

# Recommendations for best practice

## **Recommendation 1:**

### **Non-proliferation** (see chapter 3)

- All states with nuclear weapons programmes should separate them from their civil nuclear power programmes, and then place the latter under international safeguards.
- All non-nuclear weapon states with existing nuclear power programmes or embarking on nuclear power for the first time should adopt and implement IAEA comprehensive safeguards and the Additional Protocol.
- Universities and industry organisations should develop education and awareness raising courses on non-proliferation and nuclear security to be included in the training of personnel in the nuclear industry, including scientists, engineers, technicians and managers.
- Nuclear fuel should be developed and nuclear reactors configured to enable the maximum burn up of fuel, thereby decreasing the attractiveness of plutonium in spent fuel for use in nuclear weapons. To be feasible, this needs to be consistent with efficient and economic operation.

## **Recommendation 2:**

### **Nuclear governance** (see chapter 5)

- At the national level, regulation of nuclear power programmes should be based upon an integrated approach to nuclear safety, security and safeguards.
- At the international level, in the absence of a specific Convention on nuclear security, appropriate security information could be included on a voluntary basis in national reports submitted as part of the peer review process of the Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management, and the Convention on Nuclear Safety. This practice would be promoted by integrating nuclear safety and security into the IAEA's advisory services for member states.
- An integrated approach to industry-led peer reviews should be developed possibly through collaboration between the World Association of Nuclear Operators and the World Institute of Nuclear Security.
- Non-proliferation and nuclear security need to feature more explicitly in corporate governance arrangements with similar status to that given to nuclear safety.

## **Recommendation 3:**

### **Integrated fuel cycle management** (see chapter 6)

Spent fuel should be reprocessed only when there is a clear plan for its reuse. This plan should seek to:

- Minimise the amount of separated plutonium produced and the time for which it needs to be stored.
- Convert separated plutonium into Mixed Oxide (MOX) fuel as soon as it is feasible to do so.
- Identify nuclear power reactors in advance to use MOX fuel and ensure conversion into MOX fuel matches reactors' loading schedules and fuel specifications.
- Transport plutonium as MOX fuel rather than in a separated form.

When planning interim storage:

- The amount of spent fuel stored in ponds in the vicinity of reactors should be minimised by removing spent fuel as early as is feasible for interim storage elsewhere whether onsite (away from reactors) or offsite.
- Interim storage at centralised stores offsite may be more secure than distributed storage at numerous reactor sites.
- If wet storage is to continue in the interim, then sufficient storage capacity should be planned to reduce the need for high density packing and to guarantee continuous cooling.
- Whenever possible, interim storage under dry conditions should be adopted to enhance nuclear safety and security.

To ensure cradle to grave planning:

- Governments should establish a national policy that considers the long term role of nuclear power in the country's energy policy. This national policy should specify the requirements for managing spent fuel and radioactive wastes, including sufficient capacity for interim storage, as well as initiating plans for delivering timely geological disposal from the outset.
- Governments, in partnership with regulators, industry and academia, should develop a long term R&D roadmap to support these management strategies. It should be based on participation in relevant international R&D programmes.
- Operators should formulate spent fuel management strategies that cover the entire lifetime of their reactors. International fuel cycle arrangements should be sought, especially when national capacity is lacking.
- Governments should support collaborative R&D programmes on spent fuel and radioactive waste management. This should include joint studies to explore international fuel cycle arrangements, including geological disposal, although there would be no need for commitments to implement them immediately.