



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Montréal, 15 to 19 April 2013

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2015-2016 Edition

2.1 : Part 1 — General

**DRAFT AMENDMENTS TO THE TECHNICAL INSTRUCTIONS TO ALIGN WITH THE UN
RECOMMENDATIONS — PART 1**

(Presented by the Secretary)

SUMMARY

This working paper contains draft amendments to Part 1 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals at its sixth session (Geneva, 14 December 2012). It also reflects amendments agreed by DGP-WG12 (Montreal, 15 to 19 October 2012).

The DGP-WG is invited to agree to the draft amendments in this working paper.

Part 1

GENERAL

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Chapter 2

LIMITATION OF DANGEROUS GOODS ON AIRCRAFT

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2.3 TRANSPORT OF DANGEROUS GOODS BY POST

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2.3.2 The following dangerous goods may be acceptable in mail for air carriage subject to the provisions of the appropriate national authorities concerned and these Instructions which relate to such material:

- a) patient specimens as defined in 2;6.3.1.4 provided that they are classified, packed and marked as required by 2;6.3.2.3.6;
- b) infectious substances assigned to category B (UN 3373) only, when packed in accordance with the requirements of Packing Instruction 650, and solid carbon dioxide (dry ice) when used as a refrigerant for UN 3373; and

UN Model Regulations, paragraph 1.1.1.6, ST/SG/AC.10/40/Add.1

Highlighted text is in the UN Model Regulations but not the TIs. Whether or not to include in TIs to be determined.

- c) radioactive material in an excepted package conforming to the requirements of 1;6.1.5], the activity of which does not exceed one-tenth of that listed in Part 2, Chapter 7, Table 2-452-14, and that does not meet the definitions and criteria of classes, other than Class 7, or divisions, as defined in Part 2;

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UN Model Regulations, new paragraph 1.1.1.9, ST/SG/AC.10/40/Add.1

Potential contradictions with Special Provision A69 and location of text to be discussed.

2.6 LAMPS CONTAINING DANGEROUS GOODS

The following lamps are not subject to these Instructions provided that they do not contain radioactive material and do not contain mercury in quantities above those specified in Special Provision A69:

- a) lamps that are collected directly from individuals and households when transported to a collection or recycling facility;
- b) lamps each containing not more than 1 g of dangerous goods and packaged so that there is not more than 30 g of dangerous goods per package, provided that:
 - 1) the lamps are certified to a manufacturer's quality management system; and

Note.— The application of ISO 9001:2008 may be considered acceptable for this purpose.

- 2) each lamp is either individually packed in inner packagings, separated by dividers, or surrounded with cushioning material to protect the lamps and packed into strong outer packagings meeting the general provisions of 4;1.1 and capable of passing a 1.2 m drop test.
- c) used, damaged or defective lamps each containing not more than 1 g of dangerous goods with not more than 30 g of dangerous goods per package when transported from a collection or recycling facility.

The lamps must be packed in strong outer packagings that are sufficient for preventing release of the contents under normal conditions of transport meeting the general provisions of 4;1.1 and that are capable of passing a drop test of not less than 1.2 m.

Note.— Lamps containing radioactive material are addressed in 2;7.2.2.2 b).

Chapter 3

GENERAL INFORMATION

Parts of this Chapter are affected by State Variation BE 1; see Table A-1

3.1 DEFINITIONS

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UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1

Approval. For the transport of ~~Class 7~~ radioactive material:

Multilateral approval. The approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and also, where the consignment is to be transported through or into any other country, approval by the competent authority of that country.

Unilateral approval. The approval of a design which is required to be given by the competent authority of the country of origin of the design only.

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Confinement system. For the transport of ~~Class 7~~ radioactive material, the assembly of fissile material and packaging components specified by the designer and agreed to by the competent authority as intended to preserve criticality safety.

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Containment system. For the transport of ~~Class 7~~ radioactive material, the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during transport.

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Criticality safety index (CSI) assigned to a package, overpack or freight container containing fissile material. For the transport of ~~Class 7~~ radioactive material, a number which is used to provide control over the accumulation of packages, overpacks or freight containers containing fissile material.

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Design. For the transport of ~~Class 7~~ radioactive material, the description of fissile material excepted under 2;7.2.3.5.1 f), special form radioactive material, low dispersible radioactive material, package or packaging which enables such items to be fully identified. The description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, and other relevant documentation.

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Exclusive use. For the transport of ~~Class 7~~ radioactive material, the sole use, by a single shipper, of an aircraft or of a large freight container, in respect of which all initial, intermediate and final loading and unloading and shipment is are carried out in accordance with the directions of the shipper or consignee, where so required by these Instructions.

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The definition for *freight container in the case of radioactive material transport* is repeated in 2;7.1.3. It is proposed to replace the definition in this part with a cross reference to 2;7.1.3 as indicated below.

Freight container in the case of radioactive material transport. ~~An article of transport equipment designed to facilitate the transport of packaged goods by one or more modes of transport without intermediate reloading, which is of a permanent enclosed character, rigid and strong enough for repeated use, and must be fitted with devices facilitating its handling, particularly in transfer between aircraft and from one mode of transport to another. A small freight container is that which has either an overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m³. Any other~~

freight container is considered to be a large freight container. For the transport of Class 7 material, a freight container may be used as a packaging. See 2.7.1.3.

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Large salvage packaging. (See UN Recommendations, Chapter 1.2). Not permitted for air transport.

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Management system, for the transport of radioactive material. A set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner.

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Maximum normal operating pressure. For the transport of ~~Class 7~~ radioactive material, the maximum pressure above atmospheric pressure at mean sea level that would develop in the containment system in a period of one year under the conditions of temperature and solar radiation corresponding to environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during transport.

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DGP-WG/12-WP/36:

Net quantity. Either:

a) The mass or volume of the dangerous goods contained in a package excluding the mass or volume of any packaging material; or

b) the mass of an unpackaged article of dangerous goods (e.g. UN 3166).

For the purposes of this definition, “dangerous goods” means the substance or article as described by the proper shipping name shown in Table 3-1, e.g. for “Fire extinguishers”, the net quantity is the mass of the fire extinguisher. For articles packed with equipment or contained in equipment, the net quantity is the net mass of the article, e.g. for lithium ion batteries contained in equipment, the net quantity is the net mass of the lithium ion batteries in the package.

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UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1

Neutron radiation detector. A device that detects neutron radiation. In such a device, a gas may be contained in a hermetically sealed electron tube transducer that converts neutron radiation into a measureable electric signal.

Radiation detection system. An apparatus that contains radiation detectors as components.

Radiation level. For the transport of ~~Class 7~~ radioactive material, the corresponding dose rate expressed in millisieverts per hour or microsieverts per hour.

Radioactive contents. For the transport of ~~Class 7~~ radioactive material, the radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging.

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Transport index (TI) assigned to a package, overpack or freight container. For the transport of ~~Class 7~~ radioactive material, a number which is used to provide control over radiation exposure.

Through or into. For the transport of ~~Class 7~~ radioactive material, through or into the countries in which a consignment is transported but specifically excluding countries “over” which a consignment is carried by air, provided that there are no scheduled stops in those countries.

Chapter 4

TRAINING

Parts of this Chapter are affected by State Variations AE 2, BR 7, CA 18, HK 1;
see Table A-1

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4.2 TRAINING CURRICULA

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DGP-WG/12-WP/4 and DGP-WG/12-WP/17

Table 1-4. Content of training courses

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Shippers and packers</i>		<i>Freight forwarders</i>			<i>Operators and ground handling agents</i>					<i>Security staff</i>	
	1	2	3	4	5	6	7	8	9	10	11	12
	Categories of staff											
General philosophy	x	x	x	x	x	x	x	x	x	x	x	x
Limitations	x		x	x	x	x	x	x	x	x	x	x
General requirements for shippers	x		x			x						
Classification	x	x	x			x						x
List of dangerous goods	x	x	x			x				x		
Packing requirements	x	x	x			x						
Labelling and marking	x	x	x	x	x	x	x	x	x	x	x	x
Dangerous goods transport document and other relevant documentation	x		x	x		x	x					
Acceptance procedures						x						
Recognition of undeclared dangerous goods	x	x	x	x	x	x	x	x	x	x	x	x
Storage and loading procedures					x	x		x		x		
Pilots' notification						x		x		x		
Provisions for passengers and crew	x	x	x	x	x	x	x	x	x	x	x	x
Emergency procedures	x	x	x	x	x	x	x	x	x	x	x	x

KEY CATEGORY

- 1 — Shippers and persons undertaking the responsibilities of shippers
- 2 — Packers
- 3 — Staff of freight forwarders involved in processing dangerous goods
- 4 — Staff of freight forwarders involved in processing cargo or mail (other than dangerous goods)
- 5 — Staff of freight forwarders involved in the handling, storage and loading of cargo or mail
- 6 — Operator's and ground handling agent's staff accepting dangerous goods
- 7 — Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)
- 8 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail and baggage
- 9 — Passenger handling staff
- 10 — Flight crew members, loadmasters and load planners
- 11 — Crew members (other than flight crew members)
- 12 — Security staff who are involved with the screening of passengers and their baggage and cargo or mail, e.g. security screeners, their supervisors and staff involved in implementing security procedures

Table 1-5. Content of training courses for operators not carrying dangerous goods as cargo or mail

Contents	<u>Categories of staff</u>				
	7 <u>13</u>	8 <u>14</u>	9 <u>15</u>	10 <u>16</u>	11 <u>17</u>
General philosophy	X	X	X	X	X
Limitations	X	X	X	X	X
Labelling and marking	X	X	X	X	X
Dangerous goods transport document and other relevant documentation	X				
Recognition of undeclared dangerous goods	X	X	X	X	X
Provisions for passengers and crew	X	X	X	X	X
Emergency procedures	X	X	X	X	X

KEY CATEGORY

~~7~~13— Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)

~~8~~14— Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail (other than dangerous goods) and baggage

~~9~~15— Passenger handling staff

~~10~~16— Flight crew members, loadmasters and load planners

~~11~~17— Crew members (other than flight crew members)

Note 1.— Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in Tables 1-4 and 1-5. For example, in respect of classification, staff involved in implementing security procedures (e.g. screeners and their supervisors) need only be trained in the general properties of dangerous goods.

Note 2.— The categories of personnel identified in Tables 1-4 and 1-5 are not all encompassing. Personnel employed by or interacting with the aviation industry in areas such as passenger and cargo reservation centres, and engineering and maintenance, except when acting in a capacity identified in Table 1-4 or 1-5, should be provided with dangerous goods training in accordance with 4.2.

4.2.8 Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter to which their various categories of staff should be familiar with is indicated in Table 1-6.

Table 1-6. Content of training courses for staff of designated postal operators

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Designated postal operators</i>		
	<u>Categories of staff</u>		
	A	B	C
General philosophy	x	x	x
Limitations	x	x	x
General requirements for shippers	x		
Classification	x		
List of dangerous goods	x		
Packing requirements	x		
Labelling and marking	x	x	x
Dangerous goods transport document and other relevant documentation	x	x	
Acceptance of the dangerous goods listed in 1;2.3.2	x		
Recognition of undeclared dangerous goods	x	x	x
Storage and loading procedures			x
Provisions for passengers and crew	x	x	x
Emergency procedures	x	x	x

KEY CATEGORY

- A — Staff of designated postal operators involved in accepting mail containing dangerous goods
- B — Staff of designated postal operators involved in processing mail (other than dangerous goods)
- C — Staff of designated postal operators involved in the handling, storage and loading of mail

Note.— Guidance on the aspects of training to be covered by staff of designated postal operators can be found in S-1;3.

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UN Model Regulations, Chapter 1.5, ST/SG/AC.10/40/Add.1

Chapter 6

GENERAL PROVISIONS CONCERNING ~~CLASS 7~~ RADIOACTIVE MATERIAL

6.1 SCOPE AND APPLICATION

6.1.1 These Instructions establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material. These Instructions are based on the IAEA *Regulations for the Safe Transport of Radioactive Material*, (2009¹² Edition), IAEA Safety Standards Series No. ~~TSR-R-16~~, IAEA, Vienna (2009¹²). Explanatory material can be found in *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material* (2005 Edition), IAEA Safety Standard Series No. TS-G-1.1 (Rev. 4²), IAEA, Vienna (2008¹²). The prime responsibility for safety must rest with the person or organization responsible for facilities and activities that give rise to radiation risk.

6.1.2 The objective of these Instructions is to establish 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. This protection is achieved by requiring:

- a) containment of the radioactive contents;
- b) control of external radiation levels;

- c) prevention of criticality; and
- d) prevention of damage caused by heat.

These requirements are satisfied firstly by applying a graded approach to the limits of the contents for packages and aircraft and to the performance standards, which are applied to package designs depending upon the hazard of the radioactive contents. Secondly, they are satisfied by imposing ~~requirements-conditions~~ on the design and operation of packages and on the maintenance of the packagings, including consideration of the nature of the radioactive contents. Finally, they are satisfied by requiring administrative controls including, where appropriate, approval by competent authorities.

6.1.3 These Instructions apply to the transport of radioactive material by air, including transport that is incidental to the use of the radioactive material. Transport comprises all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of the radioactive material and packages. A graded approach is applied to the performance standards in these Instructions that are characterized by three general severity levels:

- a) routine conditions of transport (incident free);
- b) normal conditions of transport (minor mishaps); and
- c) accident conditions of transport.

6.1.4 These Instructions do not apply to any of the following:

- a) radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;

Note.— The highlighted text below does not appear in the UN Model Regulations.

- b) radioactive material in or on a person who is to be transported for medical treatment because the person has been subject to accidental or deliberate intake of or contamination from radioactive material or to contamination and is to be transported for medical treatment, [taking into account the necessary radiological protection measures with respect to other passengers and crew, subject to approval by the operator];

≠ *Note.— Guidance material may be found on www.icao.int/safety/DangerousGoods/Pages/Guidance-Material.aspx.*

- c) radioactive material in consumer products which have received regulatory approval, following their sale to the end user;
- d) natural material and ores containing naturally occurring radionuclides (which may have been processed) which are either in their natural state or have only been processed for purposes other than for extraction of the radionuclides, and are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in 2.7.2.2.1 b) Table 2-12 or calculated in accordance with 2.7.2.2.2 a) and 2.7.2.2.3 to 2.7.2.2.6; For natural materials and ores containing naturally occurring radionuclides that are not in secular equilibrium, the calculation of the activity concentration must be performed in accordance with 2.7.2.2.4;
- e) non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit specified in the definition of contamination in 2.7.1.

6.1.5 Specific provisions for the transport of excepted packages

6.1.5.1 Excepted packages which may contain radioactive material in limited quantities, instruments, manufactured articles and empty packages as specified in 2.7.2.4.1.1 are subject only to the following provisions of Parts 5 to 7:

- a) the applicable provisions specified in 5.1.1 i), 5.1.2.4, 5.1.4, 5.1.6.3, 5.1.7, 5.2.2, 5.2.3, 5.2.4.2, 5.3.2.12 e), 5.3.3, 5.3.4, 5.4.4, 7.2.5, 7.3.2.2 and 7.4.4 1.1.2, 5.1.6.3, 5.1.2.2.2, 5.1.2.4, 4.1.1.13, 7.2.10.3.1, 7.3.2.1 to 3.2.4 and 7.1.6; and
- b) the requirements for excepted packages specified in 6.7.3; ~~and~~

except when the radioactive material possesses other hazardous properties and has to be classified in a class other than Class 7 in accordance with Special Provision A130 or A194, where the provisions listed in a) and b) above apply only as relevant and in addition to those relating to the main class or division.

- c) ~~if the excepted package contains fissile material, one of the fissile exceptions provided by 2.7.2.3.5 must apply and the requirement of 6.7.6.2 must be met.~~

6.1.5.2 Excepted packages must be subject to the relevant provisions of all other parts of these Instructions. If the excepted package contains fissile material, one of the fissile exceptions provided by 2;7.2.3.5 must apply and the requirements of 7;2.10.4.3 must be met.

6.2 RADIATION PROTECTION PROGRAMME

6.2.1 The transport of radioactive material must be subject to a radiation protection programme, which must consist of systematic arrangements aimed at providing adequate consideration of radiation protection measures.

Changes in addition to those introduced into the 18th Revised Edition of the Model Regulations are proposed here for the sake of alignment with the UN text. The additional changes are highlighted in yellow. Changes introduced by the UN for the 18th Revised Edition also editorial.

6.2.2 Doses to persons must be below the relevant dose limits. Protection and safety must be optimized in order that the magnitude of individual doses, the number of persons exposed, and the likelihood of incurring exposure must be kept as low as reasonably achievable, economic and social factors being taken into account, and doses to persons must be below the relevant dose limits, within the restriction that the doses to individuals are subject to dose constraints. A structured and systematic approach must be adopted and must include consideration of the interfaces between transport and other activities.

6.2.3 The nature and extent of the measures to be employed in the programme must be related to the magnitude and likelihood of radiation exposure. The programme must incorporate the requirements in 6.2.2 and 6.2.4 to 6.2.7, 7;2.9.1.1 and 7;2.9.1.2. Programme documents must be available, on request, for inspection by the relevant competent authority.

6.2.4 For occupational exposure arising from transport activities, where it is assessed that the effective dose either:

- a) is likely to be between 1 and 6 mSv in a year, a dose assessment programme via workplace monitoring or individual monitoring must be conducted; and or
- b) is likely to exceed 6 mSv in a year, individual monitoring must be conducted.

When individual monitoring or workplace monitoring is conducted, appropriate records must be kept.

Note.— For occupational exposure arising from transport activities, where it is assessed that the effective dose is most unlikely to exceed 1 mSv in a year, no special work patterns, detailed monitoring, dose assessment programmes or individual record-keeping need be required.

6.2.5 In the event of accidents or incidents during the transport of radioactive material, emergency provisions, as established by relevant national and/or international organizations, must be observed to protect persons, property and the environment. Appropriate guidelines for such provisions are contained in "Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material", IAEA Safety Standard Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002).

6.2.6 Emergency procedures must take into account the formation of other dangerous substances that may result from the reaction between the contents of a consignment and the environment in the event of an accident.

6.2.7 Personnel must be appropriately trained in the radiation hazards involved and the precautions to be observed in order to ensure restriction of their exposure and that of other persons who might be affected by their actions.

6.3 QUALITY ASSURANCE MANAGEMENT SYSTEM

~~Quality assurance programmes based on international, national or other standards acceptable to the competent authority must be established and implemented for the design, manufacture, testing, documentation, use, maintenance and inspection of all special form radioactive material, low dispersible radioactive material and packages, and for transport and in-transit storage operations to ensure compliance with the relevant provisions of these Instructions. Certification that the design specification has been fully implemented must be available to the competent authority. The manufacturer, shipper or user must be prepared to provide facilities for competent authority inspection during manufacture and use and to demonstrate to any cognizant competent authority that:~~

- ~~a) the manufacturing methods and materials used are in accordance with the approved design specifications; and~~
- ~~b) all packagings are periodically inspected and, as necessary, repaired and maintained in good condition so that they continue to comply with all relevant requirements and specifications, even after repeated use.~~

A management system based on international, national or other standards acceptable to the competent authority must be established and implemented for all activities within the scope of the Instructions, as identified in 1;6.1.3, to ensure compliance with the relevant provisions of these Instructions. Certification that the design specification has been fully implemented must be available to the competent authority. The manufacturer, shipper or user must be prepared to:

- a) provide facilities for inspection during manufacture and use; and
- b) demonstrate compliance with these Instructions to the competent authority.

Where competent authority approval is required, such approval must take into account and be contingent upon the adequacy of the ~~quality assurance programme~~ management system.

6.4 SPECIAL ARRANGEMENT

6.4.1 Special arrangement means those provisions, approved by the competent authority, under which consignments which do not satisfy all the requirements of these Instructions applicable to radioactive material may be transported.

6.4.2 Consignments for which conformity with any provision applicable to ~~Class 7~~ radioactive material is impracticable must not be transported except under special arrangement. Provided the competent authority is satisfied that conformity with the ~~Class 7~~ radioactive material provisions of these Instructions is impracticable and that the requisite standards of safety established by these Instructions have been demonstrated through alternative means, the competent authority may approve special arrangement transport operations for a single consignment or a planned series of multiple consignments. The overall level of safety in transport must be at least equivalent to that which would be provided if all the applicable requirements had been met. For international consignments of this type, multilateral approval must be required.

6.5 RADIOACTIVE MATERIAL POSSESSING OTHER DANGEROUS PROPERTIES

6.5.1 In addition to the radioactive and fissile properties, any subsidiary risk of the contents of a package, such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness, must also be taken into account in the documentation, packing, labelling, marking, placarding, stowage, segregation and transport, in order to be in compliance with all relevant provisions for dangerous goods of these Instructions.

6.6 NON-COMPLIANCE

In the event of a non-compliance with any limit in these Instructions applicable to radiation level or contamination:

- a) the shipper, consignee, operator and any organization involved during transport, who may be affected, as appropriate, must be informed of the non-compliance;
- ~~a) the shipper must be informed of the non-compliance by the operator if the non-compliance is identified during transport; or~~
- ~~b) the shipper and the operator must be informed of the non-compliance by the consignee if the non-compliance is identified at receipt;~~
- ~~b) the operator, shipper or consignee, as appropriate, must:~~
 - i) take immediate steps to mitigate the consequences of the non-compliance;
 - ii) investigate the non-compliance and its causes, circumstances and consequences;
 - iii) take appropriate action to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance; and
 - iv) communicate to the relevant competent authority(ies) the causes of the non-compliance and corrective or preventative actions taken or to be taken; ~~and~~
- ~~c) the communication of the non-compliance to the shipper and relevant competent authority(ies), respectively, must be made as soon as practicable and it must be immediate whenever an emergency exposure situation has developed or is developing.~~