



ONR GUIDE			
ONR Transport Permissioning External Guidance			
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1. INTRODUCTION

Background

- 1.1 The civil transport of radioactive material (Class 7 dangerous goods) is regulated in the UK under Part 3 of The Energy Act 2013 and The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG). CDG implements within GB the international requirements for transport of hazardous goods by road and rail, ADR¹ and RID². These set harmonised standards for the safe transport of dangerous goods within and between member states and are closely based on the requirements of the IAEA Safety Standards 'Regulations for the Safe Transport of Radioactive Material' – SSR-6.
- 1.2 There are similar international requirements based on SSR-6 applicable to sea and air transport namely the International Maritime Dangerous Goods Code and the International Civil Aviation Organisation's Technical Instructions for the Safe Transport of Dangerous Goods by Air. These are implemented in the UK by The Merchant Shipping Act, The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations, The Air Navigation Order and The Air Navigation (Dangerous Goods) Regulations.
- 1.3 ONR is the GB Competent Authority (CA) and Enforcing Authority for the civil carriage of Class 7 goods by road and rail. ONR also acts on behalf of the other UK CAs with respect to the issuing of transport approvals namely: the Secretary of State for Transport and the Maritime and Coastguard Agency for transport in UK waters; the Civil Aviation Authority for air transport; and the Department of the Environment Northern Ireland for road transport in that part of the UK.
- 1.4 The regulatory framework applicable to radioactive materials transport differs from that established for nuclear installations safety due to the need to preserve consistent regulatory standards across international boundaries. Hence many of the provisions given effect through CDG, which dutyholders are responsible for meeting, are largely prescriptive.
- 1.5 The regulations provide a regulatory framework to ensure the control of risk from the transport of radioactive material is reduced to 'as low as is reasonably achievable, economic and social factors being taken into account' (ALARA), which is equivalent to 'so far as is reasonably practicable' (SFAIRP) in UK legal terms (and 'as low as reasonably practicable' (ALARP)). The regulations achieve this in a harmonised manner through the establishment of a prescriptive set of requirements that must be satisfied to ensure safety and to protect persons, property and the environment from the effects of radiation in the transport of radioactive material.
- 1.6 The regulations apply a graded approach to contents limits and to performance standards for package designs, and for conditions on operation and maintenance etc depending upon the hazard of the radioactive contents. CA approval is required for higher hazard transport package designs and shipments as defined within the regulations. These are typically Type B(U), Type B(M) and Type C, fissile packages, certain shipments and other design types. For each of these, various sets of prescriptive design (and shipment) requirements must be satisfied.

¹ European Agreement concerning the International Carriage of Dangerous Goods by Road, issued by the United Nations Economic Commission for Europe, Committee on Inland Transport

² Regulations concerning the International Carriage of Dangerous Goods by Rail, Appendix C of the Convention concerning International Carriage by Rail, issued by the Intergovernmental Organisation for International Carriage by Rail

Special Arrangement

- 1.7 Situations can arise where it may be impracticable for the transport of consignments of radioactive materials to satisfy all the applicable requirements of the regulations. Such situations may be unplanned events arising during transport, which result in a package in some way not meeting all relevant requirements of the regulations; another example would be the transport of large components generated from nuclear facility decommissioning. Shipments in these situations are permitted under a provision of the regulations known as a Special Arrangement.
- 1.8 The regulations also require, in certain circumstances, a Special Arrangement approval for sea transport and for air transport if the surface radiation levels of the package exceed 2 mSv/h (see SSR-6 paragraphs 575 and 579).
- 1.9 The nuclear landscape is rapidly changing both nationally and internationally. There are:
- decommissioning activities and uncertainty associated with the nature of some legacy radioactive materials;
 - strategic safety and security imperatives that require movement of radioactive materials; and
 - novel nuclear materials / components, which will need to be transported now or in the near future.
- 1.10 Given the uncertainties associated with these areas, it may be difficult in some circumstances to design (or modify) a package so that it meets all the standard package design features prescribed in the regulations with sufficient certainty. Therefore, to enable such package designs to be used for unique radioactive material shipments, it may, providing certain conditions are met, be appropriate to use a Special Arrangement for a transport operation.
- 1.11 The Special Arrangement approval is described in paragraph 310 of SSR-6.
- Consignments for which conformity with the other provisions of these Regulations is impracticable shall not be transported except under special arrangement. Provided the competent authority is satisfied that conformity with the other provisions of these Regulations is impracticable and that the requisite standards of safety established by these Regulations have been demonstrated through means alternative to the other provisions, the competent authority may approve special arrangement transport operations for single or a planned series of multiple consignments. The overall level of safety in transport shall be at least equivalent to that which would be provided if all the applicable requirements had been met. For consignments of this type, multilateral approval shall be required.*
- 1.12 The above IAEA regulation is transposed into UK law for all modes of transport via the Acts and Regulations discussed above. This provision allows ONR to take an enabling approach to shipments of certain radioactive materials whilst ensuring safety standards are not compromised. Since the normally applicable regulatory requirements are not being satisfied, each Special Arrangement must be specifically approved by the CAs of all the countries through which the package is to be transported (ie multi-lateral approval).
- 1.13 The concept of the Special Arrangement is intended to give flexibility to dutyholders to propose alternative safety measures that deliver an overall level of transport safety that is at least equivalent to those measures required by the regulations. Another flexible approach, for road and rail transport, provided in CDG is the Regulation 12 Authorisation, which allows the CA to authorise the domestic transport of radioactive

materials for unusual and exceptional situations³, which are contrary to the provisions and requirements of the prescriptive international regulatory framework, provided safety is not compromised (ie it is demonstrated that risks are ALARP). A Regulation 12 Authorisation might be used for example to permit the transport of very low levels of radioactive material if there are administrative compatibility issues between different types of regulation governing radiological risk.

2. PURPOSE AND SCOPE

- 2.1 This document provides guidance on ONR's expectations for applications for Special Arrangement approval. It should be read in conjunction with the 'Applicants Guide'⁴, which provides general guidance on applications for CA approval and their supporting safety cases.

3. GUIDANCE

- 3.1 It is important to note that a Special Arrangement is not a package design option and is not for routine transport operations. Special Arrangements are only considered and issued by ONR in exceptional circumstances and therefore need to be considered on a case by case basis. Accordingly it is important for dutyholders to contact and engage with ONR at an early stage in their deliberations.
- 3.2 First and foremost, dutyholders are expected to design and manufacture (or modify) a transport package to be fully compliant Type A, B or C (or other relevant) requirements. ONR will only consider a Special Arrangement in circumstances where a package complies with the majority of the specific Type-requirements but it is shown to be impracticable to comply with a certain provision or related set of provisions of the regulations.
- 3.3 The regulations require that an application for approval of shipments under Special Arrangement shall include all the information necessary to satisfy the CA that the overall level of safety in transport is at least equivalent to that which would be provided if all the applicable requirements of the Regulations had been met. Moreover, the regulations ask for a statement of the respects in which, and reasons why, the shipment cannot be made in full accordance with the applicable requirements. They also ask for a statement of any special precautions or special administrative or operational controls (compensatory measures) that are to be employed during transport to compensate for the failure to meet the applicable requirements.
- 3.4 In order to satisfy the above (paragraph 3.3), the Applicant will need to develop and submit an adequate transport safety case to ONR. The safety case should clearly demonstrate which requirements of the regulations the package cannot meet and why it is impracticable to do so. It should provide a clearly substantiated demonstration and conclusion that the proposed compensatory measures will reduce the overall risk from the transport operation to ALARP and will ensure compliance with relevant provisions of the Ionising Radiations Regulations including prior risk assessment, restriction of exposure and dose limitation. Hence a safety outcome will be achieved at least equivalent to that if the package met all the applicable requirements of the regulations.
- 3.5 The Special Arrangement safety case should include as a minimum the following:
- a) Demonstration that the design is compliant with the regulations apart from those provisions for which a Special Arrangement is requested.

³ wording comes from the directive 2008/68/EC

⁴ TRA-PER-GD-014 Guidance for Applications for UK Competent Authority Approval, ONR 2016

- b) Justification of the reason for the need for a Special Arrangement. This should demonstrate that a suitably robust optioneering process has been conducted in relation to achieving compliance of the package design with relevant Type-requirements. This should consider aspects such as a new design, use of alternative packages, modifications etc.
 - c) Justification, with suitable evidence, of why it is impracticable for the package design being proposed to be used for the shipment(s) to meet all the applicable requirements.
 - d) Description of the additional safety measures (compensatory measures): ie special precautions or special administrative / operational controls that are to be employed to provide at least an equivalent level of safety to that if all the applicable requirements had been met. This part of the safety case will need to contain much more than a statement of such controls. The safety case should be presented in a claims, arguments and evidence format for each of the compensatory measures to be employed, and clearly justify how and why they will deliver at least an equivalent level of safety to that if all the applicable requirements had been met.
 - e) The safety case should include a suitably comprehensive and appropriate hazard identification study for all stages of the transport operation in order to be able to identify the nature and magnitude of the hazards and associated risks that will need to be controlled by compensatory measures.
 - f) An analysis of the hazards and associated risks and of the suitability of the proposed compensatory measures against each of these to deliver at least an equivalent level of safety / risk reduction should be carried out and recorded. Depending on the circumstances and complexity, this part of the safety case (or supporting documentation) may also require formal fault analysis such as design basis / deterministic safety analysis and/or probabilistic safety analysis.
 - g) The safety case should include suitably robust engineering, management system and where appropriate human factors substantiation of the adequacy of the compensatory measures and feasibility of their implementation during all stages of transport.
- 3.6 As mentioned in paragraph 1.3, ONR also acts on behalf of the UK CAs for sea and air transport with respect to the issuing of transport approvals. ONR may therefore consult these organisations before granting a Special Arrangement approval that covers these modes of transport. ONR is likely to carry out inspections during the assessment process and/or prior to commencement of shipments under a Special Arrangement, to confirm the feasibility and adequacy of implementation of the compensatory measures.