ULD and ULD CARE- 50 years of evolution

The 1970's

To visit the origins of ULD we need to go back to January 1970 when the first Boeing 747 carried passengers between New York and London. This marked the first ever commercial flight of an aircraft carrying passengers and ULD, prior to that day the only ULD operations had been on freighter aircraft.

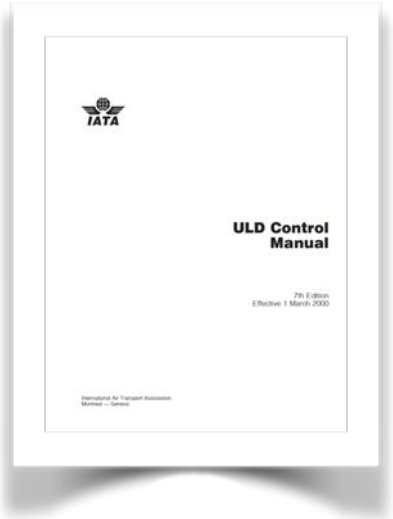
As the number of widebodied aircraft operations expanded the use of ULD to carry cargo also expanded.

Interlining had always been a basic principle within the airline community, with the IATA Multilateral Interline Traffic Agreement or MITA providing a framework for such activity.

With the introduction of ULD the transfer of cargo from one airline to another became a far simpler proposition but at the same time there was a necessity to provide for the safe and timely return of the transferred ULD back to its original owner airline.

With this need in mind a group of airlines set about establishing a protocol for the control of interlined ULD. Operating as a special interest group under the auspices of IATA the Interline ULD User Group or IULDUG came into existence.

As a first step a set of standard practices and procedures was is created, this was known as the ULD Control Manual, an IATA publication. Simultaneously an IT system, hosted on the IATA mainframe in Montréal was created, the purpose of this system being to record and distribute records of every interline ULD transfer between members.



The IULDUG was from the very outset a self financing group, charging an annual membership fee and a per transaction charge, a system that still stands today.

The early lower deck ULD of this era where typically heavy, rather clumsy devices, requiring a great deal of maintenance to keep them operational. Tare weights around 120 Kg were quite normal and many airlines preferred their ULD to be equipped with forkliftable bases so as to facilitate handling in very basic cargo warehouses.

The 1980's

The 1980s saw a rapid increase in the use of widebody containerised aircraft with multiple airlines taking deliveries of these high-capacity aircraft and the use of ULD became ever more widespread.

At the same time airlines increasingly chose to outsource their ground operations to third-party providers, this decade saw the beginning of the spectacular growth in the ground handling and cargo handling industries.

Another development saw the increasing amount of off airport buildup of ULD by freight forwarders /brokers, making good use of the intermodal opportunities offered by ULD.

.And while the airline and air cargo industries suffered the usual ups and downs overall long-term trend was for a steady growth, leading to a steady increase in the numbers of ULD in use.

Against this background the IULDUG continue to operate and expand, attracting new members and processing an ever increasingly larger number of transactions.

Meanwhile ULD designs continued to develop. 1988 saw the entry into service of the A320 with Air France, this being the first single aisle passenger aircraft designed to use ULD, so introducing the 45 inch high AKH. This era also saw the rapid growth of the courier express industry which resulted in the introduction of a number of ULD suited to these particular operations.

The 1990's

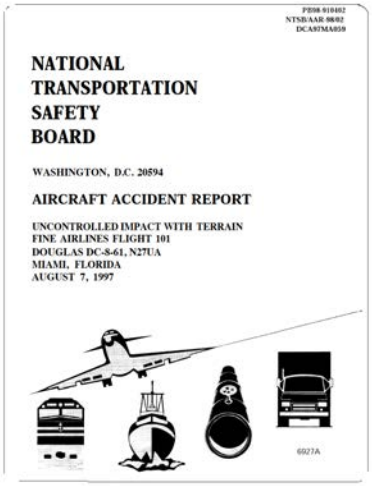
The early years of this decade continued much along the same lines, with ever increasing use of outsourced service providers for ground operations and increasing use of off airport buildup and breakdown of ULD. By now that had developed into an ever widening range of cargo handling facilities, with some locations featuring state of the art cargo terminals while others are little more than simple cargo sheds and with wide variations in ULD handling standards.

At the same time some of the larger airlines had established ULD fleets of significant size , and attention was starting to turn to trying to manage what was becoming significant expense in repairing damaged ULD.

And with ever increasing fuel costs airlines were seeking to reduce the weight of the aircraft and associated equipment, kicking off a pursuit of lighter and lighter ULD, by now most ULD were no longer equipped with forkliftable bases, metal doors had been replaced with lighter fabric doors, and a typical LD3 container weighed around 80 Kg.

Another development during this decade was that IATA established their strategic partner program, enabling suppliers to the industry to become part of the standard setting activities that perform a major part of IATA activities. As a result the IULDUG annual meeting saw an increasing number of ULD OEM's and associated entities taking part in these events and contributing to the discussions.

August 7, 1997 marked a turning point when Fine Air flight 101 crashed on takeoff from Miami airport. The accident investigators very quickly determined that a significant contributor to this accident was the movement of cargo during the takeoff rotation causing the aircraft C of G to move beyond limits and resulting in a non-recoverable stall.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NATIONAL
TRANSPORTATION
SAFETY
BOARD

WASHINGTON, D.C. 20594

AIRCRAFT ACCIDENT REPORT

UNCONTROLLED IMPACT WITH TERRAIN
FINE AIRLINES FLIGHT 101
DOUGLAS DC-8-61, N27UA
MIAMI, FLORIDA
AUGUST 7, 1997

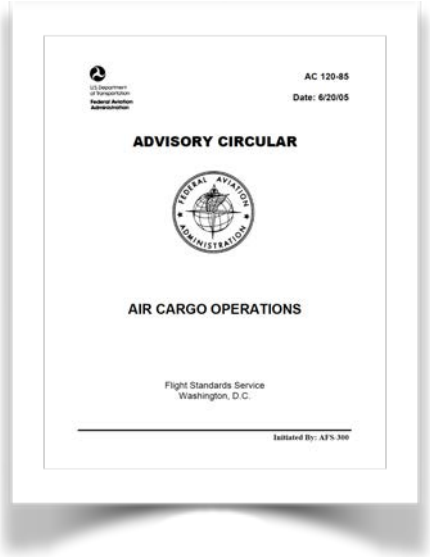
6027A

Upon further investigation by the regulators it came to light that a great deal of cargo loading activities did not comply with aircraft weight and balance procedures, and so did not meet the standards required under aviation regulations. This set in motion a chain of events that would have a considerable effect on the operation of ULD throughout the industry in the years to come.

The 1990's was a decade of very rapid growth in ULD, in no small part by the opening up of China as a source of manufactured goods and the growth of the semiconductor, computer and consumer electronics industry, with its ever more sophisticated supply chains and just in time manufacturing. Temperature controlled ULD, up till now a relatively small sector started to become mainstream as demand for this type of transport grew.

The 2000's.

The new millennium ushered in a challenging time for the ULD community. On one hand global trade and air cargo activity continued to expand at a rapid pace, new airlines, new routes, larger aircraft carrying more cargo-and ULD, while on the other hand ULD controllers were faced with ever increasing challenges of managing larger and more complex ULD fleets along with the ever increasing cost of trying to keep these ULD in serviceable condition.


AC 120-85
Date: 6/20/05

ADVISORY CIRCULAR

AIR CARGO OPERATIONS

Flight Standards Service
Washington, D.C.

Initiated By: AFS-300

And then came the publication of advisory circular AC 120-85 Air Cargo Operations by the FAA in mid 2005. This publication was the outcome of the investigation into the fFine Air crash seven years earlier, reflecting the authorities recognition that all too often cargo operations were being carried out using methods that did not comply with the weight and balance and other regulatory requirements. Alongside the publication of this AC the FAA put their frontline inspectors through a comprehensive training in air cargo operations based on the AC, these inspectors then put that new knowledge to work carrying out spot checks on flights on the ramps throughout the US.

The impact on airlines was considerable, many suddenly found themselves at the receiving end of sanctions from the FAA, particularly US carriers but also any foreign carrier landing on US soil.

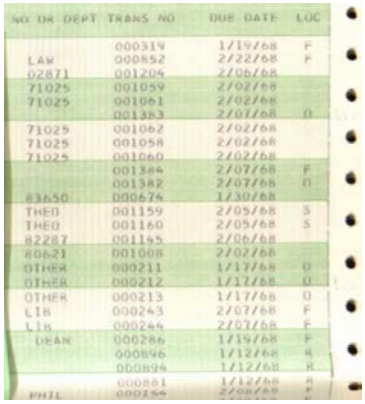
All this happened at the time when both aircraft and ULD fleets were growing and large volumes of air cargo were being flown into the US especially from locations in Asia, for airlines the issue was how to educate and enforce compliance by independent ground

handlers and cargo terminals operating halfway around the world. A great deal of money was thrown at the problem but the challenges still remained, and this highlighted the lack of a single source of operational standards for ULD activities.

Within the IULDUG discussions focused more and more on the challenges of complying with regulatory standards, everybody could identify the problems but finding solutions was a much larger challenge.

Once again fuel costs had raised its ugly head during this decade and the pursuit of lighter ULD continued, with the introduction of composite panel materials for the first time. While not necessarily less durable nevertheless ULD manufacturers were severely challenged to combine lower tare weights with the same or even lower maintenance costs.

Notwithstanding these challenges by the end of this decade the IULDUG recognised that the original IT system, still operating on the IATA mainframe and producing paper-based reports for its members had passed its use by date and so a web-based system was commissioned from an independent third-party supplier which is in fact the system still in use today.



The 2010's

The 2010's started with a bang ! At the IATA World Cargo Symposium in early 2010 the ULD community was greatly surprised to see IATA committing to putting greater resources into the whole subject of ULD, giving it recognition as a strategic component of air cargo.

And at the same event the IULDUG and IATA reached an agreement whereby the IULDUG would separate from IATA and become a wholly independent operation, a process that was undertaken over the subsequent months of 2010.

During 2011 the IULDUG was rebranded as ULD CARE and before long had established a website and was sending regular newsletters to its membership, followed by the creation of a 10 minute video SOS-ULD in an effort to reach out to the wider community of the air cargo industry by this new medium.

And in spite of having separated from IATA there continued to be a great deal of collaboration between the two organisations, with IATA being the standard setter while ULD CARE used its expertise resources to try to take these standards and turn them into easily applicable tools and solutions and to spread the message far and wide.

The structure of the new organisation also reflects the wider spread of the membership. Whereas only airline members had voting rights in the former IULDUG the new ULD CARE board now includes members from pooling companies and OEM's

2012 brought another cargo restraint accident, National AirCargo Flight 102, a B747 freighter loaded with heavy duty military vehicles taking off from Bagram in Afghanistan. Once again cargo broke loose during takeoff, causing the aircraft to become unflyable. And, once again, the investigation and report highlighted widespread failings to observe the requirements of the weight and balance procedures when loading the aircraft

Given the nature of the cargo, very heavy duty military vehicles restrained by straps, there emerged a very significant focus on the carriage of any kind of cargo which did not fit either into a container or onto a pallet under a cargo net. AC120-85A issued in 2015 contained a great deal of additional guidance on the carriage of such cargo,. including making a very very clear statement that while a container or a pallet and net is a ULD a pallet and straps is not a ULD and must be operated according to a different set of standards. This new focus on the restraint of special cargo has added just another level of challenge to complying with regulatory expectations.


U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Air Cargo Operations Date: 6/25/15 AC No: 120-85A
Initiated by: AFS-300 Change:

This Flight Standards Service (AFS) advisory circular (AC) contains guidance on cargo loading. It is intended for air operators, Original Equipment Manufacturers (OEM), Supplemental Type Certificate (STC) holders, Parts Manufacturer Approval (PMA) holders, Technical Standard Order (TSO) holders, and aircraft owners and operators who manufacture their own parts.

This AC responds to a recent aircraft accident involving a part 121 air carrier that was transporting heavy military vehicles, known as "special cargo." It was revised after evaluating special cargo operations, load planning, restraint calculations, restraint methods, freight staging, freight forwarding, and interlining of cargo. It enhances the safety of flight operations by clearly identifying responsibilities of parties and enhances guidance concerning the operator's Weight and Balance (W&B) control program and procedures for cargo restraint and aircraft loading, unit load devices (ULD) and restraint devices, and the transport of special cargo. It also provides clarity regarding cargo handling training requirements. Adhering to the recommendations in this AC is one means, but not the only means, for air carriers to better manage their cargo operations.

John S. Duncan
Director, Flight Standards Service

And, in 2010 the in flight fire & subsequent crash of UPS flight 6 at Dubai raised the spectre of Lithium Battery fires. While there had already been a number of ground and in air fires caused by Lithium batteries none had resulted in crew deaths, so UPS Flight 6 and Asiana flight 911 a few months later sent a tremor through the industry as the risks of carrying Lithium batteries became ever more apparent..

Having created SOS-ULD as a major commitment to advocacy on behalf of the ULD community ULD CARE turned its attention to creating solutions. This might seem a little strange, but ULD CARE Info felt that while some individual airlines could and indeed have created their own solutions from time to time this is a demanding exercise for one airline to take on and therefore ULD CARE could add value by taking such initiatives on behalf of the community.

The first such solution was a book, ULD EXPLAINED. This publication is intended to provide simple, easy to read, extensively illustrated guidance on the various aspects of ULD. Available in both hardcopy and e-book this publication is slowly but steadily penetrating the industry and we hope making a difference.

Another initiative is the ULD CARE ULD Code of Conduct.

Many industries rely on codes of conduct to maintain industry standards, however in aviation this is not a common practice due to the existence of the high levels of government regulation through national aviation authorities.

ULD however fall into a kind of grey zone, on one hand the moment they are on board the aircraft they are subject to the same regulatory compliance as any other aircraft part on the other hand when they move of the aircraft and into a ground handler, cargo terminal or freight forwarder they are suddenly in a completely

unregulated environment. This is where a Code of Conduct for ULD operations can be applicable. Since it's soft launch three years ago the Code of Conduct is slowly but steadily gaining traction and it is the ambition of ULD CARE that over time it will become widely adopted.

A major challenge that has been identified in the last few years is the extraordinarily high turnover of staff in the ground handling and cargo terminal community. Given the often poor working conditions and low salaries this should not come as a surprise, but the impact on ULD handling is considerable, as organisations struggle to maintain adequate level of competence amongst their staff. The challenge has to be to deliver low-cost multilingual instructional information to the vast number of people who work with ULD on the ramp or in the terminals. In 2019 ULD CARE launched ULD60Seconds, which are literally 60 seconds long instructional briefs on different aspects of ULD operations in an initiative to support a greater awareness of correct ULD handling practices across the industry.

ULD60seconds.com

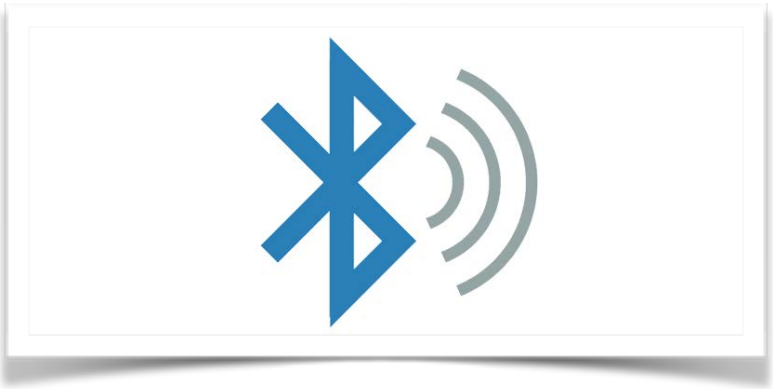
Another major factor in the ULD environment is the increasing use of more sophisticated products, such as temperature controlled containers (TCC) and fire containment devices such as FCC and FRC. Temperature control containers are of course hugely supportive of the rapidly growing transportation of pharmaceuticals, a sector of interest to most airlines while FCC and FRC are one part of the protection against lithium battery fires. Both these products have

introduced a new level of operational sophistication into the ULD operating environment, requiring high levels of operator competence if the equipment is to be used both affectively and without incurring extensive and costly damage.

While one might imagine that almost 50 years on that ULD development would have plateaued this was not the case. With a never ending pursuit of lighter tare weights the search for the lightest possible ULD continues.

2020's and beyond.

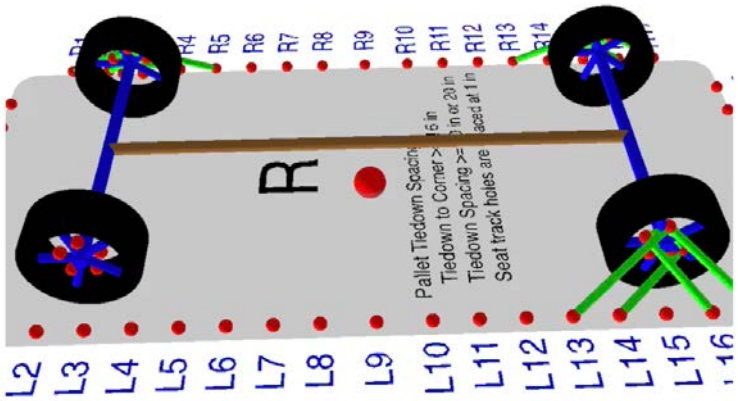
At the end of the previous decade the industry finally started to see some interesting possibilities for new technologies but could bring meaningful and affordable changes to ULD operations. The first of these was probably Bluetooth Low Energy (BLE) which may finally unlock the challenge of identifying the location and condition of ULD in real time. For many years various groups have tried to achieve this through RFID but it has never come to anything, so the arrival of BLE gives cause for optimism and already some of ULD CARE's members have implemented the use of BLE tags on their ULD fleets. Initially the deliverable from BLE was to identify a ULD location accurately and in real time, but already new purposes for this technology are coming to light such as temperature reporting, and the possibility of a fully connected ULD seems not far away.

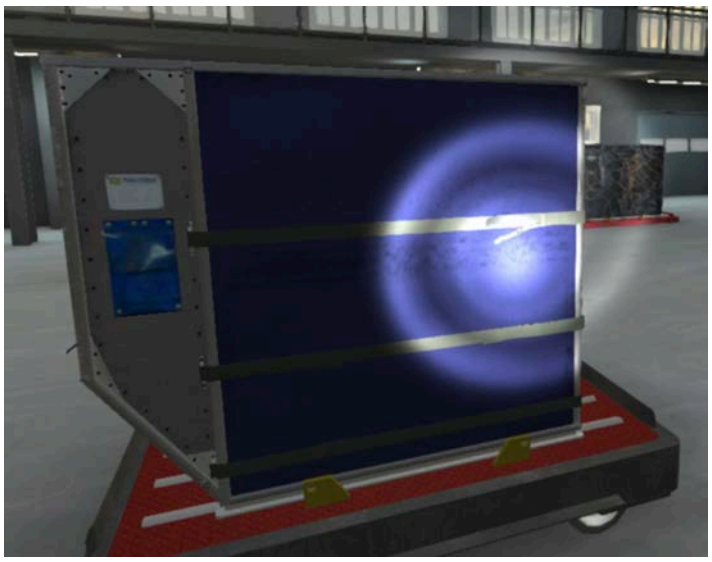


Blockchain has also moved into the spotlight at ULD CARE. Although initially Blockchain was seem to be primarily a tool for crypto currencies it is now proving it's worth in logistics and supply chain and after spending 18 months learning about this new technology ULD CARE has embarked on a joint project with SITA to run a proof of concept of the IULDUG system on Blockchain.

The transfer of custody of ULD from one party to another occurs all day every day all around the world and yet is still using the paper-based ULD control receipt, resulting in inaccuracies and delays in information reaching ULD controllers. Moving to Blockchain with app based data input can remove all the obstacles and inaccuracies that plague this process and move ULD control into the 21st-century

Another exciting area is in the use of augmented reality (AR) on mobile devices such as smartphones and ULD CARE has initiated a project to apply AR to checking the installation of tiedown straps to special cargo. In the aftermath of the National Air Cargo crash the correct restraint of special cargo, particularly items like vehicles has come under a great deal of regulatory scrutiny and has also identified quite serious shortcomings, any tool that will simplify and deliver increased compliance in this area has to be of considerable value.





Related to augmented reality is virtual reality or VR. Made popular in gaming applications and with increasingly affordable hardware there are absolutely opportunities to apply virtual reality for training purposes. Although only being in early days for this ULD CARE has every intention to investigate how this new technology can deliver value to the ULD community.

Summary

This has been a brief tour of 50 years of ULD and ULD CARE. ULD remains an indispensable component of the air cargo and airline industry, indeed it is impossible to imagine any kind of airline or air cargo operation without ULD, and ULD have delivered enormous value to the entire industry over the past 50 years.

ULD CARE remains relevant to the worlds airlines, from its early days in the 1970's as operator of the IULDUG interlining system for its member airlines it has evolved to a role today of not only continuing to run and enhance the IULDUG system but also being an advocate and solutions provider for the ULD community.

Unfortunately ULD remain rather far down the food chain in terms of management focus, all too often only getting attention when something goes badly wrong. Rather than dwell on this problem ULD CARE chooses to put its financial and human resources, limited though they may be, towards reducing or even eliminating waste and risk in ULD operations for the betterment of the global air cargo industry.