



## **Next Generation Safeguards Initiative**

#### Enhancing International Safeguards: Challenges and Opportunities for the 21<sup>st</sup> Century

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June 2008





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Introduction



#### "Strengthening of the safeguards system to ensure its effectiveness, credibility and independence" is one of the major challenges likely to face the IAEA in the 2020 timeframe.

IAEA 20/20 Vision for the Future, February 2008

#### "The U.S. Department of Energy will launch this year a Next Generation Safeguards Program."

Energy Secretary Bodman, IAEA GenCon, September 2007







# Global expansion of nuclear energy



Number of countries with nuclear power reactors could soon double; increasing strain on safeguards



- Countries with Nuclear Power
- Countries Considering Nuclear Power





# Diffusion of sensitive nuclear technology



Enrichment and reprocessing bring nuclear weapons capability within reach of possessor



Libya's gas centrifuges, supplied through the Khan network





## Expanding IAEA responsibilities



New facilities, materials, Additional Protocol reporting, and demands in Iran, North Korea and India place huge strains on IAEA resources and safeguards credibility

	1984	2007
NNWS with Comprehensive Safeguards Agreements	41	154
NNWS with INFCIRC/66 Agreements	11	3
NWS with Voluntary Offers	3	5
Safeguarded Nuclear Installations	451	659
Significant Quantities of Safeguarded Sensitive Material	1,090	11,874
New Enrichment Plants planned/under construction	~1	6+
Additional Protocols Implemented	0	84





## Shrinking safeguards technology base



The technologies and community of experts available to support international safeguards has thinned:

- Aging technology
- Retirements
- Competing missions
- Shrinking U.S. complex

Safeguards Staffing Historical Overview

(Figures drawn from LLNL, LANL, SNL)







### **Fundamental Safeguards Review**



2007: DOE/NNSA "Fundamental Review" of the international safeguards system

- <u>Objective</u>: Examine the challenges that the system must confront today and over the next 25 years.
- <u>Scope</u>: (1) policies and authorities; (2) technology development; (3) human and financial resources
- <u>Recommendation</u>: Establish an integrated U.S. initiative that leverages DOE and other technical asset and international partnerships



#### **Result: Launch Next Generation Safeguards Initiative**



### Next Generation Safeguards Initiative

#### • NGSI Goals:

- Strengthen safeguards policies and approaches
- Revitalize the U.S. safeguards technology and human capital base
- Improve integration of safeguards objectives with international cooperation programs
- Promote a "safeguards culture" through nuclear infrastructure development





### **NGSI: Technology Development**



At declared facilities, make safeguards more efficient and effective through incorporation of advances in automation, measurement, and information technology

- Measurement techniques, timeliness, and uncertainty
- Remote / unattended monitoring systems
- Design verification tools and authentication technologies
- Information search, collection, extraction, analysis, and management tools for safeguards analysts
- Advanced safeguards for fuel cycle facilities: e.g. safeguards-by-design





### **NGSI: Technology Development**



Technology needed for detection and investigation of undeclared nuclear activities, especially at or near declared facilities

- Robust, multi-functional fieldportable instruments for use during visits / inspections
- In-field sample screening, e.g.
- Certify additional analytical labs







### **NGSI: Human Resources / Training**



The international safeguards community faces a human capital crisis, with professionals required across a broad range of safeguards-relevant disciplines.



- Expand outreach and partnerships to enable international partners to study safeguards at U.S. national laboratories and universities
- Establish mentoring / training program for young safeguards professionals
- Provide expanded training for safeguards personnel across the board (IAEA, State Systems of Accounting & Control, Labs)
- Attract new safeguards professionals into the field



## **NGSI: Policies and Authorities**

The IAEA can accomplish much of its expanded mission under its existing legal authorities.

- Universal adoption of the Additional Protocol and the revised SQP
- Reinforce information-driven, state-level approach to safeguards
- Sharing of proliferation information with the IAEA; special inspections
- Nexus between effective safeguards and peaceful nuclear sharing









No state alone can strengthen international safeguards: requires a shared commitment to build capacity

<u>Needed</u>: Combination of Multilateral, Regional, and Bilateral activities to build a safeguards "culture"

#### Forms of Cooperation

Strengthen State Systems of Accounting and Control

*Coordinate assistance to adopt best practices for safeguards, safety, and security* 

*Collaboration / test advanced safeguards technologies* 

*Cooperative demonstrations of safeguards applications* 

*Groupings for safeguards professionals* 

Safeguards education





- Developing 5-year plan for safeguards technology, human capital development, and international outreach
- Surveying safeguards technology relevant programs across government, academia, and industry
- Pilot safeguards course for next generation experts
- Accelerate safeguards technology development: focus on new reactors; fuel cycle facilities
- International working meeting to be held in Washington next September

## NGSI: a catalyst for a larger international commitment to strengthen the international safeguards system