NEW REGULATIONS TO SHIP LARGE OBJECTS AS SURFACE CONTAMINATED OBJECTS

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Transport of Large Objects

- Expected increase in requests to move large components/objects (e.g. steam generators):
  - Many reactors reaching end of design life
  - Large number of steam generators transported
  - Currently they are often shipped under special arrangement
  - Volume of shipments and industry experience growing
  - No longer “special”, but routine

Photo of a Steam Generator from a Canadian Power Reactor in storage on its side
New SCO-III Regulations

• Group led by Canada developed specific requirements for the transport of large objects based on international/industry experience and International Atomic Energy Agency (IAEA) guidance.

• Many Member State and industry representatives were involved in the development of these requirements and guidance.

• SCO category (SCO-III) chosen as most logical place to insert requirements.

• Term “large object” used to be a more general definition and to align with SCO terminology.
History of Development

• Proposed regulations for a new SCO-III, large object category submitted to the IAEA Secretariat for Member State review in 2013

• Proposed regulations were discussed and revised based on Member State input at the 30th IAEA transport safety standards committee meeting (TRANSSC 30) and at a Member State meeting on SSR-6 change proposals in 2015

• Final iteration of the new regulations accepted for publication in SSR-6 at the 34th IAEA transport safety standards committee meeting (TRANSSC 34) in 2017
Current Status

- New SSR-6 2018 regulations published that include SCO-III
Status of Guidance for SCO-III

• Proposed guidance for SCO-III in SSG-26 advisory material submitted to the IAEA Secretariat for Member State review in 2017
• Member State comment period on revisions to the SSG-26 advisory material ended in January 2018, and these comments are currently being discussed and dispositioned
• SSG-26 revision now in SPESS 11 - expected to be approved at TRANSSC 39
SCO-III Regulations in SSR-6

SSR-6, Table 1:

Surface contaminated objects

UN 2913 RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II or SCO-III), non-fissile or fissile-excepted
413. *SCO* shall be in one of two-three groups:

(a) *SCO-I*... (as is)

(b) *SCO-II*...(as is)

(c) *SCO-III*: A large solid object which because of its size cannot be transported in a type of package described in these Regulations and for which:

(i) All openings are sealed to prevent release of *radioactive material* during conditions defined in para. 520(e);

(ii) The inside of the object is as dry as practicable;

(iii) The *non-fixed contamination* on the external surfaces does not exceed the limits specified in para. 508;

(iv) The *non-fixed contamination* plus the *fixed contamination* on the inaccessible surface averaged over 300 cm$^2$ does not exceed $8 \times 10^5$ Bq/cm$^2$ for beta and gamma emitters and *low toxicity alpha emitters*, or $8 \times 10^4$ Bq/cm$^2$ for all other alpha emitters.
520. *LSA material* and *SCO* in groups *LSA-I*, and *SCO-I* and *SCO-III* may be transported, unpackaged, under the following conditions:

(a) through (d) as is; ...

(e) For *SCO-III*;

(i) Transport shall be under *exclusive use* by road, rail, inland waterway or sea;

(ii) Stacking shall not be permitted;

(iii) All activities associated with the shipment, including radiation protection, emergency response and any special precautions or special administrative or operational controls which are to be employed during transport shall be described in a transport plan. The transport plan shall demonstrate that the overall level of safety in transport is at least equivalent to that which would be provided if the requirements of para. 648 (only for the test specified in para. 724, preceded by the tests specified in paras. 720 and 721) had been met.

(iv) The requirements of para. 624 for a *Type IP-2 package* shall be satisfied, except that the maximum damage referred to in para. 722 may be determined based on provisions in the transport plan, and the requirements of para. 723 are not applicable.

(v) The object and any shielding are secured to the *conveyance* in accordance with para. 606.

(vi) The transport shall be subject to *multilateral approval*. 
522. The total activity in a single hold or compartment of an inland waterway craft, or in another conveyance, for carriage of LSA material or SCO in a Type IP-1, Type IP-2, Type IP-3 package or unpackaged, shall not exceed the limits shown in Table 6. For SCO-III, the limits in Table 6 may be exceeded provided that the transport plan contains precautions which are to be employed during transport to obtain an overall level of safety at least equivalent to that which would be provided if the limits had been applied.

Note added to Table 6 to see paragraph 522 for SCO-III.
SCO-III Regulations in SSR-6

827A. An application for approval of SCO-III shipments shall include:

(a) A statement of the respects in which, and of the reasons why, the consignment is considered a SCO-III.

(b) Justification for choosing SCO-III by demonstrating that:
   (i) no suitable packaging currently exists;
   (ii) designing and/or constructing a packaging or segmenting the object is not practically, technically or economically feasible;
   (iii) no other viable alternative exists;

(c) A detailed description of the proposed radioactive contents with reference to their physical and chemical states and the nature of the radiation emitted;

(d) A detailed statement of the design of the SCO-III, including complete engineering drawings and schedules of materials and methods of manufacture;

(e) All information necessary to satisfy the competent authority that the requirements of para. 520(e) and the requirements of para. 522, if applicable, are satisfied;

(f) A transport plan;

(g) A specification of the applicable management system as required in para. 306.
SCO-III Advisory Material in SSG-26

• Much of the guidance from Appendix VII of SSG-26 was moved into the new proposed regulations or into the corresponding guidance paragraphs for the new proposed regulations.

• The only information left in Appendix VII is the guidance for the calculation of activity intake for transport of SCO-III based on the Q method.

• Guidance was added to SSG-26 in the appropriate paragraphs to describe the large object concept, the sealing of openings, determination of surface contamination and dryness.

• Paragraph 310.5 guidance was also moved to paragraph 413.7 bis., removing any references to special arrangement.
Conclusions

- There has been an increasing demand in many countries for transportation of large radioactive objects.
- Many large objects must currently be transported under special arrangement.
- As experience with this type of transport has grown, specific regulatory requirements are needed to allow the movement of large radioactive objects without the need for special arrangement.
- A set of standard provisions for transport of large objects have been developed and included in the latest published transport regulations, SSR-6 2018.
- Guidance on large object regulations will be included in revised SSG-26 now at SPESS 11.
Thank You! Questions?
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