6.0B CARRIER REQUIREMENTS – AIR
STUDENT WORKBOOK
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Module 6.0b: Carrier Requirements – Air

Introduction

Introduction
This module is based on Part 175 of 49CFR, and presents the DOT requirements for transporting hazardous materials by air. Topics include quantity limitations, packaging requirements, excepted materials, separation requirements, and notification to the Pilot-in-Command.

These training modules are for training purposes only, and should not be used as a hands-on guide to the daily work of hazardous materials transportation. The HMR, at the time of transportation, are your guide for the transportation of hazardous materials.

Objectives
1. Identify the DOT requirements for air transportation of hazardous materials, as set out in Subparts A, B, and C of Part 175.
2. Compare the uses of the guidelines found in Part 175 with those of the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transportation of Dangerous Goods by Air.
3. Distinguish between the responsibilities of the shipper and the air carrier.
4. State the notification guidelines for passengers, pilots and facilities.
5. Identify the exceptions to the Carrying of Hazmat in Cabins or on Flight Decks regulation.
6. Define cargo aircraft, passenger aircraft, forbidden and magnetic field.
7. Evaluate the packaging requirements for all air transportation.
8. Identify quantity limitations and exceptions, loading, and unloading and storage guidelines for air transportation.
9. Identify guidelines related to completing discrepancy and incident reports.

Part 175 - Carriage by Aircraft
This module discusses the requirements for carrying hazardous materials by air including both carrying hazardous materials as a passenger, and accepting and/or transporting hazardous materials in commerce: as an air carrier, in any aircraft in the US, and all aircraft registered in the US, anywhere in the world.

Part 175, Carriage by Aircraft, is divided into Subparts A, B, and C which details the requirements for air transportation in addition to those contained in Parts 171, 172, and 173 of the HMR, which were addressed in Modules 1 – 5.

In addition to Part 175, we will review packaging requirements unique to air preparation.
Subpart A
Subpart A contains the air carrier requirements for inspecting and accepting hazardous materials for air transportation, documentation, training, and reporting of discrepancies.

Subpart B
Subpart B addresses air carrier requirements regarding loading, unloading, and handling of hazardous materials, including quantity limitations, stowage compatibility, cargo location, and orientation of packages.

Subpart C
Subpart C contains special requirements for certain classes and commodities such as flammable liquids, poisons, radioactive materials and infectious substances.

All US and Foreign Carriers Must Comply with 49 CFR, Subchapter C
All US air carriers and foreign air carriers operating flights to or from US airports must comply with the 49 CFR requirements governing the acceptance, storage, loading, and transportation of hazardous materials by air.

These requirements are in Subchapter C of 49 CFR, Parts 171-180.

International Civil Aviation Organization Requirements
Instead of preparing shipments in accordance with 49 CFR, Parts 172 and 173, you may package, mark, label, classify, and describe shipments on shipping papers in accordance with the International Civil Aviation Organization’s Technical Instructions for the Safe Transport of Dangerous Goods by Air, also known as ICAO Technical Instructions (TI).

This facilitates both domestic and international transportation by air; however, as required by Subpart C of Part 171, shipments offered in accordance with the ICAO Technical Instructions must also conform to all applicable requirements of Subpart C, Part 175, and the conditions or requirements of a United States variation, when specified in the ICAO Technical Instructions.

Training Requirements

Training of HazMat Employees
An air carrier to whom the HMR apply may not transport a hazardous material by aircraft unless each of its hazmat employees involved in that transportation has been trained and tested as required in sections 175.20 and 172.700-704.

- Initial training is required within 90 days for new employees or employees who assume new hazmat responsibilities. Until they are trained, these employees may perform a hazardous materials employee function only under direct supervision.
- DOT requires that hazmat employees be retrained and tested at least once every three (3) years.
- However the FAA, under 14 CFR, requires training for air carrier employees every two (2) years.
- Both DOT and FAA require the employer to maintain training records.
Training Program Requirements in 49 CFR

Training must include general awareness/familiarization, function specific, safety training, security awareness, and in-depth security training (when an employer must develop and implement a security plan). A person may not perform a hazmat function unless they have been trained in that function or, for a new employee or one who changes job functions, they work under the direct supervision of someone who is trained.

If any regulatory requirement pertaining to a function the employee performs changes, the employee must receive training concerning that function immediately.

Training Program Requirements in 14 CFR: Will Carry/Will Not Carry

Training for US air carriers must also incorporate training requirements in 14 CFR, Parts 121 and 135. Under these regulations, air carriers may be defined as "will carry" or "will not carry."

Both “will carry” and “will not carry” operators are required to include certain information in their manuals regarding the handling of hazardous materials. Additional information must be provided in “will carry” manuals.

Shipper Carrier Responsibilities

Shipper & Air Carrier Responsibility

The air carrier relies on the shipper for compliance with the HMR based on the package markings and description on the shipping papers. Air carriers do not open packages or test contents of packages. The air carrier must verify that the shipper has prepared the packages and shipping documents properly. Section 175.30 lists specific items that a carrier must check before accepting hazardous material packages.

Shipper Responsibilities

In preparing a hazardous material for transportation by air, the shipper must:

- Classify the hazardous material
- Determine if the material is regulated as a hazardous material for air transportation, and the quantities that are authorized
- Properly describe the hazardous materials on the shipping documents, and provide two copies of the shipping documents
- Determine packaging requirements
- Package the material accordingly
- Mark and label the package to communicate the hazard of the material
- Determine placarding requirements, as necessary
Acceptance of Overpacks
If an overpack is used:

- The proper shipping name, ID number, labels, and any special handling markings on the inside packages must be clearly visible or be reproduced on the outside of the overpack.
- The overpack must display the word "OVERPACK."

Air Carrier Responsibilities
The air carrier must verify that the material, as described on the shipping papers, is authorized and is within the quantity limitations for passenger or cargo aircraft, respectively, as specified in the HMT. Additionally, the air carrier must verify the content and accuracy of the shipping papers by asking questions such as these:

- Is the material properly described on a shipping paper?
- When required, does the shipping paper contain emergency response information?
- Has the shipper certified that the shipment is in proper condition for transport by air?
- Are two copies of the shipping papers accompanying the shipment?

The air carrier must also determine whether the hazardous materials are correctly marked, labeled, and (when required) placarded. Package markings must correspond with the proper shipping name and ID number, as required, on the shipping documents. Hazardous materials permitted on cargo aircraft, but not on passenger aircraft, must be labeled with a “CARGO AIRCRAFT ONLY” label.

Packages must be in good condition for air transportation and the package integrity must not have been compromised, and is not leaking. Check that the seals on radioactive material packages have not been broken.

Refuse Improperly Prepared Packages
If an air carrier employee finds that the shipper has not prepared the package properly, the air carrier must refuse the package.

Air Passenger Facilities Notification
Air carriers that transport passengers must display signs warning passengers that the carriage of some hazardous materials aboard aircraft, in their luggage, or on their person is prohibited by Federal law. The signs must inform passengers of special exceptions that are permitted and penalties for failure to comply with the law.

Each notice must be legible and be prominently displayed so it can be seen by passengers in locations where the aircraft operator issues tickets, checks baggage, and maintains aircraft boarding areas.
Air Cargo Facilities Notification
At cargo facilities, a similar sign must be displayed informing shippers of the requirements applying to air shipments of hazardous materials, and the penalties for failure to comply with those requirements.

Exceptions to Prohibition

Exceptions to Prohibition Against Carrying Hazmat in Cabins or on Flight Decks
Hazardous materials may not be carried in the cabin of a passenger aircraft or on the flight deck of any aircraft, except as authorized in the HMR. The list of exceptions is quite long. For ease of comprehension, exceptions are grouped into five categories:

- Hazmat required for the safe operation of aircraft
- Hazmat intended for personal use of passengers and crew
- Hazmat intended for use in special aircraft operations
- Wheelchairs and other mobility and medical devices
- Miscellaneous hazmat exceptions

Hazmat Required for Safe Operation of Aircraft
Hazardous materials required for the safe operation of the aircraft include aviation fuel and oil in tanks required to operate the aircraft. Hazardous materials required on board an aircraft to make the aircraft airworthy include fire extinguishers, oxygen generators, escape chutes, and life rafts.

Replacement Equipment
Items of replacement containing or classified as hazardous materials must be transported in compliance with the HMR, including the offeror’s own company-owned materials (COMAT).

- When shipping its own COMAT, the operator may use alternate packaging that provides at least an equivalent level of protection to those required by 49 CFR.
- The company’s own aircraft batteries are not subject to the quantity limitations in sections 172.101 and 175.75.
- Oxygen or a hazardous material intended for the generation of oxygen for medical use by a passenger, is excepted, subject to the restrictions of section 175.8(b)(1).
- Dry ice for food and beverage service; alcohol, perfumes, and colognes carried for sale on the aircraft are also excepted.
- A serviceable tire in a tire assembly, not inflated to a gauge pressure that exceeds the maximum rated pressure for that tire, is also accepted.

Hazmat Intended for Personal Use of Passengers or Crews
Flight crew and passengers may carry hazardous materials intended for personal use. Non-radioactive medicinal and toilet articles (including aerosols) may be carried by flight crew and passengers in checked or carry-on baggage. Other aerosols for personal use in Division 2.2 with no subsidiary risk may only be carried in checked baggage only.
The aggregate quantity of these excepted hazardous materials carried by each person may not exceed 2 kg (70 ounces) by mass or 2 L (68 fluid ounces) by volume and the capacity of each container may not exceed 0.5 kg (18 ounces) by mass or 500 ml (17 fluid ounces) by volume.

Some personal smoking materials are excepted from the HMR, such as one packet safety matches or a lighter intended for use by the individual when carried on one’s person or in carry-on baggage only.

Portable electronic devices (e.g., watches, calculating machines, cameras, cellular phones, laptops and notebook computers, camcorders, medical devices, etc.,) containing dry cells or dry batteries (including lithium cells or batteries) and spare dry cells or batteries for these devices, when carried by passengers or crew members for personal use. Portable electronic devices powered by lithium batteries may be carried in either checked or carry-on baggage only and must be individually protected so as to prevent short circuits (e.g., by placement in original retail packaging, by otherwise insulating terminals by taping over exposed terminals, or placing each battery in a separate plastic bag or protective pouch).

In addition, each installed or spare lithium battery must not exceed the following:

- For a lithium metal battery, a lithium content of not more than 2 grams per battery.
- For a lithium ion battery, the Watt-hour (Wh.) rating must not exceed 100 Wh. With the approval of the operator, portable electronic devices may contain lithium ion batteries exceeding 100 Wh., but not exceeding 160 Wh. and no more than two individually protected lithium ion batteries each exceeding 100 Wh., but not exceeding 160 Wh., may be carried per person as spare batteries in carry-on baggage.

Additional Personal Use Materials
A crew member or passenger may carry small arms ammunition, for personal use only, in their checked baggage. The ammunition must be securely packed in fiber, wood or metal boxes, or containers specifically designed for that purpose.

Perfumes and colognes purchased through duty-free sales are permitted in carry-on baggage. Alcoholic beverages are permitted in carry-on or checked baggage subject to the quantity limited prescribed in section 175.10(a)(4).

Dry ice used to cool perishables may be carried in both checked and carry-on baggage with the approval of the operator. Quantities are limited to 2.5 kg (5.5 pounds). The packaging must permit the release of carbon dioxide gas. When in checked baggage, the package must be marked “DRY ICE” or “CARBON DIOXIDE, SOLID,” and marked with the net weight of dry ice.
**Hazmat Intended for Use in Specialized Air Operations**

Hazardous materials intended for use in special aircraft operations include:

- Hazardous materials loaded and carried for purposes of aerial seeding, dusting, spraying, fertilizing, crop improvement, or pest control
- Parachute activation devices, hazardous materials used during dedicated air ambulance, firefighting, or search and rescue operations
- Smoke grenades, flares, and pyrotechnics used during scheduled air shows
- A transport incubator unit or organ preservation unit
- Hazardous materials to be expended during flight for weather control, or environmental restoration and protection

**Wheelchairs and Other Mobility and Medical Devices**

In addition to oxygen and other hazardous materials used to generate oxygen for medical use by a passenger, other hazardous materials that might be carried to meet the medical and mobility needs of passengers or crew members include implanted medical devices, such as a heart pacemaker, and radio pharmaceuticals that have been injected or ingested, and battery-powered wheelchairs and other mobility devices.

**Hazardous Materials Intended for the Medical Needs of Passengers or Crew**

**Nonspillable Batteries**

Wheelchairs and other mobility devices may be accepted as checked baggage provided the battery:

- Meets the requirements of section 173.159a(d)
- Must be disconnected and the terminals insulated, unless the battery design provides effective means of preventing unintentional activation
- Must be securely attached to or removed from the wheelchair or mobility aid

**Spillable Batteries**

Wheelchairs or other battery-powered mobility aid devices equipped with a spillable battery are excepted when carried as checked baggage, provided visual inspection including removal of the battery, where necessary, reveals no obvious defects.

However, removal of the battery from the housing should be performed by qualified airline personnel only. The battery must be disconnected and terminals insulated to prevent short circuits, and the pilot in command must be advised, either orally or in writing, prior to departure, as to the location of the battery aboard the aircraft.

The wheelchair or mobility device is also excepted when it is loaded, stowed, secured, and unloaded in an upright position, or the battery is removed, and carried in a strong rigid packaging under the conditions of section 175.10(a)(16).

**Lithium Ion Batteries**

A wheelchair or other mobility aid equipped with a lithium ion battery, when carried as checked baggage, is accepted provided the battery meets the requirements of section 175.10(a)(17).
**Miscellaneous Hazmat Exceptions**

Miscellaneous hazardous materials (hazmat) exceptions include: a small medical or clinical mercury thermometer for personal use when carried in a protective case or checked baggage; and a weather agency mercury barometer carried as carry-on baggage, provided the individual advises the operator of the presence of the barometer or thermometer in the baggage. The barometer or thermometer must be packaged in accordance with section 175.10(a)(13).

**HazMat Packing**

It is important that all parties involved in the handling of hazardous materials use a common set of terms and definitions. Shown in the table below are the definitions for four of those terms. The term “passenger aircraft” and “cargo aircraft” will be used throughout the remainder of this module.

<table>
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<th>Definition of Terms</th>
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<td><strong>Passenger Aircraft</strong></td>
</tr>
<tr>
<td><strong>Cargo Aircraft</strong></td>
</tr>
<tr>
<td><strong>Forbidden</strong></td>
</tr>
<tr>
<td><strong>Magnetic Field</strong></td>
</tr>
</tbody>
</table>

**Quantities Limitations on Aircraft**

Column 9 of the Hazardous Materials Table titled, “Quantity Limitations,” forbids or limits the quantity of hazardous materials in one package that may be offered or transported by aircraft. Unless otherwise specified, the quantity limits are net quantity limits. That is, the total weight of the hazardous material, not including the tare weight of the package. For liquids, the quantity limits refer to net volume.
Hazardous Materials Packaging
Packages offered or intended for air transportation must comply with the general packaging requirements in section 173.24, 173.24(a), and 173.27. Unless otherwise noted, each packaging used for the shipment of hazardous materials must be designed, constructed, and maintained to prevent the release of the hazardous materials.

Proper packaging is critical to the safe transportation of hazardous materials, especially in air transportation where the hazardous materials are subjected to changes in temperature, altitude, and pressure.

Class 4, 5, and 8 Materials
Packages containing Packing Group III materials of Division 4.1, 4.2, 4.3, or 5.1 materials, or Class 8 materials, must meet performance tests at the Packing Group II level, even though Column 5 of the HMT shows that the materials are in Packing Group III.

Prevent Leakage
Packagings must be designed and constructed to prevent leakage that may be caused by internal pressure changes in altitude and temperature during air transportation.
Prevent Leakage/Packaging for Liquids
The HMR recognize two different methods of ascertaining the suitability of packagings for the transportation of liquid hazardous materials. The packaging must withstand the greater of these vapor pressure measurements:

- The total gauge pressure measured in the receptacle at 55°C (131°F) multiplied by a safety factor of 1.5 determined on a basis of a filling temperature of 15°C (59°F) and a degree of filling such that the temperature is 55°C (131°F) or less
- 1.75 times the vapor pressure at 50°C or (122°F) less 100 kPa (15 psig)
- 1.5 times the vapor pressure at 55°C (131°F) less 100 kPa (15 psig)

Internal pressure that produces a gauge pressure of not less than 75 kPa or 11 psig for liquids in Packing Group III of Class 3 or Division 6.1, or 95 kPa or 14 psig for other liquids

Prevent Leakage/Pressure Test Requirements
Packagings subject to the hydrostatic pressure test and marking requirements must have a marked test pressure of not less than 250 kPa (36 psig) for liquids in Packing Group I, 80 kPa (12 psig) for liquids in Packing Group III of Class 3 or Division 6.1, and 100 kPa (15 psig) for other liquids.

However, the inner packaging of a combination packaging need not meet the pressure requirements, if it is packed inside a supplementary packaging that meets the pressure requirements and other applicable requirements of the HMR.

Packages Must Be Securely Closed
Packages must be securely closed. Friction-type closures, such as stoppers and corks, must be held securely in place by positive means. Screw-type closures must be secured to prevent loosening from vibration or substantial changes in temperature or pressure.

For a package to be offered in accordance with the HMR, and for a UN certification to remain valid, you must close the package by the same method of closure used during testing. To assure proper closure you must obtain closure instructions from the packaging manufacturer and close the packing as specified therein.

Venting of Packages by Air
Unless otherwise notes, venting packages to reduce internal pressure is not permitted when packages are being transported by air.
Absorbent Materials
Combination packages of liquids in Packing Group I of Class 3, 4, 5, 6.1, and 8 require absorbent materials when the inner container is made of glass, earthenware, plastic, or metal. The absorbent material must be such that it does not react dangerously with the liquid. When a liquid hazardous material in Packing Group I is being transported on a passenger aircraft, and the regulations require absorbent material, there must be sufficient material to absorb the contents of all inner packagings containing such liquids.

Combination Packagings Regulations: Absorbents/PGI Cargo Aircraft – PGII Passenger Aircraft
For packaging Group I liquids being offered for transportation on a Cargo Aircraft Only and Packing Group II liquids offered for passenger aircraft, there must be enough absorbent material in the package to absorb the contents of one of the inner packagings. If the inner packagings are different sizes, there must be enough material to absorb the contents of the packing with the greatest quantity of liquid.

<table>
<thead>
<tr>
<th>Table 1—Maximum Net Capacity of Inner Packaging for Transportation on Passenger-Carrying Aircraft</th>
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<tbody>
<tr>
<td>Maximum net quantity per package from Column 9a of the §172.101 table</td>
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<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Liquids:</td>
</tr>
<tr>
<td>Not greater than 0.5L</td>
</tr>
<tr>
<td>Greater than 0.5L, not greater than 1L</td>
</tr>
<tr>
<td>Greater than 1L, not greater than 5L</td>
</tr>
<tr>
<td>Greater than 5L, not greater than 60L</td>
</tr>
<tr>
<td>Greater than 60L, not greater than 220L</td>
</tr>
<tr>
<td>Greater than 220L</td>
</tr>
<tr>
<td>Solids:</td>
</tr>
<tr>
<td>Not greater than 5 kg</td>
</tr>
<tr>
<td>Greater than 5 kg, not greater than 25 kg</td>
</tr>
<tr>
<td>Greater than 25 kg, not greater than 200 kg</td>
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<tr>
<td>Greater than 200 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2—Maximum Net Capacity of Inner Packaging for Transportation on Cargo Aircraft</th>
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</thead>
<tbody>
<tr>
<td>Maximum net quantity per package from Column 9b of the §172.101 table</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Liquids:</td>
</tr>
<tr>
<td>Not greater than 2.5L</td>
</tr>
<tr>
<td>Greater than 2.5L, not greater than 30L</td>
</tr>
<tr>
<td>Greater than 30L, not greater than 60L</td>
</tr>
<tr>
<td>Greater than 60L, not greater than 220L</td>
</tr>
<tr>
<td>Greater than 220L</td>
</tr>
<tr>
<td>Solids:</td>
</tr>
<tr>
<td>Not greater than 15 kg</td>
</tr>
<tr>
<td>Greater than 15 kg, not greater than 50 kg</td>
</tr>
<tr>
<td>Greater than 50 kg, not greater than 200 kg</td>
</tr>
<tr>
<td>Greater than 200 kg</td>
</tr>
</tbody>
</table>
Hazardous Materials Packagings: Quantity Limitations – Combination Packaging

When combination packagings are being offered for air transport, the inner packaging must conform to the quantity limits set forth in section 173.27(f), Table 1 and 2. Table 1 indicated quantities permitted in inner packagings for passenger aircraft. Table 2 indicated quantities permitted in inner packagings for cargo aircraft.

Hazardous Materials Packaging: Cargo Tanks & Tank Cars

You must not transport tank cars and cargo tanks containing hazardous materials aboard aircraft.

Hazardous Materials Packaging: Cargo Aircraft Only Packages

Hazardous materials shipped by air and authorized for cargo aircraft only must have the “CARGO AIRCRAFT ONLY” label affixed to the package, in addition to the hazard class label. The label warns those who handle the shipment that it may not be transported on a passenger aircraft.

Quantity Limitations

Aircraft Quantity Limitations and Cargo Locations

In addition to the quantity limitations in the HMT, some quantity limitations depend on cargo locations.

**Passenger Aircraft**

A net weight of not more than 25 kg or 55 pounds of hazardous material may be carried in an inaccessible cargo compartment, or in a freight container within an accessible cargo compartment. Additionally, a net weight of not more than 75 kg or 165 pounds of a Division 2.2 (non-flammable compressed gas) may be carried on a passenger-carrying aircraft, for a grand total not to exceed 100 kg.

**Cargo Aircraft**

On a cargo aircraft, the quantity limits apply to inaccessible cargo compartments, and to accessible cargo compartments when the materials are not loaded in a freight container, but are loaded in a manner that makes them inaccessible.

- Class 3, PG III (unless the substance is also labeled CORROSIVE)
- Class 6 [unless the substance is also labeled FLAMMABLE LIQUID (PG II and III only)]
- Division 6.2 Class 7 (unless the hazardous material meets the definition of another hazard class)
- Class 9 and those marked as Limited Quantity or Excepted Quantity are excepted from these limitations
### Activity: Think It Through

For each scenario below, identify if the hazardous material is able to be shipped via air transportation. Mark the appropriate column to indicate your answer: yes or no.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A passenger aircraft is carrying 35 kg of anhydrous ammonia in a freight container within an accessible cargo compartment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. A passenger aircraft is carrying 150 lbs. of a Class 2 non-flammable compressed gas in an inaccessible cargo compartment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. A cargo aircraft is carrying 47 lbs. of bromobenzene in an approved container within an accessible cargo compartment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Answers:** 1. no, 2. yes, 3. yes

### Loading Hazardous Materials – Passenger Aircraft

On a passenger aircraft, hazardous materials may be carried in a main deck cargo compartment provided that the compartment is inaccessible to passengers and that it meets all certification requirements for Class B compartment or Class C compartment (14 CFR 25.857).

### Loading Hazardous Materials – Accessible and Inaccessible Loading

“Accessible” means that each package is loaded where a crew member or other authorized person can access, handle, and, when size and weight permit, separate such packages from other cargo during flight, including a freight container in an accessible cargo compartment. A package is considered accessible when transported on a cargo-only aircraft if it is:

- In a cargo compartment certified by FAA as a Class C aircraft cargo compartment
- In an FAA-certified freight container that has an approved fire or smoke detection system and fire suppression system in accordance with certified requirements

“Inaccessible” means all other configurations to include packages loaded where a crew member or other authorized person cannot access, handle, and when size and weight permit, separate such packages from other cargo during flight, including a freight container in an accessible cargo compartment.

### Quantity Limitation Exceptions

When packages in the hazard classes or divisions listed below are carried on cargo aircraft, they may be carried in a location inaccessible to a crew member during flight and are not subject to the quantity limitation specified in section 175.75.

- Class 7 (radioactive) materials
- Division 6.1 (poisonous/toxic) materials (unless the substance is also labeled for any hazard class or division except “FLAMMABLE LIQUID”)
- Division 6.2 materials (etiologic or infectious substances)
- Class 3, PG III (unless the substance is also labeled “CORROSIVE”)
- Class 9 (miscellaneous) materials
- Limited Quantities and Excepted Quantities

**Air Transport - Only Available Means**

Only when other means of transportation are impracticable or not available, packages of hazardous materials may be carried aboard cargo aircraft in accordance with procedures approved in writing by the FAA Regional or Field Security Office in the region where the operator is located.

**Small Single Pilot Cargo Aircraft**

When packages of hazardous materials are carried on small, single pilot cargo aircraft, they are excepted from the quantity limitations specified in section 175.75, provided that:

- The aircraft carries only the pilot, an FAA Inspector, the shipper or consignee of the material or a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material.
- The pilot is provided with written instructions on the characteristics and proper handling of the materials.
- Whenever a change of pilots occurs while the material is on board, the new pilot is briefed under a hand-to-hand signature service provided by the operator of the aircraft.

**Radioactive Materials**

Radioactive materials are limited to 3.0 Transport Index (TI) per package or a total of 50.0 TI per passenger aircraft. The limits are 10.0 TI per package, with a maximum of 200.00 TI per cargo aircraft.

**Packages with Orientation Arrows**

Hazmat packages marked with “THIS SIDE UP” or “THIS END UP” or arrows to indicate the proper orientation of the package must be stored and loaded in accordance with the markings. A package without orientation markings containing a liquid hazardous material must be stored and loaded with the top closure facing upward.

**Movement Restricted**

Packages containing hazardous materials must be secured in an aircraft so that movement or damage of the package in flight is prevented.

Packages containing Class 7 (radioactive) materials must be secured in a manner that ensures that the separation requirements of sections 175.701 and 175.702 will be maintained at all times during flight.
**Stowage Compatibility**

Incompatible hazardous material may not be placed next to each other or in a position that might lead to a dangerous interaction in the event of leakage. The Stowage Compatibility Table is located in section 175.78. The numbers across the top of the table and the numbers along the left hand side of the table represent hazard classes.

An “X” at the intersection of a row and a column means that these materials may react dangerously with each other and may not be placed next to or in contact with each other in storage, on board the aircraft, or in a position that would allow interaction in the event of leakage of contents.

![Stowage Compatibility Table](image)

**Discrepancy/Incident Reports**

**Pilot Notification**

Before an aircraft departs, the pilot-in-command must be given written notification describing all hazardous materials that have been loaded. This does not apply to the exceptions listed in section 175.10. The operator of the aircraft must provide the pilot-in-command with accurate and legible written information as early as practicable before the departure of the aircraft.

The written information must specify at least the following:

- Proper shipping name, hazard class and identification number (including any hazardous materials remaining aboard from previous stops)
- Total number of packages
- Location of packages aboard the aircraft
- Confirmation that no damaged or leaking packages have been loaded aboard the aircraft
- For Class 7 (radioactive) materials, the number of packaged overpacks or freight containers, their category, transport index (if applicable), and their location aboard the aircraft
- Date of the flight
- Telephone number of a person not aboard the aircraft from whom the information contained in the notification of pilot-in-command can be obtained

**NOTE:** Refer to section 175.78 for specific requirements regarding the stowage compatibility of cargo.
• Confirmation that the package must be carried only on cargo aircraft if its transportation aboard passenger-carrying aircraft is forbidden
• For UN1845 Carbon Dioxide, solid (dry ice), only UN number, proper shipping name, hazard class, total quantity in each hold aboard the aircraft, and the airport at which the package(s) is to be unloaded must be provided.

The notification to pilot-in-command must be readily available to the pilot during flight as it contains information that would be critical in case of a spill.

**Reporting Discrepancies**
In addition to acceptance requirements, 49 CFR, Part 175, Subpart A contains requirements for reporting hazardous materials discrepancies. Discrepancies are situations where hazardous materials are improperly described, certified, labeled, marked, or packaged in a manner that is not known at the time the air carrier accepts the shipment.

If you discover a discrepancy after the shipment has been accepted, notify the nearest FAA Regional or Field Security Office by phone or electronically as soon as practicable.

**List of Discrepancies**
Discrepancies are situations where hazardous materials are improperly described, certified, labeled, marked, or packaged in a manner not ascertainable when accepted under the provisions of section 175.30(a), including packages or bags that are found to contain hazardous materials subsequent to their being offered and accepted as other-than-hazardous materials.

• Packages that exceed the authorized quantity limitations for air transportation
• Hazardous materials not described or certified as such on shipping papers
• Unauthorized inside containers or improper closures
• Inside containers not oriented as shown on package
• Insufficient/improper absorbent material (when required)
• Undeclared/hidden shipments of hazardous materials

**Reportable Incidents**
Despite all safety efforts, incidents do occur. When hazardous materials are involved in certain transportation incidents, a report is required as soon as practical, but no later than 12 hours after the incident occurs. For these types of incidents, you must notify the National Response Center (NRC).

You must also file a written Hazardous Materials Incident Report, Form DOT F 5800.1, within 30 days of discovering any unintentional release of hazardous materials or unintentional discharge of hazardous waste, as well as under certain other conditions (see the guidelines in section 171.16). Unless a requirement listed in section 171.15 applies, you do not need to notify the NRC by phone.
Radioactive/Infectious Substances
You must notify the NRC as soon as practical in the event of fire, breakage, spillage, or suspected radioactive contamination from a radioactive material. You must also notify the offeror in such a case as soon as practical.

You must notify the NRC or CDC as soon as practical in the event of fire, breakage, spillage, or suspected contamination involving an infectious substance other than a diagnostic specimen or regulated medical waste.

Other Incidents
Hazmat incidents that result in any of the following require notification as soon as possible to the National Response Center (NRC) or the Center for Disease Control (CDC):

- Death or injury requiring hospitalization
- Change in operational flight pattern or the routine of an aircraft
- Shutdown of a major facility or transportation artery for more than one hour
- Evacuation of the general public that lasts more than one hour
- Release of marine pollutant in the quantity identified
- Any situation that, in your judgment, requires notification, even if none of the above conditions are met (for example – a continuing danger to life, although no death has yet occurred).

Summary
You have completed all the material for Module 6.0b. You should be able to:

- Identify the DOT requirements for air transportation of hazardous materials as set out in Subparts A, B, and C of Part 175
- Compare the uses of the guidelines found in Part 175 with those of the International Civil Aviation Organization's (ICAO’s) Technical Instructions for the Safe Transport of Dangerous Goods by Air
- Distinguish between the responsibilities of the shipper and the air carrier
- State the notification guidelines for passengers, pilots and facilities
- Identify the exceptions to Carrying of Hazmat in Cabins or on Flight Decks regulations
- Define cargo aircraft, passenger aircraft, forbidden, and magnetic field
- Evaluate the packaging requirements for air transportation
- Identify quantity limitations and exceptions, loading and unloading, and storage guidelines for air transportation
- Identify guidelines related to completing a discrepancy report
References