39th Nuclear Safety Standards Committee
39th Waste Safety Standards Committee

Joint Session

30 June – 2 July 2015

Agenda item NW 2.3

DS360 - Safety of Nuclear Fuel Reprocessing Facilities

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IAEA
International Atomic Energy Agency
Introduction

Provides an update on the progress of DS360 since June 2014;

1. Overview of DS360
2. Member States comments
3. Comments by SSC members;
   1. Statistics
   2. Specific comments
   3. General comments
4. Discussion by RASSC and NSGC last week
DS360 Overview

• DS360 provides guidance on meeting the requirements of NS-R-5 for nuclear fuel reprocessing facilities, particularly the recently published Appendix IV and incorporating the best practices of Member States.

• DS360 will become one of a series of IAEA Nuclear Fuel Cycle Safety Guides covering various specific types of facility.

• An outline of DS360 was provided to NUSSC and WASSC at their June 2014 meetings.
Comments solicited for 120 days in 2014, ~370 comments were received

Comments generally improved consistency and readability

- Accepted ~ 90%
- Rejected ~ 10%
States Comments Accepted

Typical comments accepted;

1. Replace *sky effect* by *cloud shine*

2. Better description of ancillary waste processing

3. Guidance on dynamic and static confinement improved
4.128 The objective of safety analysis not to define the shielding requirements, but to demonstrate that the designed shielding is sufficient to meet predefined radiological criteria - This is the initial stage of design. Final stage given in 4.134

4.129 …initial approach to estimate internal dose, then to assess the design the radiation protection - Estimate of internal dose may be negligible.

4.129 Representative person / person(s)
SSC Committee Comment Overview

SSC members provided ~140 comments in May 2015

~ 20% of the comments were un-actionable, being comments on other MS comments

Many comments were editorial, generally supportive & providing / requesting clarifications

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Inserted: Any waste generated at reprocessing facility should be characterized by physical, chemical and radiological properties to allow its subsequent optimum management, i.e. appropriate pre-treatment, treatment, conditioning and selection or determination of an interim storage or disposal route. To the extent possible, the management of waste should ensure that all waste will meet the specifications for existing interim storage and/or disposal routes. For future disposal options (i.e. if a disposal route is not available), a comprehensive waste characterization should be performed in order to provide a data base for future waste management steps.

Also strengthened other text on characterisation and disposal routes
1. Reference latest revisions of standards, accepted subject to approval of the other revisions by SSCs

2. Add reference to NS-G 3.1 External Human Induced Events in Site Evaluation for NPP rejected. IAEA guidance is not to reference NPP and RR documentation in FCF safety standards and guides except in very well defined cases (e.g. alignment of new, accepted definitions)

3. Clarify references to GSR Part 5 and DS447 (not 448) accepted

4. New format for references recommended by MTCD
All SSC member comments related to criticality accepted

4.5 All processes with fissile materials should be designed in such a way as to avoid prevent an accidental criticality event.

*Added paragraphs on solids and firefighting systems;*

7.91 The procedures and training for responses to fires in areas containing fissile material should pay particular attention to the prevention of a criticality and preventing any unacceptable reduction of criticality safety margins.

* + clarifications and editorial changes*
Refer to chemical hazards in main safety functions – accepted but not in the bold text

To be in line with the wording used in Para IV.36 of NS-R-5 (Rev. 1), the term firefighting features should be replaced by fire dampers. Though features is a more generic term, this comment was accepted.

Update on TECDOC-727 and TECDOC-994, which were issued in 1997 and 1998 – rejected, they’re all we have
SSC Comments – Siting

Reformat and clarify text.  Accepted

Add a requirement on installation of seismic monitoring system or automatic seismic trip system.  Rejected

Earthquake can cause different events that can jeopardize the safety of the facility. These are not limited to a flooding.  Rejected – this is guidance, the requirements provide the comprehensive listing
General Comments by SSC Members

Most significant were:

1. Link publication of DS360 with DS478 rejected
   - NS-R-5 (Rev.1) including the relevant Reprocessing facility Appendix IV has only just been published
   - The majority of “shall” statements for Reprocessing facilities will remain unchanged by revision of NS-R-5
   - DS360 is part of a suite of guides; SSG-5, 6, 7 and DS381
   - Significant unnecessary delay: A guide based upon NS-R-5 revision (DPP478) would not be available for several years

2. Significant overlap between sections 4 and 7, particularly relating to wastes, accepted

3. Reference latest revisions of standards - accepted subject to approval of the other revisions by SSCs

IAEA
**Discussion in RASSC**

*New text in section 1;*

The requirements of NS-R-5 apply to plants using the PUREX process to reprocess fuels containing uranium and plutonium on a commercial scale. This guide does not specifically address thorium breeder reprocessing (THOREX) as insufficient experience of these facilities at a commercial scale exists in many countries. However, the similarity between aqueous processes means that these recommendations will apply with suitable adjustments, to many types of fuel.

*With additional resolutions, DS360 cleared by RASSC*
Discussion in NSGC

1. Make consistent use of nuclear security instead of physical protection

2. Some comments from France were accepted by IAEA but omitted from resolutions table in error

Accepting these comments, DS360 cleared by NSGC
Requested Action

Approval of NUSSC and WASSC for submission to CSS