Slide 1

The National Air Carrier Association and its member airlines share the NTSB's goal of advancing safety in air cargo transportation. Air carriers place safety of flight as their number one priority and go to great lengths to assure cargo operations do not detract from this priority.

For more than three years, the U.S. cargo airline industry has been working with the FAA to identify cargo safety issues that need to be addressed and to establish best practices and procedures for their resolution to help bring about standardization. Safety issues and processes were identified in an FAA Cargo Strategic Action Plan. From that plan, implementation strategies were developed. Work intensified during the summer of 2003 when air carriers met with the FAA through working groups with specific expertise to address each safety issue identified. For each safety issue identified, the FAA and working groups developed standards, procedures, and controls.

The collaborative efforts of the FAA and air cargo industry resulted in a draft Advisory Circular which provides air carriers with recommendations for managing their air cargo operations. The Advisory Circular covers cargo operations performed by air carriers and other agencies involved through outsourcing. It includes operational processes, procedures, and certification.

Once the recommended Advisory Circular is published, air carriers and their FAA safety inspectors will share a common reference for the standards, procedures, and controls air carriers should adopt for their cargo operations. Adoption will increase safety and provide needed standardization among air carriers and others in the air cargo industry.

As Dave Cann of the FAA mentioned in his presentation, the Advisory Circular is divided into two Parts. Part 1 includes Operational Processes and Procedures. Part 2 includes Certification. My presentation covers Part 1. Part 1 is divided into 7 Chapters, each focusing on procedures air carriers should have for managing their air cargo operations. My presentation summarizes each chapter.

Slide 2

The next few slides list industry participants that worked with the FAA through working groups on the development of the Advisory Circular. There where **6 Associations**. There where **31 US Air Carriers**. And there where **2 major freight forwarders**.

Slide 6

Who should use this Advisory Circular?

Air carriers who carry cargo, checked baggage, hazardous materials, & Company Materials (COMAT) under Title 14 of the Code of Federal Regulations.

Contractors, Vendors, & Customers air carriers use to perform cargo weighing, cargo buildup, & aircraft loading.

Repair facilities & manufacturers of cargo handling systems, unit load devices, & other cargo restraints.

Slide 7

Chapter 1 of the Advisory Circular covers weight and balance procedures air carriers should have.

Aircraft Manufacturer's Weight & Balance Manual - Each type-certificated, transport category aircraft has an FAA-approved weight and balance manual from the aircraft manufacturer that contains all the information necessary to control weight and balance during all operations. This manual should be the basis for an air carrier's weight and balance procedures.

Supplemental Type Certificate or Other FAA Provided Data - For aircraft converted to cargo from passenger operations and for aircraft with other modifications, such as a cargo handling system, a weight and balance supplement describing the modification's effect on the aircraft is FAA•approved and issued as part of a supplemental type certificate (STC) or major alteration.

When applicable, the air carrier's weight and balance procedures should include supplemental type certificate (STC) supplied data, or other FAA-approved data.

Slide 8- Weight and Balance Procedures

Air carrier's weight & balance procedures should contain, as appropriate for their aircraft types and operations:

Aircraft Weighing Procedures -

Aircraft Operating Weight Limits such as Maximum Zero Fuel Weight, Maximum Taxi Weight, Maximum Take Off Weight, & Maximum Landing Weight

Cargo Weight Limits for aircraft positions, zones, & compartments.

Center of Gravity Range Limits for the aircraft.

Fuel Loading Data

Procedures for Supernumeraries – Supernumeraries are persons carried on all-cargo aircraft as authorized under Part 121 of the Federal Aviation regulation. Supernumeraries can be persons required to accompany the cargo during flight. For example, veterinarians and other essential personnel on horse charters to care for the horses during flight. Air carrier's weight and balance program should address how supernumeraries are handled and accounted for.

Cargo Weighing, Cargo Buildup, & Aircraft Loading Procedures

Weight & Balance Processes, Tables, Forms, & Manifest used to perform weight & balance computations.

Slide 9

Chapter 2 of the Advisory Circular covers procedures air carriers should have for the aircraft's Cargo Handling System, Smoke Barriers, & Installed Nets.

Cargo Handling System - Cargo compartments designed to accept unit load devices are equipped with a cargo handling system. The cargo handling system is designed to restrain unit load devices in the aircraft. The cargo handling system comprises various assemblies such as restraint locks, side rails, and ball and roller conveyors. A cargo handling systems may be installed in the main deck and lower deck cargo compartments.

Smoke Barrier & 9G Net or Bulkhead - When the flight crew or supernumeraries are seated on the same deck forward of the cargo handling system, a smoke barrier and 9G net or bulkhead is installed between the cargo handling system and the flight crew and supernumeraries.

Vertical & Horizontal Nets - Cargo compartments not designed to accept unit load devices are called bulk compartments. Bulk compartments have vertical or horizontal nets to restrain the cargo from shifting vertically, longitudinally, or laterally within the compartment or just from shifting onto the cargo door or cargo door area within the compartment.

Slide 10

Inspection & Repair – Air carrier's procedures should address inspection and repair of the cargo handling system, smoke barrier, 9G Net or bulkhead, and other installed cargo nets.

Air carriers may repair or replace inoperative and missing components with new, rebuilt, or overhauled components provided they are authorized for the aircraft.

Repairs may be performed by the air carrier or an authorized repair vendor using FAA-approved or -accepted data in accordance with the requirements of Title 14 Code of Federal Regulation Part 43.

Regardless who makes the repair, the air carrier has primary responsibility for determining that the repair meets applicable regulatory requirements and the air carrier's maintenance program using its Continuing Analysis and Surveillance system under Title 14 Code of Federal Regulations Part 121.

Receiving Inspection & Documentation – Air carrier's procedures should address receiving inspection and documentation for new, rebuilt, or overhauled components for the cargo handling system, smoke barrier, 9G net or bulkhead, and other installed cargo nets. Documentation should accompany the component to confirm each is certified as serviceable and to provide traceability to the data used for the repair.

Slide 11

Substitution of Components – When air carriers substitute a load bearing restraint, their procedures should address:
The load bearing units the air carrier may substitute;
The level of substitution the air carrier allows;
The conditions that support each substitution; and
FAA-approved data used for the substitution.
Minimum Equipment List (MEL) – Air carrier's procedures should address operations with deferred or missing cargo restraint equipment components. The aircraft's Minimum Equipment List (MEL) should contain adequate instructions or reference the appropriate manual for dispatch deviation procedures that describe:
Total equipment installed and minimum required for dispatch,
Loading limitations due to missing or inoperative equipment,
References showing where loading restrictions may be found,
The appropriate category for repair. and
Instructions for ensuring Minimum Equipment List (MEL) limitations are included in weight and balance computations.
Procedures should also include:
Reconfiguration of the aircraft, if necessary,
Voiding of adjacent positions, if necessary,
Accounting for limitations, and
Notification to flight crewmembers of the missing or inoperative component.

Slide 12

Chapter 3 of the Advisory Circular covers procedures air carriers should have for Airworthiness, Serviceability, & Maintenance of Unit Load Devices & Other Restraint Devices.

Unit Load Devices - A unit load devices is a container or pallet/net combination. Unit load devices are designed by the manufacturer for specific aircraft.

Certified Unit Load Devices – Certified unit load devices are manufactured in accordance with Technical Standard Order (TSO C-90 as amended), or if applicable, Supplemental Type Certificate (STC) or other FAA approved certification requirements.

Non-Certified Unit Load Devices – Non-certified unit load devices may be manufactured to industry standards such as AS, ISO, IATA, or other FAA accepted standards.

Unit Load Device Compatibility - To ensure unit load devices are compatible with the aircraft, procedures should contain the the types of unit load devices authorized for their aircraft. The types of unit load devices authorized should be based on the aircraft manufacturer's aircraft weight and balance manual, supplemental types certificate (STC), or other FAA approved sources.

Slide 13

New Unit Load Devices - Air carrier's procedures should include performing a first article inspection for new unit load devices purchased to verify their airworthiness. Procedures should also include obtaining conformity certificates for each subsequent delivery of new unit load devices.

Used Unit Load Devices – Air carrier's procedures should include an initial FAA-certified airmen inspection of used unit load devices purchased. Procedures should also include issuing a serviceable parts tag to verify airworthiness of unit load devices before putting them into service.

Receiving Acceptance Checks - Air carrier's should use trained, qualified, and authorized personnel to perform receiving acceptance checks on all new or repaired unit load devices in accordance with air carrier's procedures. Air carrier's receiving acceptance check procedures should include processes, instructions, and guidelines to ensure:

A receiving acceptance check is performed on new or repaired unit load devices before they are put into service;

A review of the required air worthiness documentation; and

A visual inspection of the unit load device.

Air carrier's procedures should also include:

Receiving the manufacturer's maintenance manuals, manual revisions, and service bulletins,

Verifying the manufacturer has clearly defined and tested serviceability limits for the unit load device,

Verifying manufacturer designs the unit load device to allow venting during changes in air pressure,

Verifying the manufacturer only uses approved parts during manufacturing, and

The manufacturer issues spare part conformity certificates.

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Air carriers are responsible for maintenance and repair of unit load devices regardless if they are certified or non-certified and regardless if they are repaired by the air carrier or a repair vendors.
Maintenance Procedures – Air carrier should have procedures for repairing unserviceable unit load devices and returning them to service. Only FAA•certificated airmen are authorized to return unit load devices to service. FAA-certified airmen should return unit load devices to service under the requirements of the applicable component maintenance manual or air carrier instructions. FAA-approved repair stations operating under Title 14 Code of Federal Regulations Part 145 should return unit load devices to service in accordance with air carrier procedures.

Air carrier's maintenance procedures should include:
The data upon which repairs are based,
Instructions on when the tare weight of a unit load device has to be updated and marked on the unit load device,
Documentation required to support unit load device tare weights, and

Air carrier's procedures should ensure:
Personnel performing repairs are qualified,
Repairs are performed in accordance with 14 CFR part 43,
Repair personnel have current data for the repair, including but not limited to, maintenance manuals, service bulletins, airworthiness directives, or other FAA•approved data,
Replacement parts used are authorized by the unit load device manufacturer or air carrier's procedures using FAA-approved data,
The tare weight of unit load devices are checked, updated, and marked on the unit load device in accordance with air carrier's procedures after repairs are performed, and
Appropriate repair documentation is provided.
Maintenance Records – Air carriers are responsible for maintaining repair records. The air carrier may maintain their own records, or allow their repair vendors to maintain them provided the air carrier can access them upon request within a reasonable period of time.

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Damage limits – Air carriers procedures should identify the amount of damage a unit load device may have and still be airworthy. The air carrier may use the damage limits provided by the unit load device manufacturer or it may develop its own with FAA acceptance. If the air carrier chooses to develop its own damage limits, it should:
Establish a procedure for developing the damage limits,
Provide the FAA with data to support the damage limits, and
Obtain FAA acceptance before using the damage limits.
Standardization of Damage limits – Air carrier's unit load devices may have been manufactured by different manufacturer's; therefore, their damage limits may not be the same for each manufacturer. An air carrier may standardize damage limits using the most restrictive damage limits.
Alternative for Container Damage - A container with damage to the shell that exceeds allowable damage limits may be accepted for use by installing a net over the shell and using it as a pallet/net combination. A reduced weight requirement may be necessary when an air carrier uses this alternative. Air carriers permitting this alternative, should include it in their procedures.
Temporary Cargo Net Restraints - Air carriers may install temporary restraints on cargo nets to compensate for cut or otherwise damaged or missing ropes or fittings, provided:
The temporary restraints are approved by the cargo net manufacturer,
The air carrier has a process in its procedures that addresses the use and limits of temporary restraints, and
The personnel that install the temporary restraints are trained, qualified, and authorized by the air carrier.

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Other Restraint Devices – Other restraint devices include straps, chains, and rope for securing cargo to a pallet or aircraft floor. When permitted by the original aircraft manufacturer(OEM), Supplemental Type Certificate (STC), or other FAA approval, air carrier's procedures should include Other Restraint Devices they permit and instructions on their use.

Damage Limits – Currently Most manufacturers of Other Restraint Devices do not provide damage limits. Therefore, air carrier's should not use them if they are damaged.

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Operational Acceptance Checks – Operational acceptance checks
are not intended to determine airworthiness; instead, they
are performed to ensure unit load devices and other cargo
restraints do not have damage greater than their damage
limits. Air carriers should not use unit load devices and
other cargo restraints with damage greater than their damage
limits. Operational acceptance checks are not intended to
be part of an air carrier's component maintenance manual
inspection program.

Personnel Used To Perform Operational Acceptance Checks – To
perform operational acceptance checks air carriers may use
personnel that they have trained, qualified, and authorized.

Frequency of Operational Acceptance Checks – Air carrier's procedures
should:

Include operational acceptance checks before each use of a
unit load devices and other cargo restraints and a final
check before loading cargo on the aircraft,
Include personnel authorized to perform operational
acceptance checks,
Include methods for clearly marking or identifying unit load
devices and other cargo restraints that fail acceptance
checks. Method used to identify equipment failing
acceptance checks should clearly distinguish them from
serviceable equipment so they are not inadvertently placed
into service.

Slide 18

Chapter 4 of the Advisory Circular covers procedures air
carriers should have for their Cargo Weigh Scales.

Tolerances - Air carriers are responsible for ensuring the weight of cargo loaded aboard their aircraft is accurate according their procedures.

Calibrations – To ensure a scale's accuracy, air carriers should have them calibrated periodically in accordance with country, state, and local government regulations (i.e., National Institute of Standards & Technology) or other standards acceptable to FAA or scale manufacturer.

Functionality Checks – To ensure a scale's accuracy between calibrations, air carrier's should routinely check their scales with a known test weight. Scales found to be inaccurate should be taken out of service until inspected and calibrated.

Equipment Tare Weights – It is common practice to weigh equipment carrying the cargo such as containers, dollies, and carts. The weight of this equipment has to be subtracted to arrive at the cargo's actual weight. The equipment's weight is commonly called tare weight. To ensure accurate cargo weights, air carrier's should determine tare weights by weighing the equipment on a calibrated scale. Air carriers should revise tare weights immediately following any repair, maintenance, or modifications to the equipment.

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Chapter 5 of the Advisory Circular covers procedures air
carriers should have for Cargo Restraint & Aircraft Loading
& Unloading.

When cargo is secured within a unit load device, the process is called **Buildup.**
Buildup is also used to describe cargo secured to a pallet with other cargo
restraints such as straps and chains. **Buildup** normally takes place in a facility
or on the ramp, but can also take place in the aircraft for certain types of cargo.
`Unit Load Devices` – Air carrier's procedures should identify
the Unit load devices authorized for use on their aircraft
and how to use them to properly restrain cargo.
`Other Cargo Restraints` – Air carrier's procedures should
identify Other Cargo Restraints authorized for use on their
aircraft and how to use them to properly restrain cargo.
Procedures should include instructions for calculating the
number of restraints needed and how to apply them to the
cargo.
`Operational Acceptance Checks` – Air carrier's procedures
should include damage limits for unit load devices and other
cargo restraints and operational acceptance checks to insure
limits are not exceeded. Procedures should identify the
personnel responsible for the operational acceptance checks
before each use and before loading cargo on the aircraft.
`Cargo Center of Gravity Limits` –Air carrier's procedures
should include center of gravity with latitude and
longitudinal vertical limits and instructions on how these
are met.
`Voided Space in Unit Load Devices` – Excessive voided space
between cargo in a unit load device may allow cargo to shift
within the unit load device. Air carrier's procedures should
include methods to compensate for excessive voided space such as
the use of dunnage and supplemental restraints.

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Weight Limits – Air carrier's procedures should include weight limits for unit load devices and other cargo restraints within each aircraft position.

Contour Dimensions – Air carrier's procedures should include contour dimensions for cargo built up on pallets so they fit in the aircraft without causing damage to the aircraft's cargo liners, smoke detectors, and light fixtures.

Cargo Shoring – Aircraft floors and some pallets have floor load limits that restrict the amount of cargo weight per square foot. Cargo pieces with a weight per square foot exceeding a floor load limit have to be shored to spread the load over a greater area. Air carrier's procedures should include materials to use for shoring, methods for determining the amount of material to use, and methods for applying the material to the cargo.

Cargo Blocking & Bracing – Large cable reels, motor vehicles, and odd•shaped cargo pieces may need to stabilized with blocking and bracing material before applying cargo restraints such as nets, straps, and chains. Air carrier's procedures should include materials to use for blocking and bracing, methods for determining the amount of material to use, and methods for applying the material to the cargo.

Unit Load Device Identification – To ensure aircraft load personnel place cargo in the intended positions on the aircraft, unit load devices, especially palletized cargo, needs to be easily identifiable to them. Air carrier's procedures should include the use of tags or other methods to clearly identifying unit load devices to aircraft load personnel.

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Air carrier's procedures should include methods to prevent aircraft damaged during loading and unloading.

Cargo Door Sill Guards- Air carrier's procedures should include the use of sill guards to protect cargo door and cargo handling system when loading and unloading unit load devices.

`Cargo Clearances` – Air carrier's procedures should include clearances required between cargo and the aircraft's cargo compartment liners, light fixtures, fire suppressions system, and smoke detectors.

`Cargo Doors` – Air carrier's procedures should include instructions to ensure for proper opening and closing of cargo doors.

`Tail Tipping Avoidance` – To prevent an aircraft from tipping on its tail during loading and unloading, air carrier's procedures should include, as appropriate for their aircraft types:

The use of a `tail post,` which is a non-structural device, to measure the distance between the aircraft's tail and the ground during loading and unloading.

The use of a `tail stand,` which is a structural device, or a `nose gear tether` to prevent the aircraft from tipping on its tail.

The use of `step loading and unloading` procedures to prevent the aircraft from tipping on its tail. This procedures ensures ample cargo weight is located in the nose of the aircraft during loading and unloading.

`Aircraft Damage Notification` - Air carriers procedures should identify methods to notify flight crewmembers or other authorized air carrier personnel of damaged, missing, or inoperative cargo handling system, installed nets, smoke barriers, cargo doors, and related components. These procedures should include a general guideline or list of

what specific items load personnel should report and to
whom.

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Air carrier's procedures should include processes and methods for properly restraining cargo in their aircraft.

Cargo Handling System – Air carrier's procedures should include how to secure unit load devices to the cargo handling system using its locks and side rails.   As an extra precaution, **p**rocedures may include placing all locks up in voided positions.

Installed Nets – Air carrier's procedures should include how to restrain cargo in bulk compartments and pods with installed vertical or horizontal nets. Also any requirements for evenly distributing cargo within bulk compartments.

Flight Crew Access Aisles – Air carrier's procedures should include how to create a flight crew access aisle to cargo requiring it during flight.

Special Cargo Loads – Air carrier's procedures should include how to load and restrain special cargo loads, such as:

Non-frangible or incompressible cargo – Cargo that is very dense, such as an engine.

Sharp cargo – Cargo that has a piercing or penetrating nature, such as pipe.

Oversize or overhang cargo – Cargo who's length or width exceeds an aircraft pallet.

Motor vehicles and other wheeled cargo.

Live animals such as horses requiring special stalls in the aircraft.

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Air carrier's procedures should include processes and methods for properly loading cargo within their aircraft's weight & balance limits.

Center of Gravity Range Limits – Procedures should include Center of Gravity Range Limits for the aircraft as well as longitudinal, lateral, and vertical center of gravity limits for the cargo.

Weight Limits – Procedures should include Weight limits for the aircraft and its positions, zones, and compartments.

Processes, Tables, Forms, & Manifests - Procedures should include Weight and Balance Processes, Tables, Forms, and Manifests load personnel should use to ensure the aircraft is loaded within its limits. Also to communicate cargo weights and locations to the flight crew or other authorized air carrier personnel.

Slide 24

Chapter 6 of the Advisory Circular covers procedures air carriers should have for Load Supervision, Load Verification, & Air Carrier Audits.

Air carrier's should designate a trained, qualified, and authorized person or persons, such as an employee or employee of a vendor, contractor, freight forwarder, or customer to ensure:

Slide 25

- ❑ Air carriers should have a program acceptable to the FAA for periodic audits of its cargo operations.
- ❑ This program should include audits of sufficient scope and frequency to ensure personnel are following air carrier's procedures.

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Chapter 7 of the Advisory Circular covers procedures air carriers should have for Training personnel it uses to perform cargo operation functions. At a minimum, training should explain how personnel are to perform their function according to air carrier's procedures.

Air carriers should ensure training is provided to its own employees as well as employees of contractors, vendors, freight forwarders, and customers. Personnel requiring training typically include:

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Air carrier's training program should include:

Curriculum - A curriculum accepted by air carrier's normal training procedures.

Recurrent Training Requirements and Intervals -

Authorized Delivery Methods – Authorized Delivery Methods such as:

Classroom sessions,

On-the-job training,

Computer-based training, or

Other training methods air carrier may consider appropriate

Personnel Authorized to Deliver Training – When not practical for the air carrier to deliver training directly to employees of its contractors, vendors, freight forwarders, and customers, the air carrier may approve one of their employees to provide the required training.

Training Records - Procedures should include maintenance of training records in accordance with air carrier's policy or applicable regulations.

Slide 28

Although I only presented you a summary of the Draft
Advisory Circular, hopefully I have given you a good
understanding of its detailed contents.
Participants spent a lot of time with the FAA through
working groups developing this Advisory Circular.
I feel most industry participants will agree that this was a
worthwhile process and one that promotes flight safety. I
also feel they will agree that this Advisory Circular will
give air carriers needed standardization for their cargo
operations.