SAFEGUARDS PERSPECTIVES

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WNU Summer Institute
August, 2008
Overview

- Safeguards in Canada: Past, Present & Future
- Safeguards Challenges
- Conclusions
Safeguards in Canada

The Policy Framework

- Longstanding commitment to peaceful use
- Strong support for effective nuclear non-proliferation regime
- Emphasis on cooperation & transparency
Safeguards in Canada

The Legal Framework

- Atomic Energy Control Act, 1946
- Nuclear Safety and Control Act, 2000
Safeguards in Canada

Fuel Cycle Characteristics

- Uranium Mining & Milling
- Refining & Conversion
- Fuel Fabrication
- Nuclear Power Reactors
- Research Reactors
- Spent Fuel Storage
- R&D
The Canadian Fuel Cycle

Uranium Mining and Milling → Uranium Refining → Uranium Conversion → Uranium Fuel Fabrication

U3O8 → UO3 → UO2

Spent Fuel In Dry Storage

Spent Fuel in Wet Storage

Research and Development

Chalk River Laboratories

Power Reactors
Safeguards: Where in Canada?
The Early Years

Focus on Effective Safeguards Approaches

- C/S system for power reactors
- Closed-circuit TV
- Seals
- Yes/No monitors
- Bundle counters
The Early Years

Promote Safeguards Efficiency

- AECB/IAEA pursuit of alternative safeguards approaches
  - 1980’s: Developed, tested & implemented the zone approach for natural uranium
  - 1990’s: Development & testing of
    - unannounced inspections (ATAP)
    - real-time reporting concept
    - remote monitoring capability
Current Experience

- Implementing strengthened safeguards
  - Broad conclusion attained in 2005
- Moving towards State-level integrated safeguards
Current Experience

Implementing Strengthened Safeguards

Objectives:

- Attain/Maintain broad safeguards conclusion
  - High level of confidence in Canada’s compliance with peaceful use commitments

- Optimize safeguards implementation through State-level integrated safeguards approach
Current Experience

Attaining Broad Conclusion

**Challenges**
- Activities pre-dating safeguards agreement
- Policy change on starting point of safeguards

- Required close IAEA/CNSC/Industry cooperation
Current Experience

Moving towards State-level IS

- Consultations mechanisms

INDUSTRY  IAEA  CNSC
Current Experience

Moving towards State-level IS

- Phasing-in approach
  - Agreed priorities
  - Available resources

- Transfers of spent fuel to dry storage

384 bundles
4 modules
70 tonnes full
60 tonnes empty
Into the Future

Implementation of State-level IS approach

Current Implementation
- Research reactors, static dry storages, LOFs
- Dry storage transfers of spent fuel at multi-unit stations

Under Development
- Procedures for natural uranium processing facilities (refining, conversion, fuel fabrication, fresh fuel storage)
- Procedures for multi-unit power reactors, transfers of spent fuel to dry storage at single-unit power reactors
- Chalk River Nuclear Laboratories
Into the Future

Maintaining the broad conclusion

- Successful implementation of Canada/IAEA Safeguards Agreements
  - Meeting reporting requirements
  - Facilitating inspector access

- Ensuring appropriate regulatory oversight
  - Effectiveness of the SSAC
Into the Future

Addressing industry developments

- Refurbishment of power reactors

- Nuclear renaissance
  - New power reactors
  - New supporting infrastructure (e.g. new mines)
Safeguards in Canada: Conclusion

- Canada and the IAEA have had a long history of working together to facilitate effective safeguards in Canada, efficiently implemented.
- Effective interactions between industry, SSAC and the IAEA are key.
- Openness, transparency are required for the IAEA to do its job – provide credible conclusions.

Commitment, Communication & Cooperation
Safeguards Challenges

“This global challenge (viz. the proliferation of weapons of mass destruction and their means of delivery) requires a multifaceted solution….We have a range of tools available to tackle this threat…While all of these instruments are necessary, none is sufficient by itself. Not all proliferation challenges require the same remedies. We need to deploy the tools which are most effective in each case…”

G8 Declaration, Evian Summit
Safeguards Challenges

The Global Context
- Recognition/Relevance Challenges
- Implementation Challenges

20/20 and Beyond

Conclusions
Safeguards Challenges

The Global Context

Recognition/Relevance Challenges

Current Environment

- Threats to the Nuclear Non-proliferation Regime (DPRK, Iraq, Iran)
- Debate on Multilateral Institutions as appropriate mechanisms for prevention or response
- Criticism of the Agency’s Safeguards System
Safeguards Challenges

NON-PROLIFERATION REGIME

Commitment

Verification
Safeguards Challenges

The Global Context

Challenges

- To continue to foster an enhanced understanding of the IAEA’s mandate
  - Role and value of Agency’s safeguards
  - Reporting on Safeguards Implementation (SIR)
- To promote maximum commitment
  - AP as the norm
- To deal appropriately with non-compliance
  - Current Iranian situation
Safeguards Challenges

The Global Context

Implementation Challenges

- To ensure that safeguards efforts are appropriately focused
- To maximize the potential of the AP
- To develop and implement State-level IS approaches
Focused Safeguards Effort

Focus verification activities where they are needed most (materials, situations)

- Differentiation
- Adaptability

Appropriate balance between Quantitative and Qualitative
IAEA Verification Effort

**PDIs, 2006**
- Japan, 2680, 28%
- Canada, 1099, 12%
- Germany, 635, 7%
- Other, 5065, 53%

**Number of Facilities, 2006**
- Japan, 267, 29%
- Canada, 34, 4%
- Germany, 110, 12%
- Other, 514, 55%
IAEA Verification Effort

**PDIs, 2007**
- Japan, 2526, 28%
- Canada, 1010, 11%
- Germany, 579, 6%
- Other, 4841, 55%

**Number of Facilities, 2007**
- Japan, 287, 30%
- Canada, 34, 4%
- Germany, 118, 12%
- Other, 510, 54%
Safeguards Challenges

The Global Context

Implementation Challenges

- Maximizing the potential of the Additional Protocol
  - Increased commitment + increased access + increased information = basis for credible assurance
  - Value of credible assurance?
  - Effectiveness/efficiency
Safeguards Challenges

The Global Context

Implementation Issues

- Develop & implement State-level IS approaches
  - Greatest potential for optimization
  - Elaboration of State-level considerations and incorporation into IS approaches
  - Appropriate balance between quantitative analysis and qualitative considerations
Safeguards Challenges

The Global Context

- Implementation Issues
  - Expert judgment

- State Evaluation
  - Information gathering
  - Information analysis
Safeguards Challenges

20/20 and Beyond

Vision 20/20

IAEA Secretariat Exercise
- What kind of IAEA will the world need?
- How can the IAEA fulfill that need?

Comprised of 3 elements
- Environmental scan
- Prioritization of key areas of work
- Consideration of resource requirements
Safeguards Challenges

20/20 and Beyond

Report of Commission of Eminent Persons
Established by the IAEA DG
- Examined the future role of the IAEA
- Secretariat’s report provided some background
- Reviewed all areas of the IAEA’s Mandate
Safeguards Challenges

20/20 and Beyond

Safeguards Considerations

- States should provide access to information, sites and people required to provide the necessary level of confidence in the IAEA’s safeguards conclusions.
- States should provide the financial, technological and human resources necessary for the IAEA to carry out its mission.
- The IAEA should strengthen its safeguards culture and adopt new approaches to recruiting, training and retaining highly qualified personnel.
Safeguards Challenges

20/20 and Beyond

Safeguards Areas of Interest

- Fostering greater transparency by States – Additional Protocol Plus
- Search for indicators of weaponisation
- Alignment of safeguards, nonproliferation and physical protection measures – Generation IV, Global Nuclear Energy Partnership
- Enhanced role for IAEA in disarmament field – verification of fissile materials cutoff, monitoring excess nuclear materials
Safeguards Challenges

CONCLUSIONS

• There are many challenges to address on several levels
• There is recognition of the challenges and considerable groundwork has been laid
• There is a history of working together (IAEA Secretariat, SAGSI, Member States)

Technical leadership, vision, political commitment and a cooperative spirit will transform challenges into opportunities