

KEMENTERIAN PERHUBUNGAN  
DIREKTORAT JENDERAL PERHUBUNGAN UDARA

PERATURAN DIREKTUR JENDERAL PERHUBUNGAN UDARA

NOMOR : KP 063 TAHUN 2018

TENTANG

PETUNJUK TEKNIS PERATURAN KESELAMATAN PENERBANGAN SIPIL  
BAGIAN 8900 - 2.2 (*STAFF INSTRUCTION* 8900 - 2.2) TENTANG PETUNJUK  
TEKNIS PROGRAM BAGASI TERCATAT DAN PENGOPERASIAN KARGO  
(*CARRY ON BAGAGE PROGRAM AND CARGO OPERATIONS*)

DENGAN RAHMAT TUHAN YANG MAHA ESA,

DIREKTUR JENDERAL PERHUBUNGAN UDARA,

- Menimbang :
- a. bahwa Keputusan Menteri Perhubungan Nomor KM 18 Tahun 2002 Tentang Persyaratan-Persyaratan Sertifikasi dan Operasi Bagi Perusahaan Angkutan Udara Niaga Untuk Penerbangan Komuter dan Charter sebagaimana telah diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 63 Tahun 2017 telah mengatur mengenai bagasi tercatat dan pengoperasian kargo;
  - b. Bahwa berdasarkan pertimbangan sebagaimana dimaksud pada huruf a, perlu menetapkan Peraturan Direktur Jenderal Perhubungan Udara tentang Petunjuk Teknis Peraturan Keselamatan Penerbangan Sipil Bagian 8900 - 2.2 (*Staff Instruction* 8900 - 2.2 ) Tentang Petunjuk Teknis Program Bagasi Tercatat dan Pengoperasian Kargo;

- Mengingat :
1. Undang-Undang Republik Indonesia Nomor 1 Tahun 2009 tentang Penerbangan (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 1, Tambahan Lembaran Negara Republik Indonesia Nomor 4956);
  2. Peraturan Presiden Nomor 7 Tahun 2015 tentang Organisasi Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 5);

3. Peraturan Presiden Nomor 40 Tahun 2015 tentang Kementerian Perhubungan (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 75);
4. Keputusan Menteri Perhubungan Nomor KM 18 Tahun 2002 Tentang Persyaratan-Persyaratan Sertifikasi dan Operasi Bagi Perusahaan Angkutan Udara Niaga Untuk Penerbangan Komuter dan Charter sebagaimana telah diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 63 Tahun 2017;
5. Peraturan Menteri Perhubungan Nomor PM 59 Tahun 2015 tentang Kriteria, Tugas dan Wewenang Inspektur Penerbangan sebagaimana telah diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 142 Tahun 2016;
6. Peraturan Menteri Perhubungan Nomor PM 189 Tahun 2015 tentang Organisasi dan Tata Kerja Kementerian Perhubungan sebagaimana telah diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 117 Tahun 2017;

MEMUTUSKAN:

Menetapkan : PERATURAN DIREKTUR JENDERAL PERHUBUNGAN UDARA TENTANG PETUNJUK TEKNIS PERATURAN KESELAMATAN PENERBANGAN SIPIL BAGIAN 8900 - 2.2 (*STAFF INSTRUCTION* 8900 - 2.2) TENTANG PETUNJUK TEKNIS PROGRAM BAGASI TERCATAT DAN PENGOPERASIAN KARGO.

Pasal 1

Memberlakukan Petunjuk Teknis Peraturan Keselamatan Penerbangan Sipi Bagian 8900 – 2.2 (*Staff Instruction* 8900 – 2.2 ) Tentang Petunjuk Teknis Program Bagasi Tercatat dan Pengoperasian Kargo.

Pasal 2

Direktur Kelaikudaraan dan Pengoperasian Pesawat Udara mengawasi Pelaksanaan Peraturan ini.

Pasal 3

Peraturan ini mulai berlaku sejak tanggal ditetapkan

Ditetapkan di : JAKARTA

Pada tanggal : 7 MARET 2018

DIREKTUR JENDERAL PERHUBUNGAN UDARA

ttd

Dr. Ir. AGUS SANTOSO, M. Sc

Salinan sesuai dengan aslinya  
KEPALA BAGIAN HUKUM



LAMPIRAN PERATURAN DIREKTUR JENDERAL  
PERHUBUNGAN UDARA  
NOMOR : KP 063 TAHUN 2018  
TANGGAL : 7 MARET 2018

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# Staff Instruction

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SI 8900 – 2.2  
CARRY ON BAGAGE PROGRAM & CARGO  
OPERATIONS

Amendment : 0

Date :

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REPUBLIC OF INDONESIA – MINISTRY OF TRANSPORTATION  
DIRECTORATE GENERAL OF CIVIL AVIATION  
JAKARTA – INDONESIA





## FOREWORD

1. PURPOSE : This Staff Instruction prescribes responsibilities, policies, and procedures to be used by the Directorate General of Civil Aviation (DAAO) for evaluating an applicant for certification or renewal or amendment of Air Cargo Operations under Requirements of CASR Part 121 and Part 135.  
This Staff Instruction may be made available to the public so that they may better understand the authority and responsibility of the DAAO.
2. REFERENCES : This Staff Instruction should be used in accordance with the applicable regulations.
3. CANCELLATION: -
4. AMENDMENT : The amendment of this Staff Instruction shall be approved by the Director General of Civil Aviation.

DIRECTOR GENERAL OF CIVIL AVIATION

ttd

Dr. Ir. AGUS SANTOSO, M.Sc.

Salinan sesuai dengan aslinya  
KEPALA BAGIAN HUKUM



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## **CHAPTER I INTRODUCTION**

### **1. PURPOSE**

This Staff Instruction (SI) provides guidance DGCA Staff and Applicant dealing with DGCA to evaluate baggage and cargo handling program for operations of aircraft under Air Operator Certificate (AOC) 121 and 135 operator; This staff Instruction (SI) is correspond with SI 8900-3.325 regarding Evaluation and acceptance of Ground Operation Manual.

### **2. DEFINITIONS AND ABBREVIATIONS**

- 1) Active Unit Load Devices (ULD). ULDs with active temperature control systems for transporting temperature-sensitive cargo. These systems consist of a highly insulated container with a battery-operated heating/cooling system integrated into the construction of the container. Active ULDs are intended to be operating during flight. Active ULDs are battery-powered in flight and are only recharged while on the ground. The “active” component of these units typically consists of a vapor cycle refrigeration/heat pump type system that is powered by various types of large batteries, depending on the manufacturer.
- 2) Aircraft Loading Schedule. The loading schedule is used to document compliance with the certificated Weight and Balance (W&B) limitations contained in the manufacturer’s Aircraft Flight Manual (AFM) and W&B manual (WBM). The loading schedule is developed by the operator based on its specific loading calculation procedures and provides the operational limits for use with the operator’s W&B program accepted under this AC.
- 3) Approved Parts. Unless used with reference to another person, means parts approved by the DGCA.
- 4) Baggage.
  - a) Checked-in baggage in any passengers baggage submitted by passenger of an aircraft to the carrier and to be transported by the same aircraft.
  - b) Cabin Baggage (carry on baggage) is any good/baggage carried by the passenger and under supervision of the passenger himself/herself.

- 5) Cargo. Is any good transported by aircraft including animals and plants other than posts, supplies needed by the aircraft during flight.
- 6) Cargo Handling. An operator's methods of accepting, weighing, securing, transporting cargo on the ground, and the loading and unloading of an aircraft.
- 7) Cargo Loading System (CLS). Equipment installed to the floor of an aircraft cargo compartment to restrain aircraft ULDs against the ground/flight loads. It usually consists of such items as rollers, side guides, and locks for securing ULDs to the aircraft structure. It does not include ULDs, barriers and tiedown straps.  
NOTE: The CLS is certified as part of either the aircraft's type certification (TC) or a Supplemental Type Certificate (STC).
- 8) Certified Restraint Straps. These devices should meet the requirements.
- 9) Certified Unit Load Device (ULD). A ULD should meet the requirements of STC requirements, if applicable; or other approved certification standards.
- 10) Company Materials (COMAT). Company material, commonly called COMAT, is an industry term used by operators to describe nonrevenue materials and supplies owned by the operator that are shipped by the operator in support of its operations.
- 11) Dunnage. Materials used to support and protect cargo in an aircraft cargo compartment or padding used in a shipping container to protect the container's contents.
- 12) Dynamic Load. Loads imparted on the structure of the aircraft by loaded cargo during taxi, takeoff, cruise, and landing.
- 13) First Article Inspection. Inspection of the first of a manufactured component to ensure compliance with certification and airworthiness requirements.
- 14) Floating Pallet. ULD positioned over one or more pallet position and not fully restrained by the aircraft ULD restraint system, but restrained to the aircraft structure by means of strapping to tiedown fittings.
- 15) Frangible (Compressible) Cargo. Aircraft manufacturer's W&B documents vary on this definition; therefore, you should reference their document.

- 16) Freight Staging. The holding of cargo awaiting transportation and the delivery of cargo to the aircraft in the right sequencing of cargo according to the load plan.
- 17) Dangerous Good (DG). A substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous, and materials that meet the defining criteria for hazard classes and divisions in accordance the International Civil Aviation Organizations (ICAO) Technical Instructions.  
Note : Information for DG provided in Appendix A of CASR Part 145.
- 18) Interlining. Transfer from one operator to another, whether the same or different aircraft types are used. For example, a ULD transferred from a domestic operator to a foreign operator.
- 19) Load Supervisor. An operator-determined name, such as loadmaster or load lead, identifying the job function of the person with overall responsibility for supervising the loading of the aircraft. This person is responsible for signing the load manifest. Refer to CASR part 121, sec. 121.665, Load Manifest.
- 20) Non-certified Unit Load Device (ULD). A ULD that is not certified by the ULD manufacturer, does not meet the requirement or Parts Manufacturer Authority (PMA) certification requirements, and/or is not listed in the OEM aircraft WBM (TC or STC).
- 21) Offset Cargo. Cargo positioned on the pallet in a manner that the cargo is shifted beyond the perimeter of the pallet resulting in either 1) the center of gravity (CG) limits of the pallet being exceeded, or 2) the restraint by the net to the pallet becoming ineffective in protecting the aircraft and preventing cargo shift.
- 22) Overweight Cargo. Cargo that exceeds the maximum allowable weight as defined by the aircraft WBM for aircraft ULD position.
- 23) Overhang Cargo. Cargo that extends beyond the perimeter of the pallet in at least one direction but still allows the net to perform its intended function. The pallet can still be restrained by the CLS and does not require additional straps to the aircraft structure.

- 24) Outsized Cargo. Cargo that exceeds the maximum allowable contour of an aircraft ULD such that the ULD must be loaded on board an aircraft as a non-CLS restrained ULD.
- 25) Pallet (Air Cargo). A flat platform with flat under-surface of standard dimensions, on which cargo is assembled and secured and which interfaces directly with the aircraft handling and restraint system.
- 26) Piercing Cargo. Piece of cargo of a piercing or penetrating nature, such as rods, pipes, extrusions, beams, etc., that could become a projectile hazard under flight operational loads.
- 27) Pod. An external container attached to an aircraft for carrying cargo.
- 28) Primary Restraint. The restraint of the cargo payload to the aircraft structure for flight and other loads.
- 29) Rigid Cargo. Cargo with a density that is rigid in nature, as defined in the aircraft manufacturer's W&B document.
- 30) Sharp Cargo. Cargo that has a piercing or penetrating nature, or cargo with sharp edges or corners.
- 31) Special Cargo. Cargo not contained in a ULD certified for the airplane CLS or not enclosed in a cargo compartment certified for bulk loading is special cargo. This type of cargo requires special handling and securing/restraining procedures.
- 32) Special Handling Procedures. Additional or unique procedures, as determined by the operator, which may be required for some cargo in order to protect the cargo or the aircraft during handling acceptance, loading, or in flight. Dangerous Good must be handled per regulatory requirements.
- 33) Supernumeraries. Persons that are not members of the crew, who are carried on board all-cargo aircraft that do not comply with all passenger-carrying requirements of part 121.
- 34) Supplemental Restraint. Restraint that is utilized in addition to primary restraint in order to stabilize cargo and prevent shifting.
- 35) Tall Rigid Cargo (TRC). Tall cargo is cargo greater than 98 inches tall. Certain sections of tall cargo can be frangible and certain sections can be rigid. If any part of the rigid section of tall cargo is above 98 inches, the tall cargo is TRC. TRC is only applies to the Boeing 747 aircraft.
- 36) Tare Weight. The weight of the empty ULD, including its normal complement of loading restraint devices. Also, the empty weight of other

material handling equipment (e.g., baggage carts and dollies) used to weigh cargo on a scale.

- 37) Temporary Restraint Device. Temporary net restraint fittings installed in place of damaged or missing fittings, or temporary net take-up hooks and net corner lashing lines.
- 38) Unit Load Device (ULD). A device for grouping, transferring, and restraining cargo for transit. It may consist of a pallet with a net or it may be a container.
- 39) Unitized. Consolidated multiple packages or items loaded into or on a ULD.
- 40) Vendor. Any person or entity performing a service for the operator. This includes, but is not limited to, a freight forwarder, service providers, contractor, subcontractors, customs brokers, shipper, and another operator that performs cargo buildup, aircraft loading, and unloading for the operator. This also includes repair services provided by an DGCA-certificated entity.  

Zone Weight. Cumulative weight as loaded within a designated zone within the aircraft such as a specific area on the upper deck cargo area plus the cargo loaded on the lower deck directly beneath.
- 41) Aircraft Flight Manual (AFM).<sup>\*</sup> Identifies all operating limitations, including operating speeds and door operation, and contains allowable aircraft fuel and cargo loading directly or by reference. Any additional information necessary to safely operate the aircraft should also be provided.
- 42) Aircraft Loading Document.<sup>\*</sup> Describes the types of cargo containers allowed, how the containers are restrained, and loading requirements when latches are missing or broken. This may be contained in the Weight and Balance (W&B) manual. Ensures compatibility of the cargo loading system (CLS) with the cargo conversion. These modifications have often been incorporated independent of each other. In addition, if the use of tiedown fittings is permitted, the tiedown strength and limitation data should be provided.
- 43) Cargo Restraint System. Designed for all critical ground, flight, and emergency landing loads. This includes seat tracks, pallet locks, side restraints, and roller trays. The 9G rigid barrier or cargo restraint net, if

required, and its attachment, and the fuselage surrounding structure must be analyzed for critical payloads.

- 44) Certification Plan. Lists all steps necessary to complete DGCA certification of the modification. At a minimum, the plan should discuss scope of the project, schedule, use of Engineering data submittals, and conformity issues.
- 45) **Compatibility Evaluation. The applicant evaluates each aircraft to be modified to ensure it is compatible with the Supplemental Type Certificate (STC) modification. The applicant also identifies and evaluates modifications, alterations, or the incorporation of other STCs that change the type design of the aircraft to be modified. The applicant notes and makes accommodations for differences and necessary drawing changes.**
- 46) Weight and Balance (W&B) Manual.\* Describes aircraft fuel and payload distributions and CG restrictions. Defines applicable ULDs. Provides any other relevant information necessary for the safe operation of the aircraft.”

### **3. DGCA RESPONSIBILITIES**

DGCA make coordination with an AOC holder or Applicant of AOC to ensures the following:

- a. DGCA Certification Program Manager (CPM) make coordination with applicant of AOC/OC certification process.
- b. Certification Program Manager responsible for prepare issuance of the Certificate and/or Operations Specifications and ACL if any information data as required fully copied.
- c. Any additional or changes as required issuance or amendment or change of major operations aspect is the following certification process.
- d. Any other changes that not effect to Operations Specifications, Principle Operation Inspector (POI) and/or Principle Maintenance Inspector (PMI) make coordination with AOC/OC Holder to review and process of any changes.
- e. The certificate holder/applicant is responsible to provides any detail information data as required during certification and continue surveillance.



#### **4. REGULATORY REFERENCES**

- a. CASR Part 135 “Certification & Operating Requirement Commuter and Charter”.
- b. CASR Part 121” Certification and Operating Requirements Domestic, Flag and Supplemental Air Carrier”.
- c. CASR Part 23 “Airworthiness Standard Normal Category Airplane”.
- d. CASR Part 25 “Airworthiness Standard Transport Category Airplane”.
- e. CASR Part 27 “Airworthiness Standard Normal Category Rotorcraft”.
- f. CASR Part 29 “Airworthiness Standard Transport Category Rotorcraft”.
- g. SI 8900-3.18 Amdt. 0 - Air Operator Certificate, Operating Certificate and Operations Specifications.
- h. SI 8900-3.181 Amdt. 0 – Authorization, Condition and Limitation
- i. SI 8900-3.325 Amdt. 0 - Evaluation and acceptance of Ground Operation Manual
- j. SI 8900-2.1 Amdt. 0 - Certification or Renewal or Amendment of a CASR Part 121 and Part 135 Air Operator Certificate (AOC)

## CHAPTER II OPERATIONAL PROCESSES AND PROCEDURES

### **1. GENERAL**

#### **a. General Purpose**

Provide information and guidance concerning approval, methods, procedure, training and Specific items in handling baggage and cargo.

#### **b. Airplane/Rotorcraft W&B Manual**

The Weight and Balance Manual (WBM) is part of the operating limitations section of the Airplane Flight Manual (AFM/RFM). In accordance with CASR part 21, sec. 21.41, the operating limitations are part of the airplane type certificate (TC) and, therefore, can be modified only by changing that certificate; that is, by obtaining an amended TC or Supplemental Type Certificate (STC) or DGCA Alteration approval. Revisions to the AFM are approved as AFM supplements, and the approval is based on a finding that, with the AFM revisions, the airplane continues to meet the applicable airworthiness standards. Operators are required to comply with the operating limitations by CASR part 91, sec. 91.9(a). The aircraft WBM is often a separate document, but remains part of the AFM. CASR part 25, sec. 25.1583(c) authorizes the WBM as a separate document.

#### **c. Operation Manual**

If the procedures provided by the aircraft manufacturers do not have sufficient detail and guidance, an air operator may develop Operation Manual Supplemental Procedures and submit it to the DGCA for approval. Any time the operator develops a procedure it can not contradict applicable regulation. Regulation always supercedes company manuals. Supplemental procedures ensures that cargo handling personnel have the guidance necessary to maintain safety of flight operations. An operator should have a training program in place for cargo buildup, cargo loading system (CLS) configuration, aircraft loading/unloading, carriage of Dangerous Good (DG), and special cargo. Personnel associated with these job functions and the supervising of cargo loading operations should be trained and qualified in these positions.

#### **d. Manual Contents**

The DGCA considers the following a recommended minimum level of detail that should be included in an air operator's manual that is essential to air cargo operations. The recommendations to safely transport baggage and cargo an air operator (AOC) must:

1) Baggage

- a) Describe the term "Carry-On Baggage." Air Operator should NOT include approved child restraint devices that are properly used during flight in definition of carry-on baggage. Child restraint devices are carry-on baggage if they are stowed in the cabin during flight. They also may be checked and transported in a cargo compartment.
- b) Provide information the items Air Operator will accept as carry-on baggage for each passenger, and may stipulate the maximum dimensions of these items to ensure proper stowage.
- c) Ensure that Air Operator carry-on baggage program does not compromise with approved weight and balance program.
- d) Proper stowage carry-on baggage explanation. This part of the program depends on the type of aircraft covered by the program, including cabin configuration and other space factors. Stowage program should ensure that:
  - i. Carry-on baggage does not obstruct passenger movement to, from, or across the aisle;
  - ii. Items stowed in overhead bins fit securely, and flight attendants can close the bins without using force; and
  - iii. There is little or no chance of baggage and other articles falling out of overhead bins when the bin doors are opened.
- e) Describe procedures to verify that each article of baggage is properly stowed in an approved compartment or other specifically approved area before flight attendants close the passenger entry doors on each flight. The description should include:
  - i. Methods to ensure carry-on baggage and cargo do not exceed the approved weight limitations or load limits for the specific place they are stowed, including the restraints used to secure them. Emphasize that flight attendants should not place items in overhead bins that exceed bin weight limits and that they

- should be able to close the bins without using force. They should also make sure that passengers do not overload the bins.
- ii. A list of specific items passengers can carry in the cabin and stow outside of specified carry-on baggage compartments. This should be a short list! Specify locations where flight attendants can stow these items, and how they should restrain them to ensure that they will not shift under emergency load conditions. Specify an approved weight limitation for each restraint or “tie-down” area to ensure that articles do not shift under the specified load conditions.
  - iii. Procedures for stowing unusual or fragile articles. Passengers may want to carry large or fragile objects that need special stowage. Flight attendants should understand that it is the passenger’s responsibility to ensure that these objects are securely packed to withstand normal handling. If you cannot check or stow an item in a manner that ensures the safety of the aircraft and its occupants, or if the passenger believes that the item cannot be packed to withstand normal handling, then the passenger will have to ship the item by some other means.
- f) Ensure that carry-on baggage does not interfere with access to and use of emergency equipment, and recommends that a required crewmember position have the responsibility for ensuring that carry-on baggage does not restrict access to emergency equipment.
  - g) Stow canes or other assist devices in approved areas, such as under a seat, in approved cargo bins or fitted holders, or, if appropriate, along the fuselage wall.
  - h) Procedures to prevent passengers from bringing on board baggage that, for any reason, cannot stow properly. Specify which personnel are responsible for this part of the program. Description should include the following elements:
    - i. The area of operation, including terminal and scanning point facilities, where employees will determine whether baggage should or should not be allowed on the aircraft.
    - ii. Scanning facilities and locations, including operations at facilities other than those owned, or ordinarily used, by air operator.

- iii. The duties of personnel responsible for the scanning. Make sure these duties are manageable
- iv. Procedures to prevent passengers from bringing on board baggage that will exceed :
  - a. The approved weight limits of stowage areas, cargo bins, and “tie-down” areas;
  - b. The number or size of items specified in carry-on baggage program; or
  - c. The total space of the approved stowage areas available on an aircraft.
- i) Establish procedures for informing travelers and travel agents about the specific carry-on requirements. Air Operator may accommodate travelers with special baggage problems, provided baggage safely stowage. Provide information to passengers about procedures for accommodating special baggage prior to the flight, and about the types of materials that they should not carry in their carry-on baggage, such as hazardous materials.
- j) Include information about carry-on baggage program in the appropriate parts of the crewmembers’ manual. Air Operator should cover all of the elements listed above, especially crewmember responsibility for verifying that baggage is stowed properly and will not hinder the availability and use of emergency equipment; and other pertinent information that the principal operations inspector determines should be in the crewmembers’ manual.
- k) Provide training to appropriate ground personnel and to all crewmembers regarding approved carry-on baggage program. The training should include at least carry-on baggage limitations; baggage scanning; processing of carry-on baggage that you cannot accommodate in any of the passenger compartments; proper stowing of carry-on baggage, cargo and unusual items in the cabin; crew coordination; applicable passenger information; types of and limitations on stowage provisions; verification that carry-on baggage is stowed so it does not interfere with emergency equipment; and how to handle carry-on baggage during an emergency.

## 2) CARGO

- a. Have procedures for control of Weight and Balance (W&B) for both aircraft and cargo.
- b. Have procedures to study and evaluate the capability of any aircraft the operator may use to transport any type of cargo, including special cargo. This determination should be made prior to accepting a shipment. Operators may include a reference to the source document for this evaluation.
- c. Have procedures for loading and unloading all types of cargo, including Company Material (COMAT).
- d. Have procedures to restrain cargo in aircraft compartments, including main deck, lower deck, fore and aft compartments, or pods, in accordance with the requirements of the Original Equipment Manufacturer (OEM)'s WBM, Supplemental Type Certificate (STC) W&B supplement for certified ULDs, non-certified ULDs, bulk loaded cargo, and special cargo.
- e. Have procedures for the use, storage and evaluation of the condition of cargo restraints (e.g. straps, netting, and ropes) used to restrain bulk, ULD, or special cargo. Procedures should provide for routine serviceability checks and the identification and removal of any unserviceable restraint devices. Procedures should also provide the process to follow if failed restraints are identified while in use.
- f. Have procedures to control the use, calibration, or verification of weigh scales for operators and vendors.
- g. Have procedures to control the repair of ULDs, aircraft cargo loading systems (CLS), cargo restraint devices, and other miscellaneous aircraft cargo handling equipment required for loading or unloading aircraft. This also includes installed nets and installed smoke barriers.
- h. Have procedures in its manual system for the control of all manuals and manual revisions applicable to air cargo operations. These procedures should ensure the operator:
  - 1) Has current versions of the manuals, and
  - 2) Provides authorized maintenance personnel and vendors with current manuals and manual revisions.

- i. Have procedures to assure that all personnel are properly trained, qualified, and authorized to perform their job function(s).
- j. Have procedures for reconfiguring the CLS and document that the appropriate personnel have been notified. This ensures maintenance, flightcrew, and the loading crew are aware that center of gravity (CG) limits may have changed for current and future flights.
- k. Have procedures and processes for determining the carriage of special cargo.
- l. Have procedures for freight forwarding, interlining, and freight staging.
- m. Have procedures for the carriage of Dangerous Good (DG).
- n. Have procedures for incorporating a Continuing Analysis and Surveillance System (CASS) to verify the performance and effectiveness of its CLS maintenance program and provide corrections to any deficiencies discovered in the program.
- o. Have procedures for incorporating a closed-loop system that monitors the elements of surveillance, analysis, corrective action, and follow-up to verify the performance and effectiveness of its W&B control program (including cargo operations) and provide corrections to any deficiencies discovered in the program.

## **2. WEIGHT AND BALANCE CONTROL PROGRAM**

### **a. Develop Weight & Balance Control Program.**

Type-Certificated (TC) aircraft have an approved WBM provided by the OEM. The OEM WBM for an aircraft is the basis for an operator's W&B control program. operating instructions may be used to achieve the limitations in the WBMs.

- A) Modified aircraft. for aircraft with a passenger-to-cargo conversion, or other modifications such as an aircraft CLS-a W&B supplement describing the modification's effect on the aircraft is approved and is issued as part of an STC or amended TC.
- B) W&B Control Program. An air operator's w&b control program should include at least :
  - a) Loading limitations, including limitations on empty or unoccupied positions with missing or damaged restraints;

- b) Information on aircraft cargo restraint systems, such as aircraft CLSs, installed nets, ULDs, and other restraint devices;
- c) Requirements for special cargo loads;
- d) A list of ULDs compatible with the CLS;
- e) Aircraft operating weights;
- f) Information for the determination of an aircraft's CG;
- g) Weight limitations for each compartment and zone, when applicable;
- h) Procedures for incorporating fuel loading and usage into the aircraft's W&B calculations;
- i) Instructions for, and samples of, load documents and manifests, to include special cargo loading documents;
- j) Aircraft loading schedules; and
- k) Processes and procedures to monitor the W&B control program.

**b. Contents of an Aircraft Operator's W&B Manual.**

Operator WBMs must be based on an aircraft's W&B data, amended TCs, and applicable STCs.

- 1) Aircraft Basic Operating Weight Control. An aircraft must conform to the basic operating weight determined by the operator.
- 2) Zone and Compartment Weight Limitations. An operator's aircraft must conform to all zone weight limitations and compartment weight limitations under the aircraft manufacturer, TC holder and STC holder W&B requirements.
- 3) CG Range Limitations. The operator must include reference charts and tables in its W&B manual, or other manual that provide the approved weight and CG range limitations.
- 4) Aircraft Weight. An operator's aircraft must conform to the aircraft manufacturer's W&B requirements, and should establish procedures for weighing the aircraft using the manufacturer's WBM requirements or other approved or accepted methods.
- 5) Aircraft Major Alteration Requirements. Major alteration to cargo configuration must be consider:
  - a) A major alteration to an aircraft that changes the W&B requirements and/or limitations must be accomplished utilizing approved data.



- b) The operator must have a procedure in place to ensure all supplemental information developed, issued, and approved for that aircraft is incorporated into the operator's W&B control program. An operator should apply the most restrictive ranges of the alteration incorporated to the operation of that aircraft. For example, if multiple STCs apply, the operator should use the STC with the most restrictive W&B limitations when incorporating the supplemental information into the operator's W&B control program.
  - c) In cases of multiple STCs applied to a single aircraft, the STCs should be evaluated for effect on each other and the appropriate limitations applied. At a minimum, an operator should include the supplemental information described above and cross-reference the supplemental information in the operator's WBM. In addition, the operator should organize the supplemental information in a way that facilitates use by loading personnel. Finally, the operator should include the supplemental information in the operator's WBM and any charts or tables that indicate proper weight and CG range limitations. The operator must incorporate CLS STCs into its maintenance program.
- 6) aircraft CLS Limitations. The operator must conform to, and apply, the W&B and CG limitations of the aircraft class, as established by the OEM/STC WBM. the operator should apply the most restrictive limitations considering all major alterations made to the aircraft. reconfiguration of the CLS, such as re-positioning pallet locks, should only be accomplished using the OEM/STC WBM. the operator must have a method to determine w&b calculations for any reconfiguration of a CLS.
- 7) Carriage of other persons (other than flightcrew). the regulations of CASR part 121 allow for the carriage of certain persons aboard an airplane without complying with certain passenger-carrying requirements of part 121. These persons are commonly referred to as supernumeraries. They may be carried aboard an airplane because of their necessity for the safety of the flight, their relationship with the air carrier, or by virtue of certain knowledge and abilities attributed to them through selection and mandatory training. An operator must

establish procedures for the carriage of supernumeraries through in the operations manual, and procedures must address:

- a) Method for calculating the weight of supernumeraries and their carry-on and checked baggage, such as actual weight or standard average weight;
- b) Any special procedures or limitations when carrying supernumeraries aboard an aircraft. These limitations may be specified as part of the type design in the Type Certificate Data Sheet (TCDS) or a limitation in the casr part 25 for the carriage of supernumeraries; and
- c) Instructions for documenting the weight of supernumeraries, and for communicating the information to the pilot in command (pic) or other authorized, trained, and qualified personnel for determining w&b.

### **3. CLASSIFYING CARGO COMPARTMENT FOR FIRE SUPPRESSION, CARGO LOADING SYSTEM COMPONENTS, INSTALLED NETS, AND SMOKE BARRIERS**

#### **a. Cargo Compartment Classification**

- 1) **Class A**; a class a cargo or baggage compartment is one in which-
  - a) **THE PRESENCE OF A FIRE WOULD BE EASILY DISCOVERED BY CREWMEMBER WHILE AT HIS STATION; AND**
  - b) Each part of the compartment is easily accessible in flight.
- 2) **Class B**. a class B cargo or baggage compartment is one in which-
  - a) There is sufficient access in flight to enable a crewmember to effectively reach any part of the compartment with the contents of a hand fire extinguisher;
  - b) 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;
  - c) There is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station.
- 3) **Class C**. a class C cargo or baggage compartment is one not meeting the requirements for either a class a or b compartment but in which-
  - a) there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station;

- b) there is an approved built-in fire extinguishing or suppression system controllable from the cockpit.
  - c) there are means to exclude hazardous quantities of smoke, flames, or extinguishing agent, from any compartment occupied by the crew or passengers; there are means to control ventilation and drafts within the compartment so that the extinguishing agent used can control any fire that may start within the compartment.
- 4) **Class E.** A class E cargo compartment is one on airplanes used only for the carriage of cargo and in which-
- a) there is a separate approved smoke or fire detector system to give warning at the pilot or flight engineer station;
  - b) there are means to shut off the ventilating airflow to, or within, the compartment, and the controls for these means are accessible to the flight crew in the crew compartment;
  - c) There are means to exclude hazardous quantities of smoke, flames, or noxious gases, from the flight crew compartment; and
  - d) The required crew emergency eits are accessible under any cargo loading condition.

**b. Cargo Compartments Designed To Accept ULDS.**

These compartments are equipped with an aircraft CLS designed to restrain ULDs in the aircraft. CLSs also position ULDs, enabling them to move easily in and out of the aircraft. The CLS comprises various assemblies, such as restraint locks, side rails, and ball and roller conveyors. Some CLSs are powered, and some may be installed in main deck and/or lower deck compartments. When the flightcrew and/or other persons are seated on the same deck forward of the CLS, a smoke barrier is installed (as applicable) between the CLS and those persons.

**c. Cargo Compartments Not Designed to Accept ULDS.**

These cargo compartments are called bulk compartments, and may have vertical or horizontal nets. depending on its design and purpose, the net may restrain cargo from shifting vertically, longitudinally, and laterally within the compartment or from shifting onto the cargo door or cargo door area within the compartment. bulk compartments protect aircraft systems and structures against damage from shifting cargo for all flight and landing conditions.

Note: Care should be taken when loading bulk cargo in these compartments to ensure that it does not block fire detection sensors or fire suppression agent nozzles, if installed.

**d. CLS Components.**

- 1) Substituting CLS Component. An operator may substitute aircraft CLS components under several different procedures, depending on the certification method for the components being substituted. substitution also may involve replacing CLS components, or subcomponents of an aircraft cargo restraint assembly, with those of another design. if an operator substitutes a cls component, the operator must have a procedure that addresses:
  - 2) The load-bearing components that the operator may substitute;
  - 3) The level of substitution, such as a complete assembly or parts of an assembly, the operator allows and the conditions that support each process; and Approved data used.

**Note:** CLS components are certificated under methods such as a Parts Manufacturer Approval (PMA), Production Certificate (PC), TC, amended TC, STC, or under rules governing owner-produced parts.

**e. Substituting PMA Products.**

An operator may substitute aircraft CLS components manufactured under a PMA. Installation data and any limitations may be found in the:

- 1) The component maintenance manual (CMM);
- 2) The manufacturer's illustrated parts catalog or the air carrier's supplemental manual;
- 3) The operator's instructions based on DGCA-approved data, the aircraft manufacturer, or STC holder; and

**f. Substituting TSO Products.**

An operator may substitute CLS components manufactured under a TSO if the operator has procedures to determine whether the unit is eligible for installation. An operator may substitute products approved under a TSO using information from:

- 1) SBs;
- 2) STCs;
- 3) Aircraft manufacturer's TC;
- 4) CMMs; or

5) Manufacturer's illustrated parts catalogs

**g. Substituting PC, TC, Amended TC, AND STC Products.**

Parts can be approved through the PC, TC, amended TC, and STC processes. These processes include instructions for interchanging CLS components. An operator may substitute these components using the following source documentation for these processes:

- 1) Type Certificate Data Sheet (TCDS);
- 2) SBs, service letters, or equivalent DGCA-approved data; and
- 3) Manufacturer's instructions for continued airworthiness (ICA)

**h. Substituting Owner-Produced Parts.**

CASR Part 21 indicates an operator may manufacture parts for use on its own aircraft. In such cases, an operator must have processes to:

- 1) Identify components manufactured for the aircraft CLS in its maintenance program;
- 2) Ensure another operator or vendor does not sell or distribute the parts it manufactures;
- 3) Show its owner-produced parts meet the equipment manufacturer CLS type design; and
- 4) Maintain the continued airworthiness of the owner-produced part.

**i. Addressing CLS Component Discrepancies.**

An operator may address aircraft CLS component discrepancies by replacing or repairing the applicable component. If the operator discovers systemic problems with the reliability of its components, the operator should report such problems to the component manufacturer. An operator's CASS should track all cargo loading component discrepancies to measure the performance and effectiveness of the operator's maintenance and inspection program.

**j. Replacing a CLS Component.**

An operator may replace a CLS component with a new, rebuilt, overhauled, or repaired serviceable component. This component must meet requirements for installation on the particular aircraft

**k. Repairing a CLS Component.**

- 1) Operator Responsibility. An operator may repair a component on the aircraft, or may have a vendor repair a component. Under certain circumstances, an accepted manual may allow minor repairs using DGCA-accepted data. The repair vendor may be under the direct

control of an operator, or may be a vendor the operator designates. The operator has primary responsibility for determining that the component meets applicable regulatory requirements, and the repair vendor is authorized to repair the component.

- 2) Vendor Repair. CLS components repaired by a vendor should undergo a receiving inspection using operator procedures. The component should also have documentation to (1) confirm each component is certified as serviceable, and (2) provide traceability to the data used for repair. The documentation should include:
  - a) Identity of the company that owns the component;
  - b) DGCA repair station certificate number, if applicable, and vendor name;
  - c) Component part number;
  - d) Component serial number, if applicable;
  - e) Component nomenclature;
  - f) Component times and/or cycles, if applicable;
  - g) Quantity of components;
  - h) Specifications used for repair;
  - i) Certification statement of procedures used;
  - j) Traceability documentation;
  - k) Signature of an authorized agent.
- 3) Retention of Repair Records. The operator must retain its repair records in accordance with its established procedures to comply with the requirements of CASR 121.380.

**1. CLS Components in the Minimum Equipment List (MEL).**

- 1) Dispatch deviation procedures. An operator must ensure the aircraft mel contains adequate instructions, or references an appropriate manual, for dispatch deviation procedures that describes
  - a) The total number of items installed and minimum number required for dispatch;
  - b) The loading limitations because of missing or defective equipment;
  - c) The references showing location of loading restrictions;
  - d) The appropriate category for repair; and
  - e) The instructions for ensuring MEL limitations are included in W&B computations and the load plan.
- 2) Procedures for Inoperative or Missing CLS Components.

An operator should include procedures for inoperative or missing CLS components in the operator MEL. These procedures should include any requirements for:

- a) Reconfiguration of the aircraft, if necessary;
- b) Voiding of adjacent positions, if necessary;
- c) Accounting for limitations;
- d) Notification to the PIC and other appropriate personnel the operator deems necessary of the missing components;
- e) Notification to the PIC and other appropriate personnel the operator deems necessary of the missing components;
- f) Annotation in the aircraft maintenance logbook.

**m. Installed nets in the maintenance program an operator maintenance program contains procedures for maintenance and inspection of installed**

- 1) The Program Should Encompass:
  - a) In-house or vendor repair procedures;
  - b) Receiving inspecti
  - c) on procedures; and
  - d) Serviceability limitations.
- 2) Authorized Vendor List. The operator should include vendors on its authorized vendor list, and any required inspection item requirements

**n. Smoke Barriers**

- 1) Smoke barrier Control Procedures.

All smoke barriers act as a blockade between the cargo and crew, preventing smoke and flames from entering the passenger cabin and flight deck areas of the aircraft. they can be permanent or attachable and in a variety of forms, such as doors or curtains. an operator must have procedures to control the airworthiness and subsequent operational serviceability of smoke barriers. the operator should provide aircraft-specific training on the description, operation, function, and preflight of smoke barriers.
- 2) **Inspection.**
- 2) Inspect the overall condition of the smoke barrier curtain, if installed, or cockpit door seal, barrier net assembly, or solid bulkhead. Ensure that the net (if used) has the proper rating for its intended G-loading. Inspections of the smoke barrier should include, at a minimum:

- a) The smoke barrier curtain must be free of tears, holes, and cuts to prevent smoke from entering the forward cabin and flight deck;
- b) The cockpit door seal, for condition and integrity;
- c) The barrier net, for condition and security (i.e., check for frayed straps, hardware integrity, and proper markings);
- d) Cargo compartment retention nets, for condition and security;
- e) The solid bulkhead, for condition and security; and
- f) The required placards (such as loading, fire suppression, and so forth) for condition, legibility, and security.



## CHAPTER III UNIT LOAD DEVICES AND CARGO RESTRAINT DEVICES

### 1. RESTRAINTS.

Aircraft cargo restraint methods come in two general categories: primary and supplemental. An operator has overall responsibility for ULDs and other cargo restraint devices and should have accepted procedures to control the operational serviceability of them, whether a primary or a supplemental restraint. When primary or supplemental restraint is attached directly to the aircraft structure, see Section 2.8, Transport of Special Cargo, for additional guidance.

### 2. PRIMARY RESTRAINT.

This is the restraint of the cargo payload to the aircraft structure for regulatory load conditions (e.g., flight and emergency landing). This restraint secures cargo in the forward, aft, vertical, and lateral directions. Primary restraint is used to secure:

- a. Cargo:
  - 1) To a pallet using applicable net (net is the primary restraint); 2.4.2.1.2  
Within a container (container is the primary restraint); or
  - 2) To the aircraft structure (straps, ropes, etc. is the primary restraint).
- b. ULD to the aircraft structure using the CLS (e.g., locks and side rails).
- c. WBM Provisions. Some airplane WBMs may provide additional tiedown to the aircraft structure to restrain ULDs if the following conditions exist:
  - 1) The ULD weight limit is limited either by restraint configurations or by missing and/or inoperative restraints.
  - 2) The ULD is loaded to a weight greater than allowable for the chosen loading position with all restraints operative, and a greater weight is allowed by the aircraft WBM with tiedown (e.g., the floor is more capable than the restraint system).

**NOTE: See Section 2.8 for additional guidance.**

### 3. SUPPLEMENTAL RESTRAINT.

Supplemental restraint is additional restraint that prevents shifting and is used to stabilize cargo to a pallet or container. When supplemental restraints are attached to the CLS or aircraft structure, it creates a parallel load path to the ULD, therefore classified as special cargo. See Section 2.8 for additional

guidance. An exception would be stabilization straps in a certified bulk compartment.

#### **4. ULDS AND OTHER CARGO RESTRAINT DEVICES.**

##### **a. ULD Definition.**

A ULD is a device for grouping, transferring, and restraining cargo for transit. It may consist of a cargo pallet and cargo net combination. The term ULD includes the following equipment:

- 1) Pallets and nets.
- 2) Certified and non-certified aircraft containers.

##### **b. Types of ULDS.**

- 1) Background.
  - a) Certified ULDS are defined in aircraft WBMs and require no further analysis. However, non-certified ULDS and other payloads require further analysis to determine if the aircraft and restraint system is structurally adequate.
  - b) ULDS designs may exceed the structural capability of an aircraft. To preclude failures of the aircraft cargo restraint system the requirements of the aircraft WBM must be observed.

- 2) Certified ULD.

A ULD meeting the requirements STC requirements, if applicable; or other approved certification standards. A certified ULD is structurally capable of restraining a load and/or protecting the aircraft systems and structure. Only ULDS that are permitted by the aircraft WBM (TC or STC) are certified for use on that aircraft. To remain a certified ULD for an aircraft, the ULD must be restrained by the aircraft's CLS, such as pallet locks and side guides. A certified pallet and a certified net can be combined and certified as a unit. The operator should have on file for all its certified ULDS an DGCA approval letter, certificate, or other certifying document, such as a conformance certificate provided by the ULD equipment manufacturer.

- 3) Certified Cargo Pallet and Net (ULD).

Most operator WBMs recognize a TSO cargo pallet and net combination as the primary restraint for unitized cargo. A cargo pallet net is the only restraint device that takes the shape of the cargo while restraining the

load in all directions, so that the load is spread to the net fittings and pallet edge rails.

4) Non-Certified ULDs.

A ULD that does not meet the TSO or PMA certification requirements, and/or is not listed in the aircraft WBM (TC or STC). Non-certified ULDs should meet a standard (see Appendix B, Guidance Material, for suggested standards). The operator should have documentation stating its design criteria for manufacturing the non-certified ULD.

5) Active ULDs.

a) Active ULDs are ULDs with active temperature control systems for transporting temperature sensitive cargo. Unlike the typical ULD, active ULDs are capable of heating and/or refrigerating as required. These systems consist of a highly insulated container with a battery-operated heating/cooling system integrated into the construction of the container. Active ULDs are intended to be operating during flight. Active ULDs are battery powered in flight and are only recharged while on the ground. The “active” components of these units typically consist of a vapor cycle refrigeration/heat pump type system that is powered by various types of large batteries, depending on the manufacturer.

b) Only Active ULDs approved under part 21, § 21.8(d) or § 21.305(d); a TC; or an STC may be used on U.S.-registered aircraft and marked with an “Active Unit Load Device” placard (see Appendix I, Active Unit Load Device Marking). Additionally, if an operator intends to deploy these containers in their fleet, they should have procedures in their manuals to ensure only containers that are properly prepared, and which meet the handling and airworthiness requirements of the manufacturer, are carried on an aircraft. To carry these devices, operators should incorporate or reference the pertinent parts of the device’s certification documents into its manual. These may include:

- i. Required markings, placards, and labeling;
- ii. ICAs to include proposed limitations and restrictions necessary to safely carry the device on an aircraft; and
- iii. Operating instructions for the device.

6) Temperature-Controlled Shipping Containers.

Temperature-controlled shipping containers are devices designed to maintain their contents within strict temperature controls. These devices may bear a TSO, STC; PMA, or be allowed by the TC. These units should be approved in the limitations section of the certification document for use with certain Net-Pallet combinations. To carry these devices, operators should incorporate or reference the pertinent parts of the device's certification documents into its manual. These may include:

- a) Required markings, placards, and labeling;
- b) ICAs, to include proposed limitations and restrictions necessary to safely carry the device on an aircraft; and
- c) Operating instructions for the device.

**c. Other Restraint Devices.**

1) Other Types of Cargo Restraint Devices.

The operator may use cargo restraints such as straps, ropes, cables, and nets. These restraints must be approved per aircraft manufacturer W&B documentation or STC holder documentation. The operator's manual should address their use, serviceability limitations and a process to follow if failed restraints are identified while in use. If the operator doesn't use an authorized cargo pallet/net combination as the primary restraint, the operator's manual should have policies and procedures to address this issue. For example, if a strap is used as the primary restraint, the cargo may be:

- a) Loaded in an aircraft compartment that meets the type design for compartment restraint, or
- b) Restrained by cargo straps or other authorized devices to the aircraft as described in the aircraft's manual, an STC supplement, or a WBM.

2) Certified Straps.

These devices should meet the requirements of Cargo Restraint Strap Assemblies. In it, the DGCA describes the minimum performance standards (MPS) by which cargo restraint strap assemblies are approved and identified with applicable requirement markings.

**5. DETERMINING ULD COMPATIBILITY.**

It is critical to safety of flight for the operator to have procedures confirming that ULDs on board an aircraft are compatible with the aircraft, regardless of

who owns the ULD. Not all ULDs are authorized as compatible with all aircraft, so an operator should have procedures for:

- a. Compatibility. Ensure certified and non-certified ULDs are compatible with the aircraft and do not present a hazard to the aircraft.
- b. Standards. Ensure non-certified ULDs meet a standard (see Appendix B for suggested standards).
- c. Communicate. Inform employees and vendors loading aircrafts converted from passenger to all-cargo by an STC that the aircraft could have different ULD requirements than other STC conversions or production aircraft configurations in the operator's fleet.
- d. Differences. Ensure personnel understand that compatibility, limits, or restrictions may exist between similar aircraft types with STC conversions, and that the aircraft may have been produced as a freighter by a TC holder.

The following list details examples of the differences:

- 1) Aircraft weight limits;
- 2) Cargo zone index changes forward/aft body;
- 3) CG limits;
- 4) Forward and aft body structure loading limits;
- 5) Fuel index tables;
- 6) Individual compartment maximum loads;
- 7) Lateral cargo unbalances;
- 8) Main deck door opening variances;
- 9) Maximum allowable loads limited by restraint;
- 10) Maximum allowable takeoff weight limits;
- 11) Maximum area load limits;
- 12) Maximum cargo zone load limits, including cumulative loads above and below deck;
- 13) Maximum cumulative loads aft to forward;
- 14) Maximum floor loading limits;
- 15) Maximum ramp weight limits;
- 16) Maximum ULD gross weight restrictions by aircraft position;
- 17) Missing inoperative cargo restraint limits;
- 18) Reduced over wing zone capabilities;
- 19) ULD height restrictions;
- 20) Asymmetrical load limits; and
- 21) Zero fuel weight restrictions.

- e. ULD Contour and Dimensions. Compare the size of the main and lower deck compartment door openings with the contour and dimensions of ULDs to be loaded. An operator should take into consideration any height restriction within the aircraft cargo compartments.
- f. Approved ULD Limitations. Ensure approved ULD limitations are maintained in the manual. An operator should base these limitations on data from applicable aircraft WBMs or STC supplemental WBMs. The limitations should identify which ULDs are compatible with specific aircrafts, and should also be easily accessible by all affected persons.

**NOTE: The limitations section of the AFM or AFM supplement may include information from the aircraft WBM.**

- g. Authorized ULDs. Ensure its aircraft WBM or other appropriate manual states which ULDs may be carried aboard the aircraft on the main deck or lower lobes. In certain instances, particularly with an aircraft's lower lobes, certain compartments may be certified to carry bulk or restrained cargo, or both. The WBM or other appropriate manual should identify the ULDs by the type authorized to be carried aboard the aircraft, considering the aircraft and CLS capabilities.
- h. Use of Non-Certified ULDs. Ensure the operator does not use non-certified ULDs in any compartment of an all-cargo or combination aircraft, unless (1) the ULDs are authorized by aircraft manufacturer or WBM, or (2) tiedown instructions describe how to restrain the ULDs as bulk cargo.
- i. Unauthorized Pallet and Net Combinations. Ensure employees and vendors don't combine incompatible nets and pallets.

## **6. RESPONSIBILITIES FOR THE MAINTENANCE AND REPAIR OF ULDS, PALLETS, AND NETS.**

ULDs, pallets, and nets must be maintained under an operator's or vendor/supplier's maintenance program that satisfies the ICAs of the ULD manufacturer. The operator should have a program to determine the serviceability of the ULD when it is intended to be placed on board the aircraft and ULD traceability through their authorized vendor list which is made available to the DGCA.

## **7. RESPONSIBILITIES OF AN OPERATOR AFTER PURCHASING/LEASING A ULD.**

### **a. Certified and Non-Certified ULDs.**

- 1) Certified ULDs.
  - a) New Certified ULDs. When an operator purchases/leases new certified ULDs, it should perform a first article inspection (see Appendix C, Definitions Related To Air Cargo Operations) of the ULD to confirm its conformance to the type design, and is eligible for installation on the operator's aircrafts. The equipment manufacturer must show conformity on subsequent deliveries of new ULD equipment.
  - b) Used Certified ULDs. When an operator purchases/leases used certified ULDs, it should perform a serviceability inspection, conducted by appropriately trained certificated personnel, if existing records don't confirm the ULD's serviceability. After completing the inspection, the operator issues a tag verifying the serviceability of the ULD before placing it into service. After an initial inspection, the operator should then maintain its own maintenance inspection and repair records for the ULD. If the ULD has appropriate records to verify its serviceability, the operator should perform a receiving inspection in accordance with its procedures.
- 2) Non-Certified ULDs. When purchasing or leasing a new or used non-certified ULDs, the operator should:
  - a) Obtain the manufacturer's current CMMs and illustrated parts list, subsequent manual revisions, service letters, or SBs;
  - b) Verify that the manufacturer establishes clearly defined and tested serviceability limits in accordance with IATA, SAE, or ISO standards, or another standard acceptable to the DGCA;
  - c) Provide a trained, qualified, and authorized person to perform a quality audit of a repair/overhaul facility where the ULDs are repaired/overhauled;
  - d) Check that the manufacturer designs all ULD equipment to allow venting during changes in air pressure, if required
  - e) Check that only OEM-approved parts were used during manufacturing;
  - f) Check that the manufacturer issues spare part conformity certificates; and

- g) Perform a first article inspection of the ULD received to ensure its serviceability.
- 3) Active ULDs. In addition to the certified ULD requirements under subparagraph A.1).a) above, consult with the DGCA

**b. Receiving a Purchased/Leased ULD.**

When receiving a ULD, an operator should have a trained, qualified, and authorized personnel perform a receiving inspection of the ULD, using the operator's procedures. The receiving procedures should include processes, instructions, and guidelines to:

- 1) Check each ULD before it is put into service;
- 2) Review the required documentation for new and repaired ULDs to ensure the ULD is serviceable; and
- 3) Conduct a visual inspection of the ULD.

**NOTE: Certificated personnel do not need to conduct receiving checks. The operator may designate a trained, authorized, and qualified person to conduct the checks. Receiving checks don't determine the airworthiness of a ULD because a repair vendor or the ULD equipment manufacturer has confirmed the ULD's serviceability before return to service.**

**c. Maintaining ULD Repair Records.**

An operator should have procedures for retaining certified and non-certified ULD repair records. An operator may maintain its own records, or have repair vendors maintain the records, provided the operator can access them upon request within a reasonable period of time.

**d. Procedures for Maintaining and Repairing ULDs.**

An operator should have procedures to maintain and repair certified and non-certified ULDs. The procedures should be the same for both types of ULDs, except for establishing appropriate damage limits and specific repair procedures. The procedures should:

- 1) Clearly state the data supporting the maintenance and repair.
- 2) Detail transporting damaged ULDs aboard its aircraft to a repair station, provided the damaged ULDs do not pose a hazard to the safety of flight. The procedures would include restraining the ULD as bulk cargo if necessary.
- 3) Address how frequently the operator or repair vendor should check ULD tare weights, and how it should mark updated tare weights on ULDs.



The operator should manage control of ULD tare weights by documenting them and retaining the documentation using operator procedures.

**e. Standards for Repair of ULDs.**

An operator should have procedures to ensure that:

- 1) Personnel who repair ULDs are trained, qualified, and authorized;
- 2) ULDs are repaired per the operator's maintenance program;
- 3) Parts for ULD repair meet or exceed equipment manufacturer standards, and are authorized by either the ULD manufacturer or the operator's processes using accepted data;
- 4) The appropriate current data is available to repair the ULD, including operator maintenance manuals, ULD manufacturer maintenance manuals, SBs, Airworthiness Directives (AD), ULD manufacturer CMMs, or other accepted data;
- 5) The tare weight of each ULD is checked using the operator's procedures;
- 6) The new tare weight is marked on each ULD using the operator's procedures; and
- 7) ULD and associated component or article repair is per part 43, whether the operator or a repair vendor performs the repairs.

**f. Use of a Repair Station/Vendor to Repair ULDs.**

- 1) An operator should provide its repair vendors with written authorization to repair its ULDs, and ensure the availability of all necessary data and manuals for repairing its ULDs.
- 2) An operator should conduct audits of contracted repair stations:
  - a) For the vendor's training program, and
  - b) To ensure repair stations comply with the operator's maintenance program requirements.

**g. Returning a ULD to Service.**

An operator should have procedures for repairing unserviceable ULDs and approving them for return to service. As required by part 43, only appropriately trained and certificated personnel can return a ULD to service. Personnel should return ULD equipment to service under the requirements of the applicable CMM or operator instructions. certificated repair stations operating under part 145 should return ULDs to service using operator procedures.

- 1) An operator may use accepted data in place of the requirements of the manufacturer's CMM. An operator may also choose to strictly follow the manufacturer's maintenance procedures. Regardless, an operator should clearly state which data it uses in its manual system.
- 2) An operator should use its CASS to verify the performance and effectiveness of its CLS maintenance program and provide corrections to any deficiencies discovered in the program.

#### **h. ULD and Restraint Damage Limits.**

##### 1) Identifying or Revising Damage Limits.

It is important that the operator specify damage limits for ULDs and related restraint equipment. The operator may use the damage limits provided by the manufacturer or may develop its own damage limits, with acceptance. If the operator develops its own damage limits, it should:

- a) Establish a procedure for developing the new damage limits;
- b) Provide the DGCA with data to support its new damage limits; and
- c) Obtain DGCA acceptance before using the new damage limits.

##### 2) Standardization of Damage Limits for ULDs.

An operator may standardize damage limits for ULDs transported upon their aircraft. The operator doesn't need DGCA approval if the operator applies the most restrictive damage limits categorized by the type of ULD. An operator publishing less restrictive damage limits should provide the DGCA with engineering data to support its decisions.

##### 3) Exceeding Allowable Damage Limits of a ULD.

A container that exceeds allowable damage limits, with damage to its shell, may be accepted for use by installing an authorized net over the shell and using an authorized pallet/net combination. A reduced-weight requirement may be necessary when an operator uses this procedure. The operator should develop procedures for using the damaged ULD with a net.

#### **i. Establishing Usage Limits for Cargo Straps.**

Cargo strap assemblies should be determined serviceable prior to use. If a cargo strap manufacturer does not provide damage limitations for their cargo straps, an operator should develop guidance to include, at a minimum, not using the strap if:

- 1) Buckle Latch Mechanism. A buckle latch mechanism will not lock or stay engaged. This allows the web to slip while under tension, or may result in the web binding or being out of alignment.
- 2) Mechanism Integrity. Attached mechanisms, fittings, hooks, and rings are bent, deformed, cracked, broken, or missing.
- 3) Webbing Integrity. Webbing is partially cut or torn, knotted, unraveling, or has loose or missing sewn stitches.
- 4) Environmental Conditions. The strap is deteriorated due to environmental conditions.

**j. Additional Procedures for Cargo Nets.**

If the operator owns or leases cargo nets, it should consider using additional procedures for cargo nets, such as:

- 1) Assigning a unique marking or serial number to nets and placarding that marking or number on the nets;
- 2) Placarding nets with their damage limits;
- 3) Attaching an identification tag to the operator's nets; or
- 4) Ensuring proper storage when not in use to prevent damage.

**k. Temporary Installation of Restraints on a Cargo Net.**

- 1) Installation Requirements. An operator may install temporary restraints on a cargo net if:
  - a) The temporary restraints are authorized for use;
  - b) The operator has a process in the manual system addressing the use and limits of temporary restraints; and
  - c) Personnel that install the temporary restraints are trained, qualified, and authorized.
- 2) Purpose. The operator may install temporary restraints for the purpose of addressing items such as:
  - a) Using a bridge strap to bridge cut or otherwise damaged ropes, or missing or damaged fittings;
  - b) Installing temporary fittings and hooks to compensate for damaged or missing fittings, using equipment manufacturer or operator procedures; or
  - c) Installing net corner and supplemental lashing lines.

**l. Performing Operational Checks on ULDs or Other Cargo Restraint Devices.**

An operator should perform an operational check for damage before using ULDs and other restraint devices for movement or buildup, and should conduct a final serviceability check before loading cargo aboard the aircraft.

- 1) Purpose. Operational checks should not determine a ULD's airworthiness. Instead, they ensure the ULD or other restraint devices do not have obvious damage greater than their damage limits. An operator should not use ULDs or other restraint devices with damage greater than damage limits specified.
- 2) Individuals Who May Perform Operational Checks. Although it is acceptable, certificated personnel don't have to perform operational checks. Operators should train, qualify, and authorize personnel to perform serviceability checks. Operator procedures should identify who performs these checks and when the checks are performed.
- 3) ULDs That Fail an Operational Check. An operator should have a procedure for clearly marking or identifying ULDs and other restraint devices that fail operational checks. The method for identifying failed equipment should clearly distinguish these items from serviceable equipment so the operator or cargo loading vendor does not inadvertently place failed equipment into service. A procedure should be in place for individuals to report damage to persons responsible for maintaining the ULD.

**NOTE: The operator may correct clerical, data entry, or other errors of omission resulting in misidentifying or removing a ULD from service, and the ULD returned to service, provided the operator has a procedure in its manual system for identifying and correcting such errors.**

## CHAPTER IV OPERATIONS FOR CARGO HANDLING AND AIRCRAFT LOADING

### 1. GENERAL

- a. **Procedures.** An operator should have procedures in its manual system for ULDs, cargo requiring unique or special handling, special cargo, cargo buildup, loading and unloading, and restraining cargo. The procedures should include bulk loading and unloading of cargo, both compartment-restrained and restrained by other devices, if the operator permits. The procedures should use the operator WBM and aircraft manufacturer/STC WBM.
- b. **Procedures for Authorized Restraint Devices.** An operator should have specific procedures for cargo restraint devices it is authorized to use and a process to follow if failed restraints are identified while in use. Examples of these devices include installed nets, a CLS, certified ULDs, non-certified ULDs, and other restraints.

### 2. OPERATOR PROCEDURES ON ULD BUILDUP AND CARGO RESTRAINT. AN OPERATOR'S PROCEDURES ABOUT ULD BUILDUP AND CARGO RESTRAINT SHOULD ADDRESS:

#### a. ULD CG Limits.

Procedures should address maintaining longitudinal, lateral, and vertical CG limits of a built-up ULD. The operator should consider the following guidelines when developing the procedures:

- 1) Place sturdier, heavier, and larger cargo pieces on the bottom of the load and evenly distribute them over the length and width of the pallet base.
- 2) Place smaller, lighter, and fragile cargo pieces on top and evenly distribute them from the center over the length and width of the ULD.
- 3) Level off the cargo in the ULD when less than full.
- 4) Interlock or overlap small pieces when practical.

#### b. Voided Space in ULDs.

To minimize voided space within a ULD and between cargo pieces, the operator should consider using the following:

- 1) Supplemental restraint devices to restrain cargo within a container when less than full; and
- 2) Dunnage in voided spaces.

**c. Cargo Contours.**

The operator should have procedures about contouring cargo loads for the aircraft's interior dimensions when using a pallet/net combination, pallet/strap combination, or other restraint methods/devices. The operator should consider using techniques such as contour templates or charts. Also, the operator should consider procedures for operational conditions in which variance in contouring might occur. For example, variance in contouring might occur when forming an aisle to access DG or to ensure the integrity of a particular load. The operator also should account for height restrictions if required by the TC/STC WBM.

**d. ULD Identification Tags.**

The procedures should include tags to identify ULDs loaded aboard operator aircrafts, especially when using pallet/net or pallet/strap combinations; their identification is not always visible. The operator may use electronic tagging if it is authorized by an STC or other DGCA authorized means for the particular aircraft.

**e. ULD Weight Limits.**

The operator should include procedures so that cargo does not exceed ULD gross weight or area load limits if stated by the ULD manufacturer.

**f. Serviceability Checks.**

The procedures should include checking the condition of ULDs and other restraint devices for damage before using them, conducting serviceability checks to ensure noted damage does not exceed damage limits, and a process to follow if failed restraints are identified while in use. The operator should base serviceability checks on information from the equipment manufacturer, the STC, or other data acceptable to the DGCA.

**g. Fastening Container Components.**

The operator's procedures should address the correct method of positive closure and locking of container nets, curtains, and rigid or flexible doors after buildup. The operator should base these procedures on information from the container manufacturer, the STC holder, or another source with information acceptable to the DGCA.

**h. Fastening a Cargo Net to a Pallet.**

The operator's procedures should address how to fasten a cargo net to a pallet properly after buildup. The operator should base these procedures on information supplied by the pallet/net manufacturer or the STC holder.

**NOTE: Personnel whose job functions include determining compatibility of pallet and net combinations (per operator's procedures), pallet and airframe compatibility, and cargo restraint device (e.g., intermixing straps) should have training in these areas.**

### **3. OPERATOR PROCEDURES ON CARGO LOADING AND UNLOADING.**

**An operator's procedures about aircraft loading and unloading should address:**

**a. Sill Guards (if applicable).**

The operator's procedures should detail using, attaching, and detaching these devices. If an operator stows sill guards in the aircraft when they are not in use, the procedures should include the proper stowage in the aircraft.

**b. Tail Posts (if applicable).**

The operator's procedures should address using a nonstructural device called a tail post if the operator needs it to measure the distance between the aircraft's tail section and the ground during loading and unloading. Procedures should include instructions on attaching, detaching, and using it. If an operator stows the tail post in the aircraft when not in use, the procedures should include the proper stowage in the aircraft.

**c. Tail Stands (if applicable).**

The operator's procedures should address using a structural device called a tail stand if the operator needs it to prevent the aircraft from settling on its tail during loading and unloading. The procedures should include instructions on attaching, detaching, and using it.

**d. Tail Tipping Avoidance.**

The operator's procedures should address methods to prevent the aircraft from tipping on its tail during loading and unloading. Examples of these methods include step loading and unloading of cargo, or nose gear tethering. Should address the proper use of cargo compartment and bulkhead doors, installed nets, and smoke barriers.

**e. Aircraft Floor and ULD Base Load Limits.**

The operator's procedures should address the aircraft's floor load limits if the operator loads cargo directly onto the aircraft's floor. These limits can be expressed as area load or linear/running load limits. The procedures also should address floor load limits for a ULD base if the ULD manufacturer has a limit. Operators should base these procedures on information from the

aircraft manufacturer or an STC WBM or supplement. The procedures should address how to distribute, or shore, cargo weight greater than a floor load limit. For more information, see paragraph 2.G Procedures for Cargo Shoring.

**f. Aircraft Weight Limits.**

The operator's procedures should address the weight limits for aircraft cargo positions, floors, zones, and compartments, and measures to ensure the operator does not exceed them. The operator should base these limits on information from the aircraft manufacturer or STC WBM or supplements.

**g. Aircraft CG Range Limits.**

The operator's procedures should address the CG range limits for the aircraft, and longitudinal, lateral, and vertical CG limits for cargo positions. The procedures also should prevent an operator from exceeding these limits. The operator should base these procedures on information from (1) the aircraft manufacturer or (2) STC WBM or supplements.

**h. Cargo Access Aisle.**

The operator's procedures should address a method for creating a flightcrew access aisle to cargo requiring access during flight. Examples of cargo requiring such access includes certain DG or live animals.

**i. Aircraft Damage Avoidance.**

The operator's procedures should prevent damage during loading and unloading to the cargo handling system, cargo liners, smoke detectors, light fixtures, fire retardant flow nozzles, and similar devices.

**j. Aircraft Damage Notification.**

The operator's procedures should notify flightcrew members or authorized maintenance personnel of a damaged, missing, or inoperative cargo compartment, cargo handling system, installed net, or smoke barrier and related components. These procedures should include a general guideline or list of what specific items cargo loaders should report to flightcrew members or authorized maintenance personnel, such as holes in the cargo compartment liner, and damaged or missing cargo handling system restraints and rollers, and installed nets and smoke barriers.

**k. Cargo Clearance.**

The operator's procedures should detail the minimum clearance, or distance, requirements between cargo and airplane systems and structure



(e.g., cargo compartment liners, light fixtures, fire suppression systems, and smoke detectors).

#### **1. CLS.**

The operator's procedures should describe how to use the aircraft's CLS to restrain ULDs. The operator must engage all CLS restraints for loading ULDs and in voided positions. Engaging cargo restraints in voided positions prevents cargo shift resulting from floor lock failure.

**NOTE: Only certificated personnel under CASR 65 may adjust CLS components by physical removal and reinstallation. Trained, qualified, and authorized loading personnel may adjust or reposition a component if it is part of the operational instructions of the CLS.**

#### **m. Bulk Loaded Cargo.**

The operator's procedures should properly load bulk cargo in cargo compartments and pods certified for bulk cargo. The operator must not bulk load cargo in a cargo compartment or pod unless the aircraft manufacturer's WBM or STC authorizes it, and unless it is included in the operator manual system. If the aircraft manufacturer's WBM or STC doesn't contain enough detail for bulk loading cargo, the operator should establish procedures to ensure the safety of flight that address:

- 1) Cargo Clearance. The minimum clearance, or distance, requirements between cargo and airplane systems and structure (e.g., light fixtures, smoke detectors, etc.).
- 2) Load Distribution. Evenly distributing, or spreading, the cargo within compartments and pods over their length, width, and height.
- 3) Aircraft Nets. Properly using installed nets.
- 4) Aircraft Smoke Barriers. Properly using installed smoke barriers between cargo and flightcrew members and passengers.

#### **n. Cargo Requiring Special Handling Procedures.**

Some cargo may require additional or unique procedures to protect cargo or the aircraft during handling, acceptance or loading, or in flight. Examples of special handling procedures include ceremony or instructions for transporting human remains, feeding live animals in transit, signature service forms for tracking mail/cargo, compatibility with DG, protective gear when handling cryogenics, etc. The operator's procedures should address cargo loads requiring special handling, which may include the following:

- 1) Offset cargo;
- 2) Overweight cargo;
- 3) Overhanging cargo;
- 4) Outsized cargo;
- 5) Sharp or piercing cargo;
- 6) Crated heavy machinery;
- 7) Reels or spools;
- 8) Motor vehicles and other wheeled cargo;
- 9) Tall cargo;
- 10) Rigid cargo;
- 11) Tall rigid cargo (TRC);
- 12) Cargo not fully restrained by the CLS;
- 13) Human remains;
- 14) Foodstuff, feed, and postal mail;
- 15) DG (in compliance with CASR Part 92 subpart 92C );
- 16) Active ULDs (approved);
- 17) Temperature control ULD containers; and
- 18) Live animals:
  - a) Small animals, such as mice, rats, dogs, and cats, typically shipped in self-contained boxes or containers and typically loaded with other cargo in bulk compartments and ULDs. The procedures should address measures to:
    - i. Reduce the risk of animals escaping from containers while in the aircraft.
    - ii. Identify animals that have escaped from their containers in the aircraft.
    - iii. Remove escaped animals from the aircraft.
  - b) Large animals, such as horses and cattle typically shipped in special containers, stalls, or penning systems that are STC approved. The procedures should address measures to:
    - i. Verify that special containers, stalls, or penning systems are compatible and authorized for the aircraft.
    - ii. Ensure special containers, stalls, or penning systems are properly installed in the aircraft.
    - iii. Protect the aircraft from damage by animal waste, such as urine or solid waste.

- iv. Manage out-of-control animals in the aircraft.
- v. Remove animal waste from the aircraft.

19) ULDs;

20) Special cargo; and

**NOTE: Cargo requiring special handling procedures is a separate but related concept to special cargo. See Section 2.H for more information and to assist in identifying when one of the *cargo requiring special handling* examples listed above is classified as special cargo.**

21) Radio Frequency Identification (RFID) cargo.

#### **4. USE OF CARGO RESTRAINT DEVICES OTHER THAN ULDS.**

An operator may use other restraint devices as the primary restraint of cargo if authorized by (1) the aircraft manufacturer WBM or (2) STC supplementary WBM. The authorizing document should include serviceability limits, operational and repair procedures, and meet the flammability requirements of CASR part 25.

#### **5. PROCEDURES FOR USE OF PRIMARY RESTRAINT DEVICES OTHER THAN THE CLS.**

If an operator uses straps and other restraint devices as primary cargo restraints, it should have procedures for their use. These procedures must be based on the information provided by the aircraft manufacturer or STC holder. These procedures should address:

- a. Installing straps or other restraint devices to aircraft structure to include the CLS (e.g., floor tracks, rings, and hardware). An operator should emphasize in its procedures that reduced load limits and minimum separation requirements may exist between tiedown points if using the same aircraft floor track, ring, or hardware for multiple tiedowns. Operators must address minimum tiedown separation requirements for pallets so it does not overstress the aircraft floor attachments. Reference aircraft manufacturer prohibitions.

**NOTE: Intermixing cargo restraint devices made of different materials is not recommended**

- b. Calculating other restraint devices for a given cargo load based on the restraint criteria in the aircraft's WBM.

- c. Calculating the number of straps or restraint devices required based on the device's rated strength and limiting factors specified in the aircraft WBM or its supplement. The manufacturer's WBM or its supplement may require strength reductions of the strap or other restraint devices based on limiting factors such as aircraft sidewall or floor angles and the strength of attachment hardware.

**NOTE: The best method to determine the effectiveness of a strap or other restraint devices is that the reaction to load must be in the same direction as force is applied. Consideration should be given to strap installation angle and resulting reduction in available restraint**

- d. Properly arranging straps or other restraint devices around the cargo or attached to the cargo. Instructions should include correctly cinching adjacent net panels together with a net corner lashing rope and secure the end of the rope to the net panel to prevent disengagement.
- e. Restraining cargo using the aircraft's ultimate load conditions described by the manufacturer's WBM or its supplement. The operator should consider that these devices must provide restraint in the forward, aft, vertical, and lateral directions.

**NOTE: DGCA does not recommend that an operator tie multiple pieces on a pallet with straps or other restraint devices without an approved TSO net encompassing the load. Cargo, because of its size, condition, or shape that cannot be netted, must be classified and transported as special cargo.**

## **6. OPERATOR PROCEDURES FOR SUPPLEMENTAL CARGO RESTRAINT DEVICES.**

If the operator uses other restraint devices as supplemental cargo restraints, it should have procedures for their use. These procedures should be based on the information provided by the aircraft manufacturer, or the STC holder. These procedures should address:

- a. Using and attaching other restraint devices to the aircraft's installed seat track, tiedown track, and/or tiedown rings (See Section 2.H);
- b. Using and attaching other restraint devices to the pallet base tiedown track of commercial pallets according to the ULD manufacturer requirements and rings of military pallets; and

- c. Properly arranging other restraint devices around the cargo or attached to the cargo.

**NOTE: The operator should use care when positioning straps on cargo to prevent contact with sharp edges or irregular surfaces. The strap must not be prone to slippage from its intended position on cargo, and the operator should engage the lock mechanism so the strap is taut without being over-tightened.**

## **7. PROCEDURES FOR CARGO SHORING.**

Aircraft floors and some pallet bases have a load bearing weight limit, also called a floor load limit. Shoring is a technique to distribute the weight of a cargo piece over a larger area greater than its original load bearing area, which is also called a footprint or contact area. Cargo pieces heavier than a load bearing weight limit require shoring. The operator should have procedures describing:

- a. Materials acceptable for use in shoring, such as wood planks or plywood;
- b. Calculations or methods for determining the amount and thickness of shoring materials; and
- c. Methods for applying shoring material to the cargo piece.

## **8. BLOCKING AND BRACING TECHNIQUES.**

An operator may need to stabilize cargo pieces such as large cable reels, motor vehicles, wheeled cargo, and odd-shaped cargo to prevent shifting during loading, unloading, and flight conditions. The operator should use blocking and bracing techniques to stabilize such cargo pieces. The operator's procedures should describe:

- a. Acceptable materials for blocking and bracing;
- b. Calculations or methods for determining the amount and thickness of blocking and bracing materials; and
- c. Methods for applying blocking and bracing materials to the cargo piece.

## **9. FRANGIBLE (COMPRESSIBLE) CARGO.**

Frangible cargo may be required in certain positions for protection of the aircraft, occupants, and its ability to withstand emergency landing conditions, as required by the aircraft manufacturer W&B document. An aircraft

manufacturer's W&B document varies on this definition, therefore, you should reference their document prior to developing procedures.

**10. CARGO LOADING PROCEDURES FOR COMBI-CONFIGURED AIRCRAFT.**

Aircraft configured for carrying passengers and cargo on any deck such as combi-configured aircrafts, may require special cargo loading procedures. The operator should have special procedures to load such aircraft, and these special procedures should be based on requirements established by the aircraft manufacturer or STC holder.

## **CHAPTER V LOAD SUPERVISION, LOAD VERIFICATION, AND OPERATOR AUDITS**

### **1. SUPERVISING CARGO LOADING.**

An operator should designate a trained, qualified, and authorized person or persons with the duty of supervising the loading of the aircraft, such as a load supervisor, to ensure:

- a. All cargo is properly built up and weighed;
- b. Vendor's cargo scales have current calibration certificates;
- c. Planning and calculation of cargo and passenger placement maintains the aircraft within permissible CG and structural load limits;
- d. Cargo is properly secured with the appropriate type(s), quantity and placement of cargo restraint, and all pallet locks are engaged when used;
- e. The aircraft is correctly loaded and unloaded using the operator's procedures;
- f. Cargo is placed on the aircraft in such a way as to prevent overloading sensitive sections of the airframe and cargo floor;
- g. CLS, ULDs, and other restraint devices are in serviceable condition and properly used;
- h. Standard average weight or actual baggage weights are confirmed;
- i. Flightcrew members or authorized maintenance personnel are notified of damaged, missing, or inoperative cargo compartments, CLSs, installed cargo nets, or smoke barrier components;
- j. All cargo-related documents are accurate and properly completed before submission to flightcrew members; and
- k. The load manifest is signed by a trained, qualified, and authorized person.

**NOTE: Operators may use different terminology to identify person who has the duty of supervising the loading of aircraft or the load supervisor function, such as loadmaster, load lead, and load chief. The load supervisor may physically load the aircraft, but primarily supervises loading crews and procedures.**

**NOTE: The signature of the person supervising the load, on the load manifest, indicates the aircraft is loaded correctly.**

## **2. CARGO LOADED.**

Operators should designate personnel to provide information to the PIC, or the operator's authorized, trained, and qualified loading personnel, about how the aircraft was loaded. The designated loading personnel may provide loading information on one or more forms or documents, and may present it in hardcopy or electronic form. They may include additional information and certifications based on operator-specific requirements for cargo, such as DG, live animals, or special cargo. Operators should note that this information does not impact the requirements for a load manifest per CASR 121.665.

## **3. INFORMATION CARGO LOADED.**

The information indicating that cargo is properly loaded should include:

- a. The flight dates.
- b. The flight numbers.
- c. The aircraft registration number.
- d. The origin of the flight leg.
- e. The destination of the flight leg.
- f. The ULD numbers (for cargo carried in ULDs).
- g. The weight of each ULD loaded aboard the aircraft.
- h. The weight of the bulk cargo, by compartment or position, as applicable.
- i. The load schematic for special cargo.
- j. A certification statement verifying that:
  - 1) All ULD locks are up;
  - 2) All installed nets or smoke barriers are properly attached;
  - 3) All ULDs loaded are in an operational condition;
  - 4) All cargo was loaded using operator cargo loading procedures;
  - 5) Tail stand or post was removed, as applicable; and
  - 6) All cargo was loaded aboard the aircraft as depicted on the load plan form, verification form, or other similar documents.
- k. The signature, or electronic equivalent, of the load supervisor or other authorized, trained, and qualified loading personnel.

## **4. MAINTAINING RECORDS OF CARGO LOADING VERIFICATION INFORMATION.**

Operators must have procedures to retain a completed and signed copy, or electronic equivalent, of the document(s) containing the information listed in



chapter VI.5 above with the load manifest, per CASR 121.695 or CASR 121.697, as applicable.

**5. PERFORMING CARGO BUILDUP AND LOADING AUDITS.**

Operators should have a program acceptable to DGCA for periodic audits of cargo planning, building, and loading. The audits should be of sufficient scope and frequency to ensure that all cargo handling personnel are following operator's cargo procedures. (See Chapter II.D.2, Operator's Evaluation System for W&B Control).

## CHAPTER VI TRANSPORT OF SPECIAL CARGO

### **1. SPECIAL CARGO.**

Cargo that is not contained in a ULD certified for the airplane CLS or enclosed in a cargo compartment certified for bulk loading is special cargo. This type of cargo requires special handling and securing/restraining procedures.

### **2. SPECIAL CARGO ANALYSIS FUNCTION (SCAF).**

The operator should identify a person who has overall responsibility for the SCAF. Operators should develop policies and procedures for the identification, acceptance, and carriage of special cargo. If an operator carries special cargo, it must comply with the TC/STC WBM. Operators should use the SCAF to determine if the cargo is indeed special cargo, evaluate associated risks, and develop a plan to ensure a safe flight using TC/STC WBM data. The operator should ensure participants are trained, qualified, and authorized to perform functions listed below in paragraph 2.8.3.

- a. Person with Overall Responsibility. Examples of a person with overall responsibility of the SCAF that do not require the technical expertise of SCAF functions may be:
  - 1) Director of Safety (DOS);
  - 2) Chief pilot;
  - 3) Director of Operations (DO);
  - 4) Director of Maintenance (DOM);
- b. SCAF Participants. Examples of SCAF participant(s) who will require technical expertise in SCAF functions may include:
  - 1) Loadmaster;
  - 2) Engineering; or
  - 3) Other trained and qualified persons.
- c. Other trained and qualified persons.

### **3. PROCEDURES FOR PLANNING A SPECIAL CARGO TRANSPORT.**

The operator should develop policies and procedures for transporting special cargo. Procedures must be based on approved data from the aircraft manufacturer/STC WBM.

- a. SCAF Responsibilities. Based on the operator's procedures, the SCAF will:

- 1) Evaluate Cargo Transport. Determine the aircraft's ability to safely transport the cargo without causing structural damage. Evaluate the cargo and identify its tiedown capabilities. Take into account the special handling needs, placement of special cargo, weight limits, floor loads, and cargo clearance. See paragraph 2.8.4, which provides characteristics associated with special cargo in assisting the SCAF in determining special cargo.
- 2) Determine Restraint. Provide a method to determine the appropriate quantity and types of restraint, shoring, and arrangement confirming the determination of the load's restraint capability in each direction. The operator should demonstrate that the orientation secures the load for all aircraft operations. Restraint loads must not exceed the rating of cargo tiedown points, pallet tiedown fittings, or aircraft structure. The operator should also demonstrate restraints are distributed in accordance with the airplane/STC WBM.
- 3) Construct a Load Schematic. Construct a diagram/pictorial schematic based on approved airplane WBM/supplement. The schematic should:
  - a) Illustrate restraint calculations and a proposed tiedown scheme for each special cargo item.
  - b) Include the number and angle of restraints and the attachment points from the special cargo to the aircraft structure confirming the determination of the load's restraint capability in each direction.
  - c) Illustrate the position of all pieces of special cargo in relation or adjacent to the CLS and all other cargo having special requirements resulting from the carriage of the special cargo. Refer to Appendix H, Example Proposed Tiedown Scheme.

**NOTE: The special cargo tiedown scheme will comply with the approved airplane WBM/supplement and can be incorporated into the operator's manuals. A separate load schematic will not be necessary for the items incorporated in the operators' manuals. However, when using this procedure, the operator should reference the manual and page number on a cargo loading document and retain it with load manifest.**

- b. Operator's Responsibilities. The operator should:
  - 1) Loading. Make load schematic and any necessary instructions available to the loadmaster, load supervisor, ground personnel, and flightcrew, as

appropriate. Documents should be made available to those personnel involved with, or responsible for, the loading and securing of cargo.

**NOTE: The operator should ensure that persons with the duty of supervising the cargo loading utilizes schematic and instructions during cargo loading.**

- 2) Record Retention. File the load schematic as outlined above in subparagraph 2.8.3.1.3 with the load manifest.

#### **4. CHARACTERISTICS ASSOCIATED WITH SPECIAL CARGO.**

Anytime restraint is attached directly to the aircraft floor, the cargo should be classified as special cargo. This includes supplemental restraints because it creates parallel load paths. The acceptance of special cargo requires a determination that the loading and restraint capabilities of the airframe and associated restraint devices provide compliance with all limitations contained in the approved TC/STC, AFM, and WBM. The operator should have procedures to determine if the cargo is indeed special cargo. The following list contains examples of characteristics to help make this determination:

##### **a. Offset Cargo**

Cargo positioned on the pallet in a manner that the cargo is shifted beyond the perimeter of the pallet resulting in either 1) the CG limits of the pallet being exceeded, or 2) the restraint by the net to the pallet becoming ineffective in protecting the aircraft and preventing cargo shift. A reason for offsetting the cargo could be to meet aircraft clearance requirements. Offset cargo is special cargo.

##### **b. Overweight Cargo**

Cargo that exceeds the maximum allowable weight as defined by the aircraft WBM for aircraft ULD position.

##### **c. Overhang Cargo**

Cargo that extends beyond the perimeter of the pallet in at least one direction but still allows the net to perform its intended function. The pallet can still be restrained by the CLS and does not require additional straps to the aircraft structure.

##### **d. Outsized Cargo**

Cargo that exceeds the maximum allowable contour of an aircraft ULD such that the ULD must be loaded on board an aircraft as a non-CLS restrained ULD.

**e. Sharp or Piercing Cargo**

Cargo of a piercing or penetrating nature, or cargo with sharp edges or corners, such as rods, pipes, extrusions, or beams, that could become a projectile hazard during flight operations.

**f. Unusually Shaped Cargo**

Cargo that is irregular in nature, such as crated heavy machinery, reels, spools, compressed springs, and actuators. Risks associated with these items include:

- 1) Can roll and shift during transportation due to their shape;
- 2) Hard to lift and move without damaging the edges;
- 3) Can be bundled together and require blocking and bracing techniques to prevent cargo shift;
- 4) Can become projectiles if not handled and secured properly; and
- 5) The weight is concentrated in a very small area and often exceeds the floor-bearing weight capacity of the aircraft.

**g. Motor Vehicles and Other Wheeled Cargo**

Motor vehicles and other wheeled cargo with heavy weights represent a higher hazard and should be systematically handled with reinforced precautions, checks, and cross-checks, to include:

- 1) Fuel levels,
- 2) Load shoring and restraint,
- 3) Blocking and bracing (chocking) wheels to restrict movement, and
- 4) Tiedown attachment points.

**h. Tall Cargo and TRC.**

Currently, TRC only applies to the B-747. Tall cargo is cargo greater than 98 inches tall. Certain sections of tall cargo can be frangible and certain sections can be rigid. If any part of the rigid section of tall cargo is above 98 inches, the tall cargo is TRC. If the entire rigid section of tall cargo is at or below 98 inches, the tall cargo is not TRC. It is the responsibility of the operator to determine if cargo is tall cargo or TRC.

**i. Cargo Not Restrained by the Aircraft CLS.**

Cargo not fully engaged by the cargo loading restraint system but secured to the aircraft structure. Cargo not fully restrained by the aircraft CLS becomes special cargo.

**j. Cargo Using a Sandwich Pallet.**

A sandwich pallet is the practice of placing a pallet on top of another pallet for various reasons such as additional shoring, the upper pallet being damaged, or when stacking empty pallets. In some cases, wood (skid or plywood) is placed in between the pallets. In all cases, the upper pallet becomes cargo. A base pallet that is not secured by the CLS is special cargo.

**k. Floating Pallet.**

ULD positioned over one or more pallet position and not fully restrained by the aircraft CLS, but restrained to the aircraft structure by means of strapping to tiedown fittings. Floating pallets are special cargo.

## CHAPTER VII USE OF MULTIPLE CARGO ENTITIES

### 1. INTERLINING.

Interlining is considered when cargo is transferred from one operator to another, whether using the same or different aircraft types. The receiving operator must ensure that all cargo being transferred is acceptable and capable of transportation on the receiving operator's aircraft.

- a. Procedures an Operator Should Have for Interlining. The operator should develop standards for accepting cargo in accordance with their policies and procedures, which include, at a minimum:
  - 1) Cargo check (visual examination) including serviceability of ULDs;
  - 2) ULD compatibility with aircraft (see paragraph 2.4.6, Determining ULD Compatibility); and
  - 3) Special cargo verification and validation, if applicable.
- b. Using Vendors to Interline or Build Up Cargo. The use of third parties, foreign and/or domestic, reduces the need for the operator to employ personnel or to contract directly for interlining built-up cargo, aircraft loading, unloading, and cargo handling at a particular location. See Appendix C, Definitions Related to Air Cargo Operations, and paragraph 2.9.2, Vendors, for additional information on vendors.

### 2. VENDORS.

#### a. Vendors Performing ULD Handling or Buildup.

- 1) As previously mentioned, the operator is ultimately responsible for the security of the cargo and safety of flight. There are multiple entities involved in the movement of cargo. Examples of these entities include shippers, vendors, freight forwarders, contractors, subcontractors, customs brokers and service providers. All play a role in the air transportation of cargo, and these roles may include cargo buildup, freight staging, cargo loading, and tiedown. Vendors performing ULD handling or buildup must ensure that:
  - a) Requirements are met in accordance with the instructions of the operator;
  - b) Sufficient and proper ULD storage capacity is available for all units handled;

- c) All staff and supervising staff receive training appropriate to the tasks performed; and
  - d) Full access is guaranteed to enquiries or audits from the operator's Maintenance Quality Assurance departments.
- 2) An operator should have a system in place to perform audits of a vendor at regular time intervals.

**b. Operator Program for Vendors to Use in ULD Buildup or Loading**

Given that it is common practice for an operator to carry cargo loads that vendors have built up or loaded, an operator should have a program that ensures vendors perform cargo buildup and loading using the operator's procedures. Under such a program, an operator should have procedures to:

- 1) Train a vendor employee to train other vendor employees (train-the-trainer method), or accept the vendor's training program and procedures provided they meet or exceed the standards established in the operator's training program and procedures.
- 2) Designate a trained, qualified, and authorized person to oversee the vendor services to ensure the vendor performs the services in accordance with the operator procedures.
- 3) Audit vendors for compliance with operator procedures and training programs.
- 4) Have a recordkeeping system to track all trained individuals, including vendors, in cargo operations that are authorized, qualified, and trained by the operator.

**NOTE: All cargo built by authorized, trained, and qualified personnel must meet operator standards before being loaded.**

**3. FREIGHT FORWARDING.**

An operator may engage with other companies such as freight forwarders for organized shipment of cargo. An operator should have a system in place to perform audits of a freight forwarder at regular time intervals.

**4. RESPONSIBILITY FOR MULTIPLE ENTITIES.**

DGCA recognizes it is common practice for multiple entities to perform different services associated with air cargo operations but the operator is always ultimately responsible for cargo loading and securing and safety of flight. Therefore, the operator should ensure multiple entities are trained,



qualified, and authorized to perform duties, audit third party operations, and ensure adherence to the operator's procedures, when applicable.

## **CHAPTER VIII FREIGHT STAGING**

### **1. STAGING CARGO AT DIFFERENT OPERATING LOCATIONS**

An operator may engage in the process of staging cargo at different operating locations. When storing or staging cargo, the operator should ensure the following:

- a. Proper security of all cargo is maintained;
- b. Proper special handling of cargo is provided;
- c. Proper storage of cargo that is also safe from natural elements;
- d. Appropriate climate control for cargo is provided, if applicable (e.g. refrigerated); and
- e. Proper documentation of all cargo is maintained.

### **2. TRANSPORTING STORED/STAGED CARGO**

Prior to loading the aircraft, the operator should ensure when transporting cargo that has been stored or staged, an acceptance check is performed to ensure:

- a. Documentation and cargo weights are accurate;
- b. Cargo is clear of debris such as sand, snow, or water; and
- c. Cargo meets requirements.

**1. USING CHECKLISTS AND JOB AIDS.**

The operator should develop a system when performing tasks to incorporate controls as part of their processes and procedures. In other words, checks and restraints are designed into a process to ensure a desired result. This could be a checklist or job aid. For example, a loading checklist or job aid and predeparture checklist or job aid may be used together to positively verify that the condition, weight, and sequencing of each pallet is correct for each loaded position on the aircraft. Examples of checklists and job aids with related items (not all inclusive) to accomplish this may include the following:

- a. Cargo Acceptance:
  - 1) Documentation;
  - 2) Visual check;
  - 3) Special cargo (Contact SCAF); and
  - 4) DG (See Dangerous Goods Checklist).
- b. ULD Serviceability:
  - 1) Receiving check; and
  - 2) Damage limits.
- c. Cargo Buildup:
  - 1) CG;
  - 2) Cargo contour; and
  - 3) Marking and labeling.
- d. Aircraft Pre-loading, Loading, and Unloading:
  - 1) Pre-loading: Visual check of CLS for broken missing components;
  - 2) Loading: Adequate restraint used to secure cargo; and
  - 3) After loading: Check that all locks are in the up position.
- e. Flightcrew Predeparture and Post-Flight Cargo:
  - 1) Final check that cargo is secured properly;
  - 2) Load manifest signed and supporting documentation available; and
  - 3) After flight, were any broken restraint devices identified?
- f. DG:
  - 1) Dangerous Goods Checklist accomplished; and
  - 2) Notification to PIC.
- g. Live Animal: Dry ice not compatible with live animal.
- h. Special Cargo:

- 1) SCAF; and
  - 2) Cargo restraint schematic.
- i. Vehicle Inspection:
- 1) Leaking fluids; and
  - 2) Gas tank levels.
- j. Station Audit:
- 1) Documentation;
  - 2) Training records;
  - 3) Scale calibration;
  - 4) Operators manuals; and
  - 5) Vendor audits.

### **1. OVERVIEW.**

An operator should establish and maintain a closed-loop system for the continuing analysis, evaluation, and surveillance of the performance and effectiveness of its W&B control program. The closed-loop system should include at least: surveillance, root cause analysis, corrective action, and followup. This system periodically monitors the performance and effectiveness of the W&B control program, which includes cargo operations, to ensure constant compliance. ( Developing and Implementing an Air Operator Carrier Continuing Analysis and Surveillance System) Operators can add this system to their CASS or they can develop their own closed-loop system.

**NOTE: This is a shared responsibility between operations and maintenance roles. A process should be in place to ensure that the operator reports and tracks this information to the CASS or similar parallel closed-loop system.**

### **2. SYSTEM LIST.**

The system should define how and when the operators/applicants audit the W&B cargo operation control system to include, at a minimum:

- a. Aircraft loading;
- b. Cargo buildup;
- c. Carriage of Special Cargo;
- d. Vendors;
- e. Personnel training;
- f. Freight forwarders; and
- g. CLS.

### **3. SYSTEM PERFORMANCE.**

System performance should be monitored to include such items as load plans, load manifests, aircraft configuration changes, cargo loading and restraint system performance (e.g., broken straps identified after use in flight and in-flight shift of cargo), and human factors issues with loaders, load supervisors, and vendors.

#### **4. SYSTEM EFFECTIVENESS.**

System effectiveness should be monitored to identify the reliability of the overall performance for cargo operations.

## CHAPTER XI TRAINING PROGRAMS

### 1. TRAINING PROGRAMS.

Operators should develop a cargo operations and W&B training programs. Training should explain employee functions (commensurate to their tasks and responsibilities), and express expectations of job duties and responsibilities according to the operator's procedures. An operator should have procedures to train its employees, managers, and vendors to its standards, as applicable. Personnel performing cargo operation functions must be trained, qualified, and authorized, as defined in the operator's manual. This training must be easily identified by documentation in training records and authorization documents readily available.

### 2. TRAINING PROGRAM COMPONENTS.

The operator's training program should include:

- a. A curriculum acceptable to the DGCA.
- b. Procedures for maintaining training records using the operator's policy or applicable regulations.
- c. Recurrent training requirements and intervals not to exceed 24 months.

**NOTE: In accordance with CASR part 121 regulatory requirements, pilots and aircraft dispatchers require recurrent W&B training every 12 calendar-months.**

- d. A description of the training program methods. The program may consist of one or more of the following methods:
  - 1) Classroom sessions;
  - 2) On-the-job training (OJT);
  - 3) Computer-based training (CBT); or
  - 4) Other training methodologies operators consider appropriate;
- e. A periodic review and update of the program.
- f. Proper identification of employees authorized to provide the training.
- g. General awareness and familiarization with DG training.
- h. Content, application, and use of OEM/STC WBMs (source documents).

### **3. IDENTIFYING INDIVIDUALS WHO NEED TRAINING.**

An operator should have procedures to properly identify those individuals who need training. An operator should provide training to operator and vendor loading personnel. These individuals may include:

- a. Aircraft loading personnel;
- b. Maintenance personnel;
- c. Crewmembers;
- d. Dispatchers/flight followers;
- e. Purchasing agents;
- f. Receiving personnel;
- g. Freight forwarders and shippers;
- h. Cargo sales employees and general cargo sales agents;
- i. Supervisory loading personnel;
- j. Personnel whose job function entails control of the amount and placement of fuel on board the aircraft;
- k. Ground handlers;
- l. Cargo buildup personnel;
- m. Load planners; and
- n. Persons involved with W&B and CG calculations.

### **4. CURRICULUM FOR W&B TRAINING AND CARGO OPERATIONS.**

- a. W&B.
  - 1) W&B Fundamentals. All operator and vendor personnel involved in a cargo program should receive fundamental W&B training at a general subject matter level to include:
    - a) Familiarization with varying aircraft weights based on manufacturer requirements;
    - b) The importance of conforming to and applying aircraft manufacturer and TC/STC requirements and zone or compartment limits;
    - c) The importance of accurate W&B calculations; and
    - d) The importance of proper communication among various personnel.
  - 2) W&B and CG Calculations. The operator's training course for personnel or contractors involved with W&B and CG calculations should include, at a minimum:



- a) Conforming and applying weight limitations by position, zone, or compartment of an aircraft using the aircraft manufacturer's requirements;
  - b) Determining CG limits for the aircraft;
  - c) Loading the aircraft per CG limits;
  - d) Calculating W&B and CG using operator procedures, to include automated or manual calculation systems;
  - e) Notifying the flightcrew of the W&B of the aircraft;
  - f) Accounting for the effect of weights of crews, other persons, cargo, and baggage;
  - g) Communicating W&B or CG issues to personnel involved with cargo loading;
  - h) Position of cargo and baggage;
  - i) Processes that factor CG offsets into cargo, both loaded into ULDs and loaded onto the aircraft; and
  - j) Processes and procedures to train and qualify personnel to calculate W&B.
- b. CLS. An operator should provide CLS training to personnel with job functions involving equipment installed to the floor of an aircraft cargo compartment used to restrain ULDs. The CLS usually consists of rollers, side guides, and locks for securing ULDs to the aircraft structure. Operators should qualify personnel under a training program that includes procedures, as applicable, for:
- 1) Inspections for serviceability, including accounting for damaged or missing restraint devices;
  - 2) Repairs;
  - 3) Reconfiguration;
  - 4) MEL and Configuration Deviation List (CDL);
  - 5) Loading procedures and their effect on aircraft performance;
  - 6) Potential hazards to flight caused by improper loading;
  - 7) Passenger baggage and cargo is properly loaded and restrained; and
  - 8) Authorized restraint systems for each of the operator's aircraft types.
- c. Cargo Buildup. All operator, freight forwarder, and other vendor personnel involved in cargo buildup and breakdown should receive cargo buildup training, as well as personnel whose job functions include verifying

eligibility of cargo, and selecting, assembling, and palletizing cargo for airlift. Elements of cargo buildup training include:

- 1) Concentrated loads;
- 2) Pallet load limitations;
- 3) Restraint;
- 4) Damage limits for ULDs and restraint devices;
- 5) Compatibility of aircraft/pallet and net/pallet combinations;
- 6) DG;
- 7) Scales;
- 8) Proper ULD configuration;
- 9) Container configurations and conditions;
- 10) CG offsets, profiling, and authorization for use on a particular aircraft;
- 11) Training on how to build up a ULD to comply with CG control; and
- 12) Documentation.

d. ULD. All operator and vendor personnel involved in cargo loading should receive ULD training. Personnel whose job functions include determining compatibility of pallet/net combinations (per operator's procedures), pallet and airframe compatibility, and cargo restraint devices (e.g., intermixing straps) should have training in these areas.

- 1) Elements the ULD Training Program Should Contain. The operator should develop a training program that includes:
  - a) ULD identification. This should include a review of unique ULDs and identify the risks of loading a ULD not authorized for loading aboard the aircraft.
  - b) ULD damage limits and changes to limits. If a ULD's damage limits are modified, the operator notifies all appropriate loading personnel and the training program is modified to reflect the new limits;
  - c) ULD CG Limits;
  - d) Voided space in ULD;
  - e) Cargo contours;
  - f) ULD identification tags;
  - g) ULD weight limits;
  - h) Serviceability checks;
  - i) Fastening container components;
  - j) Fastening a cargo net to a pallet; and

- k) Recurrent training for all loading personnel involved in ULD buildup. Operators should determine the time and type of recurrent training appropriate to the type of operation. Operators should require requalification and reauthorization training if loading personnel involved in ULD buildup are no longer considered properly trained, qualified, and authorized.
- 2) ULD Maintenance. Persons performing ULD maintenance should undergo training on the operator's maintenance program that includes:
  - a) Acceptance inspection;
  - b) Routine inspection;
  - c) Damage limits;
  - d) Repair;
  - e) Maintenance records; and
  - f) Return to service.
- e. Special Cargo Analysis Elements of SCAF:
  - 1) TRC: Determining TRC, loading procedures and restraint methods.
  - 2) Frangible cargo: Determining frangible cargo requirements, usage and procedures and provide training instructions.
  - 3) Procedures for transporting special cargo.
  - 4) Proficient with the content of OEM/STC WBM's.
- f. Loading/Unloading Training. All operator and vendor personnel involved in cargo loading and unloading should receive training appropriate to their function. This includes personnel whose cargo handling functions include ground transportation of cargo, movement of cargo onto or off of an aircraft, or movement/securing of cargo aboard the aircraft with appropriate devices and equipment. Elements of loading/unloading training include:
  - 1) Sill guards (if applicable);
  - 2) Tail posts (if applicable);
  - 3) Tail stands (if applicable);
  - 4) Tail tipping avoidance;
  - 5) Aircraft doors, nets, and smoke barriers;
  - 6) Aircraft floor and ULD base load limits;
  - 7) Aircraft weight limits;
  - 8) Aircraft CG range limits;
  - 9) Cargo access aisle;
  - 10) Aircraft damage avoidance;

- 11) Damage notification;
- 12) Cargo clearance;
- 13) CLS;
- 14) Bulk loaded cargo;
- 15) Cargo requiring special handling;
- 16) Shoring usage;
- 17) Blocking and bracing;
- 18) DG;
- 19) Restraint, including calculating forward, aft, lateral, and vertical restraint; the proper usage of the floor tracks and side rail attachment points for loadmasters; and/or personnel supervising the cargo load on these areas;
- 20) Special cargo;
- 21) Frangible cargo; and
- 22) Material handling equipment.

g. Supervising Cargo Loading.

- 1) Responsibilities. The operator should train, qualify, and authorize the person responsible for loading cargo on an aircraft. This person supervises the sequencing, loading, unloading, and securing of cargo, and is the last load control verification before signing the load manifest.
- 2) Elements of Cargo Loading Supervision Training. Load supervision candidates should be trained in the elements listed in subparagraphs 2.13.4.1, 2, 3, 4, and 6; as well as the below topics:
  - a) Interlining;
  - b) Aircraft cargo handling;
  - c) Cargo loading documentation;
  - d) Load planning;
  - e) Interface with foreign agencies and military units;
  - f) COMAT; and
  - g) Familiarity with the accepted operator's W&B control program or operator's manuals, including the necessary OEM/STC WBMs.

## **5. ACCIDENT/INCIDENT REPORTING.**

An operator should have procedures to ensure it trains its personnel in accident/incident reporting procedures.

## **6. PROVIDING AIR CARGO INFORMATION TO FLIGHTCREW MEMBERS.**

An operator's flight operations training should adequately inform the flightcrew, at a minimum, of the following:

- a. Potential hazards to flight caused by improper loading;
- b. Procedures used to ensure the aircraft weight is correct;
- c. Procedures to report unserviceable ULDs;
- d. Loading and weight limitations for removing or deferring cargo restraint components;
- e. Proper load configurations when using nets, straps, or containers;
- f. Requirements when loading and restraining special cargo; and
- g. General awareness and familiarization DG training.

## **7. USE OF VENDORS TO PROVIDE TRAINING.**

An operator may designate a person employed by a vendor, such as an aircraft company, ground handling company, or a freight forwarder authorized to train that company's employees. The operator should have procedures to accept the program.

## **8. EVALUATION OF TRAINING.**

An operator's closed-loop system, which monitors the elements of surveillance, analysis, corrective action, and followup, should include an evaluation of the operator's cargo training program. The operator also may use an internal evaluation program to review its training program. The operator should ensure it has procedures to periodically review the training program and make changes as necessary.

## **9. TRAINING RECORDS.**

- a. Retention. An operator should retain its current training records for the duration of employment plus 90 days. The operator should have procedures for retention of such records.
- b. Who Retains Records. The operator is responsible to ensure that training records are retained. The operator may retain these records itself, or it may choose to have the vendor retain them. The operator or the vendor may maintain the training records in electronic form or hardcopy.

## **10. TRAINING RECORD CONTENTS.**

At a minimum, an operator's training records should contain:

- a. The name of the person trained;
- b. The initial training date and most recent recurrent training date;
- c. A description, copy, or the location of training material used;
- d. The name and location of the person that provided the training; and
- e. Certification that the person was tested and successfully completed training.

## CHAPTER XII CERTIFICATIONS

### 1. GENERAL

#### a. Purpose.

This chapter provides background information for the certification and continued airworthiness of cargo aircraft. Examples of cargo aircraft include combi, passenger, all-cargo, commuter, or regional used for carrying cargo, including cargo loading systems (CLS), unit load devices (ULD), and other primary restraints.

#### b. Information Provided.

This chapter includes general information for converting passenger aircraft to freighter configuration or combi service, and content of applicable information in relevant Weight and Balance (W&B) documents.

### 2. AIRCRAFT CONFIGURATION

#### a. Certification Requirements for Cargo-Carrying Aircraft.

An aircraft designed to carry cargo, whether an all-cargo aircraft, combination cargo-passenger aircraft, or passenger aircraft, has special access requirements, structural modifications to accommodate unique loading conditions, restraint devices, appliances, and measures to ensure the security of cargo throughout the operational envelope of the aircraft. If an operator incorporates any of these design features or modifications into the aircraft design, it needs to meet certification requirements of the appropriate airworthiness standards of CASR part 25 as applicable, and have documents providing instructions for continued airworthiness (ICA).

#### b. Differences Between a Bulk Load and Nonbulk Load Cargo Compartment.

A cargo compartment is categorized or defined as bulk load or nonbulk load.

- 1) Bulk Load. The aircraft should have provisions inherent in the design and construction that prevent the cargo from:
  - a) Shifting and damaging aircraft systems and structures; and
  - b) Shifting to the extent that the aircraft center of gravity (CG) exceeds the certified limits. The design should include the requirement that the construction of the aircraft prevents unrestrained cargo, when subjected to the flight, ground, and landing loads of the appropriate

airworthiness standards, from damaging aircraft systems and structure by impact.

- 2) Nonbulk Load. An aircraft's systems and structures with a nonbulk load cargo compartment are protected by ULDs and the cargo restraint system. ULDs and other load restraints will ensure that the cargo structural loads are only applied to the aircraft through the ULD-aircraft interface of the cargo restraint system. The ULDs and cargo restraint system must meet the requirement, Cargo Pallets, Nets and Containers (Unit Load Devices) aircraft certification requirements about the retention of cargo, which provides certification requirements for the specification of the ULDs.

### **c. Features of Cargo Restraint Systems.**

- 1) Cargo Restraint System. The cargo restraint system installed in an aircraft is a critical design feature. The cargo restraint system is the primary means of ensuring the cargo loads introduced into the aircraft structure are properly distributed, and all items of mass are restrained from movement or from damaging critical aircraft systems when subjected to (1) flight, landing, and ground operational loads; and (2) loads resulting from emergency landing conditions.
- 2) Cargo Restraint System Inclusion. The cargo restraint system may include barriers, ULDs, nets, straps, chains, tiedowns, and floor locks. A cargo restraint system must have sufficient strength under the certification requirements to restrain the cargo safely and must ensure the cargo will not shift and block or reduce access to emergency exits, obstruct the flow of required fire retardants, and interfere with other design features, such as flight controls, that are critical to the safety of flight. The minimum requirements are defined in appropriate airworthiness standards.
- 3) Protection During Emergency Landings. An operator should determine whether (1) the cargo restraint system or (2) a barrier will protect all occupants from shifting cargo during emergency landings. This decision affects the aircraft's structural requirements, ULDs, and cargo restraint system.
- 4) Appliances. The cargo restraint system and the devices used to restrain the cargo to the aircraft structure are appliances.

### **d. Ensuring the Integrity of a Cargo Restraint System.**



Even though the original design of a cargo restraint system may be in compliance with the applicable certification regulations, the installation of the system may not be adequately defined. Inspections of some aircrafts have revealed wrong part numbers of installed locks, missing locks, damaged equipment needing repair or replacement, and modifications made to the cargo restraint system that appeared to compromise its integrity. To maintain the integrity of the cargo restraint system, the operator should ensure that replacement parts are authorized for the cargo restraint system components on which they are installed. It is important also to note that the operating environment for cargo restraint systems is generally more severe than what most aircraft structures ensure. Many traditional marking methods are not permanent in this environment, and to enhance the integrity of its system, an operator should ensure that its cargo restraint system markings are permanent.

**e. Installing Accommodations for Supernumeraries on Aircraft Certificated Under CASR Part 25.**

1) Exemption. A type certificate (TC) holder or an operator must petition for and receive an exemption. DGCA reviews each petition for exemption on its own merits. The enhanced capabilities of supernumeraries over passengers allow the DGCA to issue an exemption in certain instances from selected type design requirements normally included for passenger safety. In all cases, however, the desired result is the retention of all passenger safety features to the maximum extent possible, when all factors are considered, and an overall level of safety for supernumeraries comparable to that afforded to passengers.

2) Additional Concerns. DGCA may have additional concerns based on the particular aircraft configuration or other features and may require an exemption holder to provide palletized flightcrew rest facilities and access to the cargo compartment to care for live animals.

**f. Modifications and Alterations That Could Impact W&B.**

While the impact of a modification or alteration may be evident with many changes to W&B, the impact of some modifications are not readily evident, such as the following:

1) A modification to incorporate a winglet may change the cargo loading limitation over the wing box;

2) The change in zero fuel weight may alter aircraft fore and aft CG limits;

- 3) The conversion of class D cargo compartments to class C may heighten the potential for damage to certain design features in the class C compartment intended to sense smoke and discharge a fire retardant when necessary; and
- 4) The addition of an auxiliary fuel tank depending on its installation might change zonal payload weight limits on the structure.

**g. Design Elements That Could Affect the Cargo Location.**

The cargo aircraft design should accommodate uncertainties in cargo CG location expected within normal operational accuracies and tolerances. Loading personnel must consider the effect on structural loads from variations in cargo CG location in computing cargo restraint system and cargo deck loads. Unless the CG of the cargo is actually measured, the assumed location of cargo CG is based on the envelope achieved in operation. This expected variation should be part of the design and is normally a CG position loading limitation on the aircraft. These limitations are normally selected so that they can be achieved by the application of loading procedures. Cargo loading procedures for bulk and nonbulk, such as cargo contained in a ULD, should be reviewed to ensure the cargo CG is within the assumed envelope to avoid safety issues with the cargo restraint system and the affected aircraft structure.

**h. Design Approval Projects That Require ICAs.**

According to CASR part 21, all design approval applicants must submit an ICA as part of the type design for approval.

**i. Design Approvals.**

A design approval is any approved change or amendment of the type design granted by DGCA or its designees. A design approval defines or alters the approved configuration of an aircraft, aircraft engine, propeller, part, or appliance. The following are examples of design approvals and are subject to the requirements:

- 1) TCs.
- 2) Amended TCs.
- 3) STCs.
- 4) Amended STCs.
- 5) Parts Manufacturer Approvals (PMA).
- 6) TSO Authorizations.

Major repairs and alterations approved by DGCA, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance).

### 3. UNIT LOAD DEVICES

#### A. Classification of ULDs.

Certified ULDs, meaning containers or pallets/net combinations, are part of the aircraft cargo restraint system. This specification formally classifies ULDs for which certain strength capabilities have been demonstrated. But the specification also doesn't approve the installation or use of the ULD where the protection of an aircraft's systems and structure depends upon the integrity of the ULD. The vertical restraint configuration establishing the ULD type and strength capabilities are part of the classification of a ULD. As appropriate to the type design, the specification of ULDs compatible with a particular aircraft should be identified in the aircraft W&B or cargo loading document. This is the primary means for ensuring the proper ULDs are used in the operation of the aircraft.

**NOTE: If an operator uses fire containment covers or fire-resistant containers for enhanced fire protection, the operator should provide instructions in its manual on the proper inspection, installation, storage, cleaning, and use of these products.**

#### b. Using Certified Nets and Straps.

##### 1) Net and Pallet Combinations.

Net and pallet combinations are defined as ULDs by NAS 3610 and AS 36100, which also defines load capability for particular net and pallet combinations. If authorized for use, their arrangement and attachment to an aircraft structure, are identified in Original Equipment Manufacturer (OEM) reference documents. The strength capability of tiedown hardware should be provided, along with any limitations on use or acceptable configuration. The operator will have to obtain DGCA approval for the proper use of nets if the OEM has not provided the information. Regardless, the lack of information may result in a failure by an operator to ensure proper restraint of the cargo and a possible unsafe condition.

##### 2) Tiedown Straps.

Some approved cargo restraint systems use tiedown straps as a primary restraint means. These systems generally provide instructions for determining the quantity and arrangement of straps required to properly restrain the cargo. In many cases, the strap specification provided by the OEM may be only a required strap rating, such as “5,000-Pound Rated Straps.” In this situation, the operator must obtain DGCA approval for the particular straps that it is using. The operator should have procedures (1) for selecting or defining straps that meet the requirements of the approved cargo restraint system, and ensuring that purchased or manufactured straps meet the OEM requirements; and (2) in place that ensure the continued airworthiness of the straps. The straps authorized by the operator should be uniquely identified, such as with a manufacturer part number, in the operator’s operating manuals. and should meet the minimum requirements, Cargo Restraint Strap Assemblies.

3) Tiedown Strap Authorization.

With cargo restraint systems that use tiedown straps as a primary means of restraint, typically the approval is for tiedown to the aircraft’s structure using installed tracks and fittings. These systems do not generally use straps to restrain cargo to pallets, nor does approval per standards address this issue. If an operator uses straps as a primary means of restraint to a pallet, the process must be approved by the DGCA. In obtaining approval from the aircraft certification office in accordance with Order 8110.4C, the operator must provide the data necessary to demonstrate compliance with the appropriate regulations, including:

- a) Establishing strap rating requirements.
- b) How to determine the appropriate quantity of straps and their arrangement. In determining this, the operator must demonstrate that (a) the orientation of the straps secures the load for all loading conditions, (b) the loads in the straps do not exceed the strap rating, and (c) the strap loads don’t exceed the capability of the pallet tiedown fittings or tracks. The operator must also demonstrate that using tiedown straps does not introduce loads into the pallet that would exceed the tested strength of the pallet with regard to distributing the load from the pallet tiedown to the cargo restraint system latches, or the strength of the latches.

Providing the limitations for using the straps. For example, a limitation might be that the use of the straps as a primary restraint of cargo to a pallet may only be applicable to a single piece of cargo, or packaged or crated goods, where the cargo or package container is inherently strong enough to be restrained by straps or keep the contents from dispersing.

### **C. CG Offset Limits.**


- 1) Not Adhering to CG Offset Limits. A ULD specification document such as NAS 3610 and AS 36100 specifies in part the CG offset for which a ULD should have demonstrated specific strengths. If the operator doesn't adhere to the CG offset limits in operation, the operator may jeopardize the ULD's restraint of the load and the aircraft's ability to safely react to loads imposed by the ULD.
- 2) Floor Design. The design of the cargo floor and cargo restraint system is based on the assumption of loads applied to floor beams. Assumptions used in the floor design may not necessarily be the same as the ULD limits, and ULD CG offset limits for some aircrafts are more restrictive. The floor loads should include the total distributed load of the cargo in the ULD and the CG offset that may apply.
- 3) Design Assumptions. If the designer of the aircraft structural system and CLSs has assumed only a limited CG offset to which the systems must react, the operator must ensure the loaded cargo is within these design assumptions. If an operator doesn't adhere to the limitations of the design, the operator may impact the safety of operation.

## APPENDIX A

### **1. APPLICABLE FORM**

- a. DGCA Form 120-01 Pre Application Statement of Intent.
- b. DGCA Form 120-02A Pre Application Phase - Job Aids
- c. DGCA Form 120-02B Formal Application Phase - Job Aids
- d. DGCA Form 120-02C Document Compliance Phase - Job Aids
- e. DGCA Form 120-02D Demonstration Inspection Phase - Job Aids
- f. DGCA Form 120-02E Certification Phase - Job Aids
- g. DGCA Form 120-35 Evaluation & Approval of WB Control Program
- h. DGCA Form 120-27 Air Operator Proving Flight Report
- i. DGCA Form 120-31 Evaluation & Approval of OM
- j. DGCA Form 120-34 Evaluation & Approval of MEL
- k. DGCA Form 120-33 Evaluation & Approval of Maintenance Program

## 2. ADDITIONAL CHECKLIST FOR CARGO CERTIFICATION/EVALUATION

	<b>MINISTRY OF TRANSPORTATION</b> <b>DIRECTORATE GENERAL OF CIVIL AVIATION</b>	
	Office Complex Soekarno-Hatta International Airport, C3 St., Tangerang, Banten- Indonesia Telp.: (+6221) 225 66288, (+6221) 256 08887 Fax. : (+6221) 225 66399 Website : <a href="http://hubud.dephub.go.id">hubud.dephub.go.id</a> ; e-mail: <a href="mailto:daao_dgca@dephub.go.id">daao_dgca@dephub.go.id</a>	
<b>PART 121/135 SUPPLEMENTAL AIR CARRIER (CARGO)</b>		
<b>Company Name</b>		<b>Date of Inspection:</b>
<b>Certificate Number</b>		
<b>ADDITIONAL CHECKLIST FOR EVALUATION OF AIR CARGO OPERATIONS</b>		
Reference : - CASR 121 & 135 - SI 8900-xxx Chapter II		
<b>Manual Name :</b>	<b>Rev. No. :</b>	<b>Rev. Date:</b>

NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
<b>A. PROCEDURES/ OPERATIONS MANUAL</b>					
1.	Have procedures for control of Weight and Balance (W&B) for both aircraft and cargo.				
2.	Have procedures to study and evaluate the capability of any aircraft the operator may use to transport any type of cargo, including special cargo.				
3.	Have procedures for loading and unloading all types of cargo, including Company Material (COMAT).				
4.	<b>Weight and Balance Control Program Development Basis and Contents</b> Description on the W & B Control Programbasis with references made to TCDS, W & B Control Document and AFM/Rotorcraft Flight Manual,				
5.	Have procedures to restrain cargo in aircraft compartments, including main deck, lower deck, fore and aft compartments, or pods, in accordance with the requirements of the Original Equipment Manufacturer (OEM)'s WBM, Supplemental Type Certificate (STC) W&B supplement for certified ULDs, non-certified ULDs, bulk loaded cargo, and special cargo.				
6.	Have procedures for the use, storage and evaluation of the condition of				

NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
	cargo restraints (e.g. straps, netting, and ropes) used to restrain bulk, ULD, or special cargo. Procedures should provide for routine serviceability checks and the identification and removal of any unserviceable restraint devices. Procedures should also provide the process to follow if failed restraints are identified while in use				
7.	Have procedures to control the use, calibration, or verification of weigh scales for operators and vendors.				
8.	Have procedures to control the repair of ULDs, aircraft cargo loading systems (CLS), cargo restraint devices, and other miscellaneous aircraft cargo handling equipment required for loading or unloading aircraft. This also includes installed nets and installed smoke barriers.				
9.	Have procedures for reconfiguring the CLS and document that the appropriate personnel have been notified. This ensures maintenance, flightcrew, and the loading crew are aware that center of gravity (CG) limits may have changed for current and future flights.				
10.	Have procedures and processes for determining the carriage of special cargo.				
11.	Have procedures for freight forwarding, interlining, and freight staging.				
12.	Have procedures for the carriage of Dangerous Good.				
13.	a. Have procedures for incorporating a Continuing Analysis and Surveillance System (CASS) to verify the performance and effectiveness of its CLS maintenance program and provide corrections to any deficiencies discovered in the program.				
14.	Have procedures for incorporating a closed-loop system that monitors the elements of surveillance, analysis, corrective action, and follow-up to				



NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
	verify the performance and effectiveness of its W&B control program (including cargo operations) and provide corrections to any deficiencies discovered in the program.				
15.	Mathematical justification for loading provisions or schedules. This may be included under separate cover and not as part of the company manual.				
<b>B. WEIGHT AND BALANCE CONTROL TRAINING PROGRAM (MANDATORY)</b>					
1.	<p>Training Program</p> <p>These programs should contain the processes and procedures to maintain the weight and CG of aircraft dispatched. Topics in the training programs would include:</p> <ul style="list-style-type: none"> <li>a. Notification of flightcrew;</li> <li>b. Position of cargo and baggage;</li> <li>c. Calculations for average weights of persons and baggage, seasonal changes, and unusual loads (such as sports teams, military, and manifest weights of cargo, etc.);</li> <li>d. Calculations for actual weights and when to use them;</li> <li>e. Processes that take into account CG offsets for cargo, both loaded into unit load devices (ULD) or loaded onto the aircraft;</li> <li>f. Computer programs or other methods used to calculate CG; and</li> <li>g. Processes and procedures to certify personnel to calculate W&amp;B.</li> </ul>				
2.	<p>Training Program Curriculum would provide :</p> <ul style="list-style-type: none"> <li><b>a.</b> Programs for Load Personnel</li> <li><b>b.</b> Programs for Load Supervisors</li> <li><b>c.</b> Training on unit load devices Buildup</li> <li><b>d.</b> Programs for Maintenance Personnel.</li> <li><b>e.</b> Training Records</li> <li><b>f.</b> Flightcrew Awareness Training</li> </ul>				
3.	a. Cargo Operations Job &				

NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
	<p>Function Training:</p> <p><b>b.</b> Cargo Loading System (CLS). An operator should provide CLS training to personnel with job functions involving equipment installed to the floor of an aircraft cargo compartment used to restrain ulds. The cls usually consists of rollers, side guides, and locks for securing ulds to the aircraft structure. Operators should qualify personnel under a training program that includes procedures.</p> <p><b>c.</b> Cargo Buildup. All operator, freight forwarder, and other vendor personnel involved in cargo buildup and breakdown should receive cargo buildup training, as well as personnel whose job functions include verifying eligibility of cargo, and selecting, assembling, and palletizing cargo for airlift.</p> <p><b>D.</b> Unit Loading Devices (ULD). All operator and vendor personnel involved in cargo loading should receive uld training. personnel whose job functions include determining compatibility of pallet/net combinations (per operator's procedures), pallet and airframe compatibility, and cargo restraint devices (e.g., intermixing straps) should have training in these areas.</p> <p><b>E.</b> Special Cargo Analysis.</p> <p><b>F.</b> Loading/Unloading Training. All operator and vendor personnel involved in cargo loading and unloading should receive training appropriate to their function. This includes personnel whose cargo handling functions include ground</p>				

NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
	<p>transportation of cargo, movement of cargo onto or off of an aircraft, or movement/securing of cargo aboard the aircraft with appropriate devices and equipment.</p> <p><b>G.</b> Supervising Cargo Loading. The operator should train, qualify, and authorize the person responsible for loading cargo on an aircraft. This person supervises the sequencing, loading, unloading, and securing of cargo, and is the last load control verification before signing the load manifest.</p> <p>h. accident/incident reporting. An operator should have procedures to ensure it trains its personnel in accident/incident reporting procedures.</p>				
<b>C. WEIGHT SCALES</b>					
1.	<p>a. Scales used to weigh passengers, aircraft, and cargo must be calibrated and traceable to a National or International Standards.</p> <p>b. Operators/applicants must perform calibration in accordance with the civil authority for weights and measures having jurisdiction over the area in which they are using the scales.</p> <p>c. The frequency of calibration testing depends on use and handling.</p> <p>d. Certification documents should be in the English language.</p> <p>e. Periodic testing of scales using a known weight to ensure accuracy should be included in an operator's program</p>				
<b>Remark</b>					

NO	SUBJECT	SAT	UNSA T	N/A	REFER ENCE
<b>SIGNATURE</b>					
<b>Principle Inspector/ Flight Operation Inspector</b>		<b>Operation Inspector</b>		<b>Principle Inspector/ Airworthiness Inspector</b>	<b>Maintenance Inspector</b>
				<b>Certification Program Manager</b>	

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DIREKTUR JENDERAL PERHUBUNGAN UDARA

ttd

Dr. Ir. AGUS SANTOSO, M. Sc

Salinan sesuai dengan aslinya  
KEPALA BAGIAN HUKUM

