

**Paper No. 4067**

**ONR's expectations of adequate Emergency Arrangements**

**Dawn Petts**  
Office for Nuclear Regulation

**Jon Hursthouse**  
Office for Nuclear Regulation

**Abstract**

**Background:**

The carriage of dangerous goods by land in Great Britain is governed by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG), which includes requirements for radiological emergencies. ONR's experience is that some duty-holders would benefit from further guidance to discharge these duties.

**Factors to consider when writing a plan:**

The plan should provide clear instructions to the driver, carrier and consignor. Typically the driver will initiate emergency plans; however there should be contingency arrangements in case the driver is unable to take appropriate action.

The plan should address the following:-

- immediate notifications to be made
- actions to protect the driver
- prevent the situation from deteriorating
- actions to protect the public
- actions to protect the emergency services on their arrival
- actions to ensure the radioactive materials remain secure without compromising emergency response.
- actions to be taken by the consignor
- specialist advice
- interfaces with other organisations, regulatory environments, and potential cross-border effects

**Making plans effective:**

Training should be delivered to ensure that everyone understands their duties. Drivers should have copies of the plan accessible in the vehicle. Equipment required by the plan should be carried whenever radioactive material is transported. Where the consignor and carrier have separate plans,

arrangements should ensure that there are no conflicts. If there is just the one plan, both the carrier and consignor should be familiar with their roles.

**Testing emergency arrangements:**

If a plan is used more than once, it must be tested. How, and how often, is not specified but should be proportionate to the risks (typically, annually). Duty-holders should be able to justify their approach.

All relevant aspects of the plan should be tested, and the test should be recorded. The plan should be reviewed and updated if required to reflect experience and regulatory changes, with all relevant people being advised of any changes to the plan as these occur.

Tests could include desktop exercises, partial or full simulations involving some or all elements of the arrangements. Testing should not take place in public or involve radioactive material. Emergency services should only be involved with their agreement.

## Introduction

The carriage of dangerous goods by land in Great Britain is governed by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG) (1), which includes requirements for radiological emergencies.

CDG introduces into UK law international agreements for transport by road and rail, known as ADR (2) and RID (3). These agreements are based on the IAEA's SSR-6 Regulations for the Safe Transport of Radioactive Material (4). In addition CDG also implements various other directives in respect of emergency arrangements, and includes the majority of these additional requirements under Schedule 2. While ONR recognises good practice and other internationally agreed guidance (for example TS-G-1.2)(5) this paper seeks mainly to expand on ONR's regulatory expectations as regards the requirements of CDG Schedule 2.

ONR's experience is that some duty-holders would benefit from further guidance to discharge these duties. Consequently, ONR has produced written guidance for duty-holders (6) to help them meet their legal obligations. This paper seeks to re-affirm the principles outlined in that guidance and provide additional contextual information.

### Who needs an emergency plan and why?

Regulation 24 and Schedule 2 of CDG requires that a written emergency plan is prepared to deal with radiological emergencies. These are situations where urgent action is required to protect workers, members of the public or the population from exposure to ionising radiation.

Before the carriage of radioactive material takes place, CDG requires both the consignor and the carrier to have a plan, in writing, detailing emergency arrangements appropriate to protect the vehicle crew, the public, attending emergency services and the environment when transporting radioactive material. Emergency plans are required in addition to the Instructions in Writing required by ADR (Section 5.4.3 of ADR refers.)

### Factors to consider when writing a plan

An emergency plan should provide clear instructions to the driver, carrier and consignor who all have different responsibilities. It is most likely that the driver will initiate emergency plans; however there should be contingency arrangements where, in the case of injury, the driver (or accompanying vehicle crew) is unable to take appropriate action. The plan should address at least the following:

- **immediate notifications to be made:** contact the Police (in the UK, the emergency number is 999), the consignor (24 hour telephone number recommended, and this number should be included in the written arrangements) and where appropriate, the relevant Fire and Rescue body (999). Drivers and vehicle crew should be provided with appropriate equipment to make the notifications, such as a mobile phone, and the necessary arrangements implemented to ensure the phone is charged and is able to make outgoing calls.

- **actions to protect the driver:** minimise exposure to ionising radiation. This may be achieved by either moving away from the source, or by applying additional shielding, for example lead blocks, or bags of lead shot. Where these measures have been identified as appropriate, the necessary equipment must be made available on the vehicle, with suitable arrangements implemented to check the equipment is available and fit for service. The driver should be trained and equipped to identify any potential damage to the package(s), including loss of shielding or leakage of the radioactive contents and what to do in such situations. It may be necessary to apply spill kits, repackage the material or effect a temporary repair. The driver should be suitably trained to know how and when to use any protective equipment provided, and the equipment should be appropriately managed, controlled and calibrated. In all cases records of driver training, equipment maintenance and calibration should be maintained.
- **how to prevent the situation from getting worse:** drivers and vehicle crew should be trained and equipped as appropriate to control fire/heat, using the fire extinguishers required to be carried, and any additional measures that may be thought necessary, and restrict public access, where it is safe and appropriate to do so. Consideration should be given the necessary equipment, for example, ropes and posts to create a suitable cordon, temporary signage, and vehicle crew trained in their use. Crew should not approach or move packages that are significantly damaged.
- **actions to protect the public:** where equipped and safe to do so, set up temporary barriers to prevent access by the public to the incident scene. Ensure appropriate equipment is provided and adequate for the task (such as ensuring that rope are sufficiently long to achieve a cordon of the desired size) Consideration should be made at the planning stage as to how to adapt to restrictions in the desired cordon size (e.g. buildings, other carriageways etc.). Crew should remain upwind of the incident scene where significant damage to a package is suspected and advise members of the public to vacate the area in that direction where possible.
- **actions to protect the emergency services on their arrival at the scene:** The crew should understand the nature of the hazards of the material being carried, and be aware that much of the relevant information for the emergency services will be contained within the transport document. They should therefore be able to pass on details of the incident and information in the transport documentation to the emergency services, including the radioactive material being carried, the form it takes (special form, solid, liquid, gas), the amount of radioactive material present (in units of Becquerels, Bq). If there are specific details relevant to the incident of which the crew are aware, these should also be relayed, including actions already taken by the crew, any injuries to self or others, or known damage to packages or release of activity.
- **actions to ensure the radioactive materials remain secure without compromising the emergency response:** consider what to do if the vehicle is damaged to the extent that it is vulnerable e.g. where there are broken windows or doors are not lockable. If the driver or vehicle crew are able to do so, the vehicle or package should be under constant observation so that any malicious activity can be

identified. It may be appropriate to consider suitable means to record information to relay to police or security personnel, such as writing materials or cameras.

- **actions to be taken by the consignor:** include arrangements to provide advice to the emergency services and make particular notifications. This is likely to include detailed specifics of the consignment, including the nature and hazard of the risks, and details of the transport package, how it could be opened, or damage assessed, and any arrangements in place to assist recovery of the material and onward consignment, such as provision of spare packagings, or equipment to effect temporary repairs to damaged packagings. Consideration should be given to the requirements of CDG Schedule 2 Part 6, which requires a consignor (or their agent) to certify a package involved in an incident for continued use; appropriate arrangements should be developed to ensure this requirement can be discharged.
- **where to obtain specialist advice and effective support:** There are likely to be multiple sources of information, including the consignor, appointed Dangerous Goods Safety Adviser (DGSA) or Radiation Protection Adviser (RPA). Depending on the nature of the event, it is possible that advice may be required from several of these in respect of different aspects of the response, for example, to deal with circumstances where damage to a package/s or source/s is suspected, the clean-up phase, and to inform the need for further notifications to ONR and other relevant regulators in certain accident situations. Arrangements should be in place to ensure these sources of information can be easily accessed, including out of normal business hours, and allowing for individuals being on leave, sick or other absence.

### **How to produce effective emergency plans**

Training should be delivered to ensure that each person with a role in the emergency plan understands their duties in the event that the plan needs to be used, and has ready access to that plan. It is recommended that a driver should have an accessible copy of the plan in the vehicle cab. All equipment required for implementation of the plan should be carried on the vehicle whenever radioactive material is being transported.

Where a consignor and a carrier have separate plans, arrangements should be in place to ensure that there are no conflicts. In circumstances where there is just the one plan, both the carrier and consignor should be familiar with the contents as appropriate to their roles in the plan.

### **Factors to consider in relation to testing emergency arrangements**

CDG requires that where a plan is used more than once, it must be tested at suitable intervals. ONR expects that emergency plans will evolve and adapt over time to benefit from new technologies, operational experience or a change in circumstances. For the most part, these changes will be relatively minor and therefore ONR considers that the emergency plan in this situation is essentially the same and is therefore used 'more than once'. It is not acceptable to make minor changes to the plan, in order to claim that the plan is

'new' and therefore has not or will not be used more than once, simply in an attempt to avoid having to conduct a test of the plan.

The way plans are tested and how often this is done is not specified, however testing should be proportionate to the risks involved in a duty-holder's transport operation. As a guide, ONR would expect a test to be carried out approximately annually. A duty-holder should be able to justify their approach to testing.

All relevant aspects of the plan should be tested i.e. that emergency equipment is present, it works, that plans are accessible, they are up to date with contact names and telephone numbers, and that support staff as well as drivers undertake their roles effectively, and not just the driver. A record should be made to include the date of the test, names of those individuals involved, and any learning points identified. The plan should be reviewed and updated, if required, to reflect experience, with all relevant people being advised of any changes to the plan as these occur. Appropriate sources of learning should be identified, for example experience of the consigning or carrying organisation from operation or exercises, examples of practice elsewhere that the DGSA may be able to provide, various professional industry groupings and associations, and operational experience from real events in the UK or elsewhere.

Ways to test emergency arrangements could include a desktop exercise discussing the actions to be taken in the event of different emergency scenarios with individuals or groups with roles in the emergency plan. Alternatively testing could be a full or partial simulation involving some or all of the following: - a vehicle, simulated package, driver, emergency equipment, emergency services, consignor, competent advice and specialist support providers (DGSA or RPA). **It is important to note that testing should not take place out on public roads and should not involve packages containing radioactive material. Emergency services should only be involved with their express prior agreement.**

The UK has national arrangements in place as the ultimate measure in the event that all other arrangements fail. These are known as the National Arrangements for Incidents involving Radioactivity (NAIR). It is important to note that the NAIR cannot be claimed as being wholly or partly the duty-holder's plan, and duty-holders have their own arrangements in place.

## **Conclusions**

The legal requirements for preparation and testing of emergency arrangements in the UK are clearly defined in the relevant regulations, and place duties principally on the consigner and carrier of radioactive material.

Consignors and carriers must have arrangements in place to respond to an emergency during

transport. These arrangements must, in most cases be tested. The extent of the arrangements and associated testing should be in proportion to the hazard and frequency of the materials being carried. The duty-holder should be able to justify the approach they have taken in this respect.

ONR has published guidance to help duty-holders comply with their legal duties. This guidance sets out the standards ONR expects to see when conducting compliance assurance activity. Maintaining these standards is essential to ensure that, in the event an incident occurs, there is an effective and efficient response that protects the vehicle crew, members of the public, and the environment.

## References

1. The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, 2009 No. 1348
2. European Agreement Concerning the International Carriage of Dangerous Goods by Road, ADR applicable as from 1 January 2015, ECE/TRANS/242, United Nations 2014
3. Convention Concerning International Carriage by rail (COTIF) Appendix C – Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) with effect from 1 January 2015
4. Regulations for the Safe Transport of Radioactive Material 2012 Edition, Specific Safety Requirements No. SSR-6, International Atomic Energy Agency, Vienna 2012
5. Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material, Safety Guide No. TS-G-1.2 (ST-3), International Atomic Energy Agency, Vienna 2002
6. Transporting radioactive material - Guidance on emergency arrangements, Office for Nuclear Regulation, March 2016,  
<http://www.onr.org.uk/transport/emergency-arrangements-guidance.pdf>