

Developing the Next Generation of International Safeguards Specialists

Perspective from U.S. Department of Energy /
National Nuclear Security Administration
Office of Defense Nuclear Nonproliferation (NA-20)

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with Greg Dupuy (NA-241)

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Increasing Challenge for the International Safeguards System

WORKLOAD



RESOURCES



Challenges to International Safeguards: Increasing Responsibilities

Since 1983:

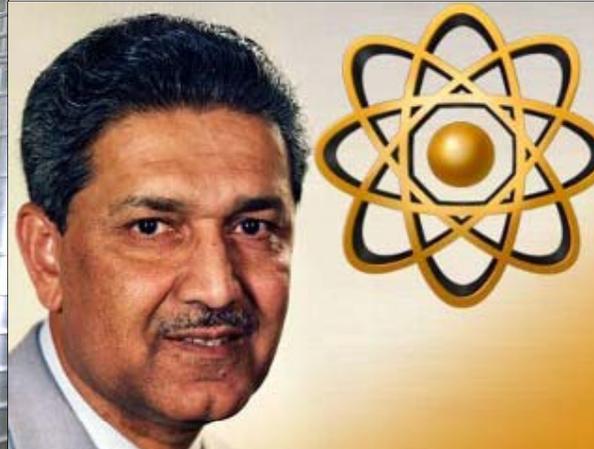
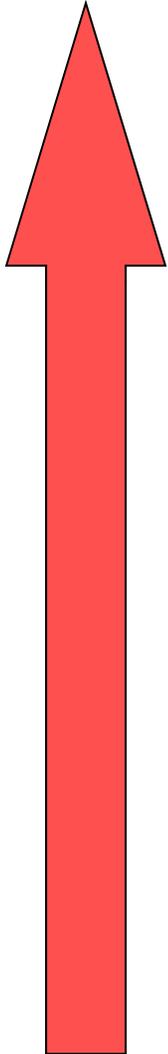
- Estimated 50% increase in facilities under IAEA safeguards
- Estimated 10-fold increase in nuclear material under IAEA safeguards
- Approximately 4-fold increase in safeguards agreements



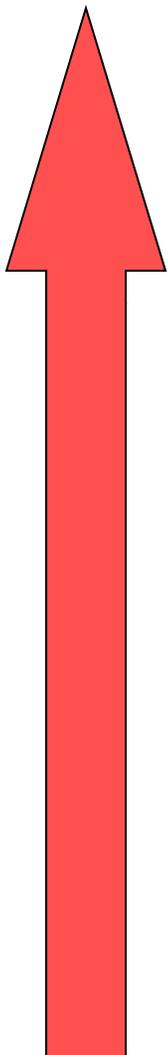
Sources: NNSA Office of Nonproliferation & International Security, "International Safeguards: Challenges and Opportunities for the 21st Century," October 2007; IAEA, "Safeguards Implementation Report for 2009," Report by the Director General.



Challenges to International Safeguards: Evolving Proliferation Threats



Challenges to International Safeguards: Evolving IAEA Mandate

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- Discovery of advanced undeclared Iraqi nuclear weapons program in 1991 led to Programme 93+2 -- strengthened safeguards
 - BOG Clarification of INFCIRC/153 (CSA): IAEA verification activities to confirm that declarations by the State are correct and complete
 - Model Additional Protocol (INFCIRC/540) approved by BOG in 1997
 - IAEA must verify the non-diversion of declared nuclear material AND provide assurances as to the absence of undeclared nuclear material and activities in a State
 - Increased reporting requirements
 - Sources of information increasing
 - Remote Monitoring
 - Environmental Sampling
 - Satellite Imagery
 - Open-Source Analysis
 - Transition to Information-Driven Safeguards

Challenges to International Safeguards: Global Nuclear Renaissance



As of July 2010:

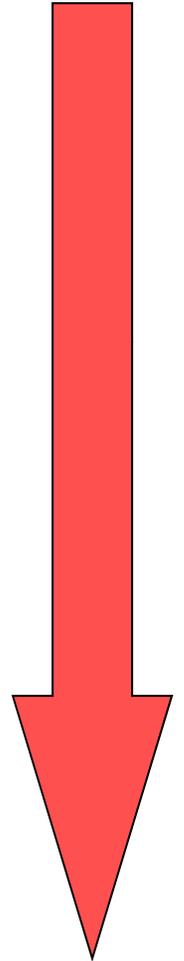
- 59 reactors under construction
 - (18 of these in NPT NNWS)
- 149 reactors on order or planned
 - (66 of these in NPT NNWS)
- 344 reactors proposed
 - (162 of these in NPT NNWS)
- IAEA anticipates at least 73 GWe in net new capacity by 2020, and then 511 to 807 GWe in place in 2030

- Increasing demand for electricity worldwide, especially in developing world
- Growing economic and political concerns surrounding fossil fuel dependency and climate change
- Nuclear power seen as a low-carbon, sustainable option for baseload electricity



Challenges to International Safeguards: Economic and Human Resources

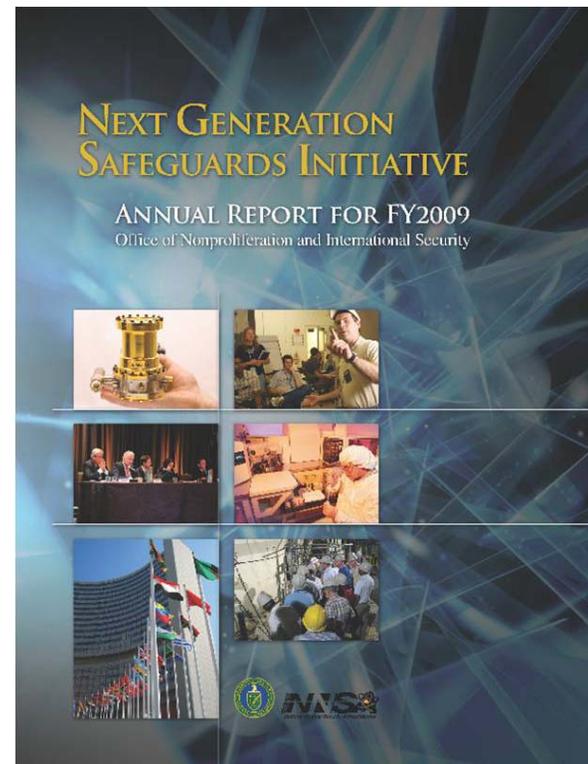
- Static IAEA budget and staffing levels
 - 0.1% increase for Safeguards Department in 2011 IAEA Regular Budget
 - Increasing responsibilities without proportional increase in staff or budget
- Attrition among safeguards professionals both at IAEA and in the United States
 - 1/3 to 1/2 of senior IAEA staff expected to retire in next few years
 - Aging workforce at U.S. National Laboratories
- Loss of critical facilities and infrastructure at U.S. DOE
 - Next generation of safeguards technologies needed to improve efficiency and effectiveness



DOE/NNSA Next Generation Safeguards Initiative

***GOAL:** Develop the policies, concepts, technologies, expertise, and infrastructure necessary to sustain the international safeguards system as its mission evolves over the next 25 years.*

- Robust, multi-year program with five key elements:
 - Policies and authorities
 - Concepts and approaches
 - Technology and analytical methodology development
 - International engagement
 - **Human capital development**



Next Generation Safeguards - A U.S. Government Priority

"Together we will strengthen the Nuclear Non-Proliferation Treaty as a basis for cooperation... To strengthen the treaty, we should embrace several principles. We need more resources and authority to strengthen international inspections."

*President Barack Obama
April 5, 2009
Prague*

"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..."

*U.S. Secretary of Energy Steven Chu
September 14, 2009
IAEA General Conference*

"Through our Next Generation Safeguards Initiative we are working to develop new techniques and technologies to modernize those international safeguards and make them more effective in preventing countries from diverting nuclear materials and technologies to military purposes."

*NNSA Administrator Thomas D'Agostino
June 22, 2010
Prague*



DOE/NNSA Human Capital Development

***GOAL:** Revitalize and expand the international safeguards human capital base in the United States by attracting, educating and training a new generation of talent.*

- Interdisciplinary approach
 - Nuclear Science and Engineering
 - International Relations/Policy
- Bring together our best minds
 - Developing partnerships between DOE National Laboratories and proximate Universities (regional approach)
- Attract, educate and train talented individuals
 - Graduate and advanced undergraduate students
 - Post-Doctoral scholars
 - Mid-career technical professionals



University-DOE National Laboratory Partnerships



UNIVERSITY of CALIFORNIA
Monterey Institute
of International Studies



TEXAS A&M 



THE UNIVERSITY of
TENNESSEE 



WASHINGTON STATE
 UNIVERSITY
UNIVERSITY of
WASHINGTON



DOE/NNSA Human Capital Development Initiatives

- Next Generation Safeguards Initiative (NGSI)
 - Safeguards summer internships at the National Laboratories
 - Safeguards summer courses
 - Graduate fellowships at eligible nuclear engineering universities
 - Curriculum development in safeguards and nonproliferation at select universities with nuclear engineering majors
- Nuclear Nonproliferation Graduate Fellowships (NGSI)
www.scuref.org (South Carolina Universities Research and Education Foundation)
- NNSA Nonproliferation Graduate Fellowship Program (NA-20)
ngfp.pnl.gov
- IAEA Junior Professional Officer Program
www.bnl.gov/iaea-jpo
- NNSA Future Leaders Program
www.nnsa.doe.gov/futureleaders



DOE/NNSA

Office of Defense Nuclear Nonproliferation

QUESTIONS?

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