ROAD TRANSPORT OF RADIOACTIVE MATERIAL

REQUIREMENTS AND GUIDANCE NOTES FOR DRIVERS AND HANDLERS
Radioactive materials are routinely transported around the world by air, sea, road and rail. In New Zealand these materials include radioactive sources used in medicine, industry, research and education. International regulations are in place to ensure that the chances of an accident, which could result in radioactive material being dispersed in the environment are minimal and to ensure that workers involved in transport, including handlers and drivers, are protected in both normal and accident conditions.


The National Radiation Laboratory (NRL) is New Zealand’s regulatory authority for radiation safety.

Handling radioactive material packages

Radioactive material presented for transport is packaged in accordance with the IAEA Regulations which ensure that it is safe to handle under normal conditions. Nevertheless, to prevent unnecessary exposure to radiation there are certain basic instructions you should follow, as the radiation exposure you receive depends on how long you stay near, and how close you are, to the package of radioactive material. To minimise radiation exposure:

- Keep your contact time with the package short.
- Handle a package of radioactive material without delay – keep it moving.
- Do not stand around, sit near or sit on a package of radioactive material.
- Do not carry out time-consuming tasks, such as paperwork, near a package.
- Keep yourself and other persons as far away as practicable from packages.
- Store packages well away from offices, rest rooms and occupied work areas.
- Do not store in the same location packages with transport indices that add up to more than 50. You will find the transport index written on the Category II or Category III yellow label (see inside next page).

Who may transport radioactive material packages?

For all radioactive material packages, apart from “excepted packages”, drivers must either have a Dangerous Goods endorsement on their driver licence or be licensed through NRL to use radioactive material under the Radiation Protection Act 1965 (or working under the instruction or supervision of a licensee) and be carrying the goods as “tools of trade”.

Before transport starts

Ensure that:

1. A completed and signed “Road/Rail/Marine Shipper’s Declaration for Dangerous Goods – Class 7 Radioactive Material” is included with the transport documents. This is a special version of a dangerous goods declaration that includes additional information to identify radioactive material. Copies of this form are available from the NRL (www.nrl.moh.govt.nz). A copy of the declaration must be carried in the cab of the vehicle as required under 5.1(3) of the Dangerous Goods Rule.

2. All packages appear to be in sound condition, undamaged and not leaking.

3. Each package is clearly labelled with one of the category labels indicated in figures 1 to 3 (see inside next page), and marked with the proper shipping name.

4. Each package is clearly marked with the consignor and/or consignee name and address, the appropriate UN number and the gross mass of the package if it exceeds 50 kg.

5. Placards, as illustrated in figure 4, are displayed in a prominent position on the front and rear of the vehicle. Additional placards may also be displayed on the sides of the vehicle.

6. Any packages are fixed securely in the vehicle in a position as remote as practicable from the driver.

7. Transport operators who carry dangerous goods for hire or reward comply with the segregation requirements in section 6 of the Dangerous Goods Rule, as summarised in table 1. People who carry radioactive material as tools of trade must ensure that they are separated as much as possible, within the load space, from incompatible dangerous goods in the table. Photographic materials should not be carried within one metre of radioactive material as radiation can cause fogging of the film.

8. Emergency Response Information is carried to comply with section 8.3 of the Dangerous Goods Rule.

9. The driver has a mobile phone or two-way radio.

Note: Items 1, 3, 5, 7 & 8 DO NOT apply to Excepted Packages (see Glossary next page).

Table 1. Segregation requirements

<table>
<thead>
<tr>
<th>Class 7 Radioactive Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must not be loaded in the same freight container or on the same vehicle as:</td>
</tr>
<tr>
<td>Class 1, 2.1, 3, 4.1, 4.2, 4.3, 5.2, 8.</td>
</tr>
<tr>
<td>Must not be loaded in the same freight container and must be separated by more than 3 metres if loaded on the same vehicle as:</td>
</tr>
<tr>
<td>Class 5.1</td>
</tr>
</tbody>
</table>
During and after transport

Ensure that:
- The journey from the point of collection to the point of delivery is as direct as possible.
- Vehicles containing radioactive goods are not left unattended unless locked in a safe and secure location. In addition, the vehicle should be fitted with a suitable alarm system that should be set whenever the vehicle is left unattended.
- No person other than the driver and his assistant(s) travel in a vehicle carrying radioactive material.
- Any vehicle placards are removed immediately after the packages have been unloaded.

Breakdowns and accidents while carrying radioactive material packages

If the following information is attached to the dangerous goods declaration, it will satisfy the requirement of the Dangerous Goods Rule for emergency response information.

- In all cases priority should be given to treating any people injured as a result of an accident.
- If there is definitely no damage to the radioactive load no special action is necessary beyond making appropriate arrangements to complete the journey as soon as possible.
- If there is, or might be, damage to the radioactive load, proceed as follows:
  - Inform the Fire Service (111) and the National Radiation Laboratory (03 366 5059 during office hours or 021 393 632 after hours) of the accident and state the number of radioactive packages being carried, quote the transport index and name(s) of radioisotope(s) as detailed on the “Shipper's Declaration”.
  - Keep yourself and others away from and avoid handling any radioactive material packages.
  - Advise the emergency services and breakdown crews in attendance that the vehicle in question has radioactive material on board.
  - If you have touched a damaged package or objects near it, wash your hands thoroughly and have yourself checked for possible contamination before you leave the scene.
  - Do not eat, drink or smoke or leave until checked for possible contamination.
  - Note any vehicles involved in the accident – the vehicles should remain at the accident site until cleared by the police or a competent person.
  - Observe any instructions given on the “Shipper’s Declaration”.

Glossary of terms used

**Transport index (TI)**
This is a single number assigned to a package containing radioactive material, and is derived from the maximum dose rate at one metre from the package.

Table 2. Labelling and categories of packages

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Index (TI)</td>
<td>Maximum radiation level at any point on external surface</td>
</tr>
<tr>
<td>0$^1$</td>
<td>Not more than 0.005 mSv/h</td>
</tr>
<tr>
<td>More than 0 but not more than 1$^1$</td>
<td>More than 0.005 mSv/h but not more than 0.5 mSv/h</td>
</tr>
<tr>
<td>More than 1 but not more than 10</td>
<td>More than 0.5 mSv/h but not more than 2 mSv/h</td>
</tr>
<tr>
<td>More than 10$^2$</td>
<td>More than 2 mSv/h but not more than 10 mSv/h</td>
</tr>
</tbody>
</table>

$^1$ If the measured TI is not greater than 0.05, the value quoted may be zero.

$^2$ Shall only be transported on an individual basis with the prior authorisation (in writing) of the National Radiation Laboratory.

Table 3. Package types

<table>
<thead>
<tr>
<th>Package Types</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type B(U) and B(M)</td>
<td>Package survives severe accident</td>
</tr>
<tr>
<td>Type A</td>
<td>Package survives minor accidents</td>
</tr>
<tr>
<td>Industrial (IP-1 / IP-2 / IP-3)</td>
<td></td>
</tr>
<tr>
<td>Excepted Package</td>
<td>Package not expected to survive accidents</td>
</tr>
</tbody>
</table>

Exempted Packages

Exempted packages are empty packagings that have contained radioactive material, or packages that contain radioactive material in limited quantities, or in instruments or manufactured articles, as specified in the IAEA Regulations. They are designed to withstand normal handling conditions during transport, but not accident situations. The radioactive content permitted in exempted packages is very limited so that in the event of the package being damaged, the radiological hazard is minimal.

The packaging for exempted packages must be designed to meet IAEA requirements and be marked with the UN number. A transport document (consignment note) is also required and this must include the UN number. However, NRL considers that provided exempted packages comply with these requirements they are not a significant risk during transport. Consequently, in accordance with 1.2 (3) of the Dangerous Goods Rule, NRL has declared that exempted packages complying with IAEA requirements do not need to be transported as dangerous goods on land in NZ.

This means that vehicles do not have to display placards, a “Shipper’s Declaration” is not required and drivers do not require an NRL licence or a dangerous goods endorsement on their driver licence.
Package labels

Figure 1
Category I - WHITE label

RADIOACTIVE

Figure 2
Category II - YELLOW label

RADIOACTIVE

Figure 3
Category III - YELLOW label

RADIOACTIVE

Vehicle placard

Figure 4
Placard.

Minimum dimensions shall be as shown, except when the design of the vehicle or the load does not allow this, in which case the placard must be as large as practicable so that the nature of the load can be readily identified from a distance of 25 metres in daylight. When different dimensions are used the relative proportions must be maintained. The number ‘7’ shall not be less than 25 mm high. The use of the word “RADIOACTIVE” in the bottom half is optional to allow the alternative use of this placard to display the appropriate United Nations number for the consignment.

Endorsed by:
New Zealand Police
Land Transport New Zealand

NRL is a specialist business unit of the Ministry of Health.

Emergency Notification:
In emergency please contact the Fire Service (111) and the National Radiation Laboratory (03 366 5059 during office hours or 021 393 632 after hours).

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