Physical Protection (Security) and Safeguards Requirements for Uranium Mines and Transport
AUSTRALIAN SAFEGUARDS AND NON-PROLIFERATION OFFICE (ASNO)

- Specialist nuclear regulatory and advisory authority
  - ~16 positions
  - DG ASNO responsible to Minister for Foreign Affairs

- Operation of WMD treaties and arrangements
  - fulfilment of Australia’s treaty commitments
  - cooperation with treaty organisations
  - contribution to, and assessment of, effectiveness of treaty regimes

- Administration of permits for possession and transport of nuclear material – safeguards (i.e. nuclear accountancy & control) and physical protection.
ASNO’s Regulatory Scope

- **OPAL**: operating 20 MW\textsubscript{th} research reactor
- **HIFAR**: shutdown 10 MW\textsubscript{th} research reactor
- **Moata**: shutdown 100 kW\textsubscript{th} research reactor
- **Silex**: decommissioned laser enrichment research facility
- **3 x operating uranium mines**
- **Miscellaneous**
WHY REGULATE URANIUM?

Australia views uranium as more than a tradable commodity – it has a distinctly different profile and risks

**National Interest**
- Australia, in deciding appropriate levels of protection applied to uranium mines and UOC considers its national interest best served by applying effective controls

**Industry Interest**
- Also in the interest of the uranium mining industry – given the profile of uranium, maintaining public confidences is served by having robust and effective security infrastructure and systems

**Treaty obligations**
- e.g. international Convention for the Physical Protection of Nuclear Materials (CPPNM), IAEA Safeguards Agreement
AUSTRALIA’S TREATY OBLIGATIONS

NPT
- Accept IAEA safeguards on all nuclear material
- Export of nuclear material to NNWS covered by IAEA safeguards

IAEA Comprehensive Safeguards Agreement
- National system of accountancy & control of nuclear material
- Report all nuclear material inventory and transactions to IAEA
- Allow IAEA inspections (does not include mines)

IAEA Additional Protocol
- Report mine details
- Allow IAEA complementary access inspections (includes mines)

CPPNM
- ensure that nuclear material within Australia, or during international transport, or in vessel under Australia’s jurisdiction, is protected

Others: e.g. SPNWZ, bilateral safeguards agreements, etc
IAEA SAFEGUARDS

Key element in international action against spread of nuclear weapons.

Safeguards are designed to ensure nuclear material in a state remains in peaceful use.

‘Trust but verify’

Verification framework:

- Key factors for determining types and frequencies of IAEA verification activities are timeliness and significant quantity
- States’ declarations, operators’ records
- Verification activities, including:
  - inspections
  - measurement and sampling
  - containment/surveillance
  - environmental sampling, satellite imagery
  - Information collection and analysis (including open-source)
PHYSICAL PROTECTION AND CONTROL – INTERNATIONAL CONVENTIONS AND GUIDELINES

- The primary treaty convention is the: Convention for the Physical Protection of Nuclear Materials (CPPNM) and its recent amendment.
- Complemented by the IAEA guidance document (INFCIRC/225) – The Physical Protection of Nuclear Materials and Nuclear Facilities
- NPT Safeguards Agreement: Art 1 of the Australia-IAEA safeguards agreement requires Australia to ensure that no nuclear material under its jurisdiction be diverted from permitted uses
  - i.e. application of “effective controls”
AUSTRALIA’S URANIUM EXPORT POLICY

Key elements

- NPT + bilateral nuclear safeguards agreement
- only for peaceful, non-military purposes
- IAEA safeguards applicable to country + Additional Protocol
- prior consent: 3rd party transfers, enrichment \( \geq 20\% \), reprocessing
- international standards of physical protection
## BILATERAL SAFEGUARDS AGREEMENTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Entry into Force</th>
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<tbody>
<tr>
<td>Republic of Korea</td>
<td>2 May 1979</td>
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<tr>
<td>United Kingdom</td>
<td>24 July 1979</td>
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<td>Finland</td>
<td>9 February 1980</td>
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<td>United States</td>
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<td>Canada</td>
<td>9 March 1981</td>
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<td>Sweden</td>
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<td>France</td>
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<td>Euratom</td>
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<td>Philippines</td>
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<td>Japan</td>
<td>17 August 1982</td>
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<td>Switzerland</td>
<td>27 July 1988</td>
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<td>Egypt</td>
<td>2 June 1989</td>
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<td>Russia</td>
<td>24 December 1990</td>
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<td>Mexico</td>
<td>17 July 1992</td>
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<td>New Zealand</td>
<td>1 May 2000</td>
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<td>Czech Republic</td>
<td>17 May 2002</td>
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<tr>
<td>United States (covering supply to Taiwan)</td>
<td>17 May 2002</td>
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<tr>
<td>Hungary</td>
<td>15 June 2002</td>
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<tr>
<td>Argentina</td>
<td>12 January 2005</td>
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<tr>
<td>People’s Republic of China</td>
<td>3 February 2007</td>
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CATEGORIES OF NUCLEAR MATERIAL –
INTERNATIONAL CONVENTIONS & GUIDELINES

- **Category I:** e.g. > 2 kg Pu, > 5 kg high enriched uranium
- **Category II:** e.g. > 500 g Pu, > 10 kg 10-20% low enriched uranium
- **Category III:** e.g. > 10 kg 0.711-10% low enriched uranium
- **UOC – less than Category III:** “...should be protected at least in accordance with prudent management practices”

Australia takes a robust interpretation of “prudent management practices” to ensure effective control
FEDERAL REGULATORY STRUCTURE RELEVANT TO URANIUM MINING AND EXPORT

NPT

UNSCR 1540

Aust/IAEA Comprehensive Safeguards Agreement – 10 July 1974

Additional Protocol to the Comprehensive Safeguards Agreement – 12 December 1997


Australia’s bilateral nuclear safeguards agreements

Nuclear Non-Proliferation (Safeguards) Act 1987

Associated Equipment

Associated Technology

Nuclear & Associated Material

Covered by a permit system administered by ASNO

Customs (Prohibited Exports) Regulations 1958 - Reg 9

Customs (Prohibited Imports) Regulations 1958 – Reg 4R

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SAFEGUARDS ACT – URANIUM MINES

- **Uranium mines:** permit to possess nuclear material
  - Minister for Foreign Affairs approves permits for new mines
  - permits apply **safeguards** and **physical protection** conditions
  - “nuclear material” is UOC, **not** ores or residues
  - permit required once over 10 kg of uranium produced

- **Uranium transport (truck, train, ship):** permit to transport nuclear material
  - permits primarily for physical protection
  - permits apply to approved routes

- **Uranium storage & handling (e.g. stevedoring):** permit to possess nuclear material
Safeguards Act – Permits for Possession of Nuclear Material

Legally a permit for possession of nuclear material not required until uranium production commences

BUT

A new mine does not want to have to retrofit security infrastructure and systems

SO

Consult with ASNO on design phase
PERMIT PROVISIONS – GENERAL

- Establish plans and procedures in order to comply with the permit
- Nominate designated individuals with responsibility for permit obligations
- Ensure personnel with accountancy and security functions are appropriately trained
- Transfer of UOC within Australia only to other permit holders
- ASNO’s approval required for each export (NB: this is not an approval wrt Customs Export Regs)
PERMIT PROVISIONS – SAFEGUARDS

The system of accountancy must:

- enable timely and accurate preparation of accountancy reports
- account for and record all uranium inventory and changes
- conduct inventory stock-take every 6 months – reported to ASNO
- Minimise shipper/receiver differences
PERMIT PROVISIONS - INSPECTIONS

The Permit Holder must:

- provide entry by any inspector (ASNO or IAEA) – and allow the exercise by that inspector of relevant powers
- provide inspectors necessary health and safety procedure information and equipment
- make relevant personnel available
- provide records where requested

Inspection frequency

- ASNO inspections usually arranged with mine to fit in with operations schedules
- IAEA inspections can be called with as little as 24 hours notice – no flexibility on access!
  - in practice IAEA gives a few days notice
PERMIT PROVISIONS – PHYSICAL PROTECTION

IAEA security guidelines and ASIO T4 review of 2006

Basic principles:
• more performance-based than prescriptive
• require facilities to develop a plan for the physical protection which is approved **before** a full permit is issued
• scalable physical protection measures
  – standardised physical protection measures for wide range of threats
  – based on ASIO **National Security Threat Assessment levels** set for uranium mines, associated infrastructure and transport – low, medium, high, extreme
PERMIT PROVISIONS – PHYSICAL PROTECTION

- Basic principle is a system to detect and/or hinder unauthorised activities

- Permits define a “secure compound” as a compound protected by a barrier (e.g. building fabric, fence) and:
  - access controls
  - security-incident detection, assessment and verification

- Drum-filling areas and drum storage areas protected as “secure compounds” with two segregated access-controlled barriers
TRANSPORT PHYSICAL PROTECTION

Mine to port
- Transport plan (i.e. security procedures, routes) approved by ASNO

Port facilities
- Storage facilities must meet definition of “secure compound”

Shipping and trans-shipment ports
- Shipping companies require a transport permit
- ASNO approves routes and vessels
- ASNO makes notifications to trans-shipment ports

Destination country
- International standards of physical protection

The robust maritime transport security regime generally meets ASNO’s requirements for UOC maritime handling
CONCLUDING REMARKS
THE PERMIT SYSTEM

• Setting standards in permits (rather than regulations) provides necessary flexibility to set tailored security requirements and be responsiveness to legislative and policy changes

  − performance-based approaches accommodates changes in miners operational requirements

• Beneficial to arrive at adequate security standards though consultative rather than a prescriptive process
Australia’s Uranium Export Policy – What does it mean for uranium producers?

- Can only supply to NPT parties with a bilateral safeguards agreement with Australia
  - Australia’s bilateral safeguards agreement network covers the majority of nuclear power countries
- For some countries, there may be limitations on which reactors can be supplied
- The Government reviews uranium supply contracts
- Exports approved by DRET – taking advice from ASNO on safeguards and security risks
- ASNO approves shipping routes and vessels
  - Approval is generally on an on-going basis
Nuclear Safeguards (Producers of Uranium Ore Concentrates) Charge Act 1993

- All producers of uranium ore concentrates pay an annual charge proportional to production
- Charge: currently 5.6012 cents per kg of U production
  - in 2007-08 yielded $455,315 for consolidated revenue.
- Maximum for one mine: $500,000
CONCLUSION – KEY POINTS

- All new mines will require a possession permit
  - consult with ASNO early and often
  - physical protection in design phase preferable to retrofitting
  - ASNO inspections during construction and prior to production
  - Likely IAEA inspections prior to production

- Transport companies will require a permit to transport
  - must include a transport security plan, which ASNO must review and accept prior to commencing transport
  - routes require a security review

- Port storage facility will require a permit
  - storage facility should meet definition of “secure compound”
  - will require a security review