IAEA Safety Standards for Fuel Cycle Facilities

March 2010

Hassan Abou Yehia
Research Reactor Safety Section
Division of Nuclear Installation Safety
Nuclear Fuel Cycle Facilities

• **Front End:**
  - Mining & Milling
  - Conversion
  - Enrichment
  - Fuel Fabrication

• **Back End:**
  - Spent Fuel Storage
  - Reprocessing
  - Waste Management
Fuel Cycle Facility Safety Standards

Safety Fundamentals

Thematic areas
- Legal and governmental infrastructure
- Emergency preparedness and response
- Management systems
- Assessment and verification
- Site evaluation
- Radiation protection
- Radioactive waste management
- Decommissioning
- Rehabilitation of contaminated areas
- Transport of radioactive material

Facilities and activities
- Nuclear power plants: design
- Nuclear power plants: operation
- Research reactors
- Fuel cycle facilities
- Radiation related facilities and activities
- Waste treatment and disposal facilities
Fuel Cycle Facility Safety Standards

• NS-R-5 Scope:
  • Front End:
    • Conversion & Enrichment
    • Fuel Fabrication
  • Back End:
    • Spent Fuel Storage
    • Reprocessing
  • Other:
    • R&D Facilities
    • Criticality
Fuel Cycle Facility Safety Standards

- NS-R-5 Structure:
  - Safety Management System
  - Siting
  - Design
  - Construction
  - Commissioning
  - Operation
  - Decommissioning
Fuel Cycle Facility Safety Standards

• NS-R-5 General Safety Requirements:
  • Defence in Depth
  • Demonstration of Safety
  • Safety Analysis
  • Safety Management System
  • Safety Culture
  • Emergency preparedness

• NS-R-5 Specific Safety Requirements:
  • Conversion & Enrichment
  • Uranium Fuel Fabrication
  • MOX Fuel Fabrication
Fuel Cycle Facility Safety Standards

Graded Approach:

- **Magnitude of “possible radiation risks”**
- **Maturity of Facility/Activity**
  - Proven design and practices
  - Existence of operational experience of similar facilities or activities
- **Complexity**
Fuel Cycle Facility Safety Standards

FCF Safety Guides:

- To be published in 2010:
  - DS317 Uranium Fuel Fabrication
  - DS318 MOX Fuel Fabrication
  - DS344 Conversion & Enrichment

- Submitted for Approval:
  - DS371 Spent Fuel Storage

- In Development:
  - DS360 Reprocessing
  - DS381 Research & Development Facilities
  - DS407 Criticality Safety
Concluding Remarks

The set of Safety Standards for Fuel Cycle Facilities will be:

- A useful support for Member States to ensure the highest level of Safety,

- The basis for the IAEA Safety Review Service (Safety Evaluation During Operation- SEDO)