Report on the second review meeting of national reports for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management May 2006

Overview

The second review meeting of contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was held from 15 to 24 May 2006 and aims to verify compliance with the Convention.

The Review process consists of submission of National Reports well in advance of the meeting in accordance with the provisions of the Joint Convention reporting requirements. Contracting parties are assigned to Country Groups and are required to review the National Reports of countries within their group. Questions are posed and responses provided in relation to the content of National Reports. Further review of national reports is undertaken through meetings of country groups, where each contracting party is required to provide a presentation on progress in complying with the Joint Convention to other members of their country group and interested contracting parties from other country groups. The first review meeting was held 3-14 November 2003.

During the second review meeting, a number of issues arose as recurring themes in country and rapporteurs reports. These issues were, not necessarily in order of priority:

- Maintenance of staff resources in both regulatory and radioactive waste management organisations.
- Preservation of knowledge for closed-down reactors and stored waste particularly in the case where the decommissioning is based on deferred dismantling.
- National waste management plans need to be developed and endorsed by the government.
- There are divided views on the ability to set in place clearance levels for wastes, and to a lesser extent exemption levels.
- Safe storage of wastes (ILW and HLW) are developed and well funded but more progress towards the development of repositories is required.
- Disposal of orphan and disused sources present challenges particularly where repatriation to the manufacturer is not available.
- Regional repositories were seen as being a solution for groups of countries with small nuclear programs however, although espoused, there were no tangible developments in this field.

  However, when questioned France commented that they cannot support large-scale international facilities, as each country must handle its own waste. In addition, although there may be some countries without critical size or appropriate geology that may consider a joint approach but France is concerned that large international facilities could lead to inappropriate dumping of radioactive waste.

- Research reactor decommissioning and SNF handling were identified by a number of owners of Russian built reactors. Although the US Global Threat Reduction Initiative (GTRI) was identified in a number of cases as being the

solution to handling of this SNF, no fallback positions were identified for handling this SNF if the US program was delayed or cancelled.

- In many cases, national policies for handling SNF and HLW have not been decided and this has increased the importance of interim storage facilities for these countries.
- There are challenges, particularly for countries with small programs, to ensure that the regulator is an independent authority.
- For federal systems there is a challenge to harmonise regulations between federal and state jurisdictions.

In terms of Australia's report to the second review meeting, the review process made a favourable assessment of the current approach to management of radioactive waste and spent fuel. The return of reprocessed wastes as ILW conditioned wastes and the publication of the National Directory for Radiation Protection were noted as highlights of current approach to spent fuel and radioactive waste management. Good practices, challenges and planned measures to improve safety were also identified in the rapporteur's report.

Opening Plenary Meeting

Mr Taniguchi (DDG of nuclear safety) welcomed delegates and reviewed the report from the 2003 meeting noting that reports should place emphasis on practical information and identify good practices and areas for improvement, progress on long-term management plans, wastes arising from uranium mining and milling, decommissioning of facilities, discharges to the environment and handling of disused sources, overlay with Convention on Nuclear Safety.

Following opening remarks, delegates were advised that 7 new countries had become contracting parties. These were Russian Federation, Lithuania, Italy, Iceland, Estonia, Uruguay and Euratom.

Mr Lacoste, president for the second review meeting, announced the officers for the meeting and put forward a proposed agenda which was accepted.

Brazil was a late ratifier (Feb 17 2006), delegates agreed that Brazil could fully participate in the meeting. Brazil had provided a national report. Brazil were assigned to Country Group 1.

China wrote to the Agency on 6 May 2006, requesting participation in the second review meeting. Delegates were asked to agree to China's participation. The delegations from the United States and Canada stated their support for the participation of China. No delegations opposed the proposal and the meeting agreed to China's full participation. China was allocated to country group three (Australia's country group) however, following confirmation of the amendments to the timetable to allow China to present, the Chinese delegation advised that there had not been sufficient time to prepare a comprehensive national report for the second review meeting. China advised that the national infrastructure had been put in place for the implementation of the Convention.

Mr Lacoste raised the issue of what strategies could be used to encourage more countries to join the Joint Convention. It was announced that the Nuclear Energy Agency of the OECD had been invited to attend as observers.

Procedural matters to establish an open ended working group including the appointment of Ms Patty Bubar as the Chair of the open ended working group. Changes to improve the efficiency of the review process had been made for the second review meeting. The open ended working group topics were to improvements to the review process, encourage more member states to ratify and the use of IAEA safety standards in the review process. The French delegation put forward some suggestions for improving the review process including extending the time between reporting periods from three to four years.

Delegates agreed to a proposal that the President's Report on the second review meeting be released to the public.

Australia's presentation to Country Group 3 of the Second Review Meeting

The Australian presentation focussed on issues raised in the first review meeting:
– Enhancement of regulatory systems
– Management of spent fuel
– Decommissioning of nuclear facilities
– Management of abandoned U mines
– Radioactive waste management

The National Directory was described as the means of achieving uniformity in radiation protection and the safety of radioactive sources across Australia's nine jurisdictions. The Country Group was advised that the first edition published August 2004 and that Commonwealth, State and Territory Governments had agreed to development processes for the NDRP.

The Group was also advised in relation to the National Directory:
- Current elements relevant to waste management
  - Code of Practice for Mining and Mineral Processing – includes waste mgmt plan
  - Exemption limits in accordance with the BSS
- Proposed elements relevant to waste management
  - Discharge limits to air, water and land
  - Code of Practice for predisposal management of radioactive waste – includes waste management plan
- Edition 2 scheduled for publication in 2007

In relation to the management of spent fuel it was reported that:
- Commonwealth policy is to send all spent fuel overseas
- US-origin fuel accepted by the US under the FRR-SNF policy now extended for fuel irradiated before May 13, 2016 – this includes new fuel of US origin for the OPAL reactor
- Fuel irradiated AFTER May 12, 2016, contracts are in place for spent fuel to be sent to France for reprocessing
- Other UK-origin spent fuel sent to Dounreay, UK or COGEMA, France for reprocessing
- To date a total of 1792 fuel elements have been shipped: there has been one shipment to the US, four shipments to COGEMA and two shipments of spent fuel to Dounreay, UK
- Moata shutdown in 1995, spent fuel is dry stored on site and return of spent fuel to the US is planned for 2006

In relation to decommissioning:
- Moata research reactor shutdown in 1995
- Decommissioning study completed
- Stage I - Removal of Fuel and auxiliaries completed in 1996
- Stage II - care and maintenance for up to 30 years (may be revised when the CRWF becomes available)

- Other facilities at ANSTO will need to be decommissioned but the currently these facilities are under control and possess licences until the CRWF becomes available. Consequently, the decommissioning of these facilities will be planned in consultation with the regulator.

This years report was expanded to include inventories of waste (tailings) and remediation of former uranium mine sites at South Alligator Valley, Rum Jungle, Nabalek, Mary Kathleen, Radium Hill and Port Pirie. Information in relation to wastes from current mines at Jabiru, Olympic Dam, Beverley and Honeymoon was also outlined.

The report outlined current waste management practices in various jurisdictions in Australia. Overview of waste inventory in terms of volume was also reported. Progress in establishing the proposed Commonwealth Radioactive Waste Management Facility was described in detail.

In terms of transboundary movement, the Group was informed that export control regulations to control export of radioactive waste from Australia are being introduced.

The Rapporteur's Report summarized the Australian Report as follows:

- Comprehensive and concise report
- One operational research reactor (HIFAR)
- One research reactor (MOATA) is shut down
- One research reactor (OPAL) being commissioned
- Fuel from RRs repatriated or sent abroad for reprocessing
- A number of regional waste stores and one repository
- Three operational uranium mines
- Many closed uranium mines
- A number of potential uranium mines

The Rapporteur highlighted the following elements of Australia's presentation:

- National Directory published in 2004 to achieve uniformity in regulations
- All waste from reprocessing returned as ILW conditioned waste (Either in cement matrixes or vitrified)

The Rapporteur's report highlighted the following Good Practices

- A number of major remediation programmes of former mining and milling sites have been completed
- All States have stores for legacy wastes
- Programme to ensure that all users of radioactive sources make arrangements for storage and/or disposal

The Rapporteur noted the following challenges:

- Ensuring a coherent approach to regulations and waste management practice in view of the complex relationship between national and regional legislation
- Remediation of closed uranium mines, especially those where there is high rainfall or where land usage has changed
- The opening of new mines may place increased demands on the regulatory authorities
- Establishment of facility for storage of ILW returned from reprocessing

The Rapporteur noted the following planned measures to improve safety

- Harmonization of legislation between jurisdictions
- Introduction of export control regulations to better control export of radioactive waste from Australia
- Establishment of facilities for disposal and longer term storage of radioactive waste.

A copy of the PowerPoint presentation is at **Attachment B**.

Other members of Country Group Three

1. Bulgaria

Following the last review meeting, Bulgaria has undertaken a comprehensive review of regulations pertaining to spent fuel and radioactive waste management. SNF from their research reactor will be repatriated to Russia, 07/08, as part of a Bulgaria-Russia-USA-IAEA initiative. Nuclear power plant (NPP) SNF has been shipped on a bi-annual basis to Russia. These arrangements are in place until 2015, after this date, a new strategy needs to be developed which could include; waste remaining in Russia or a domestic repository for SNF and/or HLW. In the interim, a facility for dry storage of NPP SNF will be constructed to ensure that sufficient storage is available.

NPPs, Kozloduy 1 & 2, are no longer generating electricity. For these units a decommissioning plan covering the first stage of decommissioning based on safe enclosure has been developed. Units 3 & 4 will close at the end of 2006.

Remediation of numerous tailings emplacements is being carried out. However, the Buhovo-2 tailings area is proving difficult to remediate primarily because of the high rainfall at the site.

All high activity sources have been secured, with US aid, and placed in storage Novi Han. Additional challenges for Bulgaria include site selection for a new, long-lived ILW repository and development of technology to handle radioactive waste precipitated in storage tanks.

General observations

– Significant progress since first review meeting especially in relation to introduction of new regulations, remediation of mining sites and management of radioactive wastes.
– Kozloduy 1 & 2 no longer generating electricity. New decommissioning strategy developed and awaiting approval. Units 3 & 4 will close end of 2006.
– Making progress in campaign to retrieve and store orphan sources

Highlights

– New and comprehensive regulations now in force
– New strategy for SF and RW management introduced in 2004
– Clearance levels have been introduced in legislation

Overview of liabilities

Long term management policy

– Spent fuel – reprocessing and HLW disposal plans
– Nuclear fuel cycle wastes – disposal in near surface sites for LILW
– Non-power wastes – disposal together with LILW
– Decommissioning liabilities – Plans in place/under development
– Disused sealed sources – collect all disused sources

Funding of liabilities

– Spent fuel – funds set aside during operation
– Nuclear fuel cycle wastes – funds set aside during operation

– Non-power wastes – licensee pays
– Decommissioning liabilities – funds set aside during operation
– Disused sealed sources – state funding for management of orphan sources

Current practice/facilities
– Spent fuel – wet on site storage & exportation to Russia
– Nuclear fuel cycle wastes – waste conditioned & stored on site
– Non-power wastes – storage in Novi Han facility
– Decommissioning liabilities – under preparation
– Disused sealed sources – continuous

Planned facilities
– Spent fuel – dry SF Storage facility planned
– Nuclear fuel cycle wastes – planned for 2015

Follow up on challenges noted at 1st review meeting in 2003
All recommendations from previous review meeting addressed

Good Practices
– Comprehensive legislation in place (internationally harmonized)
– State enterprises to manage RW established in 2004
– Successful campaign to collect all HAS at risk

Challenges
– Remediation of closed mines and tailing ponds, in particular Buhovo-2
– Site selection for new LILW repository
– Construction of dry SF storage facility
– New technology for treatment of precipitated waste in tanks is required

Planned measures to improve safety
– NRA monitoring performance indicators for waste minimisation and reduction

Other members of Country Group Three cont'

2. Ukraine

General observations
– Much remains to be done to ensure the long-term safety of the damaged Chernobyl reactor and of the contaminated material which has or will be removed from the Shelter.

Highlights
– Updated legislation introduced in 2005
– Good progress in establishing LILW waste treatment and disposal facility (Vector Complex)
– Commissioning of additional storage facilities (2003)

Overview of liabilities
Long term management policy
– Spent fuel – decision deferred
– Nuclear fuel cycle wastes – waste treatment complexes at each NPP. Final disposal at a national repository
– Non-power wastes – centralized repository
– Decommissioning liabilities – ChNPP plans in place. Operating NPPs need detailed plans to be prepared
– Disused sealed sources – Historic sources – collection and storage in centralized repository

Funding of liabilities
– Spent fuel – funds set aside during operation
– Nuclear fuel cycle wastes - financing from operation
– Non-power wastes – producer pays RW management fund. Legislative instruments under development
– Decommissioning liabilities – decommissioning fund
– Disused sealed sources – State budget for legacy. Producer pays. RW management fund under development.

Current practice/facilities
– Spent fuel – reprocessing abroad and/or interim long-term storage
– Nuclear fuel cycle wastes – on site storage, limited treatment
– Non-power wastes – storage at Radon facilities
– Decommissioning liabilities –
– Disused sealed sources – storage at Radon facilities

Planned facilities
– Spent fuel – IFS-2 at ChNPP. Centralised ISF for RNPP, KHNPP and SUNPP. Deep geological repository
– Nuclear fuel cycle wastes – Treatment complex for all operating NPPs LWTP and ICSRM for ChNPP. Centralized processing and disposal facility
– Non-power wastes – Centralized processing and disposal facility
– Disused sealed sources – Centralized processing and disposal facility

Follow up on challenges noted at 1st review meeting in 2003

– Increased staffing in technical support agency
– Revised legislation
– Implementation of new categorization of RW
– Decommissioning policy revised
– Significant progress in establishment of Vector Complex – should be operational in 2007. Should be described in greater detail in 3rd review meeting

Good Practices

– Introduction of revised comprehensive legislation
– Co-operation with other countries both in relation to provision of expertise and exchange of information on emergency preparedness
– Revision of plan for response to accidents and emergencies
– Stakeholder involvement increased

Challenges

– Construction of Chernobyl shelter
– Completion of intermediate SF storage facility at Chernobyl (SFSF-2)
– Establishment timetable for HLW management programme
– Ensure that resolution of Chernobyl safety related issues does not divert resources from other nuclear facilities in the Ukraine.

Planned measures to improve safety

– Start construction of new safe confinement (Chernobyl)
– Establishment of Vecto Complex for LILW
– Increase in staffing levels in regulatory authority
– Preparation for transfer of waste from Radon facilities to Vector Complex

Other members of Country Group Three cont'

3. Latvia

General observations
Hospitals switching from sources to accelerators

Highlights
– Security improved at a number of facilities, in particular research reactor
– Preparation of updated safety documentation
– Ongoing search and screening for orphan sources

Follow up on challenges noted at 1st review meeting in 2003
– Changes in legislation to reflect the requirements of EU Membership including, in particular HASS Directive

Overview of liabilities
Long term management policy
– Spent fuel – return to supplier
– Nuclear fuel cycle wastes – no complete fuel cycle in Latvia, current proposal – keep at treatment site in country of SNF origin
– Non-power wastes – Disposal, long-term storage for waste not suitable in near surface; regional approach
– Decommissioning liabilities – decommissioning ASAP – 'brown field' option
– Disused sealed sources – return to supplier, long term storage if impossible, regional repositories

Funding of liabilities
– Spent fuel – state budget and bilateral cooperation with USA DOE (GTRI)
– Nuclear fuel cycle wastes – State budget
– Non-power wastes – State budget
– Decommissioning liabilities – State budget
– Disused sealed sources –users, State budget for historical SSS

Current practice/facilities
– Spent fuel – wet storage, research reactor, Salaspils
– Non-power wastes – disposal and centralised storage
– Decommissioning liabilities – Preparatory stage for D&D – planning and minor decommissioning
– Disused sealed sources – centralised storage at research reactor site and at waste repository

Planned facilities
– Spent fuel – backup option – dry storage on site in transportable casks
– Non-power wastes – Long term storage at waste repository site (Baldone)
– Decommissioning liabilities – Expansion of waste repository and long term storage
– Disused sealed sources – Long term storage at waste repository

Good Practices
– Manual on procedures o counter illicit trafficking of RM
– Ongoing search and screening for illicit material and orphan sources

Challenges
– Maintaining competencies
– Management of spent fuel
– Acquisition of funds for decommissioning

Planned measures to improve safety
– Expand capacity of waste repository
– Decommissioning of research reactor
– Continued participation in IAEA technical co-operation activities
– Dedicate storage faculty for sources which cannot be returned and waste not suitable for near surface disposal

Other members of Country Group Three cont'

4. Argentina

Since the last review meeting, the Argentinean licensing system has been updated and now licences are issued for a fixed term, usually ten years. Argentina is intending to finalise the approval of the Radioactive Waste Management Strategic Plan that will harmonise national and provincial legislation and provide a framework the Radioactive Waste Management and Decommissioning Trust funds. However, these initiatives have not been furthered because of difficulties associated with the finalisation of the Radioactive Waste Management Strategic Plan. In addition, although a number of facilities are being planned, this planning is in its infancy and questions concerning the types of control in place and other details could not be answered.

General observations

– Decision on reprocessing of NPP spent fuel has been deferred

Highlights

– Strategic plan for radioactive waste management which it reviews every three years
– Implementation of IAEA Code of Conduct on the Security of Radioactive Sources

Overview of liabilities

Long term management policy

– Spent Fuel - NPP Processing decision deferred (deadline 2030)
    – RR send back to country of origin if not RR disposal
– Nuclear Fuel Cycle – disposal
– Non-power Wastes – disposal
– Decommissioning liabilities – decommissioning plan (regulatory requirements)
– Disused Sealed Sources – reuse, disposal

Funding of liabilities

– Spent Fuel - NPP operator (by law)
    – RR operator (state budget)
    – RWM Fund (created integration pending)
– Nuclear Fuel Cycle – facility operator (by law)
– Non-power Wastes – waste generator
– Decommissioning liabilities – facility operator (by law). Decommissioning Fund (created, integration pending)
– Disused Sealed Sources – source user

Current Practices

– Spent Fuel – CNA I NPP wet storage
    – CNE NPP 6yr wet storage
    – CNE NPP dry storage
    – RR wet storage (DCMFEI)
– Nuclear Fuel Cycle – LLW (storage + disposal)
        – LLW management facility
        – ILW storage

– Non-power wastes – LLW (storage + disposal)
  – ILW storage
– Decommissioning liabilities - None
– Disused sealed sources – Storage + disposal (short lived)
  – Storage (long lived)

Planned facilities
– Spent Fuel – CNA 1 dry storage
  – RR wet storage (FACIRI)
– Nuclear Fuel Cycle Waste – LILW centralised repository
  – HLW Deep Geological repository (feasibility)
  – LILW management facility (PTAMB)
– Non Power Wastes - LILW centralised repository
– Decommissioning Liabilities – LILW centralised repository
– Disused Sealed Sources – LILW centralised repository
  – HLW Deep Geological repository

Follow up on challenges noted at 1st review meeting in 2003
– Until 2003, licences were of indefinite duration, now validity period is specified in the licence
– Finalizing reassessment of AGE-Ezeiza Radioactive waste management area

Good Practices
– Rehabilitation of mining sites
– PSA and ageing management programme for spent fuel facilities at NPPs
– Key personnel at NPPs and all major facilities must be individually licensed
– Treating long lived sources as Class A Waste, which also includes HLW, should result in a high level of safety and security of these sources.

Challenges
– Approve strategic plan for SF and RW management so that funds may be availed of
– Taking decision on reprocessing of spent NPP fuel
– Completion of Atucha NPP Unit 2 will lead to the need for increased resources to manage the additional wastes generated once it is in operation
– Rehabilitation of mining and milling sites

Planned measures to improve safety
– Updating safety documentation
– Establishment of a dry interim storage facility for NPP spent fuel
– Establishment of new storage facility for research reactor fuel

Other members of Country Group Three cont'

5. Japan

There are fifty-five nuclear power plants in Japan producing about 30% of power requirements. Recent developments in Japan include changes to reactor regulation in 2003 requiring operators to include quality assurance in operation safety program and regular inspections of these programs by regulatory bodies. A revised decommissioning approach, updated in 2005, requires confirmation of the completion of the decommissioning process by regulatory bodies.

Wastes in Japan are classified by disposal requirements, i.e. wastes from reprocessing are HLW and everything else is LLW. Although some of this latter waste requires geological disposal at intermediate depths.

Rokkasho Mura reprocessing plant has commenced active testing of its circuits with an aim to be operation in 2007. Some NPPs SNF storage will fill in the near future so an interim spent fuel storage facility has been proposed and accepted for construction in Rokkasho Mura.

Dose criteria have not been established for HLW or intermediate depth disposal facilities. Japan has developed funds for handling its radioactive waste, viz. ¥ 3 billion for disposal of 40,000 HLW glass canisters, ¥ 1.1 B for dismantling of NPPs and ¥ 12,700 billion for reprocessing.

Some wastes from decommissioning especially irradiated D_2O and graphite were identified as problems. It was noted that D_2O would be returned to Canada and that depending on the levels of ^{14}C in the graphite waste, it could be disposed of by incineration with special technology utilised to clean exit gases. Disposal of graphite with higher levels of contamination were still being studied and might be incorporated into the intermediate-depth repository.

General Observations

– Large and expanding nuclear programme (55 operation commercial reactors)
– Spent fuel reprocessed
– Nuclear energy policy updated in 2005
– Body which regulates spent fuel and radioactive waste safety and body which promotes nuclear energy report to the same ministry. However independence is ensured through appropriate mechanisms

Highlights

– Legal framework for decommissioning and clearance scheme
– Offsite interim spent fuel storage facility will be in operation in 2010
– Nuclear energy policy adopted in 2005
– Rokkasho reprocessing plant under commissioning (active testing since March 2006)

Overview of liabilities

Long term management policy

– Spent fuel – reprocessing

– Nuclear fuel cycle wastes – geological, intermediate depth or near surface disposal
– Non-power wastes – geological intermediate depth or near surface disposal
– Decommissioning liabilities – immediate decommissioning of NPP
– Disused sealed sources – Return to manufacturer. Long-term storage

Funding of liabilities
– Spent fuel – utility pays fund for reprocessing
– Nuclear fuel cycle wastes – utility pays fund for disposal of HLW etc
– Non-power wastes – under discussion
– Decommissioning liabilities – operator pays into reserve fund
– Disused sealed sources – user pays fund

Current practice/facilities
– Spent fuel – overseas reprocessing Rokkasho Plant
– Nuclear fuel cycle wastes – HLW storage facility/ LLW near surface disposal facility
– Non-power wastes – on site storage
– Decommissioning liabilities – decommissioning underway
– Disused sealed sources – orphan sources to JRIA

Planned facilities
– Spent fuel – interim storage facility due 2010
– Nuclear fuel cycle wastes – geological, intermediate depth disposal facilities
– Non-power wastes – under discussion
– Disused sealed sources – under discussion

Follow up on challenges noted at 1st review meeting in 2003
– Revised framework for nuclear energy policy promulgated (2005)
– Harmonization with IAEA standards
– Licencees are required to establish QA systems (since 2003)

Good Practices
– Nuclear Energy Policy recently reviewed (2005)
– Lessons learned from JCO criticality accident promulgated in all nuclear facilities
– Well established funding schemes to cover liabilities
– Clearance schemes for NPP wastes established
– Category I and II disused sealed sources returned to suppliers (almost all outside Japan)
– Consultation with stakeholders on nuclear issues

Challenges
– Establish comprehensive regulations for non NPP wastes
– Site selection and regulations for HLW disposal
– Ensuring that early planning for decommissioning is considered. It is not a mandatory requirement
– Safety assessment for interim SF storage facility
– Ensure safe operation of Rokkasho reprocessing facility

Planned measures to improve safety
– Completion of regulation on waste management

– Full implementation of Code of Conduct on the Safety and Security of Radiation Sources
– Promotion of international co-operation to enhance safety of SF and RW management in the Asian region

Other members of Country Group Three cont'

6. Iceland

Iceland has no nuclear facilities. Electricity for its population of 300,000 is generated by geothermal and hydroelectricity. Iceland has in place an extensive program for controlling sources. As a small country, for regulatory guidance they have leveraged support from other Nordic countries, and implemented IAEA standards and EU directives. Development of a disposal facility in Iceland is not appropriate for the small inventories of waste and consequently, Iceland is pursuing a policy of repatriating sources to countries of origin and trying to negotiate for acceptance of sources in their disposal facilities. This latter initiative is not generally endorsed because of restrictions on importation of other countries' waste.

General observations
- New contracting party
- No nuclear cycle facilities
- Iceland provides an example of a small country which sees benefit in being party to the Joint Convention
- Small scale use of radiation sources
- Small number of disused sources
- National storage or disposal facility not justified. Disused sources mainly held in three licensed locations. Other held, under licence, on premises of users

Highlights
- Very small number of disused sources
- Sophisticated waste management facilities not required

Overview of liabilities

Long term management policy
- Non-power wastes – under discussion
- Disused sealed sources – re-exportation

Funding of liabilities
- Non-power wastes – by user
- Disused sealed sources – by user or State in case of bankruptcy

Current practice/facilities
- Non-power wastes – storage and discharge under licence
- Disused sealed sources – in storage and exportation

Planned facilities
- Disused sealed sources – none (centralized storage for very small number of sealed sources not justified)

Good Practices
- The location and status of the few radiation sources in Iceland is well known
- Voluntary use of EURATOM Safety Standards
- Close co-operation with other Nordic countries
- Makes use of new generation of IAEA publications

– Comprehensive emergency response arrangements
– Close monitoring of discharges

Challenges
– Finding and retaining qualified persons to staff regulatory authority
– Long-term management of disused sealed sources. Options under consideration include:
  – Exportation and disposal in countried with more developed waste management programmes
  – Conditioning
  – Disposal

Planned measures to improve safety
– Exportation of disused sources
– Implementation of Euratom HASS directive
– Conducting study on radioactive waste discharges from medical sector

Other members of Country Group Three cont'

7. Euratom

General observations
- Did not attend first review meeting
- Euratom is not currently involved in the development of regional waste disposal facilities. However it will support member states who wish to explore this option

Highlights
- Euratom has its own nuclear facilities at 4 sites (joint Research Centres). Some facilities in these are undergoing decommissioning
- Responsibility for the safety of national nuclear facilities in member states rests with the licence holder.(Licences are issued by regulatory authorities in member states)
- The Euatom Treaty obliges MSs to carryout certain activities including, for example, ensuring compliance with basic safety standards, environmental monitoring, preparation of emergency plans.
- Certain activities in EU MSs must be reported to the Commission e.g plans for disposal of radioactive waste, decommissioning plans.

Overview of liabilities

Long term management policy
- Spent fuel – reprocessing or long-term storage in national repository
- Research wastes – national repositories
- Decommissioning liabilities – Decommissioning pre-decommissioning plans ready
- Disused sealed sources – historic sources – collection and storage at third party facilities

Funding of liabilities
- Spent fuel – funds provided from the European Community budget
- Research wastes – funds provided from the European Community budget
- Decommissioning liabilities – funds provided from the European Community budget
- Disused sealed sources – funds provided from the European Community budget

Current practice/facilities
- Spent fuel – reprocessing and/or interim storage
- Research wastes –on site temporary storage, characterisation and waste minimisation
- Disused sealed sources – on site storage or shipment to third party facilities

Planned facilities
- Spent fuel – interim storage (Ispra)
- Research wastes – characterization facilities. Waste compaction. Free release facility

Good Practices

– Helps to ensure common standards of radiation protection in MSs
– Waste management plans for JRC facilities being decommissioned are well developed e.g shipment of HEU spent fuel in Petten to US
– Euratom encourages, through its framework programmes, research in a wide range of subjects which include the safe management of spent fuel and radioactive waste

Challenges
– Ensuring consensus between EU MS on role of Euratom in relation to safety of spent fuel and radioactive waste management
– Establishing a coherent relationship between Euratom, the IAEA and EU MSs
– Harmonization of clearance levels in MSs.

Planned measures to improve safety
– Adoption of revised Directive on shipments between MSs

Other Country Groups

1. Sweden

Since the first review meeting in 2003, Sweden has substantially amended its safety regulations. These amendments include requirements for decommissioning plans, more stringent requirements on physical security and the inclusion as mandatory on all facilities of a certain type requirements that had previously been included in licences on a case by case basis. Planned future amendments to the regulatory framework will institute clearance levels for radioactive material.

Sweden is actively progressing its plans to construct a geological repository for spent nuclear fuel. The repository is to be constructed by a company owned by the operators of Sweden's nuclear power plants. A decision on a preferred site is expected in 2007. Subject to regulatory approval, construction is expected to commence in 2010. There is no legal requirement for waste to be retrievable; this is a decision for the operator, but any design for retrievability must satisfy the regulator.

Disposal is funded by a levy placed on electricity cost. This levy is paid into a fund that is controlled by the Swedish Government. This fund also guarantees the funding for decommissioning of reactors.

As part of the community consultation process for the repository, the proponent must consult with, *inter alia*, national environmental organisations and local interest groups. In 2004, the Swedish Parliament passed legislation allowing such organisations to apply for funding to assist their involvement in the consultation process. It was commented that this may create invoke opposition, however the Swedish delegation believed the opposite: by engaging these groups from the outset, the risk of appeals against licensing decisions is reduced.

Highlights/Good practices

- Responsibilities for safety clearly defined in legal framework
- Funding system for decommissioning and waste management in place (under review)
- Long term strategy in place for SF and Fuel cycle Waste
- Stakeholder consultation in decision making
- Central funding to be available for orphan sources and other legacy waste

Challenges/ planned measures to improve safety

- Implementation of the long-term strategy. Four new facilities to be licences, designed, built and brought into service
- Implementation of improvements to the system of management of non-nuclear waste
- Implementation of the new financing system
- Acceptance criteria for long lived waste
- Clearance criteria will be developed to support decommissioning activities

2. Netherlands

All radioactive waste must be delivered to the central waste store operated by COVRA, a state owned company. Spent fuel from power reactors is reprocessed in France and the UK, with the resultant waste returned; spent fuel from research reactors is either returned to the country of origin or sent straight to COVRA. Disused sealed sources must be returned to the manufacturer or sent to COVRA.

A programme has begun to clean-up and condition waste stored at a provisional storage facility. This programme is at the environmental impact assessment stage.

Current policy is to store all waste for at least 100 years to give sufficient time to accumulate sufficient funds and waste volumes for deep geological disposal and to gain public acceptance for such disposal. Near-surface disposal for low level wastes is not considered due to the shallow water table. Any disposal facility will be designed to allow waste to be retrieved. The Netherlands is seeking a trans-national solution to waste disposal, with implicit indications that a location outside the country is desired.

In order to ensure maintenance of skills within a limited budget, the Nuclear Safety Department has commenced a program of outsourcing 'process' work while retaining staff with an ability to effectively evaluate licence applications and inspection reports.

Good practices and challenges

– Well defined and advanced long-term strategy and framework, including NORM waste
– Keeping the knowledge on the safely enclosed Dodewaard NPP over more than one generation

3. France

At the first review meeting, France committed to the development of revised legislation for radioactive waste management, the development of disposal routes for all types of waste, and ensuring that U tailings are handled under similar arrangements to other radioactive wastes:

A Bill on nuclear security and transparency has been developed and under this Bill, the present nuclear safety authority has become an independent authority. The Bill also provides for better transparency arrangements including better public access to operator's safety documents, and updated nuclear installation regulation.

A Bill on radioactive waste management introduces a national policy for radioactive waste management, including updated provisions for banning the disposal of foreign wastes in France, and provides a legal framework for deep geological disposal. The draft radioactive waste management plan is expected to become the subject of a decree in late 2006. In related legislation, sanctions for breaching regulations will be increased markedly over those set in place in original legislation promulgated in1966.

Disposal routes for radioactive wastes not covered by existing faculties, including radium-bearing waste, graphite waste and disused sources, are being developed. Work is also being undertaken to assess the long-term impact of mine tailings.

There are no universal clearance levels in France because of lack of public acceptance of "unconditional" clearance, cost and reliability and other difficulties in applying clearance levels and no conceivable use has been identified for "cleared materials". Consequently, a disposal facility for these very low-level wastes, the VLLW repository in Morvilliers, was developed and has been in operation since summer 2003. In 2005, 25000 m^3 of waste were emplaced in this facility. The LLW disposal site at Centre de l'Aube has operated since 1992 with 114 m^3 (17,522 packages) emplaced in 2005.

The Centre de la Manche has been under institutional control since 2003. Monitoring studies are continuing and a report on the state of the capping, membrane, and sampling results is issued each year. These results show decreasing releases and environmental impact, and consequently, there is a move to implement more passive monitoring systems at this facility.

France recovers, on request, French sources distributed abroad. Sources are currently stored at provider's premises or in CEA storage. The providers' association "Ressources" takes ownership of sources for any of its failed members.

Highlights/ Good practices

- Bills being progressed on nuclear security and transparency and on RAW management
- National RAW management plan being developed
- Good Management of disposal sites for short-lived ILLW and VLLW
- Planned repositories for HLW and long life ILW
    - Assessment of deep disposal safety through underground laboratory
- Well developed spent fuel management policy
- Well defined responsibilities between operator and regulator
- Source providers insurance for disused sources

Challenges/planned measures to improve safety

- Need to implement siting, design, licensing and regulation of new facilities
- Maintaining public confidence
- Large NPP programme therefore large decommissioning programme
- Complete the development of the national plan for the management of radioactive waste
- Operators development of disposal routes for any type of radioactive waste

4. Canada

Questions and Answers:

- Disposal of disused sealed sources:
    - Atomic Energy of Canada Limited (AECL) accepts disused sources for which there is no longer a legally responsible person. OPG accepts sources from owners by commercial arrangement.
    - There is no legislative requirement that manufacturers of sealed sources accept their return or ensuring automatic right of re-entry of those sources into Canada..
    - Domestic and international transfer of Category 1 and 2 sealed sources is tracked by computerised tracking system: regulatory body is currently

uploading data on existing sources with industry to update the system as required, from June 2006.

- Some 4000 licence holders self manage varying amounts of LLW, alternative option to self-management is transferring waste on commercial basis to AECL or Ontario Power Generation (OPG). Note: waste may fall below regulatory exclusion limits.
- Long-term care of used nuclear fuel: in November 2005, the National Waste Management Organisation recommended to the Government Adaptive Phased Management for the long-term care of used nuclear fuel. Adaptive Phased Management is a technical method and a management system. The method is implemented in stages with the end goal of centralizing all of Canada's used nuclear fuel in one location, and isolating and containing it deep underground in a suitable rock formation. The management system is phased and adaptive, with explicit decision-points to incorporate new social learning and technological innovation as it is implemented. At each stage options, including a contingency for temporary shallow underground storage, can be evaluated and the plan modified before proceeding. A future society will decide whether and when there is sufficient confidence in the safety of the approach to seal and backfill the repository. When the Government of Canada decides on a management approach the NWMO will become the implementing agency. The NWMO will then seek an informed, willing community (in the Ontario, Quebec, New Brunswick and Saskatchewan provinces) to host the central facilities. NWMO would not be drawn on likely date of Government decision only indicating that the Government was discussing the matter with stakeholders.
- Port Hope Area initiative: remediation of radium and uranium refining (1.9 million ^{m3}) – two long-term management facilities both above ground engineered for 500 year life – life term still subject to agreement of nuclear safety regulator (CNSC).

Section A: Introduction

- Limited consideration given to discharges

Section B: Policies and practices

- Legislative instruments national framework for waste management regulatory policies and support activities for radioactive waste are well structured and developed
- Well developed system of financial guarantees

Section C: Scope

- All except NORM and TENORM and military waste

Section D: Inventory

- Comprehensive inventories in national report

Section E: Legislation and regulatory systems

- Structured regulatory program

Section F: Other general safety provisions

- Addressing requirements for national human resources

- Formal programs for quality assurance, radiation protection, environment protection and emergency preparedness
- Structured reg approach to decommissioning
- Demonstrated initiatives to address past waste management practices

Section G: Safety of Spent Fuel Management
- Structured licence approach to approvals for siting, construction, operation and closure of SF facilities
- Adaptive phased management approach recommended for SF not broadly understood by participants
- Thorough approach to the public consultation process
- Decision on spent fuel approach pending governmental decision

Section H: Safety of Radioactive Waste Management
- Structured approach to approvals for siting construction operation and closure
- Long term LILW facilities being implemented by OPG
- 500 yrs design life for Port Hope Facility was questioned - 500 year design life requested by local community.

Section I: Transboundary movement
Nil.

Section J: Disused sealed sources
- High risk sealed sources tracking system being established
- LLRWMO responsible for orphan sources in Canada

Highlights:
- Canada is safely managing a very wide variety of waste types (Port Hope, Kincardine (DGR) mining and milling tailings, historical and legal waste, operational waste and spent fuel)
- Open and transparent approach to public consultations – rigorous, systematic study for public engagement has been applied for the spent fuel strategy
- Financial planning in all areas
- Competent regulatory system with clear responsibilities

Overview of liabilities
Long term management policy
– Spent fuel - Waste owners (WO) responsible for the funding, organisation and operation of the waste management facilities
– Nuclear fuel cycle wastes - WO are responsible for the nuclear fuel cycle waste they produce
– Non-power - WO are responsible for non-power waste, however, this can be transferred to the responsibility of another
– Decommissioning liability - The licensee is responsible for all the decommissioning liabilities
– Disused sources - Long term management policy means WO responsible but can be transferred to

Funding of liabilities

– Spent fuel - The WO are required to provide for future liabilities in the form of funds
– Nuclear fuel cycle wastes - The WO are required to provide a financial guarantee for the decommissioning and long term management
– Non-power wastes - Long term management is funded by licensee
– Decommissioning liability - The regulatory body requires financial guarantee for decommissioning liabilities
– Disused sources - Long term management provided by licensee

Current practices/facilities
– Spent fuel - Short term management
– Nuclear fuel cycle wastes - Each WO currently operates there own waste management facility
– Non-power wastes - Interim storage, delay and decay, controlled release and incineration
– Decommissioning liability - At present financial guarantee to cover cost of decommissioning and subsequent long term management in place for uranium mining and milling – others on case by case basis
– Disused sources - Disused sealed sources transferred to AECL

Planned facilities
– Spent fuel - Recommendations on the long term management of spent fuel is before the Government of Canada
– Nuclear fuel cycle wastes - X2 Planning DGR
– Non-power wastes - X2 Shallow and deep geo rep which could be used
– Disused sources - AECL planning shallow and DGR which can be used by all parties.

Canada 1st RM follow up
NWMO study on approaches to future long term SFM
- Study has been submitted to the government

Port hope area initiative
- Ongoing

Kincardine LILW repository
- Ongoing

Updating regulatory documents (regulatory policy P-210 managing RW
- Replaced by P-290 which is already in force

Good practices
- Canada carries out excellent stakeholder consultation supported by policies that promote openness and transparency
- Canada has the mechanisms in place to secure the funding for the longer term liabilities
- Establishment of the a comprehensive sealed source tracking system for high risk sources

Challenges and follow-up
Continue the progress for long term radioactive waste management:
- Sustaining the movement for the implementation of the long term management approaches

- Fostering relationships through stakeholder consultation
- Ensuring that there are adequate human resources to implement future work
- Increasing regulatory effort necessary to support future industry initiatives
- Additional requirements for financial guarantees required study?
- Approval required to proceed with PHAI and Kincardine
- Further process on decommissioning old structures
- Completion of major projects (fuel packaging and storage project)
- Classification scheme to be established
- The amendment of regulations on exemption and clearance
- Governmental decision on NWMO recommendation

Planned measures to improve safety
- Continued efforts to develop regulatory documents, for example, on the assessment of long term safety of radioactive waste and financial guarantees
- The implementation of plans for the long term management facilities (repositories) for SF and LILW.

Conclusions
- National Report complies with the Joint Convention
- Clear and comprehensive presentation
- Comprehensive WM policy and strategy
- Competent regulatory system
- Canada is actively addressing the long term management of SF and RW
- Canada generally complies with the JC.

5. USA

Questions and Answers:
- Volume of LLW moved to the Nevada Test Site Disposal Facility is up to 20 trucks per day 4-5 days per week – some trucks travelling from as far as New York. (Julian Kelly's note)
- US orphan/disused source recovery strategy:
  - Cradle to grave approach: strategy incorporates import and export controls on high activity sources, national source tracking system and DOE operated offsite source recovery program which relates principally to proliferation or safety risk Category 1 and 2 sources (Pu, Am) and other isotopes of WMD interest in Category 3.

Scope: Article 3[1]

[1] Greater-Than-Class-C radioactive waste (GTCC) is waste generated by licensees of the U.S. Nuclear Regulatory Commission (NRC). The waste has concentrations of certain radionuclides above the Class C limits as stated in 10 CFR 61.55. GTCC waste is considered a form of low-level radioactive waste (LLW). There are four classes of LLW, in ascending order of hazard: Class A, B, C, and GTCC.

For classes A, B, and C, the NRC has regulations (10 CFR Part 61) that set concentration limits for both short-lived and long-lived radionuclides. These limits are actually formulas that reflect both the half-lives and the hazards of the radionuclides in each class.
In terms of hazard, Class A LLW is intended to be safe after 100 years, Class B after 300 years, and Class C after 500 years. These LLWs are typically disposed of in shallow land burial sites; however,

- Spent fuel:
    - Spent fuel is managed in NRC licensed or DOE regulated facilities:
        - Commercial spent fule stored in licensed pools or ISFSIs (interim spent fuel storage facilities)
        - Spent fule from former defence reactors managed in DOE regulated facilities.
- Radioactive waste:
    - Managed in NRC/State licensed and DOE regulated facilities.
    - Waste disposed at environmentally acceptable sites.
    - Transport consistent with IAEA regulations.
    - Mandated financial assurance and custodial responsibilities.
    - Institutional measures after closure

Long-term management – spent fuel

- Permanent disposal in a geological repository is established US policy.
- Interim safe storage pending availability of an operating repository.
- Spent fuel storage facilities:
    - Government: pool (2 facilities/52 Metric Ton of Heavy Metal (MTHM)); dry case (11/2,399); and research and test reactors (6/1).
    - Commercial: university research reactors (30/1), other research and test reactors (5/<1); at-reactor storage pools (99/49,000); ISFSIs (42/6,200)
- Funding responsibilities – spent fuel:
    - Yucca Mountain: costs shared among generators (including government).
    - Storage: interim storage costs borne by generators.

Current practice – foreign research reactor fuel return program:

- Shipments to date: 6 shipments to INL and 27 shipments to SRS.

Planned facilities – spent fuel:

- 14 ISFSIs planned
- private fuel storage, an 'away from reactor' ISFSI
- Yucca Mountain licence application is in preparation.

Radioactive Waste origins:

- Nuclear fuel cycle:
    - Uranium mines and mills
    - Uranium conversion and enrichment plants
    - Fuel fabrication (light water and future MOX)

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because of its high hazard, GTCC waste is not typically disposed of in shallow land burial sites or commingled with Class A, B, and C LLW.

In the United States, radioactive waste is generally defined by the use from which it was generated, as opposed to its actual hazard in terms of radioactivity. In general, there are three major categories of radioactive wastes:
* Spent Nuclear Fuel (SNF)
* High Level Wastes (HLW)
* Transuranic or TRU Waste, and
* Low-Level Wastes (LLW)

Further information at http://www.state.nv.us/nucwaste/gtcc/gtcc.htm#spent

    - Nuclear power plants
    - Reprocessing (past practices, GNEP)
- Non-power
    - Defence-related activities
    - Government and university research reactors
    - By-product use in medicine, research and industry
    - Decommissioning and site cleanup
    - Some TENORM

Long-Term Management – Radioactive Waste

- Permanent disposal is national policy and almost all nuclear wastes are disposed of the US
- By sector:
    - Government:
        - geological repository: (WIPP (facility type); TRU (waste type); 1 (number); 37,000m^3 (inventory))
        - closed greater confinement disposal: boreholes/TRU/1/200m^3
        - near surface disposal: LLW; 18; 5,800,000m^3
    - Commercial:
        - Operating near surface disposal: LLW (Class A, B, C)/3/2,660,000m^3.
        - Operating near surface disposal: 11e.(2)[2]/1/1,010,000 m^3
    - Government and Commercial:
        - Title 1: Uranium Mill Tailings Radiation Control Act (UMTRCA) disposal: residual radioactive material (tailings)/20/163,000,000 combined with Title 2
    - Commercial:
        - Title 2: UMTRCA disposal 11e.(2)/39/163,000,000 combined with Title 1.
    - Government:

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[2] The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content *(termed 11e(2) byproduct material).* Ore bodies depleted by uranium solution extraction operations and that remain underground do not constitute "byproduct material."

The classification of 11e(2) byproduct material has its origins in the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. Title I of that Act directed the Department of Energy to perform appropriate remedial actions at 22 inactive processing sites to address the residual radioactive material remaining at those sites. The term "residual radioactive material" was defined in Title I to mean: "(A) waste (which the Secretary determines to be radioactive) in the form of tailings resulting from the processing of ores for the extraction of uranium and other valuable constituents of the ores; and (B) other waste (which the Secretary determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials."

The definition of byproduct material was taken from Title II, Section 201, of the Uranium Mill Tailings Radiation Control Act, which amended the original definition in Section 11e of the AEA. This redefinition -- which consisted of adding the second category -- addresses material such as uranium and thorium mill tailings not covered under UMTRCA Title I, i.e., for locations beyond the 22 designated sites. For all practical purposes, residual radioactive material under UMTRCA Title I and 11e(2) byproduct material under Title II refer to the same type of material.

        - Other closed disposal cells/residual radioactive material (tailings)/2/3,120,000m3.

Current Practice – radioactive waste:
- HLW
- TRU Waste
- Low-level radioactive waste
- Uranium mill tailings

Planned Facilities – Radioactive Waste:
- Low-level waste and 11e.(2) disposal facilities (Waste Control Specialists – in licensing)
- Integrated Disposal Facility – Hanford site
- Treatment facilities for defence HLW at Hanford site, Idaho National Laboratory, and Savannah River Site.

Summary – Radioactive Waste
- Permanent disposal is our policy
- Treatment and disposal of TRU waste and LLW is routine and safe.

Long-Term Management and Decommissioning and Remediation:
- DOE: 1337 nuclear/radioactive facilities, 299 completed by October 2006.
- NRC:
    - 17 power and early demonstration reactors
    - 14 research and text reactors
    - 38 material sites
    - 35 uranium recovery sites
    - 3 fuel cycle sites (partial decommissioning).

Current DOE practice – decommissioning and remediation
- Strategies and schedules vary by, facility, location and extent of contamination.
- Facilities decommissioning linked to site risk-based end state, and stakeholder input.
- DOE plans sometimes subject to external approvals – EPA, States, NRC
- DOE generally retains long-term, stewardship responsibility.

Current NRC practice – decommissioning and remediation
- Dose-based regulation and ALARA (optimization).
- Regulations including criteria for unrestricted and restricted use.
- Regulations provide for stakeholder involvement.
- Remediation plans, and financial assurance mechanisms required.
- NRC reviews radiological surveys or demonstration that the site meets the criteria prior to termination.

Planned Facilities – Decommissioning and Remediation
- Termination/Completion of 13 materials sites and 9 power reactors.
- Significant reviews – 3 licence termination plans; 11 decommissioning plans.
- NRC expects to terminate 26 commercial facilities over the next 3 years:
    - 16 complex materials facilities

- 3 power reactors
- 1 research and test reactor
- 6 uranium recovery facilities.

Long-term management – disused sealed sources

- increased controls are crucial for risk-significant sealed sources;
- US supports IAEA Code of Conduct on the Safety and Security of Radioactive Sources and RS-G-1.9, 'Categorisation of Radioactive Sources'.
- Category 1 and 2 sources have additional storage security controls
- National source tracking system is key.
- Storage requirements apply whether source is held for eventual use or disposal.

Long term management – control and recovery is national priority:

- DOE recovers sources as part of its Radiological Threat Reduction Program.
- 12,000 sources recovered through 2005 with 24,000 expected by 2011.

Current Practices – disused sealed sources:

- sources disposed of or returned by licensee.
- NRC/DoE MoU to exchange information on at risk sources
- DOE stores recovered sources, including greater than class C ('GTCC') LLW.
- Sources not GTCC waste disposed of as LLW.

Planned Facilities – disused sealed sources:

- Disposal facility for GTCC waste
- LLW disposal facility in Texas for Class B/C sources.

Challenges – Spent Fuel

- Storage:
  - High burn-up fuel
  - Burn-up credit
  - New materials
- Yucca Mountain
  - Revisions to compliance period for EPA standards and NRC regulations.
  - Quality assurance concerns

What's new since last report – radioactive waste:

- WIPP recertification
- GTCC LLW environmental impact statement begun by DOE
- Waste Control Specialists application for LLW and 11e.(2) disposal facility.
- Legal provisions for non-geologic repository disposal of 'incidental' waste
- Studies on efficiency of very low level activity waste and low-level waste management
- NORM/TENORM disposal facility licensed in 2005.

Achievements – Radioactive Waste:

- 2005 is peak year for LLW disposal due to DOE decommissioning waste.
- 4,500+ TRU waste shipments to WIPP since 1999
- 6,300+ LLW shipments to Nevada Test Site in past 3 years.

Challenges – Radioactive Waste:
- Defence HLW treatment schedule.
- GTCC LLW disposal.
- Future needs for Class B/C LLW disposal.

What's New Since Last Report – Decommissioning and Remediation:
- Integrated decommissioning improvement plan.
- Revised regulations for financial assurance.
- Private sector decommissioning and remediation: 2 power reactors, 3 research and test reactors, 12 materials sites and 2 uranium recovery licences terminated.
- Government sector decommissioning and remediation: 78 sites remediated, 297 contaminated facilities decommissioned.

Planned activities to improve safety:
- Geologic disposal at Yucca Mountain for spent fuel and HLW.
- Monitoring LLW disposal capacity.
- Disused sealed source tracking, collection and disposal.
- Clean-up of contaminated sites and facilities.
- Global Threat Reduction Initiative.
- Global Nuclear Energy Partnership.

Good Practices
– Comprehensive regulatory system covering SF and all radioactive waste streams
– Very clear national policy with the declared goal of safe permanent geological disposal
– Excellent experience with WIPP operation
– Return of foreign Research Reactor Spent Fuel
– Outside disused source recovery program
– Stakeholder involvement in siting and decommissioning

Challenges
– If the potential shortage in disposal capacity for certain categories of LLW occurs, it could require additional storage solutions
– No repository for GTCC waste so far
– The lack of national clearance levels could challenge public acceptance
– The need for NRC to revise its regulations for geological disposal based on new EPA standards for a compliance period of 1 million years will require DOE to address these requirements.

6. Denmark

Denmark has operated three research reactors at the Riso National laboratory. The smallest of these, DR 1, has been decommissioned. A plan for decommissioning DR2, a 5MW swimming pool reactor, which was taken out of service in 1975, is well developed. A decision was made in 2000 not to restart the largest reactor, DR 3, and this led to a decision to shut down all nuclear facilities at the Riso site. An independent institution, Danish Decommissioning, under the Ministry of Science, Technology and Innovation, was set up buy the Danish parliament to oversee all decommissioning at the Riso site and this organisation took over all responsibility for nuclear facilities on the site in 2003. In addition to the three reactors other nuclear

facilities will be decommissioned. These include hot cells, a fuel fabrication plant and waste management facilities.

Denmark has a small number of Spent Fuel elements from its fuel fabrication program that are its responsibility. While this waste can be stored safely a long term solution has not yet been determined.

A waste management plant has been developed on the Riso site for the collection conditioning and storage of radioactive waste from Riso and from other Danish users of radioactive materials. Two laboratories have been refurbished for waste conditioning and new storage facilities have been constructed to undertake this work. Storage basins have been constructed for uranium tailings and uranium ores.

Denmark is planning a disposal facility for LILW. The financial and human resources for this project will come from Nuclear Regulatory Authorities. The preparation of a Basis for Decision was submitted to the Danish Government in 2005. The draft is awaiting clearance by the Danish Government. Public hearings will be held in the summer of 2006. The types of facilities being considered are near-surface disposal, medium depth disposal and deep disposal.

The oil and gas industry in Denmark produces approximately 10 tons of NORM waste per year. Different handling and disposal technologies are considered by the main operator.

The main challenges identified for Denmark are:

- Decommissioning of nuclear facilities at Riso
- Finding a workable solution for its small amount of spent fuel
- Maintaining human resources and specialised knowledge
- Construction of a disposal facility for LILW
- Management of NORM wastes

Highlights/Good Practice

– Parliamentary decision on decommissioning and disposal
  - Creation of “Danish Decommissioning”
– Reactor DR 1 decommissioned and project description agreed by regulator for DR2
– Waste management plant includes a new storage facility and two laboratories to enable decommissioning work
– Some progress in ‘Basis for Decision” regarding LILW repository
– Open information and public involvement
– Comprehensive register of sealed sources

Challenges/planned measures to improve safety

– Disposal facility for low and intermediate level waste
  - Site selection, design licensing
– Human resources – Nuclear Regulatory Authorities
– Complete decommissioning of Research Reactors
– Finding a solution for disposal of the small quantity of Spent Fuel
– Nuclear Regulatory Authorities
  - Inspections of waste storage facilities

- Survey for orphan sources

7. UK

Highlights

- Large power program with diversity of nuclear facilities and waste types including large amount of historical wastes, plus disused sources (large/small, sealed /unsealed)
- Unified strategic focus for management and funding of decommissioning liabilities via the NDA, with an agreed national strategy
- Intention to set up a nuclear skill institute and a national skills academy (by NDA)
- Several facilities already decommissioned – therefore substantial pool of related experience already built up
- Public consultations underway on management of both LLW and higher activity radioactive wastes (including Pu for which no further use is foreseen) – now near completion
- National JC Report makes reference to IAEA standards

Good Practices:

- Implementation of fixed and mobile radiation detection systems at ports and airports
- Extensive involvement of stakeholders (including general public) in developing national waste management policy
- Comprehensive legal framework including systematic safety reviews of nuclear facilities
- Benchmarking safety assessments principles against international practices including IAEA Safety Standards
- Ongoing reduction of environmental discharges and hazards associated with management of liquid HAW (past practice)
- Government commitment to financing management of orphan sources
- Coordination of regulatory responsibilities via MoU

Challenges

- Completion of process to put policy, strategy and plans in place for comprehensive waste management arrangements
- Will need to implement siting, design, licensing and regulation of new long term radioactive waste management facilities, and accelerate decommissioning, while maintaining public confidence
- National policy on management of LLW (including decommissioning waste)

UK – 1st Review Meeting Follow-up

White paper on management nuclear legacy:

- NDA successfully established an a national strategy for decommissioning has been approved the Government
- UK is nearing completion of the initiation stage of reviewing policy of long term management
- Progress in decommissioning Magnox reactors. UKAEA and other research sites and legacy plant at Sellafield
- Treatment of various previous problematic wastes
    - Medium active concentrate (reduction of Tc99)

- Repacking PCM
- Active sodium from PFR

UK – Planned measures to improve safety

- Completion of evaluation of options for SFM that may not be reprocessed (2007)
- Complete review of options for VLLW (2006)
- Review classification system for radioactive waste
- Finalise regulations for remediation of contaminated land and identification of 'non-licensed' sites that require remediation
- Complete review of remaining capacity of Drigg (3-5 years)

8. Finland

The presentation focussed on progress in establishing a spent fuel repository, with a site selected, public acceptance gained and construction commenced. There is still some engineering assessment directed at whether horizontal or vertical emplacement of spent fuel costs.

Other country comments were highly complimentary of Finland's program and progress with spent fuel management. Finland stated it is happy to share its experience in this regard.

There was no mention of research reactor spent fuel management in the presentation. When asked, Finland advised that all research reactor spent fuel is covered by the US take-back arrangement ending in 2016. The date for shipment of the fuel is yet to be determined.

The cost estimates for decommissioning of Finnish NPPs was raised, although decommissioning was not envisaged for several decades. It was explained that the low figure is due to a combination of factors, namely LLW disposal facilities are already in place at the NPP sites and NPPs are not required to be decommissioned to greenfield state.

Good Practices

– Early decision of Government on nuclear waste management
– Regulator – implementer dialogue within SF disposal programme
– Good public involvement in site selection process for SF repository
– Clear regulatory framework
– Successfully maintaining public acceptance of disposal programme

Planned measures to improve safety

– Reform of the STUK guides
– Completion of the underground rock characterization facility project
– Further implementation of the EU HASS Directive for disused sealed sources

9. Austria

Waste will be stored until 2030 at which time a disposal solution is expected to be in place. Storage arrangements will continue after that time if required. Austria is seeking a trans-national solution to waste disposal, provided such a repository is not

located in Austria. Accordingly, domestic disposal is not under consideration, although potential sites were previously identified. Domestic disposal options may be revisited if a trans-national repository is not forthcoming.

Disused sealed sources must be returned to the manufacturer and spent fuel from research reactors is returned to the US. Other radioactive waste is stored by Nuclear Engineering Seibersdorf (NES), a majority state-owned company. NES also provides conditioning and other waste treatment services. These services have been used in the recent decommissioning of two of Austria's three research reactors.

Recent changes to Austria's legislative framework mean that applicants for licences to construct or operate a facility must develop decommissioning plans and radioactive waste management plans as part of the application.

Concern was expressed that the NES is contracted to the same department that regulates nuclear activities, potentially compromising independence of operator and regulator.

Highlights/Good Practices

- Research reactor fuel will be sent to US. No permanent storage needed
- Interim LILW storage – to be modernised
- Funding systems in place for all RAW backed by government guarantee
- Centralised source register in place
- All nuclear liabilities are well managed
- Legal framework in place
- Inclusion of TENORM in waste management
- Insurance system for sealed sources

Challenges/Planned measures to improve safety

- Finding a solution for the ultimate disposal of the small amounts of waste
- Clarify the responsibilities of the national and regional authorities
- To report fully on the Research Reactor spent fuel
- Modernisation of the waste treatment facilities in Seibersdorf
- Completion of the adaptation of the Austrian radiation protection legislation (NORM)

Final plenary session

Following the completion of the programme of country group reports, delegations from the Contracting Parties met to review the outcomes of the process. Rapporteurs from each of the country groups reported on the main points of each country's presentation and provided observations on their Country Group.

The general observations and conclusions from each of the Country groups follow:

Country Group 1 (Romania, Netherlands, Brazil, Croatia, USA, Belgium, Belarus, Spain, Italy)

- Issues identified at the first review meeting generally followed up and reported
- Spent fuel and HLW: interim storage pending decision on geological disposal (except of the USA)
- Political decisions deferred
- Appropriate funding in place or being set up
- LILW: repositories only in Spain and the USA (except GTCC), Belgium is actively progressing site selection
- Step-wise decision making processes with broad and early stakeholder involvement appear to be a good practice to achieve public acceptance
- Problem frequently addressed: maintaining competence – regulators and implementers
- Past practices: actively being addressed by the countries concerned. In some cases international assistance required.
- Decommissioning: funding systems in place or being established
- Maintaining knowledge in case of deferred dismantling is a challenge
- Clearance: in many countries case-by-case decisions, no established national levels, split views
- Disused sealed sources: near and medium term solutions in place
- Recommendations for next national report:
    - National reports should elaborate in more detail (and with examples) on good practices and lessons learned
    - WEB references, topical text boxes etc are good features to enhance understanding of the reports
    - The overview tables as used by the rapporteurs during this review meeting give a quick glance of the situation and might become part of national reports.

Country Group 2 (Sweden, France, Lithuania, Slovenia, Austria, Denmark, Slovakia, Estonia)

- Group comprised of only European Union Countries – EU legal requirements influence findings
- Four members of the Country Group have recently acceded to the EU – consequently there are transitional arrangements in place in some instances
- Legal infrastructures complete or well advanced
- RAW strategies complete or well advanced
- RAW management plans in place or being developed – mid term or long term
- Many have LILW storage
- Countries with nuclear power plants have defined spent fuel strategies – onsite storage/reprocessing

- Variable progress on final repository for long lived waste LILW and HLW
  - Some approaching site selection stage
  - Others seeking regional partnerships (no success yet)
- Decommissioning strategies in place
- Funding systems in place (some refinement necessary)
  - Special funding arrangements for those countries that are decommissioning reactors as a consequence of accession to EU
- Clearance criteria – harmonisation is an issue
- All have source management in place (EU)
- More refinement still needed on management of orphan sources and tracing/managing historical waste

Country Group 3 (Argentina, Australia, Bulgaria, Euratom, Iceland, Japan, Latvia, Ukraine)

- Those countries which had presented a report to the first peer review meeting demonstrated progress in fulfilling their obligations under the JC
- The level of detail provided in each report was generally appropriate for the spent fuel and radioactive waste management activities in the country in question
- Some reports provided detailed information which was not relevant to the JC e.g full lists of staff in the regulatory body
- All group 3 countries are taking steps to address the issue of the safety of disused sealed sources
- All Group 3 countries appear to accept the importance of stakeholder involvement
- Those Group 3 countries with uranium mining and milling activities are addressing the issue of site rehabilitation which remains an ongoing activity in these countries
- Long term management options for HLW are still under discussion
- Spent fuel not defined as waste in some Group 3 countries, so no urgency seen to determine final disposal option

Country Group 4 (Hungary, Poland, Czech Republic, Republic of Korea, Luxembourg, United Kingdom, Greece and Russian Federation)

- Management of spent fuel and HLW – final policy undecided
  - Interim (dry) storage facilities being constructed/extended (Hungry, Czech Republic, Poland)
  - Russian Federation researching geological disposal options for SF not suitable for reprocessing/on-site storage at 'PA Mayak"
  - Korea – on site (mainly wet) storage
  - UK - reprocessing and on-site storage at Sellafield
- Research Reactor Fuel – Global Threat Reduction Initiative
- Fuel cycle wastes
  - Near surface or intermediate depth repositories – existing in Czech Republic and UK, planned for in Hungary and Korea
- Non power wastes
  - Near surface repositories – existing in Czech Republic, Hungary, Poland, UK and subject to ongoing improvements

- Disused Sealed Sources
  - New storage facilities (Hungary, Greece)
  - Export for recycling or disposal (Greece, Luxembourg)
- Uranium mining and milling wastes
  - Ongoing rehabilitation of tailing ponds and waste tailing sites (e.g Hungary, Czech Republic)
- Decommissioning liabilities
  - Nuclear Decommissioning Authority formed in the UK
- Key challenges:
  - Development of national SF and waste management strategies, especially for the back end of the fuel cycle and for long-lived waste
  - Public acceptance of geological disposal of spent fuel/HLW
  - New disposal capacity for LILW wastes, including waste from decommissioning
  - Remediation of legacy facilities (including developing accurate waste inventories) and of former uranium mining sites
  - Management of long lived disused sealed sources
  - Develop decommissioning plans and costs estimates – especially for research reactors
  - Decommissioning plans based on deferred dismantling raise knowledge management and skills retention issues

Country Group 5 (Norway, Canada, Germany, Finland, Switzerland, Morocco, Ireland, Uruguay)

- Within the group there was a general agreement that the second review meeting was more effective that the first review meeting
- Progress was demonstrated by those countries that participated in the first review meeting although not all follow-up actions have been finalised
- Legal framework is in place in all countries but significant efforts are being directed at revising, updating and completing the existing legislation
- The ability to establish and implement long term WM policy is often delayed by pending political decisions; clear progress in implementing disposal programme was demonstrated in a country where such a decision has been taken
- It was recognised that the stakeholder consultation process may be a critical component in a decision-making process
- Countries are addressing funding of nuclear liabilities but the nature of the funding mechanism is highly variable and these liabilities are not yet covered in all cases
- In countries with federal structure, harmonisation of federal and state/provincial/regional legislation is needed
- Clearance and exemption levels continue to be a challenging issue
- A good progress was recognised concerning the tracking and long term management of disused sealed sources and orphan sources
- Emergency preparedness is being implemented in all group countries
- The importance of establishing and maintaining the required human resources was recognized by the majority of group countries.

Lengthy and divergent discussions then followed in relation to the outcomes from the open ended working group.

The contents of a draft summary report of the Second Review meeting was then discussed at length. The revised draft of the summary report was finalised at the following session and would be made available publicly as agreed at the first plenary meeting. The finalised Summary Report is at **Attachment A**.

The draft Report of the President of the Review Meeting was made available on the final day of the Plenary. The Report would not be made publicly available.

Report from the open ended working group

The outcomes from the open ended working group were included in the summary report and minutes of the working group were attached as annexes to the President's report. Briefly, the outcomes consisted of; support continuing efforts to promote membership in the Joint Convention and review process; overall review process should continue in the current form; and voluntary use of the IAEA Safety Standards by contracting parties in preparation of National Reports.

Attachment A

23 May 2006
JC/RM.2/03/Rev.1

Joint Convention on the Safety of Spent Fuel Management
and on the Safety of Radioactive Waste Management

Second Review Meeting of the Contracting Parties

15 to 24 May 2006, Vienna, Austria

SUMMARY REPORT

Mr Andre-Claude Lacoste, President
Ms Patrice Bubar, Vice President
Mr Young Soo Eun, Vice President
Vienna, 24 May 2006

Introduction

1. Recognizing the importance of the safe management of spent nuclear fuel and radioactive waste, the international community agreed upon the necessity of adopting a convention describing how such safe management could be achieved: this was the origin of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the "Joint Convention"), which was adopted on 5 September 1997 and entered into force on 18 June 2001.

2. The objectives of the Joint Convention are:

(i) To achieve and maintain a high level of safety worldwide in spent fuel and radioactive waste management, through the enhancement of national measures and- international cooperation, including, where appropriate, safety-related cooperation;

(ii) To ensure that during all stages of spent fuel and radioactive waste management there are effective defences against potential hazards so that individuals, society, and the environment are protected from the harmful effects of ionizing radiation now and in the future, in such a way that the needs and aspirations of the present generation are met without compromising the ability of future generations to meet their needs and aspirations; and

(iii) To prevent accidents with radiological consequences and to mitigate their consequences should they occur during any stage of spent fuel or radioactive waste management.

3. To deliver these objectives, the Joint Convention adopted a review process. The Joint Convention requires each Contracting Party to:

(i) Submit in advance to all other Contracting Parties a National Report describing how it implements the obligations of the Joint Convention;

(ii) Seek clarification on the National Reports of other Contracting Parties through a system of written questions and answers; and

(iii) Present and discuss its National Report during a Review Meeting comprising Country Group sessions and Plenary sessions.

The Joint Convention specifies that the interval between Review Meetings should not exceed three years. Documents annexed to the Joint Convention provide guidance on the form and structure of the National Reports and on the way to conduct Review Meetings.

4. The Second Review Meeting of the Contracting Parties pursuant to Article 30 of the Joint Convention was held at the Headquarters of the International Atomic Energy Agency (IAEA), which is the depositary and Secretariat for the Joint Convention, from 15 to 24 May 2006. The President of the Review Meeting was Mr Andre-Claude Lacoste, Director General of the

General Directorate for Nuclear Safety and Radiation Protection, France. The Vice-Presidents were Ms Patrice Bubar, United States Department of Energy, and Mr Young Soo Eun, Korea Institute of Nuclear Safety.

5. Forty-one Contracting Parties participated in the Review Meeting, namely: Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Euratom, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, United States of America and Uruguay. Eight Contracting Parties participated for the first time: Brazil, Estonia, Euratom, Iceland, Italy, Lithuania, Russian Federation and Uruguay.

6. Brazil was a late ratifier. However, it had produced and distributed its National Report and had asked to participate fully in the Review Meeting. Under the rules, a late ratifier may be allowed to participate with the consensus agreement of the Contracting Parties at the Review Meeting. The Contracting Parties agreed by consensus to Brazil's request at the Plenary session on 15 May.

7. China informed the President that it had completed the internal ratification procedures on 29 April 2006 with a view to becoming a Contracting Party, but had not yet deposited its instrument of accession with the depositary. However, it had requested to participate in the Review Meeting. At the Plenary session on 15 May, the Contracting Parties agreed by consensus to China's request to participate as a full participant in the Second Review Meeting.

8. The Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD) was present as an observer.

General Observations

9. Despite a large diversity of national situations, all Contracting Parties shared the view that the Second Review Meeting showed that progress has been made since the First Review Meeting.

10. Areas for which the need for further work was identified at the first Review Meeting have been addressed by the Contracting Parties and reflected in their National Reports and oral presentations during the Second Review Meeting.

11. During the Second Review Meeting, Contracting Parties demonstrated their commitment to improving policies and practices particularly in the areas of

(i) national strategies for spent fuel and radioactive waste management;

(ii) engagement with stakeholders and the public; and

(iii) the control of disused sealed sources.

Challenges continue in a number of areas including the implementation of national policies for the long-term management of spent fuel, disposal of high level wastes, management of historic wastes, recovery of orphan sources, knowledge management and human resources. The need to ensure that Contracting Parties' financial commitments are consistent with the extent of liabilities was also recognized.

Policy and technical highlights from the Second Review Meeting

12. The main issues on which progress was noted are as follows.

Legislative and Regulatory Framework

13. Important efforts have been made by Contracting Parties to complete their legislative and regulatory framework.

Spent Fuel and Waste Management

14. All Contracting Parties are committed to address spent fuel and waste management in a comprehensive manner. Many Contracting Parties have already developed, or are currently developing, spent fuel and waste management strategies based on increasingly comprehensive inventories, including spent fuel and waste arising, or to arise, from decommissioning.

15. Some Contracting Parties have made clear progress with the implementation of their strategic plans.

16. The Contracting Parties highlighted the increasing importance of public consultation and the need for public acceptance in order to implement their spent fuel and waste management strategic plans.

17. Many Contracting Parties have defined funding strategies for managing safely their spent fuel and wastes in accordance with their strategic plans, although some Contracting Parties started collecting the funds only quite recently.

18. Some Contracting Parties reported on progress with siting of near-surface disposals, even if this remains a difficult issue to solve.

19. The subject of geological repositories is still more difficult to handle. However, some Contracting Parties reported on progress in siting such repositories.

20. The subject of regional repositories was mentioned by several Contracting Parties. It could be appropriate for some countries to join their efforts and resources for a common solution for final disposal.

21. The subject of exemption and waste clearance was discussed. There is for the time being no international consensus on the use of clearance levels. Many Contracting Parties are implementing clearance criteria on a generic basis or a case by case basis. Public acceptance and a clear radiation protection concept are key issues for the success of using clearance levels.

Decommissioning

22. Many Contracting Parties, especially those having nuclear power plants, have established funding schemes for decommissioning.

23. The Contracting Parties' strategies vary from "immediate" decommissioning (i.e. starting from 0 to about 10 years after final shutdown) to delayed decommissioning after a long safe enclosure phase. Keeping the knowledge and memory of the installation (normal operation, modifications, incidents, etc.) was recognized as being of crucial importance, especially in the case of delayed decommissioning.

Disused Sealed Sources

24. Many Contracting Parties have established registries for sealed sources. Most Contracting Parties have indicated that they have enforced a return of disused sealed sources to the supplier. Some have not yet defined a long-term policy. Funding schemes for the recovery of orphan sources have been set up by many Contracting Parties. The disposal of disused sealed sources, especially long-lived ones, was recognized as an issue still to be solved.

25. The Contracting Parties noted the importance of implementing the IAEA Code of Conduct on the Safety and Security of Radioactive Sources.

Mining and Milling Tailings

26. Many Contracting Parties, which had or still have uranium mining activities, reported on the actions that have been undertaken with a view to putting the problematic sites in a safe condition. Much progress has been made in this respect.

Naturally Occurring Radioactive Materials (NORM)

27. Some Contracting Parties decided to include NORM or TENORM (technically enhanced NORM), or both, in their waste management policy and reported about this.

Past Practices

28. A growing number of Contracting Parties reported on the remediation activities that have been initiated in their country. Also, several Contracting Parties included the management of historic spent fuel and waste in their strategic plans.

International Cooperation

29. Many Contracting Parties see the benefit of enhancing international cooperation through the exchange of information, experiences and technology. In particular, needs for sharing knowledge and assistance were emphasized by Contracting Parties with limited radioactive waste management and research programmes.

Improvements for the next Review Meeting

30. Three topics were discussed by the Open-Ended Working Group, established at the opening plenary session and chaired by Ms. Patrice Bubar:

(i) ways to increase membership;

(ii) improvements in the review process; and

(iii) role of safety standards in the review process.

The following improvements were identified through the deliberations of the Open-Ended Working Group and through the discussions that took place within the Country Group sessions.

31. The Contracting Parties support continuing efforts to promote membership in the Joint Convention and its review process, through organized IAEA efforts, bilateral efforts for mentoring and sharing of expertise, etc. Some Contracting Parties underlined the need for financial assistance.

32. The Contracting Parties felt that the review process was maturing and no changes should be made that would dilute its strong peer review nature. The Contracting Parties amended the Guidelines to reflect adjustments that were applied during the Second Review Meeting. These amendments as well as the report by the Open-Ended Working Group are annexed to the President's Report.

33. Concerning the role of the IAEA Safety Standards, the Contracting Parties shared the view that they constituted a useful source of guidance, among others, to which a Contracting Party could refer, on a voluntary basis, in preparing its National Report.

34. For the Third Review Meeting, the Contracting Parties agreed upon the following:

(i) Make efforts to produce more focused but still self standing National Reports;

(ii) In the National Reports, provide more details on the practical implementation of actions and on the main issues that have been raised during the Second Review Meeting; and

(iii) Place greater emphasis, in the National Reports and the oral presentations, on the lessons learned and feedback experience with the implementation of concrete actions. Conclusions

35. The First Review Meeting of the Joint Convention, in 2003, noted the strong commitment of the Contracting Parties to its objectives and to the implementation of its articles.

36. The participants in the Second Review Meeting noted with satisfaction the increased number of Contracting Parties, as compared to the First Review Meeting. They hoped that that trend would continue in the future.

37. The Contracting Parties adopted, throughout the review process, an open and frank attitude, thus allowing fruitful discussions to take place, even on difficult matters.

38. The Second Review Meeting showed that many Contracting Parties had initiated, or were initiating, new actions to improve the safe management of spent fuel and radioactive waste.

39. The three trends above indicate that the Third Review Meeting, to be held from 11 to 22 May 2009, with even more participants, will benefit from an increasing technical and practical content, and further enhanced openness and frankness.

Attachment B

Slide 1

Australian Government

Presentation of National Report for the Second Review Meeting of the Joint Convention

15 – 24 May 2006

Slide 2

Australian Government

Format of presentation

Presentation is focused on issues raised in the review process:

- **Enhancement of regulatory systems**
- **Management of spent fuel**
- **Decommissioning of nuclear facilities**
- **Management of abandoned U mines**
- **Radioactive waste management**

Slide 3

Australian Government

Overview – regulatory systems

- **Australia is a federation comprising six states and two self governing territories**
- **Responsibility for radiation regulation rests with each jurisdiction**
- **No one set of common laws with common requirements**

Slide 4

Australian Government

Overview – regulatory systems

- **Legislative requirements are not identical**
- **Uniformity of practice achieved through National Directory for Radiation Protection**

Slide 5

Australian Government

Overview - spent fuel management

- Australia has no nuclear power reactors but has one operational research reactor operated by an Australian Government agency
- Spent fuel management is the responsibility of the Australian Government

Slide 6

Australian Government

Overview – U mining

- Regulation of uranium mining is the responsibility of the States and Territories
- Australia has several operational uranium mines and several uranium mines that have been closed for many years

Slide 7

Australian Government

National uniformity of radiation regulation

Slide 8

Australian Government

National Directory for Radiation Protection (NDRP)

- Means of achieving uniformity in radiation protection and the safety of radioactive sources across Australia's nine jurisdictions
- First edition published August 2004
- Commonwealth, State and Territory Governments agreed to development processes for the NDRP

Slide 9

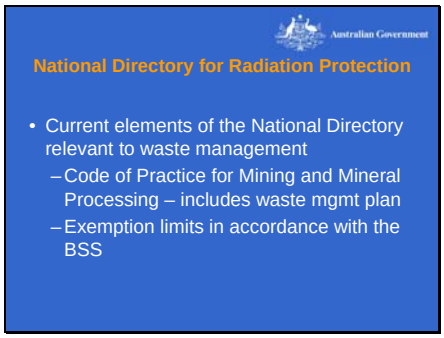
Australian Government

National Directory for Radiation Protection (NDRP)

- Developed by radiation regulators from each jurisdiction via the Radiation Health Committee
- All jurisdictions have agreed to use the NDRP to change their existing legislative frameworks

Slide 10

Slide 11



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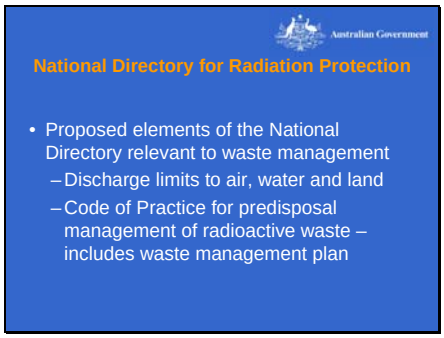

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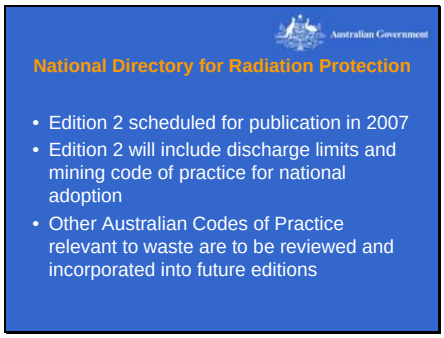

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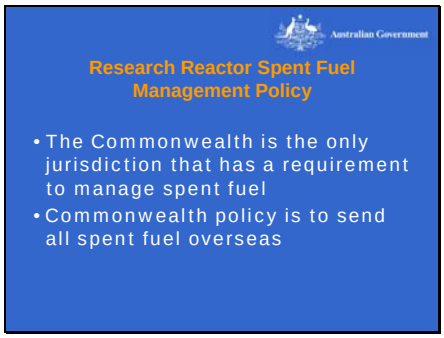
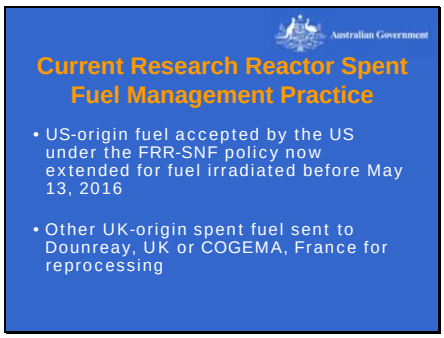


At page 4 of Australia's report, Australia's spent fuel management policy is described as follows:
The Australian government's spent fuel management policy requires that all spent fuel is to be transported overseas for indefinite storage (in the case of US-obligated fuel), or to another country for reprocessing, in the latter case with an agreement that all resulting long-lived intermediate-level radioactive waste will be returned to Australia at a mutually agreeable time for storage.
Australian Government policy is for all radioactive waste arising from operations of Commonwealth agencies (including ANSTO) to be managed at a central facility (see pages 7-9 of the Report). The wastes arising from the reprocessing of ANSTO spent fuel referred to above will be stored at that facility. Spent fuel from Australia's research reactors is aluminium-clad and therefore unsuitable for direct disposal.

Slide 16



Slide 17

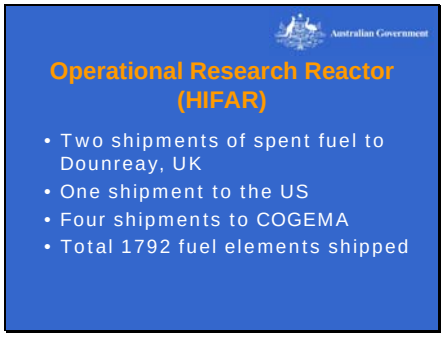
ANSTO's research reactor, HIFAR, is powered by 25 fuel elements, each containing 280 grams of uranium. Every four weeks, three or four spent elements are removed from the reactor, using a specially designed transfer flask, and put into a small pond adjacent to the reactor. The heat and radioactivity in the spent fuel decrease rapidly.

ANSTO's in-ground fuel storage facility consists of 50 holes, 16 metres deep, each lined with a stainless steel tube sealed at each end. Each tube, which can hold up to 22 spent fuel elements, is filled with dry nitrogen gas to minimise corrosion of the fuel. An improved system for monitoring these tubes has recently been introduced.

The following answer applies to HIFAR spent fuel: After initial cooling, the fuel is moved to the cropping pond and cropped about 2.5 cm either side of the fuel meat. The fuel is examined for defects, and any loose pieces produced by the cropping are removed.

The fuel is then canned and stored in a pond facility until 21 months have elapsed from the time of discharge from the reactor. The fuel is then sent to the dry, long-tem storage facility. In the facility, an air-proof plug is placed on top of the storage hole and a vacuum is drawn to dry the fuel. The hole is then back-filled with dry nitrogen. Prior to shipment, the fuel is returned to the pond and examined with a high resolution camera. If there is any reason to suspect a problem with the element, it is removed to a hot-cell and SIP tested to determine if there is any release of fission products. When the fuel is ready for transport, video and photographs are taken of each element, with one set of these images being supplied to the recipient of the fuel.
It is planned to remove all HIFAR spent fuel from ANSTO by about 2009, i.e. after HIFAR has been decommissioned. There will be no further dry storage of spent fuel at ANSTO

Slide 18



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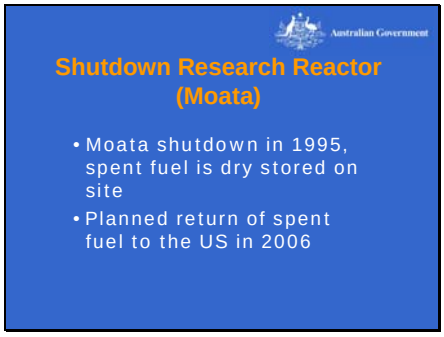
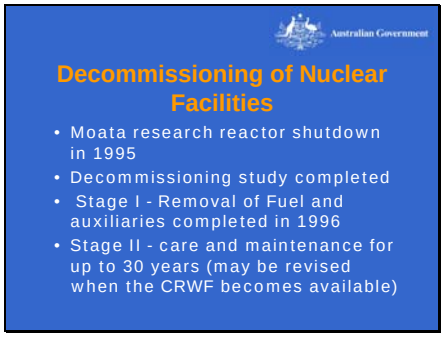
Slide 20



Slide 21

An intergovernmental Agreement between Argentina and Australia notes the possibility that Australia may, at some future time, ask Argentina to arrange for processing, conditioning or reprocessing of spent nuclear fuel from OPAL. Following treatment, all resulting radioactive wastes and conditioned fuel elements would be returned to Australia for long term storage. These provisions are a contingency arrangement, giving ANSTO a third option backing up the arrangements with the United States and ANSTO's existing contract to reprocess spent fuel with the French company COGEMA.
INVAP has given a written guarantee to ANSTO to provide an alternative solution for the management of spent fuel from the OPAL reactor, consistent with Australia's requirements and using proven technologies.
In licensing the construction of the OPAL reactor in 2002, the CEO of ARPANSA said: As far as I am aware, Argentina does not process research reactor fuel in the manner proposed at this time. It does, however, certainly have facilities that would enable it to do so (I visited such a facility in December 2000), bearing in mind that processing of relatively small fuel quantities can be undertaken in hot cells, without the scale required for a reprocessing program for a full-scale power program. I understand that the technological process is available in Argentina and the activity would be regulated by the Argentine Nuclear Regulatory Authority (ARN), which is a competent and capable body.
That situation remains the case.

Slide 22



The IAEA recommends that if the reactor tank is placed within the walls of biological shield, as is the case with Moata, that it may be desirable to leave the tank in place until there is a reduction in the radionuclide inventory through decay. There are no plans to further investigate the radionuclide inventory of the Moata reactor until there is a disposition route for the wastes produced by decommissioning. Originally, it was decided that a long term storage, estimated at 30 years, strategy should be adopted for the decommissioning of Moata. However, this period of long-term storage may be revised when the Commonwealth Radioactive Waste Management Facility (CRWF) is available.There has been a concerted effort to record as much information as possible about the Moata reactor, and ANSTO staff have witnessed and documented the decommissioning of similar reactors in the US to diminish the effects of the loss of first-hand knowledge of the operation of the

Moata reactor.
Australia is currently developing a Commonwealth waste facility to provide centralised handling of radioactive waste. Originally, it was decided that a long term storage, estimated at 30 years, strategy should be adopted for the decommissioning of Moata. However, this period of long-term storage may be revised when the Commonwealth Radioactive Waste Management Facility (CRWF) is available.

Slide 23

Slide 24

Slide 25

Slide 26

Australian Government

Uranium Mining in Australia

Slide 27

Australian Government

Uranium Mining Waste - Inventories

Northern Territory – Closed operations

– South Alligator Valley 1956 - 1964
- 13 mine sites, 1 mill site
- 1500m^3 requires new containment

– Rum Jungle 1953 - 1963
- 810,000t of ore ~ 0.4%U
- Rehabilitation in 1983 & 1990 – chemical

– Narbalek 1979
- 600,000t of ore ~ 2%U
- Final capping 1995

Slide 28

Australian Government

Uranium Mining Waste - Inventories

South Australia – Closed Operations

– Radium Hill - mine site 1954 - 1961
- 225,000 t of tailings
- Rehabilitation in 1981

– Port Perie - mill site
- 200,000 t of tailings
- Rehabilitation in 1980s

Slide 29

Australian Government

Uranium Mining Waste - Inventories

Queensland – Closed Operations

– Mary Kathleen 1954 - 1982
- 8,800 t of U concentrate
- 9,000,000 t of ore
- Rehabilitation in 1985

Slide 30

Australian Government

Uranium Mining Waste - Inventories

Northern Territory – Current operations

– Jabiru – open cut mine
- ~5000t U per annum
- Tailings stored in tailings dam on site

Slide 31

Australian Government

Ranger Mine at Jabiru

Slide 32

Australian Government

Uranium Mining Waste - Inventories

South Australia – Current operations

- Olympic Dam – underground mine (Cu U Au)
  - ~5000 t U per annum
  - 74 Mt of tailings stored in tailings dam on site

Slide 33

Australian Government

Uranium Mining Waste - Inventories

South Australia – Current operations

- Beverly - In-situ leaching
  - ~1000 t U per annum
  - 100 t per annum of solid waste
- Honeymoon – In-situ leaching
  - Pilot scale operations

Slide 34

Australian Government

Radioactive Waste Management Facilities

- Australian Government
  - Storage facilities
  - Proposed waste management facility
- States and Territories
  - Storage of legacy wastes – closed
  - Interim storage of waste
  - Disposal of waste – one State

Slide 35

Australian Government

Radioactive Waste Management Facilities

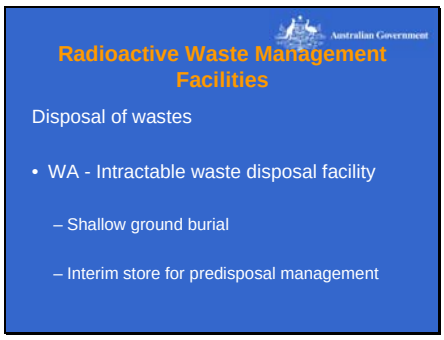
Storage of wastes - Australian Government

- ANSTO
  - Low level waste store
  - Intermediate level waste store
  - Waste management facilities
- ARPANSA
  - Intermediate level waste store
- Other Commonwealth Government agencies
  - Woomera - intermediate level waste store
  - Stores at laboratories

Slide 36

Slide 37

Slide 38



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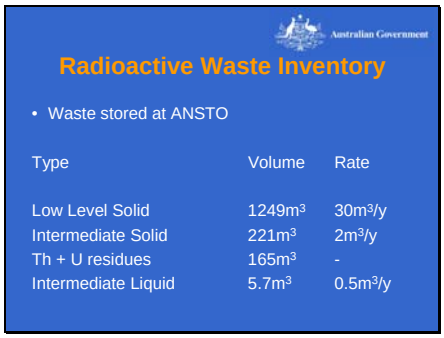
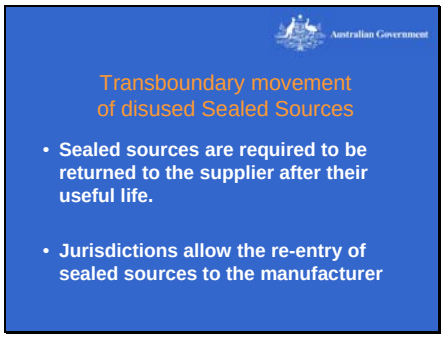


Slide 40

Nuclide	Stored	Disposed
^{241}Am	2000	10
^{137}Cs	2300	29
^{90}Sr	475	-
^{60}Co	160	0.5
^{226}Ra	340	2

Slide 41



Slide 42

Slide 43

Slide 44

Slide 45

Slide 46

Australian Government

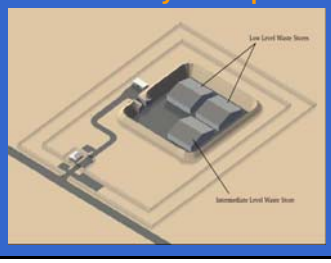
Commonwealth Radioactive Waste Management Facility

- Three Defence properties identified in the Northern Territory
- ILW-LL to be stored above ground
- LILW-SL to be disposed of if a site proves suitable, otherwise also stored
- Site characterisation studies commenced to determine type of facility that may be constructed at each of the three properties

Slide 47

Australian Government

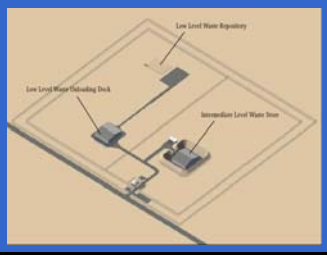
Store only concept



Slide 48

Australian Government

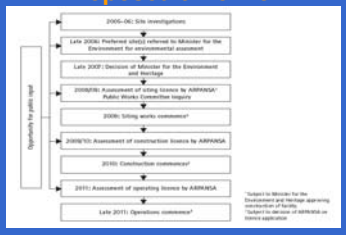
Repository/Store concept



Slide 49

Australian Government

Proposed timeline



Slide 50

Australian Government

Commonwealth Radioactive Waste Management Act 2005

- Under Australian Constitution, Northern Territory laws banning construction of Facility are almost certainly invalid
- To avoid unnecessary delays due to legal challenges, all Territory laws purporting to ban or regulate the Facility have been disallowed
- All Commonwealth regulatory processes must still be followed
- Volunteer sites may be nominated