

行政院及所屬各機關出國報告

(出國類別：實習)

危險物品法規講師專業訓練

服務機關：交通部民用航空局

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出國地區：新加坡

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危險物品法規講師專業訓練

主辦機關:

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關鍵詞: 危險物品(Dangerous Goods),國際空運協會(International Air Transport Association, IATA),危險物品處理規則(Dangerous Goods Regulations)

內容摘要: 依國際民航組織危險物品航空安全運送指南規定，從事危險物品航空運送有關人員，應完成危險物品法規初始訓練及接受定期訓練。定期訓練應於前一次訓練後，二十四個月內完成，以確保其學識能適當更新。訓練應施以測驗，以證明對危險物品運送法規之瞭解；合格者應發給證明文件。民用航空局為危險物品空運主管機關，其辦理危險物品業務相關人員應定期接受危險物品法規訓練，為自行培養危險物品法規訓練師資，民航局選派人員接受本項訓練。本訓練提供危險物品處理規則訓練講師所需課程講授、溝通技巧，並提供危險物品法規訓練教學之解決方案，以及提供危險物品法規訓練教學等實作訓練。主要訓練課目包括課程簡介、訓練目標之訂定、測驗方式及功能、學習原理、教學方法、教材與教具、教學計畫訂定及危險物品法規教學實作演練。訓練方式以共同討論及分組討論為主，共同討論由學員輪值主席，執行討論之演練及綜合結論；分組討論結果由受訓學員輪流上台報告各分組討論成果，並接受其他學員之詢問及回覆。教學實作演練由學員自行選定危險物品法規訓練課題，並製作教材、教具及二次之實作演練。未輪值教學實作演練學員區分為學員組與裁判組，分別擔任受訓學員及評分工作。演練結束後由指導講師依學員評分及錄影帶作個別講評及改進建議，第二次教學演練實作可選擇相同課題，指導講師之評分及評論著重於二次教學實作演練之缺點改進。本項訓練除學習各項教學技巧及教材教具之準備，並經由討論及教學實作演練學習危險物品法規訓練講師之專業技能。

本文電子檔已上傳至出國報告資訊網

危險物品法規講師專業訓練報告書

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摘要

依國際民航組織危險物品航空安全運送指南規定，從事危險物品航空運送有關人員，應完成危險物品法規初始訓練及接受定期訓練。定期訓練應於前一次訓練後，二十四個月內完成，以確保其學識能適當更新。訓練應施以測驗，以證明對危險物品運送法規之瞭解；合格者應發給證明文件。民用航空局為危險物品空運主管機關，其辦理危險物品業務相關人員應定期接受危險物品法規訓練，為自行培養危險物品法規訓練師資，民航局選派人員接受本項訓練。

本訓練提供危險物品處理規則訓練講師所需課程講授、溝通技巧，並提供危險物品法規訓練教學之解決方案，以及提供危險物品法規訓練教學等實作訓練。主要訓練課目包括課程簡介、訓練目標之訂定、測驗方式及功能、學習原理、教學方法、教材與教具、教學計畫訂定及危險物品法規教學實作演練。

訓練方式以共同討論及分組討論為主，共同討論由學員輪值主席，執行討論之演練及綜合結論；分組討論結果由受訓學員輪流上台報告各分組討論成果，並接受其他學員之詢問及回覆。教學實作演練由學員自行選定危險物品法規訓練課題，並製作教材、教具及二次之實作演練。未輪值教學實作演練學員區分為學員組與裁判組，分別擔任受訓學員及評分工作。演練結束後由指導講師依學員評分及錄影帶作個別講評及改進建議，第二次教學演練實作可選擇相同課題，指導講師之評分及評論著重於二次教學實作演練之缺點改進。

本項訓練除學習各項教學技巧及教材教具之準備，並經由討論及教學實作演練學習危險物品法規訓練講師之專業技能。

壹、目的

依國際民航組織危險物品航空安全運送指南規定，從事危險物品航空運送有關人員，應完成危險物品法規初始訓練及接受定期訓練。民用航空局為危險物品空運主管機關，其辦理危險物品業務相關人員應定期接受危險物品法規訓練，為自行培養危險物品法規訓練師資，民航局選派人員接受本項訓練。

本項訓練由國際航空運輸協會航空運輸及發展學院主辦，提供危險物品處理規則訓練講師所需課程講授、溝通技巧，並提供危險物品法規訓練教學之解決方案，以及提供危險物品法規訓練教學等實作訓練。完訓並經考驗合格取得證明文件者，得擔任危險物品法規訓練講師。參訓人員應先完成該運輸協會之危險物品法規訓練或其他同等級訓練。

貳、過程：

一、90.8.12 台北 - 新加坡 ：行程

二、90.8.13 - 90.8.17 新加坡 ：訓練

三、90.8.18 新加坡 - 台北 ：行程

四、訓練課程表如附件一。

參、心得

一、暖身活動

適當之暖身活動可建構有效之學習環境，降低學員之緊張與壓力，營造教師與學員教習氣氛，以打破受訓學員之封閉狀態、提昇興趣及熱力，增進學習之效果。暖身活動可借助分組、自我介紹、介紹鄰近學員及學習目標之報告等方式達成。

二、學習目標

準備及研擬訓練課程步驟為：定義工作效能需求、訂定學習需求、擬定學習目標、建構考驗方式、選擇課程內容、選擇教學方式、選擇教學器材、撰寫教學計畫、執行教學、評量教學效果、檢討與改進。講師應將其授課內容結構化，使學員能經由逐步學習以達到學習目標。

學習目標為一種文件，供學員了解其成功學習課程之目標及描述學員完成訓練後能做其訓練前無法達成之工作；為一種效能之說明，學員於完成學習後能展示之效果，以及教師用以衡量學員達成訓練目標所需之知識、能力與態度。

研擬學習目標應考量學員之教育水準、其學習能力、學習條件(可使用資源或不可使用資源)、評量效能之標準以及評量方式。評量標準，以學員達成工作所需合理時間為速度標準；以完成工作之正確比率為精確度標準；以學習產品之誤差值為品質標準。

三、測驗

測驗可提供學員了解學習之成效，加強並激發學員之學習意願，提供學員決定其學習進度；可提供學習過程之回饋，使教師了解其授課之成效。

測驗應適度涵蓋授課內容，其問題應避免以常識即可回答，避免陷阱式問題或艱深詞彙、難易度適中，以正確了解學習成效，測驗可指導並強制學員學習之態度以達成教學目標。

四、學習原理

感官刺激之效果視覺 75%、聽覺 13%、嗅覺 3%、味覺 3%、觸覺 6%。其中視覺及聽覺佔總體之 88%最為重要，因此教學必須善於使用視覺及聽覺效果以達成教學目標。學習效果可區分短暫效果及長期效果，實驗顯示學習後三小時及三天後記憶效果如下：

學習方式	學習效果	
	3 小時後	3 天後
聽覺教學	70%	10%
視覺教學	72%	20%
聽覺教學及視覺教學	85%	65%

因此，善加利用視覺及聽覺之教學方式，最能達成長期記憶之目標。動機、期望、興趣、利益、知識傳送為學習之原動力，學員宜透過逐步學習，且應使其了解每一步驟如何達成整體之目標，因此學習應注重其邏輯性。實際之操作及參與可加重學習之成效，問題之詢問與作答可達到此項目標，即時之應用可加深學習之印象及記憶效果，重複學習可增進學習成效。各項感官及教學方式之學習效果如下：

教學方式	講解	講解及示範	講解、示範及實作
感官方式	聽覺	聽覺及視覺	聽覺、視覺及實作
一週後之記憶效果	10%	20-30%	60-65%

五、教學方式

心理學家 Ruth Cohen 認為人類行為之控制思考及智力為 25%、情緒為 75%。學習亦為一種行為，教師應營造一種正面學習環境，使學員接受教師及其他事物，以提昇學員之學習情緒與意願。

講授式教學適於同時對大量學員傳授知識概念，對知識性教育之授課較有效，較不受人數、場地之限制且較為經濟。但學員易流於被動，缺少積極思考，無法兼顧學員個別差異與理解度，難以長時間維持學員注意力。

導引式教學由教師適度之指導，使學員之學習集中於特定事項，以達成學習目標。本方式之教學優點為：提昇學習興趣、雙向溝通、學員之參與感、易於檢視學習成效及掌控進度，但學習耗時、參與人數受限、較不經濟、不適宜技術性教學。

簡報式教學可區分為教室或工作外之展示及應用式展示，本項教學應善加利用學員之動機及興趣等以吸引學員之注意。對危險物品法規之訓練等較為枯燥課題，宜使用危險物品實物或實際作業之講解，以提昇學習興趣與注意力。本方式學習受成員人數之限制並較為耗時。

經由個別實作，使學員可列舉範例，對特定問題準備答案。本方式教學適於立即應用之事務，可有效加強學習記憶，並可提供回饋供教師檢視學習成效及進度，但其學習人數受設備、空間及控制幅度之限制。

分組教學透過給予特定之工作，使學員經由共同之實作以達成學習目標，分組學員參與程度越普遍其成效越好。分組教學應給予明確之工作目標、適當分組、組內分工明確，並予適當之時間控制。分組教學可使用分組問題解決、分組腦力激盪等方式，以達成學習目標。

案例研究方式為經由個人或團體對特定個案加以討論、檢討，及尋求解決方案，可使學員獲得實際體驗，培養學員分析、判斷、應用能力，提昇解決問題能力。缺點為學習易流於片段，知識體系化較難，較為耗時及需優秀指導員配合。對經驗不足之學員，難獲致深度討論。

角色扮演為設定近乎事實之場合，將該場合之任務分配給學員擔任，以進行實際行動之訓練方法。本方式較易吸引學習興

趣，可讓學員體會角色之真實感受及人際互動關係。缺點為耗費時間、易流於形式、不易達成預期目標。

程式教學借助逐步指導及實作，使學員經由系統性之學習以達成學習目標。本方式教學應明確定義學員於完成訓練後之工作能力，教學材料應可逐步導引學員學習，激發學員之反應，立即確認答案之正確性，並應分段測驗以確認其學習效果與控制進度。其優點為可適應學員不同之學習速度、學習時間彈性、立即應用、維持相同標準及節省學習時間。缺點為問題固定缺少彈性、缺少雙向溝通、設備昂貴、缺少學習動機。

六、教學設備

教學設備可按教學方法選擇使用講義、投影片、白報紙、黑(白)板、海報、多媒體電腦、視聽器材等設備。本項訓練授課教師推薦投影片最適於危險物品法規之教學，其優點為易於使用、兼顧視覺及聽覺教學效果、節省時間、受教室環境影響小、易於修改、提供逐步學習效果及重複使用，但無法於大型教室使用、機器噪音及受限於電力及設備性能等缺電。

七、教學計畫

教學計畫可提供教師組織其教材，以達到邏輯及有效之順序，提供教學過程中所需問題或測驗題目，特定課題說明所需資料，提示教學所需教材、設備，並可用以控制教學時間及進度。教學計畫應包括：教學目標、教學大綱、教學筆記、教學時間、使用設備及器材、相關參考資料。教學計畫可提供自然之方法以組織教學之材料，使其可以邏輯性及最有效之順序展示。教學計畫並可提供特別設備之檢查清單及提供特別講授所需之資源。危險物品法規訓練課程教學計畫範例如附件二

八、危險物品法規教學實作演練

本項教學實作演練由受訓學員自行選擇危險物品法規教學課目，學員須編輯教材大綱、製作教學器具並撰寫教學計畫。教學實作演練分二次實施，首次十至十二分鐘，第二次為十二至十

五分鐘。本項教學實作演練選擇課目為「危險物品事件緊急應變程序」，實作演練內容包括訂定課程目標、前言、課程內容及摘要複習，教學實作演練使用投影片如附件三。教學計畫按課程目標、前言、課程內容及摘要複習等分項課目，編定每一段教學使用時間、教學內容提示、問題、答案，並設定各階段教學使用之投影片或實務展示，教學計畫如附件四。

九、國際空運協會危險物品處理規則(以下簡稱處理規則)四十二版重要修正事項

(一)修正危險物品混合或溶液之運輸專用名稱(處理規則

4.1.3.1)。

(二)修正鋰電池之運送規定(處理規則 A45)。

(三)修正吸附材料規定(處理規則 A114)。

(四)修正未列名自身反應物質樣品之運送規定(處理規則附錄 C.1)。

(五)修正未列名有機過氧化物樣品之運送規定(處理規則附錄 C.2)。

(六)新增未分類危險物品樣品之運送規定(處理規則 4.1.2 章節)。

(七)修正危險物品運送隔離規定(處理規則 Table 9.3.A(II))。

(八)修正危險物品溫度控制規定(處理規則 3.4.1.2.6 及 3.5.2.7)。

(九)修正次要危險性標籤需具備危險物品分類數字規定(處理規則 7.2.3.2)。

(十)配合國際原子能總署安全運送文件 1996 年修正版本，全面修正放射性物質運送規定，並自 2001 年 7 月 1 日起實施(處理規則附錄 G)，原處理規則第十章同時廢止。

(十一)修正航空器使用人應負則提供旅客有關禁止攜帶及托運之危險物品資訊(處理規則 9.5.3)。

十、訓練講師：Erwin Berger，奧地利航空公司訓練部門資深講師、國際空運協會危險物品訓練專案主席。電子郵件地址：

atdi.sin@iata.org

十一、國際空運協會航空訓練及發展學院聯絡人：Ong Suzanna，電
子郵件地址:ongs@iata.org

肆、綜合檢討及建議

- 一、危險物品法規講師專業訓練除可提供講師教學技能外，並經由教學實務演練，可深入研習危險物品法規，討論危險物品空運作業之問題，及與該項訓練講師及學員建立溝通管道，對日後執行危險物品空運管理與檢查作業幫助甚多，完訓合格人員核發完訓證書(如附件五)，並可取得危險物品法規訓練講師資格。本次訓練除我國及聯合大公國民航主管機關各派一員參訓外，國泰航空、港龍航空、香港地勤公司等各派二員，越南航空派三員，其他多家航空公司各派一員參訓。建請國籍航空公司持續派員參加本項訓練，以培訓各公司內部危險物品法規訓練種子教官建立自訓能量。
- 二、依國際民航組織「危險物品空運技術指南」第一部第四章及國際空運協會「危險物品處理規則」1.5 章節規定：

從事危險物品航空運送有關人員，應完成初始訓練及接受定期訓練。定期訓練應於前一次訓練後，二十四個月內完成，以確保其學識能適當更新。訓練應施以測驗，以證明對危險物品運送法規之瞭解；合格者應發給證明文件。

初始訓練及定期訓練計畫，應由下列單位負責建立並維持：

- (一)航空器使用人。
- (二)代理航空器使用人執行貨物接收、管理、裝載、卸載、轉運或其他處理貨運業務之代理機構。
- (三)在機場內代理航空器使用人辦理旅客業務之代理機構。
- (四)在機場以外地區代理航空器使用人辦理旅客業務之代理機構。
- (五)航空器使用人以外，代理處理航空貨運之機構。
- (六)危險物品託運人；包含包裝及託運代理者。
- (七)從事旅客及其行李安全檢查之機構。

航空器使用人危險物品訓練計畫應經民航局審查及核准

外，其他各款所示各類人員之訓練計畫應經民航局或其授權單位審查及核准。

從事航空運送危險物品之工作人員應施以與其工作職責有關之訓練。其訓練應包括下列項目：

- (一)一般性熟悉訓練：使其能對一般性條款熟悉。
- (二)專職訓練：按各類人員所負職責提供系統性訓練。
- (三)安全訓練：必須包括危險物品之危險性、安全操作、及緊急處理程序。

各類人員之訓練課程最低標準如附件六。

- 三、依前項規定，民航運輸業、普通航空業、航空貨運承攬業、航空站地勤業、航空貨物集散站經營業應建立危險物品訓練計畫，並對其僱用人員實施初訓及定期複訓，其訓練計畫應由民航局或其指定單位審查。本局主管前述各業危險物品空運業務之相關單位，應按規定對其訓練計畫審核及監督其訓練之執行。
- 四、現行規定除民航運輸業及普通航空業已按前項規定，提報危險物品作業手冊及訓練手冊，送民航局審查外，其他尚未提報者，應儘速參照規定辦理。已提送危險物品作業手冊及訓練手冊者，民航局應指派合格人員審查前述各項手冊。對擔任危險物品作業手冊及訓練手冊審查及作業檢查人員，應施以危險物品法規訓練及檢查員訓練。
- 五、民航運輸業得按民航局核可訓練計畫，實施危險物品作業有關人員之危險物品法規初訓及定期複訓；其擔任危險物品法規訓練講師，應按規定定期接受危險物品法規訓練，並參加國際空運協會或其他相同之「危險物品法規講師訓練」，以持續接受法規更新及講師教學技能等知識或技能，符合國際公約之相關規定。



**PROFESSIONAL SKILLS FOR
DANGEROUS GOODS REGULATIONS INSTRUCTORS
SCHEDULE**

Singapore, 13 - 17 August 2001

Course Leader: Erwin Berger **Break Times (approx):** Coffee: 1000-1015
Lunch: 1200-1300
Coffee: 1500-1515

<u>DAY 1</u>	<u>TIME</u>
Introduction	0830 - 0900
1. Participant Introductions	0845 - 0945
2. Objectives	0945 - 1200
Job performance requirements	
Qualities of objectives	
3. Construction of Test	1300 -
4. How people learn	1730
 <u>DAY 2</u>	
4. How people learn - continued	0830 - 1200
5. Teaching methods	1300 - 1730
 <u>DAY 3</u>	
6. Training aids	0830 - 1200
7. Lesson plan	1300 - 1730
Guidelines for Instructors of DG courses	



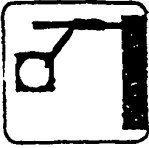
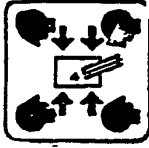
DAY 4

Written Examination	0900 - 1000
Guidelines for Instructors of DG courses - continued	1015 - 1200
IATA Training Programme Book 1-4	1300 - 1800
Questions on the Dangerous Goods Regulations	
Students first teaching session	

DAY 5

Questions on the Dangerous Goods Regulations	0900 - 1100
Students second teaching session	1100 - 1630
Close of Course	1630 - 1700

OBJECTIVES	
Expected outcome:	Student should be able to: - conduct a job analysis and write a job description - identify the tree components and the qualities of an objective - formulate objectives which fulfil the requirements outlined during lesson
Prior knowledge	DG subject

TIME	OBJECTIVES	ACTION
1120	<p><u>2.1 PREPARATION AND DEVELOPMENT OF A TRAINING COURSE</u></p> <p>1st Step 2 nd Step 3rd Step 4th Step see notes</p> <p><u>REASON FOR TRAINING</u> There are usually 4 reason why the need for training arises (not in notes) Response to problem training New system training Mandatory training Traditional training- prestige to be on a seminar, (wrong) job description</p> <p><u>2.1.1 JOB ANALYSIS:</u> see notes</p> <p>The difference between AIM and OBJECTIVE: An aim describes what the instructor intends to do, or teach during a lesson/course. An objective describes what the learner will be able to do at the end of a lesson/course.</p> <p><u>GROUP WORK ON JOB ANALYSIS</u> SEE NOTES</p>	<p>Go through steps OHP</p>   <p>RESULT on Flip</p>

SESSION 10

EMERGENCY RESPONSE

DRILL CODE AND CHART

OBJECTIVES

After completion of this session, you will be able to determine emergency response drill code and quote the risk without time delay and error by using proper document.

10.1 INTRODUCTION

- Dangerous goods incident happened, what shall you do?
- Just follow the emergency procedure.

10.2 THE RED BOOK

- The ICAO document, “The Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods” (The Red Book) will be used for finding the Emergency Response Drill Code, the hazards expected and the emergency response procedures.

10.3 THE EMERGENCY RESPONSE DRILL CODE –ERG CODE

- The ERG Code includes:
 1. DRILL NUMBER, Number 1 to 10
 2. DRILL LETTER, Character 1 or 2

- Find ERG CODE by using NOTOC:
 1. Find Proper Shipping Name or UN/ID Number from NOTOC.
 2. Find ERG CODE by using “BLUE PAGE” of DGR.

10.4 THE AIRCRAFT EMERGENCY RESPONSE DRILLS CHART

- Drill No./Class No. and the risks.
- Drill Letter Hazards and Additional Risks.

10.5 SUMMARY

- Use NOTOC to find UN/ID Number.
- Use UN/ID Number to find the ERG CODE.
- Check the risks and additional risks of Dangerous Goods by using the Drills Chart.

LESSON PLAN

for

SESSION 10

EMERGENCY RESPONSE DRILL CODE AND CHART

OBJECTIVES	
Expected outcome:	Student should be able to: <ul style="list-style-type: none"> - determine emergency response drill code - quote the risk without time delay and error by using proper document

TIME	OBJECTIVES	ACTION
1 MIN	<ul style="list-style-type: none"> ● Introduction Review Emergency procedure Introduce ICAO Document 9481 (Red Book) name and cover ● The Red Book 	Show TP P0 Show TP P1 part 2 Show “The Red Book”
3 MIN	<ul style="list-style-type: none"> ● The ERG Code ERG Code includes: <ol style="list-style-type: none"> 1. DRILL No. 1-10 usually comply with DG Class No. except Drill No. 3, 4,10 (will discuss later) 2. Drill Letter – abbreviation of hazards A, C, E – 1 or 2 letters 	Show TP P2 part 2 Use DG Training Program Book 1 P60
4 MIN	<ul style="list-style-type: none"> ● Find ERG Code by NOTOC check 3L, 3H ● Find ERG Code by Proper Shipping Name or UN/ID No. <p>Practice: find the ERG Code of UN 3207 tips: 1. Use white pages of DGR 2. find UN 3207 page located in blue pages</p>	Show TP P3 part 1 Use DGR 4.2 List of DG(blue pages) Group student, size 2 (Captain and FO)

3. find UN 3207 located in blue pages		
3 MIN	<ul style="list-style-type: none"> ● The Aircraft Emergency Response Drills Chart ● Drill Number and Risk explain Code 3 include flammable liquid and solid Code 4 specify for Spontaneous Combustion Substance Code 10 for flammable gas of high fire risk, ignition should be avoid 	Show TP P3 part 2 Use DG Training Program Book 1 p61
0.5	<ul style="list-style-type: none"> ● SUMMARY 	Show TP P3 part 3



AVIATION TRAINING AND DEVELOPMENT INSTITUTE

A handwritten signature in black ink, appearing to read "Jue Hua Chuang", written in a cursive style.

This is to certify that

Jue Hua Chuang

passed

PROFESSIONAL SKILLS FOR DGR INSTRUCTORS

given by the Aviation Training and Development Institute (ATDI)

Singapore, August 2001

A handwritten signature in black ink, appearing to read "Jean-Jacques Bourgeault", written in a cursive style.

Jean-Jacques Bourgeault, Senior Director

訓練課程最低標準

航空運送危險物品參與人員 應受訓練課程最低需求	參訓人員類別(詳見說明)							
	1	2	3	4	5	6	7	8
一般規定	X	X	X	X	X	X	X	X
危險物品限制	X		X		X	X	X	X
託運人一般規定	X		X			X		
分類	X	X	X			X		
危險物品清單	X	X	X			X	X	
一般包裝規定	X	X	X			X		
封裝指示	X	X	X			X		
標籤與標記	X	X	X	X	X	X	X	X
託運人申報單與其他有關文件	X		X			X		
收貨程序			X					
儲存與裝載程序			X	X			X	
駕駛員通告			X	X			X	
旅客與空勤人員規定			X	X	X		X	X
緊急應變程序			X	X			X	X

說明：

1. 託運人與託運人之代理，含航空器使用人聘僱人員執行託運人業務、航空器使用人聘僱人員執行公司運送危險物品準備工作。

2. 包裝人員。

3. 航空器使用人聘僱執行貨物接收人員及代理航空使用人執行貨物接收人員。

4. 航空器使用人聘僱或代理航空器使用人從事地面貨物處理、保管及行李裝載人員。

5. 辦理旅客業務人員及從事旅客及其行李安全檢查人員。

6. 航空器使用人以外機構聘僱辦理航空貨物處理之人員。

7. 飛航組員。

8. 客艙組員。



Guidelines for Instructors of Dangerous Goods Courses

10th Edition, 2001

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CANADA H4Z 1M1



Guidelines for Instructors of Dangerous Goods Courses

PREFACE

About the Guidelines

The Guidelines for Instructors of Dangerous Goods courses are intended to assist an instructor in preparing the lesson plan from which the course is to be conducted. **The Guidelines are not intended to be used as the lesson plan** as courses must be customised to meet the needs of the student. The instructor must alter the order and content of the presentation as necessary.

These Guidelines present a comprehensive outline of the entire IATA Dangerous Goods Regulations (DGR). Although the lesson plan is oriented towards operator staff training, by using Table 1.5.A of the DGR, the instructor will tailor the material found in the Guidelines to cover the aspects of the subject required for each category of personnel.

The Guidelines contain many background papers, and examples of visual aids, hand-outs and exercises to stimulate the instructor. It is expected that the instructor develop many more customised visual aids, hand-outs and exercises to augment his presentation.

About the Instructor

The instructor of dangerous goods courses must have as a minimum the following qualifications:

- 1 Current knowledge of IATA's Dangerous Goods Regulations. Where applicable, an instructor must also have current knowledge of state civil aviation dangerous goods regulations. (*Submission of current DGR and state certification required*);
2. A minimum of five (5) years working knowledge and experience in hazardous materials and safety operations or experience in cargo operations, including Dangerous Goods Handling and Acceptance;
- 3 Demonstrated ability as an instructor, including an ability to prepare lesson plans, handouts, exercises, final tests, excellent instructional techniques, communication, and interpersonal skills. (Any instructor lacking instructor experience is required to complete IATA's Professional Skills for Dangerous Goods Regulations Instructors. If the instructor has successfully completed a course or workshop on instructional techniques, a copy of the certificate and an outline of the course or workshop must be included with the application. Where possible, new instructors of dangerous goods should construct dangerous goods courses together with an established instructor.)



Guidelines for Instructors of Dangerous Goods Courses

About the requirement for training

Dangerous Goods training is mandated by the International Civil Aviation Organisation (ICAO) in their Technical Instructions for the Safe Transport of Dangerous Goods by Air. This dangerous goods training requirement is implemented by the national competent authority of each Member State. State in this context means country.

Dangerous Goods training programmes for Operator staff, and agencies acting on behalf of operators, must be reviewed and approved by that competent authority. Dangerous Goods training programmes for other parties, i.e. Shippers, Packers, Cargo Agents, etc., may be required to be reviewed and approved by the competent authority. **It is advised that the appropriate authority be contacted prior to such training taking place.**

Recurrent (refresher) training must take place **within 24 months of previous training** to ensure that knowledge is current, unless a competent authority has defined a shorter period.

The primary objective of dangerous goods training is **safety**. The training must include the following:

- **General familiarisation training** — to provide the student with an understanding of the general philosophy and main provisions of the regulations.
- **Function specific training** — to provide the student with detailed training in the requirements applicable to the job function for which the student will be responsible.
- **Safety training** — to provide the student with an understanding of the hazards presented by dangerous goods, as well as safe handling and emergency response procedures to be followed.

The ideal size of a dangerous goods course is 10 to 15 participants, enabling the instructor to give personal attention to all students. The maximum number of students should never exceed 20.

Each course should be limited to one category of personnel. The level of competence in the language of the course should be as uniform as possible. Students taking a refresher course should not be mixed with those taking the introductory or initial course for the first time.

About the standard of training

The standard of training should be measured by the competency of the students on completion of the course. The criteria for a course is the level of the course's final test, and the way it can demonstrate the ability of the student to perform his job function and the ability to extract the required information from the regulations.

Criteria for the course's final test of the introductory or initial and refresher courses is given in Course objectives and test criteria section of the Guidelines. The final test should be designed to enable the participant to demonstrate an understanding of all the subjects covered. The difficulty level should be such that the final test challenges the ability of the participant to perform their specific job function in compliance with the Regulations.



Guidelines for Instructors of Dangerous Goods Courses

Clear objectives must be stated at the start of each part of the course, and the course must include sufficient exercises to demonstrate achievement of these objectives

The following schedules are typical schemes for the allocation of time spent on each subject by the various groups of participants. They are offered as guidance for instructors and may be amended as necessary to fit the needs of the group. For example, some instructors have increased the duration of the introductory or initial course from one week to two weeks because of language difficulties.

FOR SHIPPERS, CARGO AGENTS and AIRLINE STAFF PERFORMING THE ACCEPTANCE FUNCTION:

- **Introductory course** — This in-depth course should include the following: General philosophy, limitations, general requirements for shippers, classification, list of dangerous goods, general packing requirements, packing instructions, labelling and marking, shipper's declaration and other relevant documentation, acceptance procedures, storage and loading procedures, pilot's notification, provisions for passengers and crew, and emergency procedures. IATA Dangerous Goods Training Programme Book 1 covers this material

Please note that the actual course content must be customised to the specific job duties and responsibilities of the intended participants. This includes any exercises, and the mandatory final test.

— It is suggested that an in-depth shipping or acceptance course, consisting of sufficient exercises to provide the student with confidence, and including a standard final test according to these guidelines would involve a total of 40 hours classroom time.

- **Recurrent training (Refresher)** — This training is required every 24 months, or more frequently if mandated by national competent authority. It is suggested that a refresher course, consisting of sufficient exercises to provide the student with confidence, and including a test equivalent to the introductory course test, would involve at least 16 hours classroom time

FOR STAFF PERFORMING FLIGHT CREW and LOADING FUNCTIONS:

An awareness course should include the following: General philosophy, limitations, list of dangerous goods; marking and labelling; pilot's notification, emergency procedures, loading procedures; compatibility and provisions for passengers and crew. IATA Dangerous Goods Training Programme Book 2 covers this material.

Recurrent training must take place within 24 months of previous training to ensure knowledge is current, unless a competent authority has defined a shorter period.



Guidelines for Instructors of Dangerous Goods Courses

FOR STAFF PERFORMING PASSENGER HANDLING and FLIGHT ATTENDANT FUNCTIONS:

An awareness course should include the following: General philosophy; limitations; provisions for passengers and crew; general label identification and emergency procedures. IATA Dangerous Goods Training Programme Book 3 covers this material.

Recurrent training must take place within 24 months of previous training to ensure knowledge is current, unless a competent authority has defined a shorter period

FOR STAFF PERFORMING LOADING and WAREHOUSE FUNCTIONS:

An awareness course should include the following: General philosophy; limitations; marking and labelling; storage; handling and loading procedures; provisions for passengers and crew; pilot's notification; compatibility, emergency procedures. IATA Dangerous Goods Training Programme Book 4 covers this material

Recurrent training must take place within 24 months of previous training to ensure knowledge is current, unless a competent authority has defined a shorter period

Completion of the Introductory and Recurrent Course

Exercises should be used throughout the course to monitor the progress of the participants. See Section 8 for examples of exercises used by some instructors.

To complete the course the participant must successfully pass a comprehensive final test. This is a legal requirement.

The participants who successfully complete the final test must be issued with a Certificate of training specifying the course taken.

Since initial and refresher training are required by the Regulations (DGR 1.5.0.4), records of those taking the course and those passing the course must be kept

Training records

There is a legal requirement to maintain training records, which must contain the following

- the individual's name,
- the most recent training completion date,
- a description, copy or reference to training materials used to meet the training requirement;
- the name and address of the organisation providing the training; and
- a copy of the Certificate of training issued when the individual was trained, which shows that a final test has been completed satisfactorily



Guidelines for Instructors of Dangerous Goods Courses

ACKNOWLEDGEMENTS

These Dangerous Goods Training Guidelines have been developed by the IATA Dangerous Goods Training Task Force under the general supervision of the IATA Dangerous Goods Board. The composition of the Task Force is:

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Mr. G. Peterson	Continental Airlines, Houston
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Mr. G. Richardson	Federal Express, Memphis
Mr. P. King	Gulf Air, Bahrain
Mr. M. Marx	Lufthansa Cargo, Frankfurt
Mr. G. Murphy	Scandinavian Airlines System, Oslo
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INFORMATION

Training organisations interested in having their Dangerous Goods Courses endorsed by IATA or who desire further information on Dangerous Goods Training Programme/material, etc , are invited to direct their enquiry to:

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Guidelines for Instructors of Dangerous Goods Courses

1. COURSE OBJECTIVES AND TEST CRITERIA

Basis

The International Air Transport Association (IATA) Dangerous Goods Regulations (Regulations or DGR) are based upon and fully aligned with the International Civil Aviation Organisation's (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI) and with Annex 18 to the Chicago Convention on International Civil Aviation

Both IATA and ICAO require that all personnel involved with dangerous goods receive training in the subject. The details of these requirements are to be found in Subsection 1.5 of the DGR.

Course Objectives

Course objectives describe activities which the participant will be able to do at the end of the training course.

Good training objectives consist of three basic parts:

1. Performance — what will the participant be able to do;
2. Condition — what aids should be permitted,
3. Standard — what is the acceptable level of performance or acceptable level of error

For instance, after completing the training course, the participant should be familiar with the contents of the Dangerous Goods Regulations (DGR) and be able to handle a dangerous goods shipment in accordance with the requirements of the current edition of the IATA DGR

Specifically, the participant will be able to

- apply the IATA DGR correctly,
- understand the legal aspects involved;
- identify, without error the nine classes of dangerous goods by their principle criteria;
- fully understand and differentiate between shipper's and operator's responsibilities;
- identify all dangerous goods which are:
 - (a) forbidden for air transport; or
 - (b) permitted as cargo under the Regulations; or
 - (c) excepted from the Regulations in all or in part.
- extract the relevant information from the List of Dangerous Goods and apply it,
- apply the general packing requirements and the specific packing instructions or verify that they have been followed,



Guidelines for Instructors of Dangerous Goods Courses

- verify that the use of a packaging complies with the limitations of the specification indicated on the package;
- properly mark and label a dangerous goods package or verify that the marking or labelling requirements have been met;
- complete a Shipper's Declaration for Dangerous Goods or verify that the information provided on the form complies with the Regulations;
- properly enter the appropriate information on the Air Waybill or verify that the information was entered properly;
- comply with the requirements for providing the pilot-in-command with the pertinent information on the dangerous goods loaded aboard his aircraft;
- recognise and apply the appropriate State and/or Operator variations,
- using an acceptance checklist, correctly accept or reject a shipment;
- Apply relevant emergency procedures.

The Final Test Criteria

The final test must be designed to ensure that the student demonstrates an understanding of **all subjects** listed under the heading "Course Objective Guidelines", that are applicable to their specific job duties and responsibilities.

The difficulty level should ensure that each student demonstrates that he/she can perform his/her job function in compliance with the Regulations.

The student will demonstrate his/her competency level by completing a final test which will include at least 3 complete shipment acceptance problems or for shippers, at least two of these three problems must be similar shipment preparation exercises. These, together with general questions, will ensure testing of all objectives as detailed in the "Course Objective Guidelines". If these general questions, which must be discouraged, contain any "Yes/No" or multi-choice, the DGR reference must be required

- The shipments (case study under test) should include errors designed to test the application of the rules in real life situations. Errors to be identified and corrected by the student being tested should cover:
 - State Variations
 - Operators Variations
 - Packing Groups
 - Proper Shipping Names
 - Special Provisions
 - Packing Instructions
 - Marking and Labelling
 - Specification Package Markings
 - Entries in "Authorization" Column of Shipper's Declaration.



Guidelines for Instructors of Dangerous Goods Courses

- These shipments should include:
 - 1 Regular dangerous goods shipment
 - 1 "All packed in the same UN specification package" or "Overpack".
 - 1 Radioactive shipment

(If the course does not cover Radioactive Material, a shipment of "Limited Quantity" may be substituted)

For completion of an "Acceptance Check List":

- Each shipment must consist of:
 - a completed Shipper's Declaration;
 - a picture of the package showing marks and labels;
 - completed "Nature and Quantity of Goods" and "Handling Information" boxes of the Air Waybill.
- Each shipment must be prepared incorrectly.
- For each "No" (error) found during the check, the student must explain the nature of the error in the "Comment" box on the Acceptance Check List.

For completion of shipment preparation exercises

- Full written details of the shipments must be provided for the student from which he will be able to correctly complete:
 - a Shipper's Declaration;
 - the required marks and labels on a drawing of the package;
 - the "Nature and Quantity of Goods" and "Handling Information" boxes of an Air Waybill

Marking Scheme for the Final Test

75 percent of total score for the test must come from the shipment acceptance or preparation questions, 25 percent of the score from the remaining questions.

Points shall be deducted for each error, missing answer, or additional information which is not applicable to the question.

A minimum of 80 percent of the total score is required for passing.



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2. INTRODUCTION TO THE LESSON GUIDE

Subject Matter

The dangerous goods instructor will have to produce a lesson plan to ensure that he covers the required material comprehensively. The required material depends on the category of staff being addressed. The following are the minimum legal requirements for each category of staff.

TABLE 1.5.A
Minimum Requirements for Training Curricula (1.5.2)

Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum	Category of Personnel — See key below							
	1	2	3	4	5	6	7	8
General philosophy	X	X	X	X	X	X	X	X
Limitations	X		X		X	X	X	X
General requirements for shippers	X		X			X		
Classification	X	X	X			X		
List of dangerous goods	X	X	X			X	X	
General packing requirements	X	X	X			X		
Packing instructions	X	X	X			X		
Labelling and marking	X	X	X	X	X	X	X	X
Shipper's Declaration and other relevant documentation	X		X			X		
Acceptance procedures			X					
Storage and loading procedures			X	X			X	
Pilots' notification			X	X			X	
Provisions for passengers and crew	X	X	X	X	X	X	X	X
Emergency procedures	X	X	X	X	X	X	X	X

KEY

- 1 Shippers, shippers' agents, including operator's staff acting as shippers, operators staff preparing dangerous goods as COMAT
- 2 Packers
- 3 Cargo acceptance staff of operators and agencies acting on behalf of operators
- 4 Staff of operators and agencies acting on behalf of operators engaged in the ground handling, storage and loading of cargo and baggage
- 5 Passenger handling staff and security staff who deal with the screening of passengers and their baggage
- 6 Staff of agencies other than operators involved in processing cargo
- 7 Flight crew members and load planners
- 8 Crew members (other than flight crew)

Note:

Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in Table 1.5.A — e.g. it may be more appropriate for a packer to cover the aspects with which a shipper should be familiar; if an operator carries only cargo, those aspects relating to passengers may be omitted from the training programme for his staff and flight crew



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Lesson Plans

The purpose of a lesson plan is to communicate. In order to accomplish that purpose, the plan must contain a set of elements that are a means of organising the material in a logical and effective sequence. Additionally, it is a checklist of training aids and lesson time allotment.

Each part of a lesson plan should fulfil some purpose in communicating the specific content, the objective and the learning prerequisites. Taken together, these parts constitute

1. **Introduction**
2. **Presentation**
3. **Application**
4. **Conclusion**

The Lesson Guide reproduced here is an example of how your Lesson Plan should be organised. It gives the Instructor a format of training sequence, areas of emphasis, teaching aids and reference points for cross referral.

The following consist of only lesson guides and are divided into Dangerous Goods, other than Class 7, and Radioactive Material Class 7.

The lesson guides cover all the dangerous goods regulations and is **not customised** to the needs of any one category. Shippers will require more in-depth coverage of classification and packaging procedures and requirements, while Cargo Agents and Airline Cargo Acceptance staff will require more on recognition of dangerous goods, package markings, and documentation. The minimum subject areas shown in Table 1.5A for a particular category of staff must be covered in detail.

The lesson guide has each topic listed in the first column, with any particularly important points emphasised in the second. The third column provides suggested visual aids (VA), references to relevant background papers shown in this manual; sample exercises taken from IATA Dangerous Goods Training Book 1 (DGTB1) and suggested handouts (H) found in these guidelines.

The relevant Dangerous Goods Regulations (DGR) reference is shown in the fourth column.

Careful preparation of "need to know" information is the basis of successful training.



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3. LESSON GUIDE: CLASSES 1, 2, 3, 4, 5, 6, 8 and 9

LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>GENERAL INFORMATION</p> <p>Announce name of course</p> <p>Introduce self with short description of background</p> <p>Have participants follow suit</p> <p>Announce class hours, location of facilities (rest-rooms, lunch rooms, cafeteria, etc)</p> <p>Describe how class will be conducted</p> <p>INTRODUCTION TO THE COURSE</p> <p>Why a course on dangerous goods? Safety, legal requirements</p> <p>What are "dangerous goods" and how are they rendered safe for transport?</p> <p>1 Define "Dangerous Goods"</p> <p>2 Rendered "safe for transport" by proper identification, packing documentation and handling</p> <p>General Philosophy of Dangerous Goods Regulations</p> <p>Historical background of DGR:</p> <p>1 IATA Restricted Articles Board and IATA Restricted Articles Regulations</p> <p>2 ICAO Technical Instructions for the Safe Transport of Dangerous Goods.</p> <p>3 IATA Dangerous Goods Board and IATA Dangerous Goods Regulations</p> <p>Relation to the ICAO Technical Instructions</p>	<p>Place cards with participant's name visible to others</p> <p>This information should also be made available to participants, in the form of a hand-out</p> <p>e.g. exercises, quizzes, home work, final test, notification of successful completion, etc</p> <p>Expand motivation Display aircraft part corroded by chemicals or mercury</p>	<p>BP-1, VA-1, VA-2</p> <p>BP-2</p> <p>Display copy of T I and have available for examination (VA-3, VA-4)</p>	<p>1 5</p> <p>1 0</p> <p>Preface</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Review layout of DGR and contents</p> <ol style="list-style-type: none"> 1. Important changes will be highlighted in Preface 2. Use of Table of Contents and Alphabetical Index <p>DANGEROUS GOODS REGULATIONS Section 1 — APPLICABILITY 1.1 Basis for DGR</p> <ol style="list-style-type: none"> (a) ICAO Technical Instructions are the legal regulations based on the UN Committee of Experts (UNCOE) (b) IATA DGR fully aligned (c) DGR contains additional requirements (d) DGR has become the "field" document and is recognised as such by ICAO <p>1.2 Application of the DGR Review 1.2.1 through 1.2.4.</p> <p>1.3 Shipper's Responsibilities (a) Shipper must comply with the Regulations</p>	<p>Review the symbols used in the DGR for indicating change, etc Using the Table of Contents will encourage familiarity and give the students confidence in the layout of the Regulations Using the index is a quick reference source</p> <p>Compliance with DGR means compliance with ICAO e.g. airline industry requirements and Shipper's Declaration</p> <p>Highlight applicability to all Members of IATA and people who offer DG shipments to Members</p> <p>Cannot be overemphasised as 90% of Regulations are directed at the shipper</p>	<p>ICAO T I (VA-3)</p> <p>Hand-out UN and IATA Organizations Involved in the Transport of Dangerous Goods (H-15)</p> <p>Hand-out Excerpts from reports of fines for DG violations (H-2 and H-4)</p>	<p>1 1 3 1 1 1</p> <p>1 1 4 1 1 4</p> <p>1 2 1</p> <p>1 3 2</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>1.3 Shipper's Responsibilities (cont'd) e.g. — provide information to employees — ensure articles not prohibited — identify and classify — pack — mark and label — complete Shipper's Declaration — ensure staff are trained</p> <p>(b) Special arrangements required for — Infectious substances — Dangerous Goods in Consolidations</p>			<p>1 3 3 1 1 3 3 2</p>
<p>1.4 Operator's Responsibilities</p> <p>Requirements (i) Acceptance (ii) Storage (iii) Loading (iv) Inspection (v) Provision of Information (vi) Emergency Response (vii) Retention of Records (viii) Training</p> <p>These will be reviewed in detail later</p>	<p>Point out that an operator is not required to carry any particular dangerous commodity nor is the operator prevented from imposing stricter requirements.</p>		<p>2 6 4 1 4</p>
<p>1.5 Training Requirements</p> <p>(a) Why training? (b) Train who? (c) Government approval of training (d) Record of Training</p>	<p>Explain why training is required. Note recurrent every 24 months. Explain who must be trained. Use Table 1.5 A to explain category of personnel and aspects with which they should be familiar. Some governments require approved training programmes in order to obtain a permit for carrying dangerous goods (see State Variation HKG-01).</p>	<p>HKG-01</p>	<p>1 5 0 1 5 1 1 5 3 1.5 4</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 2 — LIMITATIONS</p> <p>(a) Characteristics of dangerous goods that must not be carried on aircraft at any time</p> <p>(b) List of substances forbidden for transport by air under any circumstances</p> <p>(c) 2.1.2 describes the dangerous goods that must not be carried on an aircraft at any time unless exempted</p>	<p>These substances also appear in the List of Dangerous Goods (4.2) as "Forbidden/Forbidden"</p>		<p>2 1 1</p> <p>Table 2 1 A</p>
<p>2.2 Hidden Dangerous Goods</p> <p>Operator staff must be trained to identify and detect hidden dangerous goods</p> <p>Many common general descriptions may contain hidden dangerous goods</p>	<p>Important to question passenger/shipper when such items are presented for carriage</p> <p>Note COMAT (Company Material) and Aircraft Spare Parts are commonly undeclared.</p>		<p>2 2</p>
<p>2.3 Dangerous Goods Carried by Passengers and Crew</p> <p>Those acceptable with approval of operator</p> <p>Those acceptable without operator approval.</p>	<p>Everyone is a potential air passenger</p> <p>Note disabling devices (2 3 1 2)</p>	<p>VA-7 IATA Poster DG in Baggage</p>	<p>2 3 and Table 2 3 A</p> <p>2 3 3</p> <p>2 3 5</p>
<p>2.4 Dangerous Goods in Air Mail</p> <p>The Universal Postal Union forbids the carriage of DG in Air Mail</p>	<p>Exceptions, which are subject to the provisions of the national Postal Authority concerned</p>		<p>2 4 1</p>
<p>2.5 Dangerous Goods In Operator's Property</p> <p>Not subject to the Regulations</p> <p>Dangerous Goods required for aircraft operation</p> <p>Dangerous Goods for sale or use on aircraft</p> <p>Subject to the Regulations unless authorised by the State of the Operator</p>	<p>examples: Batteries, Fire Extinguishers, Life rafts, etc</p> <p>examples Perfumes, Alcohols, Aerosols, etc</p> <p>Examples Dry Ice for use in food or beverage</p>		<p>2 5 1 1</p> <p>2 5 1 2</p> <p>2 5 1 3</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>2.5 Dangerous Goods in Operator's Property (cont'd) Replacement spares and replacements for above limitation</p> <p>2.6 State Exemptions Note that certain forbidden items may be carried under: "Exemption" or "Approval" Additional IATA requirements</p> <p>2.7 Dangerous Goods in Excepted Quantities</p> <p>(a) Note requirements. (b) Substances/Articles permitted (c) Not permitted in Excepted Quantities (d) Baggage and Airmail (e) Quantity limits (f) Labelling (g) Documentation (h) Packing requirements include drop and stacking tests Some airlines will not accept "Excepted Quantities"</p>	<p>Exception for replacements when consigned by an operator. Specially designed containers may be used provided they at least meet the requirements for specification packaging</p> <p>"Pointing finger" symbol indicates more restrictive requirements</p> <p>Because of their very small quantity certain classes of dangerous goods are allowed to be shipped in non-specification packagings without the normal hazard labelling, marking and Shipper's Declaration requirements</p> <p>Use Table 2.7 A but note 2.7.2 for excluded materials Primary risks only are indicated. Subsidiary risks not shown</p> <p>No Shipper's Declaration. Air Waybill statement required. Intermediate inner packaging required</p>	<p>(BP-3 Also note Operator's discretion (2.6.4))</p> <p>Measuring cup showing quantity of 30 mL</p>	<p>2.5.2</p> <p>2.6.1 and 2.6.4</p> <p>2.6.2</p> <p>2.7.0.1</p> <p>2.7.0.2</p> <p>2.7.1</p> <p>2.7.2</p> <p>2.7.3</p> <p>2.7.5</p> <p>Show label Fig 2.7B (2.7.6) 2.7.7</p> <p>2.7.8 and 2.7.9</p> <p>2.9 or 2.7</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>2.8 Dangerous Goods in Limited Quantities Limited Quantities in combination packaging that does not require UN Specification outer packages This subject will be covered in more detail later in the course.</p> <p>2.9 State and Operator Variations States and Operators may file variations to the regulations, however Operators cannot file variations which are less restrictive. These variations will be covered later in the course <i>Exercises</i> to evaluate understanding of Sections 1 and 2</p> <p>Section 3 — CLASSIFICATION 3.0 General</p> <p>(a) Shippers responsibilities (b) Hazard classes (c) Packing Groups are assigned to show the degree of hazard Packing Group I — high danger Packing Group II — medium danger Packing Group III — low danger.</p>	<p style="text-align: center;">State = country, Operator = airline</p> <p style="text-align: center;">Give examples of some State and Operator variations</p> <p>For shippers this section should be covered intensively with examples, exercises, etc. Others should be made aware of the classes, divisions and packing groups together with the criteria for classification</p> <p>Operators are dependent on shipper's classification and identification of the dangerous goods</p> <p>Note that there are 9 hazard classes — each class having one or more labels. Point out that some classes are subdivided into divisions. These will be dealt with in detail as the classes are discussed.</p> <p>Point out to participants that they will be required to memorise the name and number of each class and division</p> <p>Use example such as "Paint" to show how PG affects the quantity permitted per package.</p> <p>Not all classes/divisions have packing groups.</p>	<p style="text-align: center;">VA-6 IATA poster showing labels</p> <p style="text-align: center;">VA-6 Examples of all hazard labels</p>	<p style="text-align: center;">2 8</p> <p style="text-align: center;">2 9</p> <p style="text-align: center;">3 0 5 3 0 2</p> <p style="text-align: center;">3 0 3 and 4 2</p> <p style="text-align: center;">3 0 3</p>



Guidelines for Instructors of Dangerous Goods Courses

LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>3.1 Class 1 — Explosives Class 1 is divided into 6 divisions (a) Point out what is included in this class (b) Explanation of Divisions (c) Explanation of Compatibility Groups (d) Classification of explosives</p> <p>3.2 Class 2 — Gases This class is divided into three divisions 2.1 Flammable gas 2.2 Non-flammable, non-toxic gas 2.3 Toxic gas Describe physical states Highlight precedence of hazards Aerosols are included in Class 2</p> <p>3.3 Class 3 — Flammable Liquid (a) Definition of flammable liquid (b) Liquids with FP >35°C are not regulated if they do not sustain combustion (c) Elevated temperature substances (d) Review Packing Group criteria (e) Flammable viscous substances</p>	<p>Use Table 3.1 A to explain. Note definition of Group "S" Government approval of classification/compatibility group assignment and Proper Shipping Name</p> <p>Review definition Review definition Review definition Carbonated beverages are not included – Review definition of Aerosol</p> <p>Explain Flash Point (FP) and initial Boiling Point definitions Explain conditions</p> <p>Use Table 3.3 A to explain Explain that flammable viscous liquids of PG II may be classified as PG III if they meet certain criteria</p>	<p>Explosive labels x 6</p> <p>BP-4</p> <p>Div 2.1 label Div 2.2 label Div 2.3 label</p> <p>Class 3 label BP-5</p> <p>VA-9 Table 3.3 A Viscosity Cup VA-10</p>	<p>3.1.1 3.1.3 Table 3.1 A 3.1.5</p> <p>3.2.2</p> <p>3.2.1.3 3.2.4 3.2.5.1</p> <p>3.3.1 and Appendix A 3.3.1.3 and Appendix A 3.3.1.4 and 3.3.1.5 3.3.3</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>3.4 Class 4 — Flammable Solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases</p> <p>This class is divided into three divisions</p> <p>4.1 Flammable Solids Definition Division 4.1</p> <ul style="list-style-type: none"> • Flammable Solids <ul style="list-style-type: none"> (a) Properties (b) Classification tests • Self reactive and related substances <ul style="list-style-type: none"> (a) Definition (b) Properties (c) Classification (d) Transport of Samples (e) Temperature Control Requirements (f) Desensitisation • Desensitized explosives <p>4.2 Substances liable to Spontaneous Combustion</p> <ul style="list-style-type: none"> (a) Definition (b) Properties (c) Classification tests. <ul style="list-style-type: none"> — Pyrophoric Solids, — Pyrophoric Liquids, — Self-heating Substances (d) Packing Group Criteria 	<p style="text-align: center;">EMPHASIS</p> <p>BP-6</p> <p>Div 4.1 label</p> <p>Flammable solids, self-reactive and related substances, and desensitized explosives</p> <p>If substance appears in Appendix C.1, use UN number shown. Otherwise require competent authority classification Example: "Benzene sulphathiazide" = UN 3226</p> <p>Explain transport precautions – Review Definition</p> <p>Self-heating</p>	<p>BP-6</p> <p>Div 4.1 label</p> <p>Div 4.2 label</p>	<p>3.4.1</p> <p>3.4.1.1.1</p> <p>3.4.1.1.2</p> <p>3.4.1.2.1</p> <p>3.4.1.2.4</p> <p>3.4.1.2.4 and Appendix C.1</p> <p>3.4.1.2.3</p> <p>3.4.1.2.5</p> <p>3.4.1.2.6</p> <p>3.4.1.2.7</p> <p>3.4.1.3</p> <p>3.4.2.1</p> <p>3.4.2.2</p> <p>3.4.2.3.1</p> <p>3.4.2.3.2</p> <p>3.4.2.3.3</p> <p>3.4.2.4</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>4 3 Substances which, in contact with water, emit flammable gases</p> <ul style="list-style-type: none">(a) Definition(b) Properties(c) Classification tests(d) Packing Group criteria <p>3.5 Class 5 — Oxidizing Substances and Organic Peroxides</p> <p>This class is divided into two divisions</p> <p>5 1 Oxidizers</p> <ul style="list-style-type: none">(a) Definition(b) Classification tests.(c) Packing Group criteria <p>5 2 Organic Peroxides</p> <ul style="list-style-type: none">(a) Review definition(b) Classification(c) Type of Organic Peroxide Allocation of PSN(d) Special risks(e) Desensitisation <p>Example: 52% Dibenzoyl Peroxide paste = UN 3108</p> <ul style="list-style-type: none">(f) Transport of Samples(g) Temperature Control Requirements	<p>Note these are described as "Dangerous when wet" or "water-reactive"</p> <p>Organic Peroxide Formulations listed in Appendix C may be allocated the appropriate generic Proper Shipping Name Any not listed in Appendix C 2 require approval from appropriate competent authority</p> <p>Note the hazardous properties of this Division. Note the special risks require special handling during transport</p>	<p>Div 4 3 label</p> <p>Div 5 1 label</p> <p>Div 5 2 label</p>	<p>3 4 3 1 3 4 3 2 3 4 3 3 3 4 3 5</p> <p>3 5 1 1 3 5 1 2 and 3 5 1 3 3 5 1 4</p> <p>3 5 2 1 3 5 2 2 3 5 2 3 and Appendix C 2</p> <p>3 5 2 4 3 5 2 5</p> <p>3 5 2 6 3 5 2 7</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>3.6 Class 6 — Toxic Substances; Infectious Substances</p> <p>This class is divided into two divisions</p> <p>6.1 Toxic Substances</p> <p>(a) Definition</p> <p>(b) Packing Group criteria</p> <p>(c) Classification Tests</p> <ul style="list-style-type: none"> • Oral Toxicity, • Dermal Toxicity, • Inhalation Toxicity <p>(d) Classification of Pesticides</p> <p>6.2 Infectious Substances</p> <p>(a) Definition of Infectious Substances Allocation of risk groups.</p> <p>(b) Genetically modified organisms and micro-organisms.</p> <p>(c) Biological Products</p> <p>(d) Diagnostic Specimens</p> <p>(e) Clinical and Medical waste</p>	<p>Explain LD₅₀ and LC₅₀ note criteria for toxic vapours</p> <p>Risk Group not shown on DGD or Package See Note 2</p> <p>Definition</p> <p>Definition</p> <p>Definition</p> <p>Definition UN 3291, UN 2814 and UN 2900</p>	<p>Div 6.1 label</p> <p>VA-11 Table 3.6.A</p> <p>BP-7</p> <p>Div 6.2 label</p> <p>BP-8</p>	<p>3.6.1.1</p> <p>3.6.1.3</p> <p>3.6.1.5,</p> <p>3.6.1.5.1,</p> <p>3.6.1.5.2,</p> <p>3.6.1.5.3,</p> <p>Tables 3.6.A,</p> <p>3.6.B and Fig</p> <p>3.6.C</p> <p>3.6.1.8</p> <p>3.6.2.1</p> <p>3.6.2.1.2</p> <p>3.6.2.1.3</p> <p>3.6.2.1.4</p> <p>3.6.2.1.5</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>6.2 Infectious Substances (cont'd) (f) Classification of Biological products</p>	<p>These are divided into three groups</p> <ol style="list-style-type: none"> 1. those which contain pathogens in Risk Group 1, those which contain pathogens under such conditions that their ability to produce disease is very low to none, and those known not to contain pathogens 2. those manufactured and packaged in accordance with the requirements of national governmental health authorities and transported for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals. <i>Note: Substances in 1 and 2 above are not considered infectious for the purposes of these regulations and are not subject to Division 6.2 requirements</i> 3. those known or reasonably expected to contain pathogens in Risk Groups 2, 3 or 4 and which do not meet criteria 2 above Substances in this group must be classified in Division 6.2 under UN 2814 or UN 2900 as appropriate 		3 6 2 3
<p>(g) Classification of Diagnostic specimens</p>	<p>These are divided into three groups</p> <ol style="list-style-type: none"> 1. those known or reasonably expected to contain pathogens of Risk Group 2, 3 or 4, and those where there is a relatively low probability of pathogens of Risk Group 4 are Infectious Substances (P.1 602) Note specimens transported for initial or confirmatory testing for pathogens fall in this group 2. those where there is a relatively low probability of pathogens of Risk Group 2 and 3 (P.1 650) Note specimens transported for routine screening tests or initial diagnosis for other than pathogens fall in this group 3. those known not to contain pathogens (not restricted) 	Class 7 labels	3 6 2 4
<p>3.7 Class 7 — Radioactive Substances Advise that this subject will be covered separately at end of course</p>			



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>3.8 Class 8 — Corrosives</p> <p>(a) Definition</p> <p>(b) Packing Group criteria</p> <p>3.9 Class 9 — Miscellaneous Dangerous Goods</p> <p>(a) Definition</p> <p>(b) Definition of "Aviation Regulated Solid or Liquid" material</p> <p>(c) Definition of "Magnetized Materials" Magnetized Material has its own handling label</p> <p>(d) Definition of "Elevated temperature substances"</p> <p>(e) Note examples of articles and substances that are also included in this class</p> <p>Exercises</p> <p>3.10 Multiple Hazards</p> <p>(a) Primary and Subsidiary risks must be determined</p> <p>(b) Use of Table 3 10 A for substances with two risks from Classes 3, 4, 8, Divisions 5 1 and 6 1 (except for Packing Group I vapour inhalation toxicity)</p>	<p>Formerly known as "Other Regulated Substances"</p> <p>Magnetic tapes do not come under this definition</p> <p>Note information on unregulated masses of ferro-magnetic metals</p> <p>Forbidden by Air</p> <p>Carbon dioxide, solid (Dry Ice), Engines internal combustion, Vehicles, etc</p> <p>Note: Suggest this subject is covered after "identification"</p> <p>Explain necessity to use most restrictive packing group</p>	<p>Class 8 label and VA-12 Table 3 8 A</p> <p>Corroded a/c part BP-9 and 15</p> <p>Class 9 labels BP-10</p> <p>Magnetized Material label</p> <p>DGTB1 2-1, 2-2</p> <p>VA-13 Table 3 10 A</p>	<p>3 8 1</p> <p>3 8 2</p> <p>3 9 1</p> <p>3 9 1 1</p> <p>3 9 1 2</p> <p>3 9 1 3</p> <p>3 9 1 4</p> <p>3 10</p> <p>3 10 1</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>3.10 Multiple Hazards (cont'd)</p> <p>(c) The following always take precedence</p> <ul style="list-style-type: none">— Classes 1, 2, 7 and Divisions 5.2, 6.2,— Self-reactive substances and related substances and desensitized explosives of Division 4.1,— Pyrophoric substances of Division 4.2,— Division 6.1 with a Packing Group I inhalation toxicity. <p>(d) Radioactive materials</p> <p>(e) Magnetized material</p> <p>(f) Infectious substances</p> <p>Exercise on use of Table 3.10.A</p> <p>Exercise</p> <p>Section 4 — IDENTIFICATION</p> <p>4.0 General</p> <p>4.1 Selection of Proper Shipping Name</p> <p>(a) Items listed by name</p>	<p>Selection of the Proper Shipping Name (PSN) will be covered in the next Section</p> <p>This Section is the heart of the Regulations Explain 4.0.2</p> <p>Locate in Subsection 4.2 or by UN/ID Number in 4.3</p>	<p>DGTB1 3-6</p>	<p>3 10 2</p> <p>3 10 3</p> <p>3 10 4</p> <p>3 10 5</p> <p>4 0 2</p> <p>4 1 1</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>4.1 Selection of Proper Shipping Name (cont'd)</p> <p>(b) Items not listed by name.</p> <ul style="list-style-type: none"> — Check if Forbidden (2.1), — Classify against criteria of Classes (3.1 – 3.9), — Assign most accurate Proper Shipping Name (PSN) If in doubt, contact competent authority <p>(c) Samples sent for testing where class is uncertain</p> <p>(d) Mixtures and Solutions with a Single hazard</p> <p>(e) Mixtures and Solutions with two or more hazards</p> <p>(f) Mixtures not subject to the Regulations</p> <p>4.2 List of Dangerous Goods</p> <p>Explain how to use the List</p> <p>Go through each column</p> <p>(a) UN or ID Number</p> <p>(b) Proper Shipping Name</p>	<p>Determine characteristics of substance</p> <p>Table 4.1 A lists all Generic and Hazard Class PSNs in Class or Division order</p> <p>Note if article is not listed and does not meet criteria of any hazard, it may be shipped as "Not restricted"</p> <p>Use Technical Name See Special Provision A801 for exceptions if more than one hazard.</p> <p>Note exceptions</p> <p>Characteristics of mixture or solution must be checked for classification — not the individual characteristics of each of the contents Qualifying words</p> <p>Air Waybill endorsement</p> <p>Highlight Alphabetical order, some prefixes ignored</p> <p>Bold print — correct spelling essential</p> <p>Singular or Plural</p> <p>Preferred sequence, optional order</p> <p>Symbols. star (*) = Technical Name dagger (†) = Explanation calendar (☞) = Effective July 1, 2001 hourglass (⌚) = Not applicable after June 30, 2001</p>	<p>VA-14</p> <p>BP-11</p>	<p>4.1.2 (a)</p> <p>4.1.2 (b)</p> <p>4.1.2 (c)</p> <p>4.1.4</p> <p>4.1.2 (d)</p> <p>3.10</p> <p>4.1.2 (e)</p> <p>4.1.2.2</p> <p>4.1.3.1</p> <p>4.1.3.2</p> <p>4.1.3.3 and 4.1.4</p> <p>4.1.6</p> <p>4.1.6.1</p> <p>4.1.6.2</p> <p>8.1.3.1</p> <p>8.1.3.5</p> <p>8.1.3.5</p> <p>4.1.6.2, Appendix A</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>4.2 List of Dangerous Goods (cont'd)</p> <p>(c) Class/Division — Primary risk.</p> <p>(d) Subsidiary Risk</p> <p>(e) Labels column shows hazard labels</p> <p>(f) Packing Groups for all classes, except 1, 2, 7 and some 9 shown</p> <p>Some Packing Instructions indicate Packing Groups not shown here</p> <p>(g) Passenger Aircraft Packing Instruction Number — LTD QTY</p> <p>(h) Maximum Quantity per package — LTD QTY</p> <p>(i) Passenger Aircraft Packing Instruction Number.</p> <p>(j) Maximum Quantity per package</p> <p>(k) Cargo Aircraft Only Packing Instruction Number</p> <p>(l) Maximum Quantity per package</p> <p>(m) Special Provisions</p> <p>(n) ERG Code</p> <p>4.3 Numerical cross-reference List</p> <p>Explain use of Subsection 4 3</p> <p>Exercises</p>	<p>Note sequence when more than one</p> <p>Some Packing Instructions indicate more restrictive packing group than here Example UN 1944</p> <p>Example Class 1</p> <p>Also permitted on Cargo Aircraft</p> <p>Shows the maximum net Quantity except when followed by the letter G when the maximum Gross Weight is indicated May be further limited by Packing Instruction.</p> <p>Also permitted on Cargo Aircraft</p> <p>Shows the maximum net Quantity except when followed by the letter G when the maximum Gross Weight is indicated May be further limited by Packing Instruction</p> <p>Not permitted on Passenger Aircraft</p> <p>Shows the maximum net Quantity except when followed by the letter G when the maximum Gross Weight is indicated May be further limited by Packing Instruction</p> <p>Code refers to DGR Subsection 4 4 Explain A1, A2, and A109 Discuss other examples</p> <p>Code as found in ICAO Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods (Red Book) Used by many operators on their NOTOC (Notification to Captain Forms)</p> <p>For non-English version of DGR, this is the source of the Proper Shipping Name in English Also contains the ERG Code</p>	<p>DGTB1 3-1, 3-2, 3-3, 3-4</p>	<p>4 1 6 3</p> <p>4 1 6 4</p> <p>4 1 6 5</p> <p>4 1 6 6 and 5 0 2 1</p> <p>5 1 0 1</p> <p>4 1 6 7</p> <p>4.1.6 8, Appendix A</p> <p>4 1 6 9</p> <p>4 1 6 10</p> <p>4 1 6 11</p> <p>4.1 6 12</p> <p>4 1 6 13</p> <p>4 1 6 14</p> <p>4 3</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 5 — PACKING</p> <p>(a) Shipper's Responsibilities</p> <p>(b) General Packaging Requirements</p> <p>(c) Type of packaging</p> <p>Compare definitions of Combination and Composite Packagings, Drum and Jerrican, Inner Packaging and Inner Receptacle, and Package and Packaging.</p> <p>(1) UN Specification packaging.</p> <p>(2) Limited Quantity packaging</p> <p>(3) Other Packaging</p> <p>(d) Conditions normal to air transport</p> <p>(e) Transitional Packaging</p> <p>(f) Format of Packing Instructions</p>	<p>Packaging definitions in Appendix A</p> <p>Applicable to all dangerous goods packages</p> <p>Good Quality</p> <p>Meet required specifications</p> <p>Compatible with contents</p> <p>Securely closed</p> <p>Ullage</p> <p>Pressure differentials</p> <p>Cushioning material</p> <p>Absorbent material</p> <p>Empty Packaging</p> <p>Use table 5 0 C to explain</p> <p>Permitted when "y" packing instruction applies</p> <p>Ltd. Qty packaging has to be capable of passing tests of 6 6 and be made according to specifications of 6 1 and 6 2 Must meet all requirements of 2 8</p> <p>Permitted by certain Packing Instructions, e.g P I 200, 805, 904, 910</p> <p>These are not UN nor Ltd Qty packagings</p> <p>Temperature, Pressure, Vibration</p> <p>Pre-97 UN infectious substance packaging can be used until 31 December 2000</p> <p>Note logical sequence of Packing Instructions</p> <p>Class 1 — 100 series, Class 3 — 300 series, etc</p> <p>Almost all Packing Instructions permit or require Combination Packagings</p> <p>Some also permit Single Packagings</p>	<p>VA-15</p> <p>Show examples of packagings</p> <p>VA-15</p>	<p>5 0 1</p> <p>Appendix A</p> <p>5 0 2</p> <p>5 0 2 4</p> <p>5 0 2 5</p> <p>5 0 2 6</p> <p>5 0 2 7</p> <p>5 0 2 8</p> <p>5 0 2 9</p> <p>5 0 2 12 1</p> <p>2 0 2 12 2</p> <p>5 0 2 13 5</p> <p>Appendix A</p> <p>Table 5 0 C</p> <p>5 0 3 3</p> <p>5 0 3 4</p> <p>5 0 4</p> <p>5 0 5 1</p> <p>5 0 6</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 6 — PACKAGING SPECIFICATIONS AND PERFORMANCE TESTS</p> <p>(a) Specification and performance testing</p> <p>(b) Specification markings of UN Packagings</p> <p>(c) Limited Quantity package testing requirements. return to ✚</p> <p>Section 5 — PACKING</p> <p>(f) Explain format and contents of the various Packing Instructions including Particular Packing Requirements</p> <p>(g) Use PI 900 to illustrate multiple hazards in an automobile</p> <p>(h) Use PI 904 as an example of a package that must be vented</p>	<p>This section is primarily for manufacturers of packagings but contains some information required by shippers and airline acceptance staff</p> <p>Note that UN packaging specifications are based upon performance testing Packages must be tested as prepared for transport</p> <p>Note there are special packaging specifications for Deeply Refrigerated Gases and for Infectious Substances</p> <p>Use Figures 6 0 A, 6 0 B, and Tables 6 0 C and 6 0 D.</p> <p>Note different UN specification markings for packagings for infectious substances Packagings bearing pre-1997 markings may be accepted until 31 December 2000 Packagings tested after 1st January 1997 must bear required markings</p> <p>Superpacks — 'V' packagings and 'U' packaging (infectious substance)</p> <p>If suspicious check test report</p>	<p>BP-13</p> <p>VA-18-24 Show overhead of PI 301, 302, 303 and others (Example Y305, 200) VA-23 PI 900 VA-24 overhead of PI 904</p>	<p>6 2 and 6 3</p> <p>6 4 and 6 5</p> <p>6 0 4 2</p> <p>6 0 6 and Table 6 0 E</p> <p>6 3 1.3 and 6 5 3 6 3 7 6 6</p> <p>5 1-5 9</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
9.2 Storage	Special storage conditions for radioactive materials, organic peroxides and self-reactive materials		9 2 9 2 1 2 3
9.3 Loading	Loading is a key area for shippers too Especially segregation, orientation and security.	Hand-out H-9	9 3
Loading requirements			
(a) Restrictions on Passenger aircraft	☒ ☒		9 3 1
(b) Segregation of incompatible dangerous goods	Segregation by hazard label primary risk only. Division 4 1 and Classes 6, 7 and 9 are not in Table 9 3 A as they do not require segregation from other classes		9 3 2 and Table 9 3 A(I), 9 3 A(II)
(c) Loading of Liquid dangerous goods	Orientation		9 3 3
(d) Cargo Aircraft loading	Accessibility, note exceptions		9 3 4
(e) Securing dangerous goods	Prevention of movement		9 3 5
(f) Loading inspection	Check for signs of damage		9 3 6
(g) Replacement of labels	Not at time of acceptance		9 3 7
(h) Identification of ULD containing dangerous goods	Identification tag		9 3 8
(i) Stowage of Toxic and Infectious substances	Segregation from foodstuff and animals		9 3 9
(j) Magnetized material	Not dangerous in itself, effect on a/c compass, multiple units may Produce cumulative effect.		9 3 11
(k) Carbon dioxide, solid (Dry Ice).	Information of ground staff		9 3 12
(l) Expandable Polymeric Beads	Restrictions		9 3 13
(m) Live animals	Away from heat, etc		9 3 14
(n) Wheelchairs.			9 3 15
(o) Organic peroxides and Self-reactive substances			9 3 16
Note that the loading of radioactive materials will be discussed later			
9.4 Inspection	Very important operator responsibility Review the special procedures to be followed in case of leaking or damaged packages of infectious substances or radioactive material		9 4 1 9 4 2 and 9 4 3



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9.5 Provisions of Information (a) Information to be given to the Pilot-in-Command	Information must be given in accurate and legible writing on dedicated form (NOTOC) and not be transmitted only by copies of Air Waybills or Shipper's Declaration, etc Signed copy required from Captain Must contain confirmation that no damaged or leaking packages have knowingly been loaded on the aircraft This information is normally found in the company's manuals and must include emergency action	Hand-out H-13	9 5 9 5 1 9 5 1 1 5 9 5 1 1 6
(b) Information to operator employees	Operators obligation to inform the passengers about carrying dangerous goods forbidden in baggage		9 5 2
(c) Information to Passengers	For flight attendants and passenger handling staff paragraph 9 5 3 should be emphasised in conjunction with Subsection 2 3		9 5 3
(d) Emergency information by pilot	Pilot-in-Command must notify air traffic services unit in case of emergency	Dangerous Goods	9 5 1 3
(e) Accident/Incident and Undeclared/Misdeclared dangerous goods	Operators must officially inform governmental authorities of all dangerous goods incidents	Occurance Report (following Section 9 8)	9 6 1 and 9 6 2
(f) Accident/ Incident information by Operator	Operators must provide information to the appropriate authority in the event of an aircraft accident		9 6 3
(g) Information at Cargo Acceptance areas	Legal requirement for Cargo Posters at cargo acceptance points		9 5 4
(h) Emergency Response information	Operator responsible to ensure own staff and staff agencies acting for operator are trained	BP-20	9 5.1.2
(i) Training			9 7
(j) Retention of records	Dangerous Goods documentation must be kept minimum three months Documentation required: Shipper's Declaration, Acceptance check list (when required), other transport documents		9 8



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4. LESSON GUIDE: CLASS 7

LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 10 — RADIOACTIVE MATERIAL (Class 7) Introduction Definition</p> <p>Review explanatory information</p>	<p>Explain that Appendix G is effective July 1, 2001 and hence, replaces Section 10</p> <p>Explain reasons for covering radioactive materials as a whole rather than together with the other dangerous goods (see Introduction to course)</p> <p>Describe what is meant by radioactivity and radioactive materials, types of radiation, penetrating power, etc</p>	<p>VA-28</p> <p>BP-17 and 18 VA-28-30 Samples/ pictures of package</p>	<p>10 3 1</p> <p>10 0 1</p>
<p>Applicability and Limitations</p> <p>(a) Forbidden Radioactive Materials, unless exempted</p> <p>(b) Packed with other items</p> <p>(c) Radioactive materials with other hazardous characteristics.</p> <p>(d) In Air Mail</p> <p>(e) Review shipper's responsibilities</p> <p>(f) State variations</p>	<p>Explosive radioactive material, pyrophoric radioactive liquids, vented Type B(M) packages, packages which require external cooling by an ancillary cooling system, packages subject to operational controls during transport</p> <p>Note pyrophoric solids may be carried under certain conditions, see Special Provision A79</p>	<p>10 2 1</p> <p>4 4</p> <p>10 5 5</p> <p>10 3 10</p>	<p>10 2 2</p> <p>1 3 2</p> <p>2 9</p>
<p>General Information Review units abbreviations, etc relating to radioactive material</p>	<p>Small quantities of radioactive materials are permitted in airmail.</p> <p>Note that State variations that are exclusively about Class 7 are marked with trefoil symbol</p> <p>SI units are now mandatory, i e Becquerel, Sievert</p> <p>Review conversion factors and prefixes for decimal multiples of units</p>	<p>App B2.2 3 and Tables B.3 A & B 3 B</p>	



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 10 — RADIOACTIVE MATERIAL <i>(cont'd)</i></p> <p>Classification</p> <ul style="list-style-type: none">(a) Nomenclature.(b) Review definitions of<ul style="list-style-type: none">— Activity— Radiation Level— Contamination— Low Specific Activity (LSA)— Surface Contaminated Object (SCO)— Fissile Material— Special Form(c) Proper shipping names(d) Special Provisions	<p>It is the shipper's responsibility to properly classify radioactive material</p> <p>Low Specific Activity. Surface Contaminated Object U-233, -235 and Pu-238, -239, -241.</p> <p>Specific radioactive material entries listed in the List of Dangerous Goods</p> <p>4 2 refers the reader to Subsection 10 5 for packing instructions and quantity limits.</p> <p>A78, A79, A98 and A130</p>		<p>10 3</p> <p>10 3 3</p> <p>Appendix A</p> <p>10 4 1</p> <p>4 4</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Section 10 — RADIOACTIVE MATERIAL (cont'd)</p> <p>Packing</p> <p>(a) Shipper's responsibility</p> <p>(b) Explanatory information on packing of radioactive materials</p> <p>(c) Important definitions</p> <ul style="list-style-type: none"> • A₁ and A₂, • Special Form, • Transport Index, • Contamination, • Radiation Level <p>(d) Risks</p> <p>(e) General Packing Requirements</p> <p>(f) Types of Packaging</p> <p>(g) Industrial Packages</p> <p>(h) Type A</p>	<p>Class 7 does not have packing instruction numbers as for other classes because the nature of radioactive materials classification, quantity limits and packaging methods do not lend themselves to that format</p> <p>Radiation control</p> <p>Excepted, Industrial, Type A, Type B(U) and Type B(M)</p> <p>Excepted, Industrial, Type A, Type B(U), Type B(M) and Type (C)</p> <p>Type 1, 2 and 3. Not normally shipped by air because of high weight low value ratio</p> <p>Activity limits.</p> <p>Design Requirements</p> <p>Activity limits Use of Table 10 4 A</p> <p>Mixture of radionuclides</p> <p>Design Requirements</p> <p>Approval Not required except for Special Form</p>	<p>DGTB1 7 11 1 Example 1</p> <p>DGTB1 7-1</p>	<p>10 5 1 10 5 2 1 Appendix A</p> <p>Appendix A 10 5 3 10 5 8 and 10 6 1 1 4 10 5 10</p> <p>10 6 1 1 5 10 6 1 1 6 10 6 1 1 7 10 6 1 1 8 10 6 1 1 9 10 5 12 and Table 10 4 A</p> <p>10 6 1 1 1 and 10 6 2 1</p>
<p>Exercise</p>			



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Packing (cont'd) (l) Type B — Activity limits — Design requirements: (U) unilateral approval – 10 5 13 3 (M) multilateral approval – 10 5 13 4 (i) Type C: — Activity limits — Design Requirements (k) Fissile Material (l) Special arrangement (m) Excepted package of Radioactive material — General restrictions. — Categorisation, Labelling, and Shipper's Declaration not required. Note applicable provisions — Other hazards — Material in Limited Quantity — Instruments and Manufactured Articles — Articles manufactured from Natural Uranium or Depleted Uranium — Empty Packagings — Calculating Activity limits/use of Table 10 5 A		DGTB1 7-2	10 5 13 10 5 13 1 and 10 6 1 1 2 10 5 13 2 and 10 6 2 2 10 5 14 10 5 14 1 10 6 1 1 3 10 6 2 3 10 5 14 2 10 5 15 10 6 2 4 10 5 19 10 5 9 10 5 9 1 10 5 9 2 10 5 9 3 10 5 9 4 10 5 9 5 10 5 9 6 10 5 9 7 10 5 9 8, Table 10 5 A
Exercises			

LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
<p>Packing (cont'd)</p> <p>Overpacks</p> <p>Categorisation of packages, overpacks and freight containers</p> <p>Criticality Safety Index</p> <p>Special Arrangement</p> <p>Approvals</p> <p>Inspection Requirements</p> <p>Package Testing Procedures</p> <p>Marking and Labelling</p> <p>Package use markings</p> <p>Package Specification markings</p>	<p>Note fissile material exception</p> <p>Depends on Transport Index and maximum radiation on external surface</p> <p>Package design</p> <p>Shipment</p> <p>Notification procedures</p> <p>— each shipment,</p> <p>— additional for first shipment</p> <p>Proper shipping name, UN Number, Name address of Shipper and Consignee, Permissible gross mass if exceeding 50 kg</p> <p>Excepted packages, only require gross mass if exceeding 50 kg</p> <p>Industrial Packages</p> <p>Type A packages</p> <p>Type B packages.</p> <p>Type C packages.</p> <p>Fissile materials</p> <p>Overpacks.</p>	<p>VA-29 and VA-30</p>	<p>10 5 6</p> <p>10 5 16 1 and Table 10 5 E</p> <p>10 5 16 2</p> <p>10 5 17</p> <p>10 6 2 2 13,</p> <p>10 6 2 3 7,</p> <p>10 10 3 2</p> <p>10 10 3 3</p> <p>10 10 3 4</p> <p>10 10 2 1</p> <p>10 10 2 2</p> <p>10 6 3</p> <p>10 7</p> <p>10 7 1 3 1</p> <p>10 7 1 3 2</p> <p>10 7.1 3 3</p> <p>10 7 1 3 4</p> <p>10 7 1 3 5</p> <p>10 7.1 3 6</p> <p>10 7 1 3 7</p> <p>10 7 1 4</p>



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LESSON GUIDE	EMPHASIS	TEACHING AIDS	DGR REFERENCE
Marking and Labelling (cont'd) Labelling	Shippers responsibility Quality and Specifications Primary risk. Subsidiary risk Categories I-White, II-Yellow and III-Yellow Contents and Activity Transport Index Criticality Safety Index. Overpacks Other requirements	all Cat II and III only DGTB1 7-4	10 7 2 10 7 2 1 10 7 2 2 10 7 3 1 10 7 3 2 10 7 7 1 to 10 7 7 4 10 7 3 3 1 and 10 7 3 3 2 10 7 3 3 3 10 7 3 3 4 10 7 3 4 10 7 4, 10 7 5 and 10 7 6
Exercises Documentation Shipper's Declaration requirements as applicable to radioactive materials Completion of Shipper's Declaration for Radioactive Shipment. Air Waybill completion Competent authority certificates Additional Shipment Preparation Radiation Protection and Quality Assurance Exercises	Use overhead projector to fill out Declaration Handling information. Excepted packages	DGTB1 7-4	10 8 10 8 1 10 8 2 and 10 8 3 10 8 7 10 8 7 1 and 10 8 7 2 10 8 7 3 10 8 6 10 10 10 11



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Handling Acceptance procedures		Hand-out H-11	9 1
Storage requirements Loading requirements			9 2 1 9 3 1 and 9 3 10
Separation requirements — from persons. — from undeveloped film — from Live Animals		See BP-19	9 3 10 6 and Tables 9 3 D and 9 3 E 9 3.10 7 and Table 9 3 F 9 3 14 2
Inspection requirements NOTOC requirements			9 4 3 9 5 1



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