Session 1. BACKGROUND

Presentation on “Development of International Standards for Radiation Protection and Nuclear Safety”

Note by the Secretariat

1. In accordance with paragraph 16 of General Assembly resolution 60/99 of 8 December 2005, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space will organize, jointly with the International Atomic Energy Agency, a technical workshop on the objectives, scope and general attributes of a potential technical safety standard for nuclear power sources in outer space, to be held in Vienna from 20 to 22 February 2006.

2. The presentation contained in the present conference room paper was prepared for the joint technical workshop in accordance with the indicative schedule of work for the workshop, as agreed by the Working Group on the Use of Nuclear Power Sources in Outer Space during the intersessional meeting held in Vienna from 13 to 15 June 2005 (A/AC.105/L.260).
Development of international standards for radiation protection and nuclear safety

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Outline of presentation

• Background to the development of international standards for radiation protection – the roles of:
  ▪ UNSCEAR (the science),
  ▪ ICRP (protection principles), and
  ▪ IAEA (regulatory formulation)
• IAEA Safety Standards Series
  ▪ Safety Fundamentals, Requirements, Guides
  ▪ International acceptance

Quantifying the risk from ionizing radiation

The United Nations Scientific Committee on the Effects of Atomic Radiation – UNSCEAR
• Like COPUOS, reports to UN General Assembly
• Periodically (~5 years) updates a comprehensive review of scientific studies on the effects of ionizing radiation
Providing the framework for radiation protection

The International Commission on Radiological Protection – ICRP

- Independent group of specialists
- Appointed by invitation
- Provides fundamental protection philosophy (since 1928)
- Standing of ICRP is based on the quality of its analysis and advice

Role of the IAEA

The IAEA is authorized to:

… establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for protection of health and minimization of danger …
Developing regulatory-style recommendations

The International Atomic Energy Agency publishes the *Safety Standards Series* within which:

- the Basic Safety Standards (BSS) provides an international benchmark and model for radiation protection regulations

UNSCER - ICRP - IAEA

- Effects of radiation
- Recommendations for protection
- Regulatory style standards
From recommendations to regulations

Organizations

ICRP

Drafting and Review

BSS

National Regulators

Consultation period

Process

Publications

Recommendations

Recommendations

Implementation

IAEA

IAEA

FAO

ILO

PAHO

WHO

Member States

NEA/OECD

others

Regulatory review

Safety Fundamentals

Example (SS120)

Principle 3:

Optimization of protection

For exposures from any source, except for therapeutic medical exposure, the doses, the number of people exposed and the likelihood of incurring exposures shall all be kept as low as reasonably achievable.
Safety Requirements

Example

Safety assessments

Safety assessments …

…shall be made at different stages, including siting, design, manufacture, construction, assembly, commissioning, operation, maintenance and decommissioning…

Safety Requirements (BSS)

Example

Defence in depth

A multilayer (defence in depth) system of provisions for protection and safety commensurate with the magnitude and likelihood of the potential exposure involved shall be applied to sources such that a failure at one layer is compensated for or corrected by subsequent layers, for the purposes of:

(a) preventing accidents that may cause exposure;
(b) …
Example

[Optimization of protection]

The optimization of protection should be considered at the design stage of equipment and installations, when some degree of flexibility is still available. The use of engineered controls should be examined carefully at this stage in defining the protection options.
Nuclear Safety Standards

International acceptance and norms

- Most countries now have in place, or are implementing, national standards for protection and safety that are essentially consistent with the Basic Safety Standards
- 80 IAEA Member States have made a political commitment to the Code of Conduct on the Safety and Security of Radioactive Sources (which ‘relies on existing international standards’ and ‘notes’ the BSS)
Implications for a safety framework for nuclear power sources in outer space

• What is needed for a safety framework for NPS in space?
• What lessons can be learned from IAEA experience?
• How best to work together to ensure consistency?

IAEA