

# CERTIFICATION PROCESS LESSONS LEARNED

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# Discussion Points

- Background
- Issues Found by the Cargo Focus Team (CFT)
- Progress made by Industry, Manufactures, and the FAA to Resolve Issues
- Legacy Aircraft Issues Needing Resolution
- Best Practices Going Forward
- Closing

# Background

After the National Air Cargo Crash in 2013 , 747 industry operators, Boeing, and the FAA met to discuss safer methods for cargo restraint with a focus on heavy military vehicles, but with an additional conversation regarding other types of large and special cargo that was being carried by industry. As a result of issues found during this meeting all in attendance agreed that additional review of current procedures were required and to best method to accomplish this was for industry, type certificate (TC)/supplemental type certificate holders (STC), and the FAA all work together to accomplish reviews and any required changes to operator procedures and Weight and Balance Manual issues. Additionally the FAA formed the Cargo Focus Team to assist with review of operators manuals, review and revise FAA guidance as needed and assist Certificate Management Teams to ensure that training and oversight complied with the aircraft limitations and FAA guidance

# Issues Found by the Cargo Focus Team (CFT)

During initial reviews, particularly of the Boeing 747 operators many issues were found that were being used by industry and were not contained in the Boeing 747 Weight and Balance and Loading Control Manual. Some of these items were:

- Straps to pallets
- Carriage of Code B-Mil (463L) Pallets
- Pallet Couplers
- Cargo Tied Down Straps Used in Unapproved Locations
- Simplified Strap Tie Down Strength Calculations
- Side Loaded Carriage of Intermodal Containers
- Aircraft Engine Transport

# Progress made by Industry, Manufacturers, and the FAA to Resolve Issues

Working together 747 operators, Boeing, and the FAA were able to starting in 2015 create the Boeing Supplemental Procedures Manual as well as revise the Weight and Balance and Loading Control Manual to either incorporate industry needed changes or to clarify limitations for a better understanding of the limitation. These documents produced by Boeing with FAA approval has resolved and clarified almost all issues that were initially identified. Additionally the Supplemental Procedures Manual was written to include all Boeing 747F aircraft, Boeing 777F aircraft, and the Boeing 767-300F aircraft. Some of the resolved issues in these changes include:

# Progress made by Industry, Manufactures, and the FAA to Resolve Issues

In the Boeing Supplemental Procedures Manual these items were addressed:

- Use of Restraint Straps as Primary Restraint to a Pallet
- Carriage of Size Code B-MIL (463L) Pallets
- Intermodal Container Carriage
- Pallet Coupler Devices
- Aircraft Engine Transport
- Expanded CG Versus Reduced Weight ULD

Work continues for several other items of concerns that may be added to this document, however the items addressed to this date have been very significant and have allowed the operators of these aircraft to adequately address FAA concerns and continue to operate while largely maintaining many of the past procedures that were being used.

The Boeing Sample Weight and Balance Manual has additionally addressed both operator and FAA concerns and several revisions of this document have addressed issues that I will not go into detail on due to lack of time, but they also have been significant and have been able to be incorporated because of co-operation, and the desire to work together of all parties. Work also continues with this manual and like the Supplemental Procedures Manual the continued cooperation of all parties is vital to ensure the best product is produced as a final document.

# Other Aircraft Addressed

Other aircraft types have also had some issues addressed. Most of these address straps to pallets such as IAI Bedek, and Aeronautical Engineers. These STC holders are continuing with additional projects that will hopefully in the near future be able be FAA approved and implemented into their prospective manuals.

# Legacy Aircraft Issues Needing Resolution

Older, out of production or those models no longer being converted are now the largest issue remaining for aircraft currently under review. These concern several aircraft types but for this discussion I will only include the Douglas DC-9 and the Boeing 727 aircraft. While it is important to understand that in many cases the operators, manufacturer, and the FAA have been able to resolve some issues many significant issues remain. Examples of some of these issues will be discussed in the following slides

# Legacy Aircraft Issues Needing Resolution

## DC-9 aircraft:

- Differences in manuals indicating different allowed procedures.
- Cargo tie down information that is not complete.
- Approved Pallet designations that differ between manuals
- Typos and inconsistencies in manuals.

# Cargo tie down information

Tie Down for the DC-9 series aircraft provides the following information:

Cargo restrained to these load factors shall be tied down in such a manner that the allowable tie down track loads will not be exceeded. The allowable tie down track loads are 5,000 pounds in any direction at any point on the track. Loads are not to be applied closer than 19 inches on center, and not more than 4 at any frame station. Use Brownline 21035-54 or equivalent tie down fittings.

This is an example of the Brownline Fitting required:



There is no other data in this manual instructing an operator on how this device is used to restrain the cargo. The concern is that based on these instructions an operator could apply a strap or rope per the manuals instructions and assume that each strap fitting regardless of direction, strap angle, or strap strength has 5,000 pounds of restraint in all directions. This is of course in error and even without a correction to this Weight and Balance Manual, operators should change their manuals to provide accurate procedures for restraint to the floors using straps.

Other examples including differences in pallets, procedural differences between manuals, and other typos are not as significant.

One additional point for the DC-9 manual: Recently the Boeing Company released a revision to the manual clarifying the requirement for compressable cargo. In some manuals the requirement was listed as 8,900 lbs., not the 89 inches that others specified and is the actual requirement. This was an item identified during review by the CFT and AIR and has now been corrected.

# 727 Aircraft Converted by STC

Some 727 aircraft converted by various STCs have missing or incomplete documentation as will be presented in the following slides. These documents have been in existence for a considerable period of time and currently the FAA is working with operators for resolution as in many cases the STC the aircraft was converted under has been surrendered and as such it is not possible to correct or create an FAA approved Weight and Balance Manual. Complicating this is a number of associated STCs that were accomplished that do not adequately address changes required to the Weight and Balance Manual.

# Cargo Loading

One (or more) STC's provide a document called "Cargo Loading in B-727" (Or a similar title). This document is not an FAA approved Weight and Balance Manual and although it is listed in the Master Data List (MDL) of the STC was not submitted as the weight and balance manual or the aircraft loading manual to the FAA for approval during modification during the STC. There are numerous errors in this document and it should not be used for loading of the aircraft. Such errors exist as a bulk loading statement that provides:

"Bulk loading of cargo such as cartons, boxes, and crates shall be loaded in such a manner that the tie down straps and ropes may be used **over the top** of the cargo to restrain movement sideways, upward, fore, and aft."

The use of straps only over the top of the cargo does not ensure movement of forward, aft, and sideways as given in this manual.

Additionally this manual does not provide a limitation for the distance that straps may be applied to the floor which may result in overloading the structure. Again this is not an FAA approved manual and a review of several aircraft that have additional supplemental STC's installed do not in any case supersede the information provided in this document.

# Closing

Why does this matter? My manuals have already for the most part been corrected, or no issues have been found.

This does matter, not only for cargo operators and cargo, but for all matters, particularly those that are limitations set forth by certification during the aircraft TC or STC process. This issue should teach operators, manufactures, and the FAA that continued dialogue between each other as an industry as well as individual operators is extremely important so we all understand what new procedures, operations, and for the cargo industry what types of products we carry. The lesson learned is had we all spoken to each other and developed approved processes when we desired to implement them we in all likelihood would have saved lives, aircraft, time, and would have not had to put all of ourselves through a time consuming and costly review and recovery that we have done over the last few years. There are many events by industry groups, manufactures, and the FAA that provide for the format to discuss these items and my hope is that from this we have all learned that the best practice moving forward is proactive and ensuring we address needed changes to any limitation ahead of incorporating the change so that we operate at a higher level of safety and more efficiently than any other operators in the world.