

Laboratory – University Partnerships for Safeguards Summer Courses and Internships: LLNL and MIIS as Case Study



Justin Reed • Nuclear Security Education Workshop, July 19-22, 2010
University of Tennessee – ORNL

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Safeguards and nonproliferation expertise at the National Laboratories

- Aging safeguards experts
 - Many safeguards experts at the IAEA are nearing the mandatory retirement age.
 - An internal draft study by ORISE assessed the safeguards expertise of people working on NNSA NA-24 safeguards projects. Of the respondents who self-identified as international safeguards specialists:
 - 80% are over the age of 44
 - 40% are over the age of 55
 - 20% of the total are over the age of 60
 - However, advanced degree holders in the U.S. tend to retire later.



National Laboratories' role in providing nonproliferation and international safeguards expertise

- Need to bridge skills, capabilities, and knowledge of current experts to the next generation.
- Ensure that the National Laboratories continue to play an important role in assisting with global nuclear security efforts
- Many activities supported by the NNSA **Next Generation Safeguards Initiative**

“We are **recruiting and training a new generation of safeguards experts** and expanding our efforts to help other countries pursue nuclear power safely and securely”

- Secretary of Energy Steven Chu

“**Increased investments in** the nuclear infrastructure and **a highly skilled workforce are needed** to ensure the long-term safety, security, and effectiveness of our nuclear arsenal and **to support the full range of nuclear security work to include non-proliferation**, nuclear forensics, nuclear counterterrorism, emergency management, intelligence analysis and treaty verification”

- Nuclear Posture Review Report, April 2010

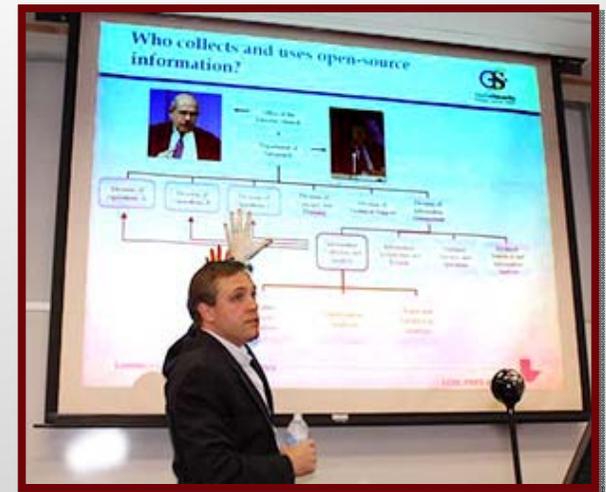
Activities to develop human resources: *university outreach*

- Specialists from the National Laboratories **provide lectures** in relevant courses or university colloquia
- **Introduce students to safeguards and nonproliferation** while they are exploring their educational and professional interests
- **Assist universities** with developing safeguards and nonproliferation curricula



Activities to develop human resources: *Safeguards courses for students*

- National Laboratories, alone and in partnership with Universities, host **short summer courses** in safeguards and nonproliferation
 - Courses held by LLNL, LANL, PNNL, ORNL, BNL
 - Example: “LLNL-MIIS Safeguards Policy and Information Analysis Course”



Co-hosted by:
**Lawrence Livermore National Laboratory and
The James Martin Center for Nonproliferation Studies
at the Monterey Institute of International Studies**



Sponsored by:
United States Department of Energy
National Nuclear Security Administration
NEXT GENERATION SAFEGUARDS INITIATIVE

"At the Department of Energy, we have undertaken a Next Generation Safeguards Initiative to meet international safeguards needs over the next 25 years and beyond...We are recruiting and training a new generation of safeguards experts and expanding our efforts to help other countries pursue nuclear power safely and securely."

- Secretary of Energy Steven Chu

June 7-11, 2010

May 18-22, 2009

June 2-13, 2008



30 Students:

Undergraduate, Graduate, Post-Doc, Young Professional

MIIS, NNSA/PNNL, U. Denver, LLNL, Singapore, Japan, Tufts, Grinnell, IAEA, U. Maryland, GW, UC-Irvine, James Madison, Egypt, U. Illinois, U. Pittsburgh, Reed College



Concepts, Objectives, Legal Foundations, and Evolution of International Safeguards with Special Emphasis on Current Policy Challenges and State-Level Safeguards Analysis





Online Preparatory Module

Advanced search

Administration

- Turn editing on
- Settings
- Assign roles
- Grades
- Groups
- Backup
- Restore
- Import
- Reset
- Reports
- Questions
- Files
- Unenrol me from Nuclear Safeguards Policy 2010
- Profile

My courses

- Nuclear Safeguards Policy
- Nuclear Safeguards Policy 2010



Introductory Module



Dear Course Participant,

Welcome to the Introductory Module!

This Module is designed to provide all course participants with the minimum tools & knowledge necessary to comprehend the more advanced and complex issues that will be covered in Monterey.

After completing the **required readings** in each section, watch the 25 to 45 minute **video presentation** by a Monterey Institute staff member on the respective topic.

All students are required to take the four quizzes

an understanding of the relevance of nuclear safeguards and their contribution to facilitating civil nuclear cooperation and supporting nonproliferation, as well as their strengths and their limitations. Furthermore, this course will provide participants with an overview of the interaction between the technical, legal, and policy aspects of nuclear safeguards.

test yourself mock-up quiz



We highly recommend the mock-up quiz. The 20 questions will cover all four sections of the module. Similar to the real quizzes, you have 20 minutes for this attempt. Nonetheless, you will be able to repeat the mock-up quiz as often as you wish.



Who collects and uses open-source information?

Expert Lecturers: National Laboratories, CNS/MIIS, IAEA, International Safeguards Community



Overview and Course Objectives

Fred Wehling, MIIS

Origins of International Safeguards

Fred Wehling, MIIS

Foundations of Nuclear Nonproliferation Treaty Safeguards

Jean Maurice Crété, IAEA

Organization of the International Safeguards System

Justin Reed, LLNL

Traditional Safeguards Implementation

Mark Schanfein, INL

Safeguards Technology for Inspections at the Facility Level: Past, Present, and Future

Mark Schanfein, INL

Challenges to International Safeguards in the 1990s: South Africa and Iraq

Richard Hooper, Wind River Consulting

Challenges to International Safeguards in the 1990s: DPRK

George Anzelon, LLNL

Strengthened Safeguards Part 1

Richard Hooper, Wind River Consulting

Strengthened Safeguards Part 2

Richard Hooper, Wind River Consulting

Global Perspectives on International Safeguards

Jean Maurice Crété, IAEA

Current Safeguards Challenges: Syria

Jonathan Essner, LLNL

The State Level Approach and the State Evaluation Process

Richard Wallace, LANL

The Information Revolution and Safeguards

Richard Wallace, LANL

Analysis-Driven Safeguards: Policy, Prioritization, Management, and Human Capital Challenges

Jean Maurice Crété, IAEA

Panel Discussion and Q&A: Working in International Safeguards

Moderator: Fred Wehling, MIIS

Safeguards and Supply

Bill Domke, LLNL

Current Safeguards Challenges: Iran

Chris Carson, LLNL

Special Lunch Discussion: The 2010 NPT Review Conference and Implications for Safeguards

Gaukhar Mukhatzhanova, MIIS

Future of Safeguards

Thomas Shea, TomSheaNuclear Consulting



Board of Governors Simulation





State Evaluation Exercise



Safeguards Careers Q & A





CNS NPT RevCon Lunch Discussion



Course Evaluation:
Overall rating: 4.22/5.00
Increased interest in safeguards: 4.11/5.00
Increased desire to pursue subject further: 4.17/5.00
Improved knowledge of subject: 4.17/5.00



Activities to develop human resources: *Interns, graduate fellows, and post-doctoral fellows*

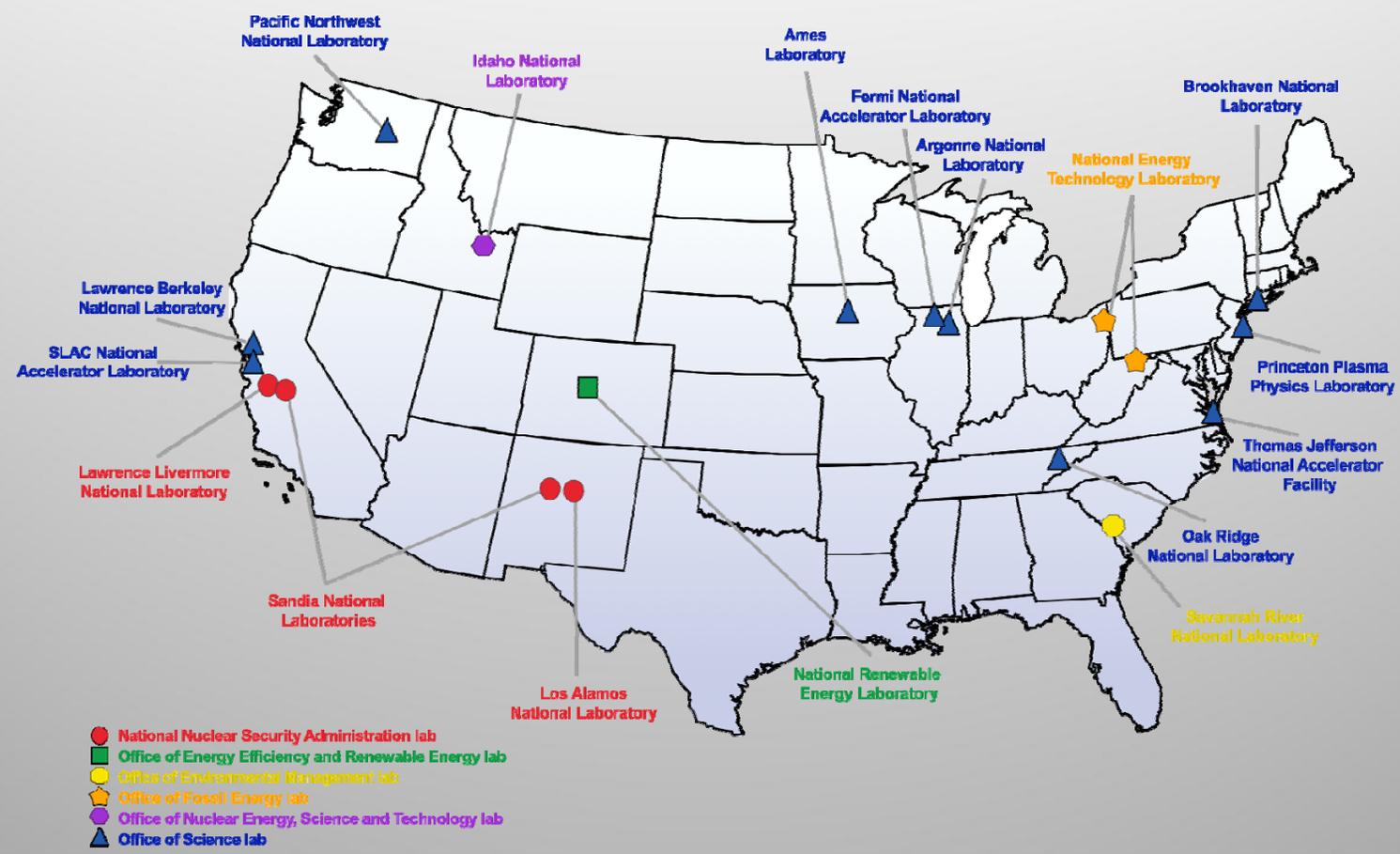
- Summer interns and post-doctoral fellows to work on international safeguards and nonproliferation projects with mentors
- Several internships develop a specific skill set
 - Example: At LLNL, two such programs:
 - Environmental sample analysis interns to teach techniques used by the IAEA
 - International safeguards policy internship with CNS/MIIS to explore the connections between technology and policy.
- INL-LLNL developed Inter-laboratory video teleconference lecture series
 - Introduces interns to activities and expertise at other laboratories



Other Summer Courses and Internships



DEPARTMENT OF ENERGY NATIONAL LABORATORIES



Activities to develop human resources: *Professional networks*



Next Gen Safeguards Professional Network

- Next Generation Safeguards Professional Network (NGSPN), established by ORNL in 2009
 - Seeks to **build connections** between the next generation experts that will see the international safeguards system into the future.
 - NGSPN **fills gap** between programs aimed at students and those aimed at mid-career professionals
 - **Open to all young professionals** in safeguards both internationally and across the National Laboratories, NNSA staff, academia, and industry.
 - Inaugural meeting of NGSPN held at ORNL in October 2009
 - Second meeting at the Pacific Northwest International Conference on Global Nuclear Security in April 2010



FOR MORE INFORMATION ON LLNL-MIIS COURSE:

Course application and information: http://cns.miis.edu/edu/course_nucsafe.htm

Online module: http://www.nti.org/h_learnmore/h5_study_guides.html

Course photos: <http://www.flickr.com/photos/41269433@No6/sets/72157624130028271/>

NNSA NCSI:

<http://nnsa.energy.gov/aboutus/ourprograms/nonproliferation/nuclearradiologicalmaterialesecurity/nuclearsafeguards>

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