



# Guidance for Safe Transport of Cargo in Passenger Cabin

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# 1. Introduction and scope

Following the disruption caused by COVID 19, various operators have approached IATA seeking guidance on how to safely transport cargo and/or mail in the passenger cabin.

Passenger aircraft are not certified to carry cargo on passenger seats or cargo unit load devices (pallets or containers) in the passenger cabin secured on the seat's tracks. However, some operators are evaluating the reconfiguration of passenger aircraft by loading cargo in the passenger seats or by removal of the passenger seats to increase the volume available for the carriage of cargo and/or mail. Any reconfiguration of an aircraft in this manner requires full evaluation of cargo restraints connected directly to the seat tracks to ensure structural loads are within design limits and the appropriate restraint system is applied. Reconfiguration of the aircraft also requires a formal authorisation from the national aviation authority of the State of the operator.

Before considering transporting cargo in the passenger cabin a comprehensive safety risk assessment shall be performed involving all the affected operational departments (i.e. ground, cargo, cabin, flight).

**This guidance will be updated as required as further information becomes available**

## 2. Objective

The purpose of this guidance is to provide the means for operators to ensure an acceptable level of safety is maintained at all times for the transport of cargo in the passenger cabin. The provides information on the considerations for a safety risk assessment and provides recommendations on how cargo and mail could be transported safely in the passenger cabin, without removing the existing passenger seats.

## 3. General Recommendations and Safety Risk Assessment

### 3.1 General recommendations

It is of the utmost importance that operators are familiar with cargo transport before even considering such an operation.

Typically, operators shall:

- a. Perform a detailed safety risk assessment to identify hazards, evaluate and mitigate correlated risks. Some examples of possible risks include, but are not limited to, the following:
  - i. Operator general knowledge of cargo transport;
  - ii. The detection of any smoke or fire and firefighting capabilities of personnel in the cabin;
  - iii. Qualification and abilities of crew member or other personnel to control and put out fire in cabin;
  - iv. The provision, location and storage of sufficient firefighting equipment such as portable breathing equipment, fire extinguishers etc. for use by personnel carried in the cabin;
  - v. EDTO operations
  - vi. Misdeclared / undeclared or hidden dangerous goods
  - vii. Unrestricted access to all cargo shipments
  - viii. Cargo leakage / spillage
  - ix. Unsecured / incorrectly loaded cargo
  - x. Incorrect loading and unloading sequence
  - xi. Operational weight and balance limits exceedance
  - xii. Qualification of ground staff to prepare and load cargo in accordance with applicable regulations and instructions
  - xiii. Occupational Health and Safety (OHS) risks associated with the new procedures.
- b. Use crew members to survey and access all areas of the cabin during all phases of flight. This is to address any possible risk of fire, leakages or other unforeseen circumstances that might occur in the cabin.
- c. Use load master or other appropriately trained personnel to coordinate all loading/unloading operations as well as cargo surveillance during the flight.



### 3.2 Safety Risk Assessment

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk				
					Probability	Severity	Rating				Probability	Severity	Rating		
<b>Cargo Hold Space</b>															
1	Inappropriate handling and carriage of dangerous goods	Uncontained fire, corrosive material leaks	Hull loss	Approval issued by NAA for the carriage of dangerous goods as cargo  Documented SOPs  Approved training program  Follow requirements in IATA DGR (acceptance checks)			Tolerable (with mitigation)								

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk		
					Probability	Severity	Rating				Probability	Severity	Rating
2	Undeclared / misdeclared or hidden DG (including high energy items)	Fire in cargo hold	Hull loss	<p>Documented SOPs</p> <p>Approved training program</p> <p>Follow requirements in IATA DGR at cargo acceptance to check for signs of undeclared DG</p> <p>Shipments carried in class "C" compartment with appropriate fire detection and suppression systems</p>			Tolerable (with mitigation)						
3	Movement of unsecured / misloaded cargo	Weight shift	Hull loss	<p>Cargo loading / fastening recommendations from Manufacturers</p> <p>Weight and Balance and loading SOPs</p> <p>Training of loading personnel</p>			Tolerable (with mitigation)						

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk		
					Probability	Severity	Rating				Probability	Severity	Rating
<b>Pax Cabin - General</b>													
4	Structural Failure of floor/ seats/ bulkheads	Excessive weight	Major equipment damage	Manufacturer recommendations			Tolerable (with mitigation)	Follow weight and balance and loading SOPs and procedures				Tolerable (with mitigation)	
5	Undeclared / misdeclared or hidden DG (including high energy items) being carried in "Class A" cabins	Uncontained cabin fire  Corrosive material or liquid leakage comprising aircraft systems	Hull Loss	Cabin declared class "A" cargo only  BCF fire extinguishers			Intolerable	100% verification of contents of cargo to be loaded in the cabin  Follow requirements in IATA DGR at cargo acceptance to check for signs of undeclared DG  Prohibit carriage of DG in the cabin  Documented SOPs assuring compliance with State and Manufacturer requirements				Tolerable (with mitigation)	
6	Collapse of load containing liquid	Liquid leakage compromising aircraft systems	Hull Loss				Intolerable	Prohibit loading of liquids in the cabin				Tolerable (with mitigation)	
7	Removal of pax seats to accommodate cargo	Incorrect weight and balance for AC configuration  Exceedance of linear, superficial, cumulative, and combined load limitations	Hull loss				Intolerable	EASA Supplemental Type Certificate (STC) or FAA Type Certificate holder approved service bulletin required  Develop new weight and balance procedures to ensure correct				Tolerable (with mitigation)	

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk			
					Probability	Severity	Rating				Probability	Severity	Rating	
								loading of AC as per Manufacturer  Training for new weight and balance loading						
8	Movement of unconstrained / misconstrained cargo in cabin beyond the structural capability of floor and bulkheads	Cargo shift / loss of control due to CG outside of certified weight and balance limits	Hull loss	Cabin Cargo loading / fastening recommendations from Manufacturers  Weight and Balance and loading SOPs and Procedures			Intolerable	Load master (or equivalent) oversee the loading and unloading of cargo in the cabin  Awareness / training for Cabin Crew use of fastening restraints						Tolerable (with mitigation)

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk		
					Probability	Severity	Rating				Probability	Severity	Rating
<b>Pax Cabin - Operational</b>													
9	Untrained personnel operating pax cabin doors	Inadvertent slide deployment	Injury to persons outside aircraft - fatality  Cost				Intolerable	Use trained personnel				Acceptable	
10	Overheating of cabin systems adjacent to cargo	Uncontained cabin fire	Hull Loss				Intolerable	Turn off entertainment systems, seat power systems, unused galley systems and any other heat generating systems that are not required for the operation of the aircraft				Tolerable (with mitigation)	



No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk		
					Probability	Severity	Rating				Probability	Severity	Rating
11	Undetected smoke or fire in cabin	Uncontained cabin fire	Hull Loss	lavatory smoke detector			Intolerable	<p>Cabin crew to carry out enhanced fire watch and fire-fighting procedures as necessary (number of crew shall be appropriate to size of aircraft and duration of flight)</p> <p>Limit loading of cargo to ensure visibility, identification and access of smoke/fire source</p> <p>Cabin cargo loading procedures to ensure fire breaks within the cabin</p> <p>If using other personnel, they shall be trained on all cabin fire watch / fighting activities (communication, equipment, procedures, etc.)</p>					Tolerable (with mitigation)

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk			
					Probability	Severity	Rating				Probability	Severity	Rating	
12	Cabin floor collapse into belly during depressurization	Structural integrity of aircraft compromised	Hull Loss				Intolerable	Cabin cargo loading procedures to ensure depressurization panels unobstructed as per manufacturer  Load master (or equivalent) oversee the loading and unloading of cargo in the cabin						Tolerable (with mitigation)

No.	Event	Hazard	Consequence <i>(worst case scenario)</i>	Existing Controls	Risk			Mitigation Action	Ownership	New Controls	Risk		
					Probability	Severity	Rating				Probability	Severity	Rating
<b>Return to Service</b>													
13	Damaged cabin fixtures and fittings	MEL non-compliance	Reduced airworthiness of Pax cabin				Intolerable	Thorough check of all cabin systems, equipment and fittings by Maintenance prior to return-to-pax - service				Tolerable (with mitigation)	
<b>OSH</b>													
14	Employee Injury	Fall from heights, trips, slips, falls and manual lifting	Fatality				Intolerable	PPE, appropriate training, SOPs to prevent fall from heights, trips, slips, falls and manual lifting, use of appropriate GSE				Tolerable (with mitigation)	

## 4. Regulatory requirements

### 4.1 General

Aviation regulations and aircraft manufacturers' permit operators to load verified cargo and mail in the cabin of passenger aircraft subject to defined conditions and, where necessary specific regulatory authorisation,

When cargo is loaded into the passenger cabin, the cargo shall not include any dangerous goods or live animals. For the purposes of this guidance document, the passenger cabin should be considered as a Class A cargo compartment. As such the operator shall ensure that sufficient cabin crew or other qualified personnel are on board to monitor the cabin throughout the duration of the flight for any indication of smoke or fire and when necessary to alert the flight crew and use the available firefighting equipment to fight the fire.

#### 4.1.1 Approved Loading Locations

Verified cargo and mail may be carried in approved stowage locations within the passenger compartment. These locations include overhead stowage bins, closets, floor mounted stowage, and under seat stowage areas.

In these cases, the following limitations typically apply:

- a. Stowage maximum capacity shall not be exceeded;
- b. The mass of cargo shall not exceed the structural loading limits of the floor or seats; detailed information on allowances should be available in the manufacturer Weight and Balance manual;
- c. The number/type of restraint devices and their attachment points shall be capable of restraining the cargo in accordance with applicable certification specifications;
- d. If the cargo is stored under the seats, then the seat shall be equipped with a restraint bar system and the cargo placed fully underneath the seat. The mass of each piece of cargo shall not exceed 9 kg (20 lb);
- e. Items shall not be stowed in lavatories or against bulkheads that are incapable of restraining articles against movement forward, sideways, or upwards and unless the bulkheads carry a placard specifying the maximum capacity;
- f. Cargo shall not be placed where it can impede access to emergency equipment or hinder egress in case of an emergency evacuation;
- g. Cargo placed in enclosed stowage areas shall not be of such size that they prevent latched doors from being closed securely;
- h. Checks should be made before take-off, before landing and whenever the fasten seat belts signs are illuminated as well as under orders of pilot in command to ensure that cargo is properly stowed.

#### 4.1.2 Non-approved Loading Locations

For carriage of cargo in other than approved locations as described in 4.1.1 above. If the operator wishes to load **cargo on the passenger seats**, the operator **shall obtain prior authorisation from their national aviation authority**. In addition, as applicable, also a supplemental Type Certificate (STC) from the manufacturer may be required.

Typically, the following additional limitations apply:

- a. Mass of cargo loaded on the seats shall not exceed seat limitation (refer to Aircraft Weight and Balance Manual);
- b. Cargo shall be adequately restrained, the number/type of restraint devices and their attachment points shall be capable of restraining the cargo in accordance with applicable certification specifications;
- c. The centre of gravity (CG) of the cargo is equal to or lower than the passenger CG shown in the envelope drawing of the seats in use as reported in the manufacturer weight and balance manual or similar documents;
- d. Cargo load shall be appropriately accounted for in the weight and balance system and any aircraft operational limit is respected;
- e. The load should be evenly distributed across the seat row. The loading on each seat should not exceed 77 kg (170 lbs).

## 4.2 Regulatory references

Some regulatory references associated with carriage of cargo in passenger seats can be found below. Further requirements may be applicable as per local regulation

**FAA - 14 CFR 121.285**

EASA: CAT.OP.MPA.160 Stowage of baggage and cargo

[Regulation \(EU\) No 965/2012](#)

AMC1 CAT.OP.MPA.160 Stowage of baggage and cargo

AMC2 CAT.OP.MPA.160 Stowage of baggage and cargo

[ED Decision 2014/015/R](#)

*Note: EASA Certification Memorandum [CM-CS-003 Issue 01 Installation of "Cargo Seat Bags" on Passenger Seats](#) provides information on carrying cargo on passenger seats. EASA does not permit CSB on passenger seats, unless the carrier obtains EASA-approved special conditions*

CAAC: [Part 121.285](#)

## 4.3 Other references

Boeing: MOM-20-0239-02B Multi Operator Message dated 20 Mar 2020

Airbus: FOT Cargo transportation in the cabin - REF.: 999.0028/20 Rev 00 dated 30-MAR-2020

IOSA Standard Manual Section Ground Handling Operations (GRH) GRH 3.4.12 and CAB 3.2.3.

## 5. Recommended Operational Procedures

### 5.1 Cargo Preparation

The type of cargo or mail which is accepted to be loaded in the passenger cabin should be carefully considered. All "special cargo" being accepted will need to follow the appropriate regulation.

Additional considerations include:

- a) Special Cargo: e.g. medical supplies might contain items such as mercury thermometer and/or alcohol-based sanitizer, which are classified as dangerous goods.
- b) Size and weight of the packages and their ability to be loaded into the available bins, bags or alternative methods. This will also include the weight distribution throughout the aircraft in accordance with the load master's instructions.
- c) Centre of Gravity (CG) of the cargo to ensure that it can be loaded equal to or lower than the CG of the passenger seat.
- d) Availability of loading, unloading, shoring, load spreading and restraint equipment
- e) Packages should be free of sharp edges as they will be manually loaded
- f) **Wet cargo should not be loaded in the passenger cabin**

### 5.2 Loading Instruction Report (LIR), Weight & Balance and Documentation

#### 5.2.1 Weight and Balance System

Most of the weight and balance systems (DCS) are set to calculate the load in the passenger cabin.

If the system is programmed to accommodate the passenger weights only; it is recommended to contact the DCS administrator to investigate appropriate solutions to adjust the system for cargo. However, in most of the cases, the systems make provision for allocating "extra" weight in each cabin section (e.g. 0a, 0b etc.) as needed.

In general, it is recommended for DCS systems to set parameters for weight allocation for each row to reduce CG error in final calculation.

#### 5.2.2 LIR

LIR forms typically do not include the passenger cabin section. It is therefore recommended to detail all information for this section in the "special instructions" box.

In the load planning it shall be considered that the cabin depressurization relief vents shall remain unobstructed.

The LIR shall report detailed instruction on the load quantity per cabin section and the loading / unloading sequence.

### 5.2.3 Load Control

The load controller shall account for the weight limits and distribution of cargo on passenger seats respecting all structural and weight distribution as usual. The final load sheet shall be verified further to ensure the operational limits are respected.

### 5.2.4 Documentation

In addition to the load sheet it is also recommended to provide the details of the cargo (cargo manifest) loaded in the cabin to the pilot in command.

## 5.3 Loading and Unloading of Aircraft

Typically, equipment designed to access aircraft passenger cabin doors is not meant to be used for loading cargo. Nevertheless, all possible measures shall be in place to prevent injury to personnel and damage to aircraft.

The recommended equipment is:

- a. Elevating Equipment
- b. Passenger Stairs

Elevating equipment, which is typically used for boarding and loading either PRM and/or catering, can be also used for loading cargo safely through the passenger door.

When using passenger stairs to load cargo into the cabin, appropriate consideration shall be made according to the size and weight of each package to be loaded

It is recommended to distribute loading personnel at different positions on the stairs and proceed to load the shipments by moving the packages from the ramp upwards; passing the packages from one person to the next. This recommendation is intended to mitigate the risk of slips, trips and falls.

When possible (e.g. more than 2 access doors), more than one piece of equipment can be used simultaneously.



**Danger:**

The use of belt loaders is **NOT** recommended due to the high risk of personnel falling from the open door(s).

## 5.4 Loading and Restraint of Cargo and/or Mail in the Cabin

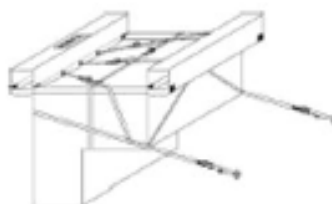
Where an operator has received a **specific approval from their national aviation authority** to load cargo and/or mail on passenger seats they should be loaded using appropriate restraint systems to ensure compliance with all applicable regulatory requirements.

- a. Recommend covering all seats with a protective material;
- b. The number/type of restraint devices and their attachment points should be capable of restraining the cargo in accordance with applicable certification specifications;
- c. Keep the cabin depressurization relief vents unobstructed;
- d. All aisles, and access to emergency equipment shall always remain free of obstructions;
- e. The cargo load shall not extend above the maximum height of the passenger seat in the fully upright position;
- f. Always adhere to the loading sequence as reported in the Loading Instruction report (LIR). As a rule, always start to load the cabin from FWD (front) to AFT and (back). Unload from AFT (back) to FWD (front);
- g. Avoid heavy items and/or shipments with sharp edges;
- h. Ensure seatbacks are in the upright position;
- i. Position the seat belts behind the seat cushions;
- j. Where possible, fold up the inner arm rests;
- k. Follow installation instructions provided by bin/ cargo seat bag (CSB) manufacturer;
- l. Ensure all bins / CSB are properly secured, and straps are latched and tensioned across the seat.

Fig1: example of installed CSB ready to be loaded



Fig 2: example of cargo CSB and secured



*Note 2: Additional information for CSB may be found in SAE ARP 4049*

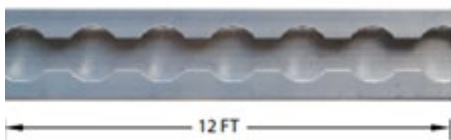


***Additional requirement to load aircraft cabin without the use of CSB:***

- m. Cover all seats with a protective material
- n. Ensure that cargo shipments are accessible to the crew in case of emergency
- o. Secure cargo in each seat row with straps and nets

*Note: Passenger seats are mounted in rails on the main deck – called seat tracks. Ensure that the net attachment fittings – sometimes called double stud fittings or single stud fittings are compatible with the seat attachment tracks in main deck floor. Typically, studs that fit the aircraft seat rails meets MS33601A standard.*

*Fig3: example of Aircraft seat rail*



*Fig4: example of stud MS33601A*



## 5.5 Cabin Operations

When cargo and/or mail is loaded into the cabin, personnel are required to be carried in the cabin in order to ensure cargo remains secured and to maintain fire watch and carry out firefighting procedures as required. The use of cabin crew is recommended. Where other personnel are assigned tasks in the cabin they are to be suitably trained and qualified.

- a. The responsibilities of cabin crew and any other personnel in the cabin shall be clearly defined.
- b. All cabin personnel shall be familiarized with the correct methods and means of restraint.
- c. Ensure entertainment systems, seat power systems, unused galley systems and any other heat generating systems that are not required for the operation of the aircraft, are isolated and an appropriate entry made in the Tech Log;
- d. Cabin fire watch and firefighting procedures may need to be amended in order to increase frequency of checks inflight and to allow firefighting procedures to be accomplished with fewer cabin personnel
- e. Other cabin procedures such as door arming/disarming, evacuation, pilot incapacitation, sterile flight deck and flight deck monitoring should also be reviewed as appropriate;
- f. The number of cabin personnel carried should be determined by consideration of:
  - i. the size of the aircraft cabin;
  - ii. the duration of the flight ;
  - iii. The amount and type of cargo carried within the cabin.
  - iv. The number of persons required to carry out both normal and emergency cabin procedures effectively.
- g. Loading of cargo in the cabin should be achieved in such a manner as to:
  - i. Ensure visibility, identification and access of any source of smoke or fire;
  - ii. introduce fire breaks within the cabin;
  - iii. Ensure depressurization vents are not obstructed;
  - iv. Ensure decals indicating the location of emergency equipment are not obstructed;
  - v. Ensure emergency equipment is not obstructed;
  - vi. Ensure aisles and evacuation routes are clear.
- h. Cabin personnel should perform checks to validate that loading has been carried out correctly and raise any concerns with the pilot in command;
- i. It is recommended that the pilot in command undertakes a physical check of the cabin before acceptance of the final load sheet;
- j. All cabin personnel shall be trained on cabin fire watch / fighting activities including communication, equipment and procedures;
- k. Load master (or equivalent) is to oversee the loading and unloading of cargo in the cabin.

## 6. Feedback and Support

For feedback, questions and/or clarifications please write to [groundops@iata.org](mailto:groundops@iata.org)

# Appendix A - Definitions

*(IATA Dangerous Goods Regulations (DGR))*

## **Cargo Aircraft**

Any aircraft, other than a passenger aircraft, which is carrying goods or property.

## **Passenger Aircraft**

An aircraft that carries any person other than a crew member, an operator's employee in an official capacity, an authorised representative of an appropriate national authority or a person accompanying a consignment or other cargo.

*Other definitions*

## **Bin or Cargo Seat Bag (CSB)**

A specially designed container / bag to be fitted in a row of seats for the purpose of stowing cargo or mail.

## **Cargo Compartment Classification**

These definitions reflect the classification requirements set out in Federal Aviation Regulation (FAR) Section [25.857](#) and European Aviation Safety Agency (EASA) Certification Standard (CS) 25.857, as shown in the ICAO document Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods ([Doc 9481](#)) (red book).

### **A Class A cargo or baggage compartment is one in which:**

1. the presence of a fire would be easily discovered by a crew member while at his or her station; and
2. each part of the compartment is easily accessible in flight.

### **A Class B cargo or baggage compartment is one in which:**

1. there is sufficient access in flight to enable a crew member to effectively reach any part of the compartment with the contents of a hand fire extinguisher;
2. when the access provisions are being used, no hazardous quantity of smoke, flames, or extinguishing agent, will enter any compartment occupied by the crew or passengers; and
3. there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station.

### **A Class C cargo or baggage compartment is one not meeting the requirements for either a Class A or B compartment but in which:**

1. there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station;
2. there is an approved built-in fire extinguishing or suppression system controllable from the pilot or flight engineer station;
3. there are means to exclude hazardous quantities of smoke, flames, or extinguishing agent, from any compartment occupied by the crew or passengers; and
4. there are means to control ventilation and draughts within the compartment so that the extinguishing agent used can control any fire that may start within the compartment.

**A Class D cargo or baggage compartment is one in which:**

1. a fire occurring in it will be completely confined without endangering the safety of the aeroplane or the occupants;
2. there are means to exclude hazardous quantities of smoke, flames, or other noxious gases from any compartment occupied by the crew or passengers;
3. ventilation and draughts are controlled within each compartment so that any fire likely to occur in the compartment will not progress beyond safe limits; and
4. consideration is given to the effect of heat within the compartment on adjacent critical parts of the aeroplane.

**Load Master**

The member of an aircraft's crew responsible for supervision and coordination of loading, unloading operations.