EASA
European Union Aviation Safety Agency

ARISE+
Funded by the European Union and implemented by the European Union Aviation Safety Agency

Safe Transport of Dangerous Goods by Air

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Safe Transport of Dangerous Goods by Air

Exercices

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PART 0

INTRODUCTION

EXERCISE

➢ **Referring to the table for abbreviations and symbols found in the foreword to the Instructions** *(IATA Appendix B)*, **state the meaning of :**

n.o.s.	
Bq	
≠ (△)	
G	
Sv	
LC	
+ (☐)	
IP	

EXERCISE

➢ **Referring to the table of contents in the Instructions** (IATA DGR)**, indicate in which part and chapter the following information is found:**

Training	
Classification of Dangerous Goods	
Limitation of DG on aircraft	
Operator's Responsibilities	
Shipper's Responsibilities	
Documentation	
Acceptance Procedures	
Notified variations from the T.I.	

PART 1

GENERAL

Which States are involved in the process of granting an **Approval** regarding the transportation of forbidden DG ?

Which States are involved in the process of granting an **Exemption** regarding the transportation of forbidden DG ?

EXERCISE

- **Referring to Table 1-4 in the Instructions:**

What subject matter should be addressed for Operator's and ground handling agent's staff accepting DG , but not Shippers	
Which personal is included in category 10	
- How often the training must be undertaken ? - From when recurrent training can be completed ? - Date of period of validity ?	

PART 2

DG CLASSIFICATION

EXERCISE

➢ **Referring to Parts 2;1 to 2;9** (IATA parts 3;1 to 3;9)**, find the class or division into which these characteristics fall:**

Characteristics	Class or Division Number	Class or Division Name
Liquid – gives off a flammable vapor at 60°C closed cup		
Solid — may cause or contribute to fire through friction		
Inorganic — yields oxygen which contributes to the combustion of other materials.		
Liquid — causes visible necrosis of skin tissue at site of contact when tested on the intact skin tissue of an animal for a period of 2 minutes.		

EXERCISE

➢ **Depending of these information, insert the corresponding class or division number and the packing group:**

Characteristics	Class or Division Number	Packing Group (if applicable)
Causes full thickness destruction of intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less		
Reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously		
Liquid having an LD50 value (oral application) of 300 mg/kg		
Substances or mixtures dangerous to the aquatic environment not otherwise classified under these Instructions, but classified by the shipper as environmentally hazardous substances		

PART 3

DG LIST

EXERCISE

➢ **Referring to Table 3-1** (IATA Table 4;2)**, find the proper UN Number and Class and/or Division (primary and/or subsidiary risk)**

Name	UN Number Class/Division
Acetic acid solution, more than 80% acid, by mass	
Adsorbed gas, toxic, flammable, n.o.s.*	
Seed cake with not more than 1.5% oil and not more than 11% moisture	
Refrigerant gas R 407C	
n-Propyl chloroformate	
Potassium tetracyanomercurate, (II)	
PETN, wetted with not less than 25% water, by mass	

EXERCISE

➢ **Referring to Attachment 1** (IATA Part 4;3) **and Table 3-1** (IATA Table 4;2)**, write the proper shipping name for the following UN numbers:**

UN Number	Proper Shipping Name
UN 0029	
UN 2055	
UN 1263	
UN 1193	
UN 1992	

➢ **Referring to Table 3-1** (IATA Table 4;2)**, fill this Table:**

Name	UN N°	Class/ Division	State variations	Special provisions
Safety devices, electrically initiated				
Dichloropropenes				
Boron trifluoride				
Vanadium compound, n.o.s.*				
Potassium persulphate				
Dinitrophenol, wetted with not less than 15% water, by mass				

EXERCISE

➢ **Referring to Table 3-1** (IATA Table 4;2)**, complete this Table:**

UN N°	Name	Class/ Division	Pack. group	Packing Instruction	Max Net Qty per Package
2238	Chlorotoluenes			355/Y344 Pax	60L/Y10L Pax
				366 CGO	220L CGO
1013		2.2			
	Engine, internal combustion, flammable gas powered				
3301		8 (4.2)			
	Barium perchlorate solution				
	Dichlorosilane				

PART 3

LIMITED & EXCEPTED QUANTITIES

EXERCISE

➢ **Indicate if these articles or substances may be transported as Excepted and/or Limited Quantity:**

UN Number	Name	Excepted Quantity	Limited Quantity
2456	2-Chloropropene		
1950	Aerosols non flammable		
3014	Substituted nitrophenol pesticide, liquid, toxic*		
1845	Carbon dioxide, solid		
2414	Thiophene		

PART 4

PACKING INSTRUCTIONS

EXERCISE

➢ **Referring to Part 4** (IATA Part 5) **and Table 3-1** (Table 4;2) **of the Instructions, answer the following questions:**

What are the packing instruction numbers for UN 3142, Disinfectant, liquid, toxic, n.o.s.*, Packing Group II when it is to be transported on a passenger aircraft ?	
To what type of aircraft do Packing Instructions 360-366 apply ?	
Is the use of single packagings permitted for Packing Instruction 371 ?	
What is the total quantity per package for Packing Instruction Y844, Packing Group II ?	
To which UN Number do Packing Instruction 681 apply ?	
What is the max. quantity per glass receptacle in a combination packaging for Packing Instruction Y544, Packing Group II ?	
What are the additional packing requirements for single packagings, Packing Group III, regarding Packing Instruction 555 ?	

EXERCISE

➢**Referring to Part 4** (Section 5) **and Table 3-1** (Table 4;2) **of the Instructions, answer the following questions:**

Which Packing Instructions apply to UN number 3373 and UN 2814 ?	
Which Packing Instruction applies to Carbon Dioxide, solid ?	
Is it possible to transport together in the same package on a passenger aircraft: **- 3 L of Crotonic acid, liquid, UN 3472, Class 8, PG III** **- 0.5 L of Propylene oxide, UN 1280, Class 3, PG I**	
Is it possible to transport together in the same package on a cargo aircraft: **- 12 kg of Potassium nitrite, UN 1488, Div 5.1, PG II** **- 10 L of Petrol, UN 1203, Class 3, PG II**	
Is it possible to transport a drum containing 5kg of UN 3091 (Lithium Metal Battery contained in equipment) in a passenger aircraft (lithium content of battery is 3.5 g) **→ detail your answer**	

PART 5

SHIPPER'S RESPONSIBILITIES

EXERCISE

➢ **Referring to Part 5** (IATA Part 7) **of the Instructions, answer the following questions:**

What additional mark is required for a single packaging of 250 L of UN 3082 ? Indicate where the mark is to be located	
The proper shipping name and UN number are printed in black on a black background. Is this acceptable?	
Which DG(s) need the "keep away from heat" handling label ?	
On a package, where is located the name of shipper and consignee ?	
Name two things that must happen before an empty packaging last containing infectious substances is returned to the shipper	

EXERCISE

➢ **Referring to Part 5** (IATA Part 7) **and to the Instructions, answer the following questions:**

What number is shown in the bottom half of the organic peroxide label ?	
What is the background colour for the Toxic Gas Class 2, Division 3 label ?	
What handling label is required for a package of Selenic Acid, UN 1905, Class 8 ?	
Which label(s) are required on a package of 2 L of Hydrazine anhydrous, UN 2029 ?	
Which label(s) are required on a UN 2910 package ?	
Which labels(s) are required for a package of Lithium metal batteries (UN 3090) packed in accordance with Section IB of Packing Instruction 968 ?	

EXERCISE

➢ **Referring to Table 3-1** (Table 4;2) **and Part 5** (Part 10) **of the Instructions, list, in the appropriate order, the description that would appear on a DGD for each of the following DG descriptions:**

UN 1170, Packing Group III	
UN 2478, Packing Group II	
Medical wastes, suspected to contain Ebola virus	
UN 0432	
UN 3356, for 2 PBEs shipped by operator to replace ones used by aircrew, Size; small, Condition; serviceable, packed in the original manufacturer's unopened inner packaging, passenger aircraft	

EXERCISE

➢ **In the box provided, complete a dangerous goods transport document for the following consignment of dangerous goods to be carried by passenger aircraft:**

UN Number: 1214 **Proper Shipping Name: Isobutylamine** **Class: 3** **Subsidiary Risk: 8** **Packing Group: II**	**Inner Packaging: Plastic** **Outer Packaging: Fibreboard box** **Net Quantity: 1 L** **Packing Instruction: 352**
Consignee: ABC Corporation **123, Avenudad Atlantica** **Copacabana** **Rio de Janeiro** **Brazil**	**Shipper: TTN Factory** **45, Grande Rue** **Parc Damoiseau** **31000, Toulouse** **France**

PART 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS & TESTS

EXERCISE

➢ **Referring to Table 6-2 & 6-3** (IATA Part 6)**, write the appropriate code for each packaging:**

reconstituted wood box	
metal drum (other than steel or aluminium), removable head	
plastic receptacle (aerosols), non-refillable	
composite plastic packaging, receptacle with outer fibre drum	
plastic jerrican, non-removable head	
plastic flexible tube	
Composite porcelain packaging, receptacle with outer wooden box	
Fibreboard boxes	

- **Referring marking shown, answer the following questions:**

4C1/Y42/S/13 F/LNE123	
Kind of packaging ?	
Meaning of "13" ?	
Possible packing group ?	
Meaning of letter "S" ?	
Meaning of letter "F" ?	
Maximum gross mass ?	
Meaning of "LNE123" ?	

PART 7

OPERATOR'S RESPONSIBILITIES

EXERCISE

➢ **Referring to Table 7-1** *(9.3.A)* **and Table 3-1** *(Table 4;2)* **of the Instructions, state if the following DG may be carried next to each other:**

Cell UN 3091 (1,5 g lithium) and Cymenes, UN 2046	
Chlorodifluoromethane, UN 1018 and Tetraethylenepentamine, UN 2320	
Battery UN 3480 (110 Wh) and Oxygen, compressed, UN 1072	
Detonators for ammunition, UN 0365 and Rocket motors, UN 0186	
Chromium trioxide, anhydrous, UN 1463 and Calcium silicide, UN 1405	
Corrosive liquid, oxidizing, n.o.s.*, UN 3093 and Aircraft engines	

EXERCISE

➢ **Referring to Part 7** *(Section 10)* **and Table 7-4** *(10.9.C&D)* **of the Instructions, state the minimum distance required from any personnel for an overpack radioactive shipment to be carried in a B747 Cargo:**

5 Type A Packages, each with a Transport Index (TI) of 2,7	**Calculation**
8 Type A Packages, for which the sum of their Transport Index (TI) is 5,4	

EXERCISE

➢**Referring to Part 7** *(9.3.4)* **and Table 3-1** *(Table 4.2)* **of the Instructions, state where the following DG may be carried as described:**

B757 Cargo **Main deck Class E, Lower deck Class D** **Amyltrichlorosilane, UN 1728**	
A330 Cargo **Main deck Class E, Lower deck Class C** **Engine, flammable gas powered, UN 3529**	
B747/200 Cargo **Main deck Class E, Lower deck Class D** **Ethyltrichlorosilane, UN 1196**	
B767 Cargo **Main deck Class E, Lower deck Class D** **Chlorotoluenes, UN 2238**	
MD11 Cargo **Main deck Class E, Lower deck Class D** **1 1A1 (10 L) of Toluidines, liquid, UN 1708**	

EXERCISE

➢**Referring to Part 7** (Section 9)**, answer the following questions (explain your answer):**

Is it possible to load in the same cargo compartment: A live animal and Dry Ice ?	
Is it possible to load in the same cargo compartment: Bananas and Strychnine, UN 1692 ?	
What is the Drill Code for: Lithium Ion Battery, UN 3480 ?	
Does a shipment of 250 kg of UN 3373 need to be mentioned on the NOTOC ?	

PART 8

PROVISIONS CONCERNING PASSENGERS & CREW

EXERCISE

➢ **Referring to Part 8** (Section 2) **and Table 8-1** (Table 2.3.A)**, state how these DG carried by passengers are allowed:**

Article	Checked baggage	Carry-on baggage	Operator approval	NOTOC
4 red wine magnums (4 X 1.50 L)				
Mobility aid, powered by a lithium ion battery (Watt-hour rating 450 Wh) *(the battery is adequately protected/enclosed)*				
An ice box containing frozen fishes, refrigerated with 3.5 kg of Dry Ice				
Equipment equipped with a gaseous oxygen bottle (medical use)				
2 boxes of hunting cartridges, each box is 7.5 kg, carried by a group of four hunters				

EXERCISE

➢ **Referring to Part 8** (Section 2) **and Table 8-1** (Table 2.3.A)**, state how these DG carried by passengers are allowed:**

Article	Checked baggage	Carry-on baggage	Operator approval	NOTOC
1 smoking device (e-cigar), powered by a 35 Wh lithium battery				
1 laser plasma lighters with a safety cap and means of protection against unintentional activation (battery Li Ion 12 Wh)				
1 connected baggage equipped with a non-removable lithium battery of 5 Wh				
1 Pax with 3 toiletry aerosols (0,4 L each) and 1 cryogenic aerosol of 0,7 L				
1 portable electronic device (computer, journalist camera, …) (battery 130 Wh) **----------** **3 spare batteries (98 Wh)**				

PART 9

EXEMPTIONS - APPROVALS

- **How to send a shipment of 160 kg of Copra, UN 1363 ?**

- **Shipment of UN0027, "Black powder, granular or as a meal", Explosives Material 1.1.D, Forbidden Pax & CGO**

EXERCICE

- **Shipment of UN0027, "Black powder, granular or as a meal", Explosives Material 1.1.D, Forbidden Pax & CGO (following)**

- **Shipment for UN0397, “Rockets, liquid fuelled with bursting charges”, Explosive Material 1.1.J, forbidden Pax & CGO**

- **Shipment for UN0397, “Rockets, liquid fuelled with bursting charges”, Explosive Material 1.1.J, forbidden Pax & CGO**

PART 10

RADIOACTIVE MATERIAL

EXERCISE

- **What must be the maximum activity of a “Fluor 18” source without a “special form agreement” to be carried out in a Type A package :**

a) < 1 A_1 **b) < 1 TBq** **c) < 600 GBq** **d) < 10^{-3} A_2**

EXERCISE

- **What is the limit for an “Americium 241” to be exempted :**

a) 70 kBq/g **b)** < 70 Bq/g **c)** 0,001 TBq **d)** 1 Bq/g

EXERCISE

➢ **A UN3333 package, whose “radiation level at any point on external surface” is 0,4 mSv/h and whose “radiation level at 1m” is less than 0,01 mSv/h :**

- **Shall be labelled with a Category II Yellow one ?** Right False
- **Shall be marked with a Trefoil ?** Right False
- **Shall be labelled with 5-22 label ?** Right False

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