“International Applicant guide”

Package Design Safety Reports for the Transport of Radioactive Material Technical guide

TRANSSC 29 - Nov 2014

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Summary

- Objectives - Scope - Main footsteps
- Guide content
- Discussions and concerns raised by participants
PDSR goals and scope

The overall objective of the intended work is to provide written guidance to designers or applicants to help them in the preparation of the Package Design Safety Reports (PDSR) to the satisfaction of the concerned competent authorities.

First objective: Enable stakeholders (applicants and CA) to identify precisely the regulatory requirements applicable to the design

- Presentation of the requirements associated with each type of package (excepted package, ... type C package).
- Requirements associated with LDM and special form materials not included
- A matrix of IAEA regulatory requirements and package type.
- This material is accompanied by explanatory text to make the rules more understandable, and provides examples.
Second objective: Clarify the competent authority expectations in terms of safety demonstration concerning:

- quality assurance;
- safety demonstration perimeter;
- physical phenomena that is necessary to take into consideration (brittle fracture at -40°C, radiolysis of hydrogenated materials, ...);
- the nature of the demonstration (testing or calculation);
- calculation codes qualification;
- Maintenance

This material is also accompanied by explanatory text to make the rules more understandable, and provides examples.
PDSR goals and scope

Scope

- Applicable for package designs requiring competent authority approval:
  - Type B(U), Type B(M), Type C packages
  - Packages containing fissile material

- Applicable for package designs not requiring competent authority approval:
  - Excepted packages, Industrial packages and Type A packages

- The final product could be a draft for an IAEA Safety guide (to be decided by TRANSSC then CSS)

- Requires a consensus between Competent Authorities, to be discussed during TRANSSC
Main footsteps

**TRANSSC 26 (June 2013) : Kicking off WG meeting**
- Validation of the objectives and scope of the PDSR guide
- Validation of the guidance structure based on:
  - European PDSR v.2 (2012)
  - Canada/US guide RD 364
  - Australian Guide RPS-2.2)
- Agreement to add 2 annexes concerning:
  1) technical references used by competent authorities
  2) guidance on emergency response preparation

**PATRAM 2013 : Progress meeting**

**TRANSSC 27 (November 2013) and TRANSSC 28 (June 2014) : Progress meetings**
Main footsteps

- **1st semester of 2014 : Final draft editing**
  - Draft prepared by Australia and France
  - Sent for review to Member States participating in review process (Canada, Germany, Japan, United States)

- **September 2014 : Draft publication**
  - Integration of comments from reviewer (or comments put aside for discussions)
  - Published on TRANSSC website by Secretary, and put on the TRANSSC 29 agenda for information and discussion
  - Comments received from WNTI
Part I: Guidance on description of the package design - PDSR should include:

- Contents list of the PDSR
- Administrative information
- Specification of contents
- Specification of packaging
- *Package* performance characteristics and compliance with regulatory requirements
- Operation
- Maintenance
- Management systems
- *Package* illustration
Part II: Guidance on justification of design conformity to the applicable regulatory provisions:

- Structural analysis
- Thermal analysis
- Containment design analysis
- External dose rates analysis
- Criticality safety analysis

For each technical analysis, it should be precised:

- Acceptance criteria and design assumptions
- Description and justification of analysis methods
- Comparison between acceptance criteria and results of analysis

Technical guidance for each package type available in Annexes 1-5
Annexes 1-5 : Packages specificities

- Annex 1 : Excepted packages
- Annex 2 : Industrial packages
- Annex 3 : Type A packages
- Annex 4 : Type B(U), B(M), and C packages
- Annex 5 : UF6 packages
Annex 7 : Technical references

Reference documents used by competent authorities for technical assessments

**Canada**
- SSG-26 – Advisory material for the IAEA Regulations for the Safe Transport of Radioactive Material
- ISO 2919 “Sealed radioactive sources - General requirements and classification”
- ISO 9978 “Sealed Radioactive Sources - Leak Test Methods”
- ISO 7195 “Packaging of uranium hexafluoride for transport”
- ANSI N14.1 “Uranium Hexafluoride – Packaging for Transport”
- ISO 12807 “Safe transport of radioactive materials - Leak testing on packages”
- ANSI N14.7, Guidance for Packaging Type A - Quantities of Radioactive Materials
- RD-364: Joint Canada - United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages and ISO 9001

**France**
- ASN Guide N°7 – Transport – Transport of packages or radioactive materials for civil use on public domain – Rev. 1 (February 2013)

- technical references
  - guidances,
  - standards,
  - reports...

commonly used for assessment by competent authority
Annex 8 : Emergency provisions

- Regulatory base : § 838(u) of SSR-6

the certificate of approval of a package design shall include the emergency arrangements deemed necessary by the competent authority

Annex 8 provides:
- The general arrangements description for a radiological emergency in transport (reflex phase, accident control phase, post-emergency phase)
- General examples of typical emergency provisions in case of limited time for heat dissipation, criticality risk, etc.
- An example of structure for an emergency plan
Appendix 8A - Example of structure for an emergency plan

1. Introduction
   Objectives.
   Regulatory context and other related emergency plans.

2. Scope.
   Concerned consignments and foreseeable events.

3. Organisation of involved entities, roles and responsibilities. Follow-up of partnerships.

4. Response arrangements
   For each action to be implemented, define available personnel, competencies, partnerships, equipments, supporting instructions and action sheets, time delays, message templates
   4.1. Criteria and release of the alert.
   4.2. Communication of information. Records and tracability.
   4.3. Measurements.
   4.4. Mitigation (repair for shielding, leaks, weathering protections, repacking, retightening ...).
   4.5. Evacuation (handling, tie-down, new conveyance, escort), proposed locations for interim safe storage of damaged packages.
   4.6. Post-accident actions.
   4.7. External communication.

5. Training responders, drills and exercises.

6. Follow-up of the emergency plan.
Discussion points

Australia, Canada, Germany, Japan, United-States and WNTI transmitted comments to the proposed document (Thank you !)

Editorial proposals
- Rephrasing, references checking, etc.
- Technical precisions (additional examples to be put in annexes, etc.)

General comments on PDSR guide objectives (WNTI)
- Concerns about redundancy with SSR-6 regulations
  → The structure of the PDSR guide follows the SSR-6 one
- Concerns about application to the non-approved package designs
  → The PDSR will apply to documentary evidence required in SSR-6 in paragraph 801, homogeneity between the different package analysis
Discussion points

Concerns about annex 8

- Emergency response not of the designer responsibility and to be included in separate documents
  → The applicant has to fulfill all the requirement including paragraph 838u. It is a guidance to be applied to the satisfaction of the competent authority that may have different instructions.

- Emergency responses associated with specific shipment conditions, more than specific packages
  → Exceptional requirements for specific shipments are not in the scope of the PDSR (see paragraph 837k).

- Some proposed examples are taken from extreme scenarios, not directly covered by requirements
  → The scenarios are not linked to the regulatory tests, it can be either beyond or beneath the severity of the regulatory tests.
Forecast schedule

- Achievement of the first complete draft
  - July 2014
- Publication on TRANSSC website
  - Sept 2014
- Presentation of the document and discussions
  - TRANSSC 29 (Nov 2014)
- Review of TRANSSC MS
  - Deadline: February 2015
- Finalized document
  - TRANSSC 30 - June 2015
- Publication process