

# Safe Transport of Dangerous Goods by Air

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# Safe Transport of Dangerous Goods by Air

## Part 1 - General



Doc 9284

Technical Instructions for the Safe  
Transport of Dangerous Goods by Air

2019-2020 Edition



Approved and published by decision of the Council of ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

# SAFE TRANSPORT OF DANGEROUS GOODS BY AIR



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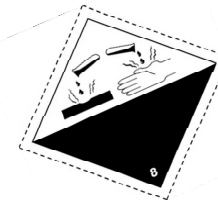
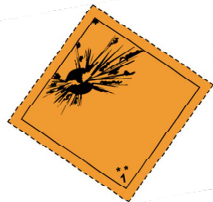
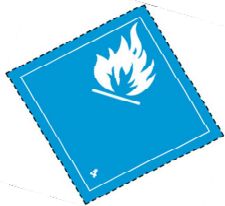
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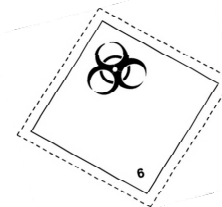
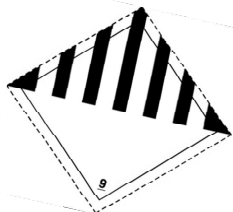
## ➤ Part 1 = General


- ✓ Chapter 1 - Scope and applicability
- ✓ Chapter 2 - Limitations of DG on aircraft
- ✓ Chapter 3 - General information
- ✓ Chapter 4 – Training
- ✓ Chapter 5 - DG security
- ✓ Chapter 6 - General provisions concerning Class 7 (radioactive)
- ✓ Chapter 7 – Incident and accident reporting

## Dangerous Goods Definition



**Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in these Instructions, or which are classified according to these Instructions.**



- **These goods can be dangerous for the aircraft, people onboard it, and goods and people on the ground (including environment)**
- **“Hazard/Risk”**  **Be aware of presence of the DG**

### ➤ **General applicability**

- **The Instructions prescribe the detailed requirements applicable to the international civil transport of dangerous goods by air **by any aircraft (including both internal and external carriage)****
- **In certain circumstances, States may grant may grant **Approval or Exemption****
- **Supplement to the TI is the guidance for the processing of approvals and exemptions**

# RESTRICTIONS

- **All DG don't have the same level regarding their risk to be assessed !!!**
- ✓ **DG forbidden under any Circumstances**
- ✓ **DG forbidden, under Exemption**
- ✓ **DG forbidden, under Approval**
- ✓ **DG of the Operator's property**
- ✓ **DG transported by Post**
- ✓ **DG forbidden on Passenger aircrafts (Cargo Aircraft Only - CAO)**
- ✓ **DG carried out on Passenger aircrafts (& cargo, by definition)**
- ✓ **DG in Limited Quantities**
- ✓ **DG in Excepted Quantities**
- ✓ **DG carried by Passengers and Crew**

# PART 1 – CHAPTER 1

## ➤ DG forbidden under Exemption

✓ In instances:

a) of **extreme urgency**; or

b) **when other forms of transport are inappropriate**; or

c) **when full compliance with the prescribed requirements is contrary to public interest**,

→ the States concerned **may grant an Exemption** from the provisions of the Instructions **provided** that in such instances every effort is made to achieve an **overall level of safety** in transport which **is at least equivalent** to the level of safety provided for in these Instructions

✓ **States concerned to deliver Exemption** are States of Origin, Operator, Transit, Overflight and Destination

✓ *Infected Live Animals* are included in the process of *Exemption Approval (States of Origin, Transit, Destination and Operator)*

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
Allyl chloroformate	1722	6.1	3 8						FORBIDDEN		FORBIDDEN	

# PART 1 – CHAPTER 1

## ➤ DG forbidden under Approval

- ✓ Some DG **usually forbidden** and described as such in the list of the Instructions **may be transported under Approval** of the competent National Authority
- ✓ These DG are identified by Special Provisions **“A1”** or **“A2”** in column 7, and **listed in the Supplement** of the Instructions
  - **SP “A1”** = Transportation by **passenger aircraft**
  - **SP “A2”** = Transportation by **cargo aircraft only**
- ✓ **States concerned** to deliver **Approval** are **States of Origin and Operator** (unless otherwise specified in the Instructions)

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	Lithium packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
Thiophosgene	2474	6.1			AU 1 CA 7 GB 3	A2			FORBIDDEN		FORBIDDEN	

### ➤ General exemptions:

- ✓ to provide, during flight, **medical aid** to a patient
- ✓ to provide, during flight, **veterinary aid** or a humane killer for an animal
- ✓ for **dropping** in connection with **agricultural, horticultural, forestry, ice jam control** and **landslide clearance** or **pollution control** activities
- ✓ for **dropping** or **triggering** in connection with **avalanche control** activities
- ✓ to provide, during flight, **aid** in connection with **search and rescue operations**
- ✓ vehicles carried in aircraft designed or modified for vehicle ferry operations
- ✓ required for the propulsion of the means of transport or the operation of its specialized equipment during transport (e.g. refrigeration units) or that are required in accordance with the operating regulations (e.g. fire extinguishers)
- ✓ contained within items of **excess baggage** being sent as cargo

### ➤ General transport requirements:

- Except as otherwise provided for in these Instructions, **no person may offer or accept** DG for international civil transport by air **unless** those goods are properly **classified, documented, certificated, described, packaged, marked, labelled** and in the condition for shipment required by these Instructions
- **Sub-contractors are included**
- **No person may transport** DG by air unless those goods are **accepted, handled and transported** in accordance with these Instructions
- **No person may label, mark, certify or offer** a packaging as meeting the requirements of these Instructions unless that packaging is **manufactured, fabricated, marked, maintained, reconditioned or repaired** as required by these Instructions
- **No person shall carry** DG aboard an aircraft in either **checked or carry-on baggage** or on his/her **person**, unless permitted by **Part 8**

- **Dangerous Goods packages opened by customs or other authorities:**
- Any package opened during an inspection must, before being forwarded to the consignee, be restored by qualified persons to a condition that complies with these Instructions



## PART 1 – CHAPTER 2

### ➤ Limitation of DGs on aircraft:

#### ➤ DG forbidden under any circumstances

✓ Any substance which, as presented for transport, is **liable to explode, dangerously react**, produce a **flame** or dangerous evolution of **heat** or dangerous emission of **toxic, corrosive** or **flammable gases** or **vapours** under conditions normally encountered in transport must **not be carried** on aircraft under any circumstance

✓ **No UN number** in the alphabetical list of the Technical Instructions (nowhere in IATA)

✓ Found in the DG List with the word **“Forbidden”** in columns 2 and 3 (but all these forbidden DG can be listed, appropriate care must be observed not to offer them to transport)

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
Chloroprene, uninhibited	FORBIDDEN											

## PART 1 – CHAPTER 2

### ➤ Limitation of DGs on aircraft:

### ➤ Exceptions for Dangerous Goods of the Operator

### ➤ The provisions of the TI **do not apply to:**

✓ articles and substances which would otherwise be classified as dangerous goods but which are **required** to be **aboard** the aircraft in accordance with the pertinent airworthiness requirements and **operating regulations** or that are authorized by the State of the Operator to meet special requirements

✓ aerosols, alcoholic beverages, perfumes, colognes, safety matches and liquefied gas lighters carried aboard an aircraft by the operator for use or **sale** on the aircraft during the flight or series of flights, but excluding non-refillable gas lighters and those lighters liable to leak when exposed to reduced pressure

✓ **dry ice** intended for use in food and beverage service aboard the aircraft

✓ electronic devices, such as **electronic flight bags**, personal **entertainment** devices, **credit cards readers**, containing lithium metal or lithium ion cells batteries, and their spare, provided batteries meet the provisions of DG carried by Pax and Crew

✓ **AOG** or **COMAT** spare parts, replacement articles, have to be transported in compliance with the TI

## PART 1 – CHAPTER 2

### ➤ Limitation of DGs on aircraft:

#### ➤ Transport of Dangerous Goods by Post

➤ In accordance with the Universal Postal Union (UPU) Convention, DG as defined in the TI, are **not permitted in mail**, except:

- ✓ patient specimens as defined in Part 2, chapter 6.3.1.4 definition provided that they are classified, packed and marked as required
- ✓ infectious substances assigned to category B (UN 3373) only, packed in accordance with Packing Instruction 650 (with or without Dry Ice)
- ✓ radioactive material in excepted package, UN2910 & 2911 only (activity almost zero)
- ✓ lithium ion batteries contained in equipment (UN 3481) meeting the provisions of Section II of Packing Instruction 967. No more than four cells or two batteries may be mailed in any single package
- ✓ lithium metal batteries contained in equipment (UN 3091) meeting the provisions of Section II of Packing Instruction 970. No more than four cells or two batteries may be mailed in any single package

## PART 1 – CHAPTER 2

### ➤ Limitation of DGs on aircraft:

#### ➤ Transport of Dangerous Goods by Post (continuous)

### ➤ Designated Postal Operator

➤ Procedure of designated postal operators (for controlling the introduction of DG in mail) **has to be reviewed and approved** by the CAA of the State where the mail is accepted

➤ Before a designated postal operator can introduce the acceptance of **only UN3481 (ion) & 3091 (metal) lithium batteries contained in equipment**, they **must have received specific approval** from the civil aviation authority

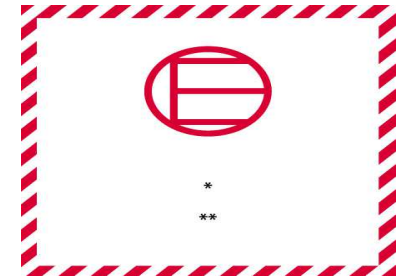
➤ NAA and CAA may find guidelines in the Supplement of the Technical Instructions

## PART 1 – CHAPTER 2

### ➤ Limitation of DGs on aircraft:

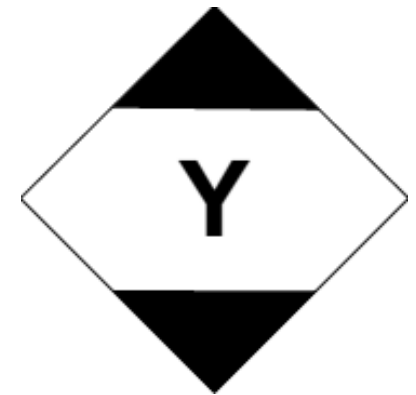
#### ➤ DGs in excepted quantities

→ small quantities of dangerous goods, which are excepted from certain provisions of these Instructions ([defined in Part 3, Chapter 5](#))



#### ➤ DGs packed in limited quantities

→ goods which are excepted from certain provisions of these Instructions ([defined in Part 3, Chapter 4](#))



### ➤ General information

- ✓ Where you can find a list of **definitions** of commonly used terms in the TI, e.g.
  - *External carriage: Any load suspended from a helicopter or in equipment attached to a helicopter*
  - *Inner packagings: packagings for which an outer packaging is required ...*,
  - *Overpack: an enclosure used to contain one or more packages ...*,
  - *Unit load device: Any type of freight container, aircraft container, aircraft pallet with a net or aircraft pallet with a net over an igloo*
  
- ✓ And **units of measurement** specified by the International System (SI), conversion factors, and also a list of authorized non-SI equivalents

## PART 1 – CHAPTER 4

### ➤ Training:

#### ➤ Training of the Stakeholders involved in the DG Transportation

#### ✓ 12 staff categories (operators carrying DG as cargo or mail)

- 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 DG)
- 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 DG
- 7 – Operator's and ground handling agent's staff accepting cargo or mail (other than DG)
- 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, load planners and flight operations officers/flight dispatchers
- 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

## PART 1 – CHAPTER 4

### ➤ Training:

- Training of the Stakeholders not involved in DG Transportation
- ✓ 5 staff categories (operators not carrying DG as cargo or mail)

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

**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**

**15 — Passenger handling staff**

**16 — Flight crew members, loadmasters, load planners and flight operations officers/flight dispatchers**

**17 — Crew members (other than flight crew members)**

## PART 1 – CHAPTER 4

### ➤ Training:

#### ➤ Establishment of training programmes

➤ Initial and recurrent dangerous goods training programmes must be established and maintained by or on behalf of:

→ a) shippers of dangerous goods, including packers and persons or organizations undertaking the responsibilities of the shipper (category 1 and 2)

→ b) operators (category 6 to 11 and 13 to 17)

→ c) ground handling agencies which perform, on behalf of the operator, the act of accepting, handling, loading, unloading, transferring or other processing of cargo or mail (category 6, 7, 8 and 13, 14)

→ d) ground handling agencies located at an airport which perform, on behalf of the operator, the act of processing passengers (category 9 & 15)

→ e) agencies, not located at an airport, which perform, on behalf of the operator, the act of checking in passengers (category 9 & 15)

→ f) freight forwarders (category 3, 4, 5)

→ g) agencies engaged in the security screening of passengers and their baggage and/or cargo or mail (category 12)

→ h) designated postal operators (Table 1-6)

### ➤ Training:

#### ➤ Approval of these DG training programmes

✓ Dangerous goods training programmes required for Operators **MUST** be subjected to **review and approval** by the appropriate **authority of the State of the Operator**

✓ Dangerous goods training programmes required for Designated Postal Operators **MUST** be subjected to **review and approval** by the **civil aviation authority** of the **State where the mail was accepted** by the designated postal operator

✓ Dangerous goods training programmes required for the others (shippers, handlers, freight forwarders and other agencies) **SOULD** be subjected to review and approval as determined by the appropriate national authority.

### ➤ Training:

#### ➤ Training Curricula

➤ Personnel **must** receive training in the requirements commensurate with their responsibilities. Such training **must** include:

- ✓ a) general familiarization training - which must be aimed at providing familiarity with the general provisions
- ✓ b) function-specific training - which must provide detailed training in the requirements applicable to the function for which that person is responsible
- ✓ c) safety training - which must cover the hazards presented by dangerous goods, safe handling and emergency response procedures

### ➤ Training:

#### ➤ Training Curricula (continuous)

➤ Personnel identified in the process of DG must be trained or training must be verified **prior** to the person performing any duty specified in the DG process

➤ Recurrent training **must be provided within 24 months** of previous training (could be completed within the final 3 months of validity of previous training, end of validity will stay the end of the month of validity of previous training)

➤ A **test** to verify understanding is **mandatory**, and confirmation that the test has been completed satisfactorily is required

➤ The records of training **must be retained for a minimum period of 36 months** from the most recent training completion date and must be made available upon request to the appropriate national authority

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **DG transportation** – Content of training courses - Table 1-4

<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
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

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

**Shippers & persons undertaking the responsibilities of shippers - Packers**

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

**Freight forwarders**

# PART 1 – CHAPTER 4

## ➤ Training:

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
General philosophy	x	x	x	x	x	x	x	x	x	x	x	x	x
Limitations	x		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	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	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	x
Emergency procedures	x	x	x	x	x	x	x	x	x	x	x	x	x

**Operator's and ground handling agent's staff accepting dangerous goods**

# PART 1 – CHAPTER 4

## ➤ Training:

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>Operator's and ground handling agent's staff accepting cargo/mail (other than DG)</i>	<i>Operators and ground handling agents</i>				<i>Security staff</i>
	1	2	3	4	5	6		8	9	10	11	12
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

**Operator's and ground handling agent's staff accepting cargo/mail (other than DG)**

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

**Operator's and ground handling agent's staff involved in handling, storage and loading of cargo and mail and baggage)**

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

Passenger handling staff

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

**Flight crew members, Loadmasters, Load planners & Flight Operations Officers/Flight Dispatchers**

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

**Crew Members (other than flight crew members)**

# PART 1 – CHAPTER 4

## ➤ Training:

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
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

Security screening staff, supervisors, ...

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

<i>Contents</i>	<i>Categories of staff</i>				
	13	14	15	16	17
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

➤ **Security staff are required to be trained** irrespective of whether the operator on which passenger or cargo is to be transported carries dangerous goods as cargo

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

<i>Contents</i>	<i>Categories of staff</i>				
	13	14	15	16	17
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

**Operator's and ground handling agent's staff accepting cargo/mail (other than DG)**

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

<i>Contents</i>	<i>Categories of staff</i>				
	13	14	15	16	17
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

**Operator's and ground handling agent's staff involved in handling, storage and loading of cargo and mail (other than DG) and baggage)**

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

<i>Contents</i>	<i>Categories of staff</i>				
	13	14	15	16	17
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

**Passenger handling staff**

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

Contents	Categories of staff				
	13	14	15	16	17
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

**Flight crew members, Loadmasters, Load planners  
& Flight Operations Officers/Flight Dispatchers**

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ **Non DG transportation** – Content of training courses - Table 1-5

✓ Only Operator's staff and their subcontractors, Categories 13 to 17

<i>Contents</i>	<i>Categories of staff</i>				
	13	14	15	16	17
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

**Crew Members (other than flight crew members)**

## PART 1 – CHAPTER 4

### ➤ Training:

### ➤ Designated postal Operators – Content of training courses - Table 1-6

<i>Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum</i>	<i>Designated postal operators</i>		
	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 documents 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

- A – Staff involved in accepting mail containing DG
- B – Staff involved in processing mail (other than DG)
- C – Staff involved in handling, storage & loading mail

### ➤ Training:

#### ➤ Instructor qualifications

- ✓ Unless otherwise provided for by the appropriate national authority, **instructors** of initial and recurrent dangerous goods training programmes **must have adequate instructional skills** and have successfully completed a dangerous goods training programme in **the applicable category, or Category 6**, prior to delivering such a dangerous goods training programme
  
- ✓ Instructors delivering initial and recurrent dangerous goods training programmes **must at least every 24 months** deliver such courses, or in the absence of this attend recurrent training

### ➤ Training: Main changes for a next future !!!!

*(Applicable from 1<sup>st</sup> January 2021)*

➤ As ICAO has recognized that the implementation of a **competency-based approach** to training for **safety-critical** functions is **essential** to ensure that enough qualified and competent personnel support the air transport system :

→ No more training typically designed around the job title

→ No more Tables 1-4 and 1-5

➤ **Competency-based training (CBT)** is designed to **ensure** that personnel can perform the **function for which they are responsible**

➤ CBT approach will design **training** and **assessment** that is specific to their **functions** and not just theoretical knowledge about dangerous goods

☞ Employers *[shall/should]* ensure that *training is designed and developed to establish clear links among the competencies to be achieved, learning objectives, assessment methods, and course materials*

➤ **Training: Main changes for a next future !!!!**  
*(Applicable from 1<sup>st</sup> January 2021)*

➤ ICAO provided guidance in implementing new dispositions on competency-based approach on training in Attachment 4 of the TI :

Table 2-1. **Generic ICAO competency framework** for dangerous goods personnel

<i>Generic competency</i>	<i>Description</i>	<i>Observable behaviour</i>
Application of procedures and compliance with regulations	Identifies and applies appropriate procedures in accordance with published operating instructions and in compliance with applicable regulations	Identifies where to find procedures and regulations
		Follows relevant procedures in a timely manner
		Complies with applicable regulations
		Applies relevant procedural knowledge
Communication	Communicates through appropriate means in the work environment, in both normal and non-normal situations	Ensures the recipient is ready and able to receive information
		Selects appropriately what, when, how and with whom to communicate
		Conveys messages clearly, accurately and concisely
		Confirms that the recipient correctly understands important information
		Listens actively and demonstrates understanding when receiving information
		Asks relevant and effective questions
		Completes accurate reports as required by operating procedures
		Announces deviations from normal or intended conditions
		Correctly uses and interprets non-verbal communication

## PART 1 – CHAPTER 4

- **Training: Main changes for a next future !!!!**  
(Applicable from 1<sup>st</sup> January 2021)

➤ ICAO provided guidance in implementing new dispositions on competency-based approach on training in Attachment 4 of the TI :

Table 2-2. **Template for an adapted competency model**

<i>Adapted competency</i>	<i>Description</i>	<i>Performance criteria</i>		
		<i>Observable behaviour</i>	<i>Competency assessment</i>	
<i>Adapted competency 1</i>	Description 1	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		
<i>Adapted competency 2</i>	Description 2	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		
<i>Adapted competency 3</i>	Description 3	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		

### ➤ Training: Main changes for a next future !!!!

*(Applicable from 1<sup>st</sup> January 2021)*

➤ Generic list of **tasks** typically performed by personnel involved in the transport of DG is described by **seven functions** which **correspond** to the **competency units**:

- **classifying** dangerous goods
- **preparing** a dangerous goods **shipment**
- **processing/accepting** cargo
- **managing** cargo **pre-loading**
- **accepting** passenger and crew **baggage**
- **transporting** cargo/baggage
- **collecting** safety data

# PART 1 – CHAPTER 4

➤ **Training: Main changes for a next future !!!!**  
*(Applicable from 1<sup>st</sup> January 2021)*

➤ Generic list of **tasks** typically performed by personnel involved in the transport of DG is described by **seven functions** which **correspond** to the **competency units**:

Table 3-1. Generic dangerous goods task list

1	<b>Classifying dangerous goods</b>		
	1.1	Evaluate substance or article against classification criteria	
		1.1.1	Determine if it is dangerous goods
		1.1.2	Determine if it is forbidden under any circumstances
	1.2	Determine dangerous goods description	
		1.2.1	Determine class or division
		1.2.2	Determine packing group
		1.2.3	Determine proper shipping name and UN number
		1.2.4	Determine if it is forbidden unless approval or exemption is granted
	1.3	Review special provisions	
		1.3.1	Assess if special provision(s) is applicable
		1.3.2	Apply special provision(s)
	2	<b>Preparing dangerous goods shipment</b>	
2.1		Assess packing options including quantity limitations	
		2.1.1	Consider limitations (de minimis quantities, excepted quantities, limited quantities, passenger aircraft, cargo aircraft only, special provisions, dangerous goods in the mail)
		2.1.2	Consider State and operator variations
		2.1.3	Determine if all-packed-in-one can be used
		2.1.4	Select how dangerous goods will be shipped based on limitations and variations
2.2		Apply packing requirements	
		2.2.1	Consider constraints of packing instructions

# PART 1 – CHAPTER 4

➤ **Training: Main changes for a next future !!!!**

*(Applicable from 1<sup>st</sup> January 2021)*

➤ **“Generic” task/knowledge matrix table provided ...**

	Dangerous goods tasks																							
	1. Classifying dangerous goods			2. Preparing dangerous goods shipment					3. Processing/ accepting cargo				4. Managing cargo pre-loading			5. Accepting passenger and crew baggage		6. Transporting cargo/baggage			7. Collecting safety data			
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2	6.1	6.2	6.3	7.1	7.2	7.3	7.4
Dangerous goods knowledge																								
Scope and applicability																								
Limitation of dangerous goods on aircraft																								
Definitions																								
Training																								
Dangerous goods security																								
General provisions concerning radioactive material																								
Reporting of dangerous goods accidents, incidents and other occurrences																								
Classification — General																								
Classification — Class 1																								

## ➤ Training: Main changes for a next future !!!! (Applicable from 1<sup>st</sup> January 2021)

### ➤ Matrix which is bound with tasks adapted to well-defined roles ...

#### 1 Classifying dangerous goods

- 1.1 Evaluate substance or article against classification criteria
  - 1.1.1 Determine if it is dangerous goods
  - 1.1.2 Determine if it is forbidden under any circumstances
- 1.2 Determine dangerous goods description
  - 1.2.1 Determine class or division
  - 1.2.2 Determine packing group
  - 1.2.3 Determine proper shipping name and UN number
  - 1.2.4 Determine if it is forbidden unless approval or exemption is granted
- 1.3 Review special provisions
  - 1.3.1 Assess if special provision(s) is applicable
  - 1.3.2 Apply special provision(s)

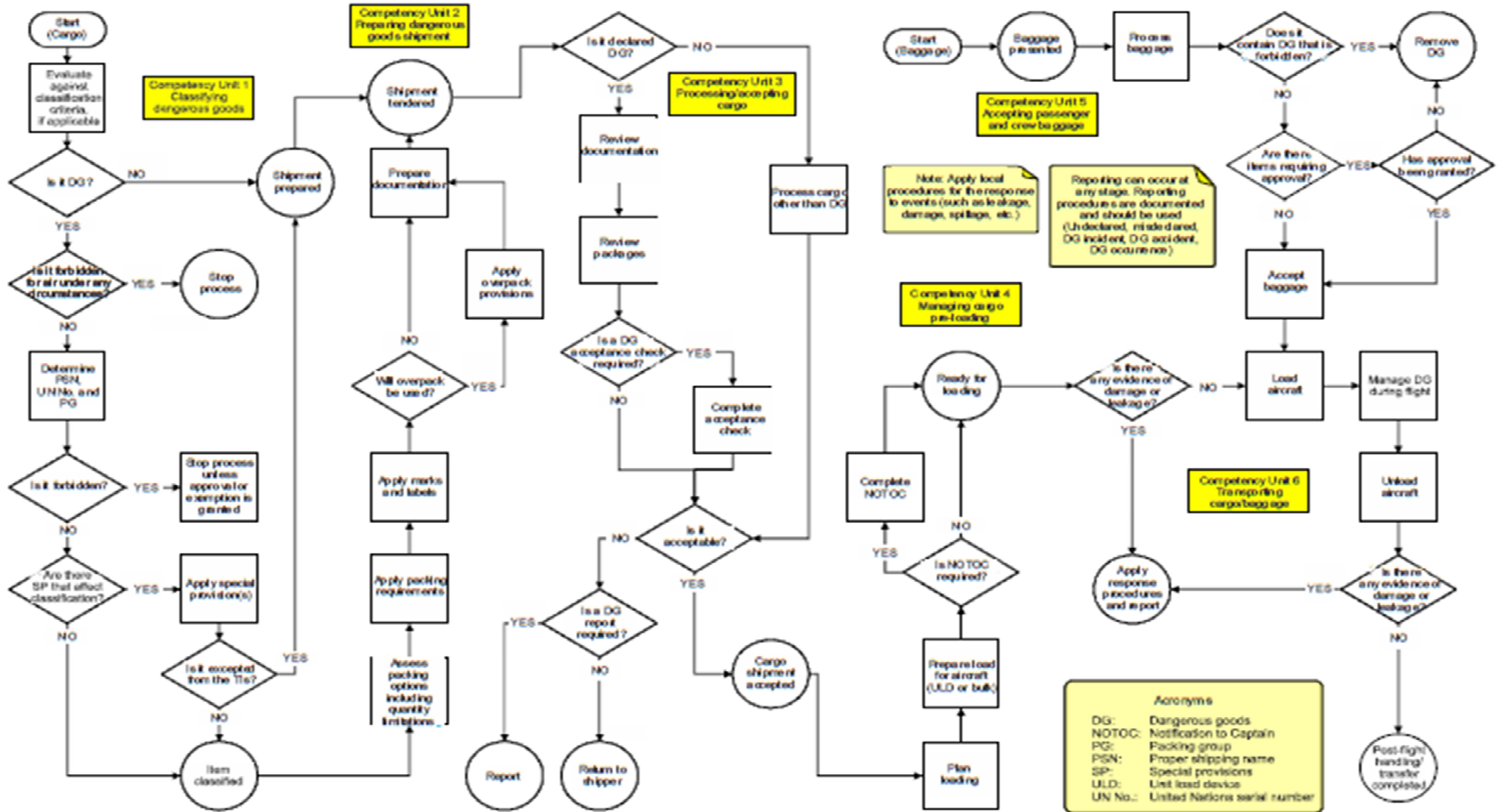
#### 2 Preparing dangerous goods shipment

- 2.1 Assess packing options including quantity limitations
  - 2.1.1 Consider limitations (de minimis quantities, excepted quantities, limited quantities, passenger aircraft, cargo aircraft only, special provisions, dangerous goods in the mail)
  - 2.1.2 Consider State and operator variations
  - 2.1.3 Determine if all-packed-in-one can be used
  - 2.1.4 Select how dangerous goods will be shipped based on limitations and variations
- 2.2 Apply packing requirements
  - 2.2.1 Consider constraints of packing instructions
  - 2.2.2 Select appropriate packaging materials (absorbent, cushioning, etc.)
  - 2.2.3 Assemble package
  - 2.2.4 Comply with the packaging test report when UN specification packaging is required

.....

# PART 1 – CHAPTER 4 – PROCESS FLOWCHART

➤ **Training: Main changes for a next future !!!!**  
*(Applicable from 1<sup>st</sup> January 2021)*



Acronyms	
DG:	Dangerous goods
NOTOC:	Notification to Captain
PG:	Packing group
PSN:	Proper shipping name
SP:	Special provisions
ULD:	Unit load device
UN No.:	United Nations serial number

## PART 1 – CHAPTER 5

### ➤ DG Security:

- Personal engaged in DG transportation should consider security requirements for the dangerous goods commensurate with their responsibilities
- Training of Table 1-4 should include elements of security awareness, should be provided upon employment and recurrent training has to be followed at least each 24 months
- Operators, shippers and others engaged in “high consequence DG” transportation, should adopt, implement and comply with a security plan (described in paragraph 5.4.2)
- Regarding radioactive material, provisions of this chapter 5 are deemed to be complied with IAEA (International Atomic Energy Agency) convention

## PART 1 – CHAPTER 5

### ➤ DG Security:

### ➤ Table 1-7 provide an indicative list of High Consequence DG

Class 1 Division 1.1 explosives

Class 1 Division 1.2 explosives

Class 1 Division 1.3 compatibility group C explosives

Class 1 Division 1.4 UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500

Class 1 Division 1.5 explosives

Division 2.3 toxic gases (excluding aerosols)

Class 3 desensitized explosives

Division 4.1 desensitized explosives

Division 6.1 substances of Packing Group 1; except when transported under the excepted quantity provisions in 3;5

Division 6.2 infectious substances of Category A (UN Nos. 2814 and 2900)

→ and **regarding Class 7 (radioactive material)**, all those which have with an activity equal or greater than 3000 A2 per single package, except those described in Table 1-8

## PART 1 – CHAPTER 6

### ➤ **General Provisions concerning Class 7:**

➤ The **objective** is to **protect persons, property and the environment** from the effects of radiation **during the transportation** of such material

➤ This protection is achieved by requiring:

- ✓ a) containment of the radioactive contents
- ✓ b) control of external radiation levels
- ✓ c) prevention of criticality
- ✓ d) prevention of damage caused by heat

### ➤ General Provisions concerning Class 7:

#### ➤ These Instructions **do not apply to** any of the following:

- ✓ radioactive material **implanted** or **incorporated** into a person or live animal for diagnosis or treatment
- ✓ radioactive material in or on a person who 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
- ✓ radioactive material in **consumer products** which have received regulatory **approval**, following their sale to the end user
- ✓ **natural** material and **ores** containing naturally occurring radionuclides (which may have been processed), provided the activity concentration of the material does not exceed 10 times the values specified in 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
- ✓ 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

### ➤ General Provisions concerning Class 7:

- Radiation Protection Program: (available on request for inspection by the national relevant authority)
- It has to be developed to make so that the radiological protection measures are taken into account
- When the effective dose for occupational exposure:
  - ✓ 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
  - ✓ b) is likely to exceed 6 mSv in a year, individual monitoring must be conducted
  - ✓ *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*
- When individual monitoring or workplace monitoring is conducted, appropriate records must be kept
- Programme documents must be available, on request, for inspection by the relevant competent authority
- Quality assurance programmes acceptable to the competent authority must be established

### ➤ Incident/Accident reporting:

➤ **All entities other than operators** (not limited to freight forwarders, customs authorities and security screening providers) who are in possession of DG:

- ✓ when a DG accident or incident occurs, or
- ✓ at the time a dangerous goods incident is discovered to have occurred , or
- ✓ who discover undeclared or misdeclared dangerous goods

→ **should follow the reporting requirements** of Part 7;4.4 and 7;4.5

➤ In Part 7;4.4 and 7;4.5, we will see than **Operators must** report accidents and incidents to the appropriate authorities of the State of the Operator and the State in which the accident or incident occurred

# Thank you for your attention



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