagency Working Group led by EM-43. Publication before October 14, 2011.

### Technical & Regulatory Support (EM-40)

Subject	Lead Office	International Meeting (yes or no)	Date of Event	Location	Purpose	Status
IAEA (International Atomic Energy Agency)	Szilagyi, EM-44	Yes	September 19-23, 2011	Vienna, Austria	55 <sup>th</sup> IAEA General Conference	EM-44 unable to attend due to travel budget restrictions. Secretary Chu will attend; EM added input to briefing memos.
IAEA (International Atomic Energy Agency) Side Event	Szilagyi, EM-44	Yes	September 21, 2011 from 13:00 – 15:00	Vienna, Austria	Representatives of Member States to participate in discussions concerning D&D and ER programs worldwide.	EM-44 unable to attend due to travel budget restrictions.
Nuclear Energy Agency's (NEA) Technical Advisory Group (TAG) 51	Szilagyi, EM-44	Yes	October 24-28, 2011	Karlsruhe, Germany	NEA-WPDD is hosting TAG 51 to present D&D projects.	EM-44 is interested in participating.
IAEA-IDN (International Atomic Energy Agency - International Decommissioning Network) Meeting	Szilagyi, EM-44	Yes	November 1-4, 2011	Vienna, Austria	Annual IAEA-IDN Meeting	Official invitation is forthcoming.
Joint Convention	D. Tonkay,	Yes	May 2012	Vienna, Austria	Peer review of	US National

<b>4<sup>th</sup> Review Meeting</b>	EM-43, J. Joyce, EM-43			spent fuel and waste management safety.	Report in preparation by Interagency Working Group led by EM-43. Publication before October 14, 2011.	
<b>Nuclear Energy Agency's (NEA) Technical Advisory Group (TAG) 53</b>	Szilagy, EM-44	No	Fall of 2012	TBD	NEA-WPDD TAG has requested that the US/ DOE/ EM /PPPO host TAG 53 in the Fall of 2012.	Preliminary Stages
<b>International Atomic Energy Agency (IAEA) Net-Enabled Waste Mgmt Data Base</b>	D. Tonkay, EM-43	No	October 2012	Vienna, Austria	Provide IAEA with radioactive waste management data.	US preparing annual submission and test batch loading.

## UKNDA and DOE/EM Activities

Subject	Lead Office	International Meeting (yes or no)	Date of Event	Location	Purpose	Status
UK NDA-DOE EM 9th Standing Committee Meeting	Han, EM-30	Yes	October /Nov 2011 (TBD)	UK	9th UK NDA-DOE EM Standing Committee Meeting	Planning stages

## APPENDIX C

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### ACROSS THE POND ARTICLE Fall 2011 UK'NDA Tony Fountain Visit Washington DC June 8<sup>th</sup>, 2011

The US DOE Office of Environmental Management hosted a meeting June 8<sup>th</sup> for the UK Nuclear Decommissioning Authority senior delegation. The visitors, Tony Fountain (CEO), John Mathieson, (Head of International Relations), Sean Balmer, (Commercial Director), Mark Lesinski, (Executive Director of Delivery) and Jon Phillips (Communications Director) were enthusiastic to discuss the progress that the US has made in their nuclear clean-up activities resulting from roughly five decades of nuclear weapons development and government-sponsored nuclear energy research.

Ines Triay and Tony Fountain led discussions concerning objectives and goals of environmental clean-up in their countries. Both sides provided an overview of the main areas of work that is being conducted. For the U.S., tank waste retrieval and immobilization; groundwater and soil remediation; deactivation and decommissioning; and spent nuclear materials management were specified. While the U.K. subjects included reprocessing of waste; vitrification; spent fuel management (including handling of degraded fuel and sludges in the storage ponds); plutonium management; and decommissioning. The majority of the meeting was focused on contract types and strategies.



## **APPENDIX D**

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### **Briefing Memorandum to Deputy Secretary Poneman**

## **Meeting with Nam Pyo Suh, President of Korea Advanced Institute of Science and Technology (KAIST)**

Deputy Secretary's Office

Friday, July 8<sup>th</sup>, 2011 at 3:30 p.m.

**Meeting requested by** Soon Heung Chang, Professor of Nuclear and Quantum Engineering,  
KAIST

**Briefing prepared by** Ana M. Han

**EVENT** You will be meeting with Dr. Suh regarding potential energy cooperation with KAIST in the areas of Energy, Environment, Water, and Sustainability. Dr. Suh may extend an invitation to you and/or Secretary Chu to visit KAIST in Daejeon, Korea. KAIST was founded with government funding and was initially staffed with a number of Korean engineering and science talents educated in the United States. KAIST continues to be Korea's foremost center of strategic research and development (R&D) projects. The University helped pioneer the establishment of competitive research oriented graduate school programs in Korea.

**Press: Closed**

### **LOGISTICS**

- None. Office meeting.

### **YOUR ROLE/CONTRIBUTION**

- To show support for the many successful ongoing collaborations between DOE-supported scientists and Korean researchers in the areas of Environmental Management, Fusion Energy Sciences, High Energy Physics, Nuclear Physics, Energy Efficiency and Renewable Energy, and Nuclear Energy.
- In addition to learning about DOE potential areas of energy cooperation, Dr. Suh would like to discuss the following:
  - Development and Deployment of KAIST's On-Line Electric Vehicle (OLEV);
  - KAIST's Mobile Harbor (MH);
  - Participation of KAIST in the Oak Ridge's National Nuclear Energy Hub.

### **PROGRAM NOTES**

- **KAIST Background:** KAIST is currently conducting research projects commissioned by the government and private businesses with research grants totaling 463 billion won (US\$320 million). In terms of ownership of intellectual property rights, KAIST holds 2,694 domestic patents and 723 international patents.



KAIST focuses on various research areas, including nuclear environmental engineering and radioactive waste management and nuclear materials. In the field of nuclear environmental engineering and radioactive waste management, the center of attention is education and research on nuclear chemical engineering, radioactive management and health physics which includes nuclear fuel cycle, radioactive waste management and disposal, performance assessment of waste disposal site, spent fuel technology and interim storage, water chemistry and isotope separation.

- The DOE Office of Environmental Management has supported research collaborations with Korea Hydro Nuclear Power's Nuclear Engineering and Technology Institute (KHNP-NETEC).
  - In 2007, the collaboration began with the cold crucible induction melters (CCIM) demonstration campaigns to vitrify an SRS Sludge Batch 4 (SB4) surrogate waste composition.
  - In 2008, the KHNP completed construction and initiated operations of a radioactive CCIM to treat intermediate-level wastes (ILW) at the Ulchin Nuclear Power Plant. This was followed by delivery of an assessment and report from NETEC regarding the lessons learned in FY09.
  
- The DOE Office of Science has supported research collaborations with Korean researchers for the past 34 years starting with collaborations at Fermilab and 13 Korean universities. Currently, Fermilab is exploring accelerator R&D cooperation, Brookhaven National Lab (BNL) and Thomas Jefferson Lab cooperate in Nuclear Physics experiments, and the Korean Superconducting Tokamak Advanced Research (KSTAR) facility continues to be an important resource for U.S. Fusion scientists.
  
- Recent meetings between DOE and Korean officials include:
  - Secretary Chu met with Minister Lee from the Korean Ministry of Education, Science and Technology (MEST) on May 12<sup>th</sup>, 2011 and signed an agreement to facilitate and promote High Energy Physics and Nuclear Physics cooperation.
  - Dr. Brinkman met with the President of the Korean National Research Foundation on March 10<sup>th</sup>, 2011 to discuss science cooperation.
  - On behalf of DOE, OSTP's Dr. John Holdren signed a Fusion Energy Sciences agreement with the Korean's MEST in June 2010.
  
- With the United States and Italy, Korea has been a driving force behind the development and implementation of the International Smart Grid Action Network (ISGAN) since its inception. Korea's engagement in ISGAN is led by the Ministry of Knowledge Economy (MKE) and the Korea Smart Grid Institute (KSGI). KSGI serves as the Operating Agent/Secretariat for the ISGAN Implementing Agreement and has hosted two ISGAN meetings in the past year (November 2010 in Jeju, June 2011 in Seoul). Korea's total financial commitment to ISGAN exceeds \$1 million.
  
- The United States and Korea enjoy a strong relationship in the area of civil nuclear energy. Korea has the fifth largest nuclear power program in the world in terms of

electricity production, and it is actively engaged in the development of advanced reactor and fuel cycle technologies, nuclear safety and safeguards, radioactive waste management, and other related programs.

- Korea is an active partner with DOE on nuclear energy R&D through the International Nuclear Energy Research Initiative (I-NERI) and was DOE's first I-NERI partner.
- **International Framework for Nuclear Energy Cooperation (IFNEC):** Korea has been a supportive Participant country in IFNEC since its formation in 2007 as the Global Nuclear Energy Partnership. In May 2011, Korea hosted the IFNEC Steering Group meeting on Jeju Island. During the meeting, participants addressed the issue of financing for nuclear power. The next Executive Committee Ministerial will be in Warsaw, Poland in September 2011 where the role of the Fukushima Nuclear Power Plant incident will be addressed.

## **ATTACHMENTS**

1. Suggested Talking Points
2. Biography of Nam Pyo Suh, President of KAIST

## **CONCURRENCES**

EM – Ana Han

EM – Shari Davenport

EM – Dae Chung

SC – Corey Cohn

NE– Robert Boudreau / Michelle Scott

EE– Robert Sandoli / Daniel Birns

PI – Ehrping Huangfu / Casey Delhotal

**BIOGRAPHY****Nam Pyo Suh, President of Korea Advanced Institute of Science and Technology (KAIST)**

Dr. Nam Pyo Suh is the President of the Korea Advanced Institute of Science and Technology (KAIST). He assumed this position on July 13, 2006. He is also the Ralph E. & Eloise F. Cross Professor, Emeritus, M.I.T.

Since his inauguration, Dr. Suh has made the goal of making KAIST one of the best science and technology universities in the world. He has initiated major research and educational activities in Energy, Environment, Water, and Sustainability (EEWS), in addition to strengthening the fields related to IT, BT, NT, and complex systems.

In 2007, KAIST received the highest award from the President of Korea for its contributions. Under his leadership, KAIST's worldwide ranking conducted by QS/London Times has jumped from around 200 to 69th overall and 21st in engineering in 2009.

Previously, he had been at MIT since 1970, where he was the Ralph E. & Eloise F. Cross Professor, Director of the Park Center for Complex Systems (formerly the Manufacturing Institute), and the Head of the Department of Mechanical Engineering for ten years from 1991 to 2001. He was also the Founding Director of the MIT Laboratory for Manufacturing and Productivity (1977-1984), The Founder and Director of the MIT-Industry Polymer Processing Program (1973-1984), Head of the Mechanics and Material Division of the Mechanical Engineering Department (1975-1977), and a member of the Engineering Council of MIT (1980-1984 and 1991-2001).

Professor Suh was educated at Buckingham, Browne and Nichols School (1955), MIT (S.B., 1959, and S.M., 1961) and Carnegie-Mellon University (Ph.D., 1964).

Prior to joining the MIT faculty, Professor Suh was with the University of South Carolina (1965-1969), USM Corporation (1961-1965), and Guild Plastics, Inc. (1958-1960, part-time). He is a Fellow and was also a Visiting Professor at Tokyo University, Japan (1989) and Yonsei University, Korea (2001). He was the William Mong Distinguished Fellow at the University of Hong Kong (2002). He invented the foam/straight lamination/forming process, while at Guild Plastics during his undergraduate years, which became a major industrial process, having produced over tens of billions of plastic parts. At USM, he invented the high-pressure USM foam molding process. USM Corporation sponsored his doctoral study and research at Carnegie-Mellon University. Other industrial firms are using his other inventions.

Professor Nam P. Suh is married to Young J. Suh (née Surh). They have four daughters, four sons-in-law, and six grandchildren.

## APPENDIX E

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### OFFICE OF TECHNOLOGY INNOVATION AND DEVELOPMENT WEEKLY REPORT August 12, 2011

#### I. Key Departmental News

##### **Russia's State Atomic Energy Corporation (ROSATOM) Meeting with DOE Senior Management on August 8, 2011**

On August 8, DOE was host to ROSATOM representatives, who met with senior leaders from EM, Science, and Nuclear Energy. The purpose of the visit was to discuss the U.S. experience in civil research and development programs and how these programs are organized within DOE. The Russian delegation was led by Deputy Director General Pershukov responsible for Rosatom's scientific and technical complex. Dr. Bolshov, of the Russian Academy of Sciences Nuclear Safety Institute, was part of the delegation and held side meetings with EM's Office of Groundwater and Soil Remediation to discuss the Advanced Simulation Capability for Environmental Management program. The Russian delegation itinerary included tours of Oregon State University, Idaho National Laboratory, Texas A&M University, Oak Ridge National Laboratory, and Argonne National Laboratory.

**Media Interest:** None

**Program Contact:** Ana M. Han, Heidi Henderson

#### II. Key Departmental News – 14-Day Projection

#### III. Press Inquiries

#### IV. 30-60-90 Date Projections

#### V. FOIA Requests

#### VI. EM Portal Calendar

## **APPENDIX F**

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### **EM-30 Quarterly Period Review**

## CHOSEN FY11 DOE-EM International Collaborative Program Proposals



Office	Country	PROPOSAL (Partners)
EM-31	Russia	Collaboration on Investigation of Next Generation Melter Technologies with Emphasis on Cold Crucible Induction Melters – <i>Automated Control, Modeling, and Innovative Draining Techniques</i> — <b>Continued Task</b>
EM-31	UK	Evaluation of Cryograb Technology for Application to US Sludge Removal Challenges — <b>New Proposal</b>
<b>EM-31 Totals</b>		
EM-32	Russia	Mercury Remediation Technology Development for DOE — <b>New Proposal*</b>
<b>EM-32 Totals</b>		
EM-33	UK	Develop Collaborative Program with the UK in the Area of Nuclear Materials Management and Disposition — <b>Continued Task*</b>
<b>EM-33 Totals</b>		
<b>TOTAL</b>		

\* Proposals that requested funding beyond FY11



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## DOE EM Upcoming International Events

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### Beijing, China

September 15-23, 2011

**Migration Conference**

*13th International Conference on the Chemistry and Migration Behaviour of Actinides and Fission Products in the Geosphere*



### Reims, France

September 25-29, 2011

**ICEM 2011**

*International Conference on Environmental Remediation and Radioactive Waste Management*



### Moscow, Russia

October 31-November 1, 2011

**AtomEco 2011**

*V International Conference and Exhibition on RW , SNF Management, D&D, and ER*



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