Nuclear export controls and nuclear safeguards

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Summary

- Parallel evolution of export controls and nuclear safeguards
- Integrated safeguards and State level approach
- AP and export control
- EU Export control framework
- ESARDA EXP-SWG
- Conclusions
Parallel Evolution of nuclear Safeguards and Export Controls

**EXPORT CONTROL**

- Zangger Committee Trigger List (1974)
- NSG Guidelines (1978, Part 1)
- Australia Group (1985)
- Missile Technology Control Reg. (1987)
- NSG Dual-Use Guidelines (1992, Part 2)
- Wassenaar Arrangement (1996)
- EU 428/2009 includes transit, brokering and ITT

**SAFEGUARDS**

- NPT Art. III.2 (1970)
  Safeguards as a condition of nuclear supply
- Comprehensive Safeguards Agreements (CSA, 1972)
- State Systems for Accounting and Control (SSAC)
- Voluntary Reporting Scheme and Programme 93+2
- Model Additional Protocol (1997, Annexes I and II)

**Revelations of Iraq and South Africa clandestine Facilities**
- Pakistan, 1998
- Iran, Libya, AQK,…
- UNSCR 1540 (2004)
- North Korea, 2006

**What to do next?**

- Nuclear Security Summit 2010 NPT Review Meeting
- Integrated SG in EU-27

Modified from US-DOE P. Heine
Non-legally binding gentlemen’s agreements:

- NUCLEAR SUPPLIERS GROUP (NSG): http://www.nuclearsuppliersgroup.org/guide.htm
- Wassenaar Arrangement: http://www.wassenaar.org/controllists/index.htm

Treaty (Legally binding):

- Chemical Weapons Convention: http://www.opcw.org/chemical-weapons-convention
• All items on the Trigger List must be subject to export review and licensing
suppliers should authorize transfer of items or related technology identified in the trigger list only when they are satisfied that the transfers would not contribute to the proliferation of nuclear weapons… or be diverted to acts of nuclear terrorism
  ▪ The “Nonproliferation Principle”

• Trigger List transfers are subject to significant conditions of supply
  • Formal government assurances
  • Minimum level of physical protection
  • Full-scope IAEA safeguards
  • Consent rights for retransfers
The threat of illicit procurement networks…

Companies Reported to Have Supplied Libya Uranium Enrichment Gas Centrifuge Parts

A.Q. Khan network:
• No “classical” State-to-State technology transfer
• Acquisition of dual use technology through network of personal contacts in Europe;
• Illicit procurement and production of parts in third countries


... Decides also that all States shall take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials and to this end shall:

... 
(c) Develop and maintain appropriate effective border controls and law enforcement efforts to detect, deter, prevent and combat, including through international cooperation when necessary, the illicit trafficking and brokering in such items in accordance with their national legal authorities and legislation and consistent with international law;

d) Establish, develop, review and maintain appropriate effective national export and trans-shipment controls...
Export Control, Nuclear Safeguards and Security

CSA & AP

U Extraction, enrichment, processing:
- materials
- facilities

Fuel fabrication, irradiation, reprocessing:

Nuclear Safeguards

Industrial production:
- Dual use equipment

Export Control:
- Regimes (EC DU Regulation), AP requirements

Physical protection

Border control
• The Model Additional Protocol of 1997 has enabled the IAEA to gain access to a much wider range of information and locations.

• The **State evaluation process** is becoming fully “information driven”, with information derived from:
  • obligatory State declarations and other reports,
  • Agency’s own verification activities (Short-Notice, Unannounced Inspections, Complementary Access inspections)
  • all relevant sources

• **Detection of clandestine nuclear** is supported by satellite imagery, environmental sampling, forensics and information analysis

• **Important indicators:**
  • trade patterns, procurement
  • R&D activities

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Abstract from DDG’s keynote speech
IAEA SG Symposium 2010
State Level Approach
Article 2.a.(ix)

...shall provide the Agency with a declaration containing the following information regarding specified equipment and non-nuclear material listed in Annex II:

For each export: the identity, quantity, location of intended use in the receiving State and date ... of export;

Upon specific request, confirmation as importing State of information provided by another State concerning the export of such equipment and material
Model Additional Protocol
Annex I - Nuclear related activities

i. The manufacture of *centrifuge rotor tubes* or the assembly of gas centrifuges.

ii. The manufacture of *diffusion barriers*.

iii. The manufacture or assembly of *laser-based systems*.

iv. The manufacture or assembly of *electromagnetic isotope separators*.

v. The manufacture or assembly of *columns or extraction equipment*.

vi. The manufacture of *aerodynamic separation nozzles or vortex tubes*.

vii. The manufacture or assembly of *uranium plasma generation systems*.

viii. The manufacture of *zirconium tubes*.

ix. The manufacture or upgrading of *heavy water or deuterium*.

x. The manufacture of *nuclear grade graphite*.

xi. The manufacture of *flasks for irradiated fuel*.

xii. The manufacture of *reactor control rods*.

xiii. The manufacture of *criticality safe tanks and vessels*.

xiv. The manufacture of *irradiated fuel element chopping machines*.

xv. The construction of *hot cells*. 
Annex II – List of equipment and non-nuclear material based on IAEA INFCIRC/254/Part1 Trigger List, 1995

I. Reactors and major equipment
II. Non-nuclear material for reactors
deuterium, heavy water, and nuclear-grade graphite
III. Reprocessing plants and especially designed or prepared (EDP) equipment
IV. Fuel Fabrication plants
V. Enrichment plants and EDP equipment
centrifuge, diffusion, aerodynamic, CHEMEX, laser, plasma, electromagnetic
VI. Heavy water production plants and EDP equipment
VII. Conversion plants and EDP equipment
Additional Protocol
An extended and updated Annex II?

Trigger list

AP Annex II

Dual Use?

AP Annex I activities
Suggestions for improving AP-related controls

- **Annex I** activities could be expanded to include more processes functional to NFC (e.g. pyro-reprocessing)

- **Annex II:**
  - update to current Trigger List version
  - Include dual use equipment, functional to some Annex I’s activities

- **NSG** is working at a *Fundamental Review to update both Trigger and Dual Use Lists*: this exercise should be taken into account to update Annex II
Some suggestions for soft measures /1

• AP to become the condition for supply of nuclear technology

• Require import declarations coupled to exports

• Outreach activities:
  • IAEA to Governments, seeking voluntary reporting
  • Governments to Suppliers, seeking denied inquiries

• Promote communication and data exchange among all Stake-holders
Mapping export sensitivity of dual use goods

- High sensitivity items
- Medium sensitivity items
- Low sensitivity items

- No concern States
- Medium concern States
- High concern States
Some suggestions for soft measures /2

- **Dual Use technology support to inspections/verifications activities:**
  - Development of Watch-lists on non-controlled technologies,
  - Development of Activity-specific handbooks,
  - Training programmes focused on dual use goods identification

- **Support measures for verification of correctness/completeness of declarations:**
  - Trade analysis
  - Tools
  - Access to expertise and scenarios’ modeling
First VTM export control workshop at JRC Ispra in 2006

JRC established contact and collaboration with various EU actors, IAEA and US DOE NNSA:

- Export control present in VTM’s portfolio of presentations, e.g. Luxembourg 2010
- Export control included in ESARDA Course on Non-Proliferation
- RG2010 identified export control as an important complement to ESARDA range of activities

EXP-Sub WG (VTM) successfully kicked-off last May 2011
- **ESARDA includes various types of members and contributors:**

  - Regulators
  - Suppliers and operators
  - R&D
  - Education & Training
  - International organisations

→ **Different views on export control…**
EU Legally binding instruments

- **Council Regulation 428/2009**: Community regime for the control of exports, transfer, brokering and transit of dual-use items

- **Council Regulations** adopting restrictive measures (embargos) against countries or non-states actors:
  - Iran, DPRK

- **Community Custom Code Reg. 2913/92** (and Security Amendments 2005)

- **Euratom Treaty** (Article 59): EURATOM Supply Agency
EC Reg. 428/2009 Annexes

- **Annex I** - lists items and technologies controlled in EU
- **Annex II** - EU General Export Authorisations
- **Annex IV** - lists items requiring authorisation also for intra-Community trade:
  - Nuclear items (Category 0)
  - Some dual use items
    (stealth technology, missile, nuclear, chemicals)
EC Reg. 428/2009 on DU goods - ANNEX IV

PART I (possibility of National General Authorisation)
- Items of stealth technology
- Items of the Community strategic control
- Items of the Category 5 Part 2 — Cryptography
- Items of the MTCR technology
- Some exceptions

PART II (no National General Authorisation)
- Items of the CWC (Chemical Weapons Convention)
- Items of the NSG technology:
  - Nearly all Annex I Category 0
  - NSG Dual Use items like tritium facilities, lithium facilities, EMIS, neutron generators, cameras, pressure sensors

Source: MTCR
On-going EU technical issues

- EU control list *(Annex I)* updates
  - Integration of Regimes’ updates takes ~ a year

- Intra-EU transfers
  - Annex IV update and reorganisation

- Harmonised technical capabilities:
  - Access to expertise → EU Pool of Experts
  - Training and EU inreach

- Harmonised DU goods rating

- Catch-all on non-listed items
  - Common criteria? Watch lists?
EC’s initiatives to improve implementation issues

• Guidelines for harmonised interpretation and implementation of DU goods export control Regulation under preparation

• GREEN PAPER opened for comments from all EU Stake-holders until October 31st, 2011
MS authority requests advice

JRC & ENER experts

- Items rating
- Unlisted items
- End-use plausibility

Knowledge base

National expert

+ ESARDA EXP-SWG?
Idea discussed:

- Become Forum of technical exchange and information sharing for various nuclear stakeholders
  - E.g. Nuclear regulators, suppliers
- Technical advice network on nuclear export controls, supporting EC-DG TRADE and Pool of Experts, IAEA
- Link export control to international nuclear safeguards / security
Example of topics discussed at EXP-SWG

- How difficult is it to have a real picture of exports to report under AP?

  Data are available from export licensing authorities, but there may be a time delay problem, or uncertainties with the actual use of licenses, especially of general, or open type.

- Upon IAEA’s request, how difficult is it to have import data?

  → ESARDA paper on some Parties’ AP experience presented at Budapest’s Symposium
Ideas for EXP-SWG first steps

• EC DU Reg. Annex IV revision
  • Less items requiring intra-EU transfer controls?

• EC DU Reg. Annex I updates (nuclear related)
  • Watch lists. Technology Guides on currently non-controlled items and processes.

• Additional Protocol Annexes updates
  • Foster the need for updates?

• Technical advice (support *Pool of Experts*)
  • Goods rating
  • Contribution to EU training on DU goods

• Workshops
Overall summary

• Importance of further developing the synergy between export control and nuclear safeguards

• Suggestions for improvements of AP Annexes, training, technical and analytical support measures

• EXP-SWG new forum for discussion and common work on export control and nuclear safeguards in ESARDA

• Collaboration on similar activities with INMM?
Background slides
Export control process

Request of supply

License needed?

Catch-all?

Technical Review:
Goods rating
End Use-End User analysis

Denial

Rejected as suspicious...

Export control process

Trade data

Customs targeting analysis

ZOLL

Douane

HS code

Dual Use code

Detection, Investigation, Prosecution

Enforcement
<table>
<thead>
<tr>
<th>BARRIER</th>
<th>ACTIONS</th>
<th>EFFECTS</th>
<th>IMPROVEMENTS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Industry outreach, Internal training</td>
<td>Denied supplies, Voluntary information to export authorities</td>
<td>Training, Information, Motivation for ICP (AEO)</td>
</tr>
<tr>
<td>Licensing</td>
<td>Items rating: Listed, non-listed catch-all, ITT, Technical End use-End User analysis</td>
<td>Denied authorizations</td>
<td>Catch-all common criteria, More GEAs? Technical support; Training / Handbooks; Tools; Resources</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Targeting analysis; Items identification</td>
<td>Detection of illicit shipments</td>
<td>Tools; communication; Access to information; Technical support; Training; resources</td>
</tr>
<tr>
<td>Investigation</td>
<td>Audits; Post-shipment analysis; trade data analysis</td>
<td>Illicit trade detected</td>
<td>Trade analysis Technical support</td>
</tr>
<tr>
<td>Prosecution</td>
<td>Justification in Court, Proportionate sanctions</td>
<td>Deterrent, Level playing</td>
<td>Less ambiguous controls, Technical justifications</td>
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