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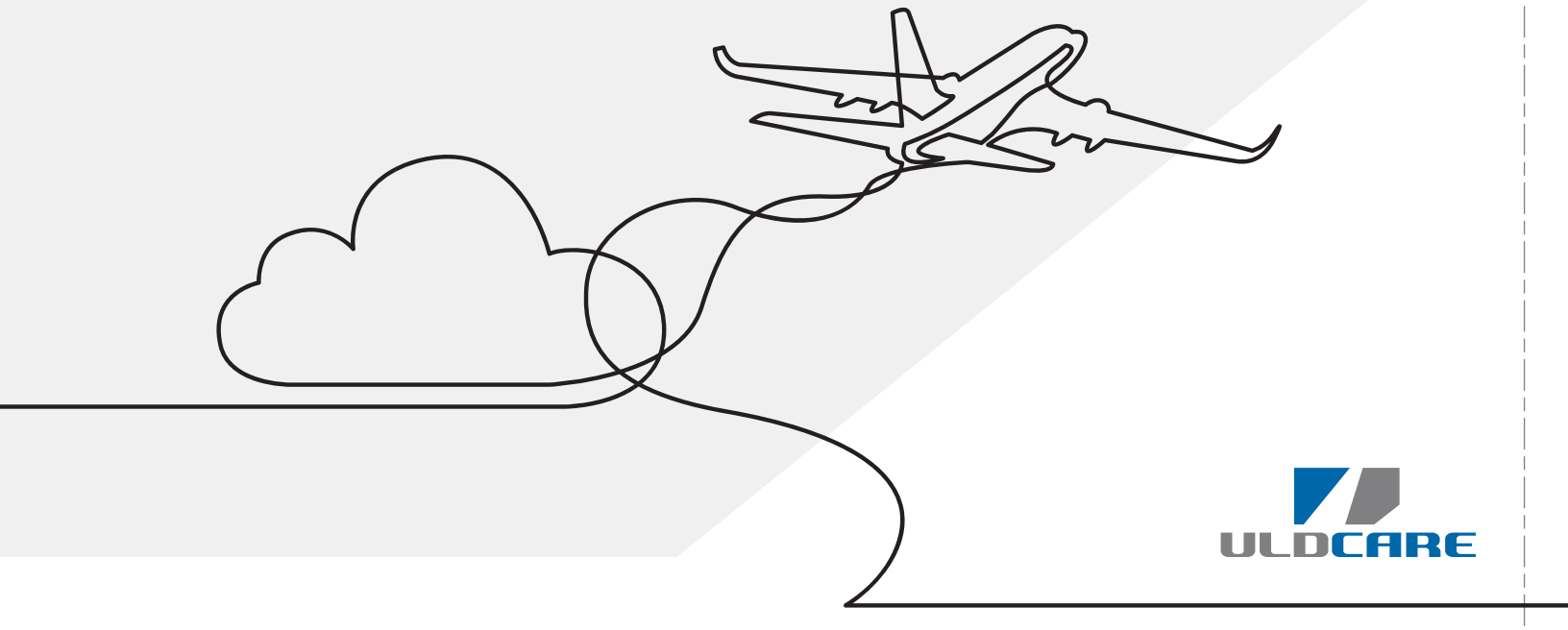
Regaining control of “off-airport ULD operations”, a White Paper by ULD CARE.

Bringing improved operational efficiency to off-airport ULD activities through innovation and digitalization.



ULDCARE

Executive Summary

Speed and efficiency form the backbone of air cargo operations and with a very significant number of shippers now building up and breaking down Unit Load Devices (ULDs) off airport one factor of critical importance is managing the care of the related ULD assets during this process.

Today's logistics operations often rely on releasing unitization equipment, such as shipping containers, rail cars and road transport equipment, to shippers, consignees and freight forwarders. ULDs enable this function in air cargo.

And while the practice of the buildup and breakdown of ULD at off-airport facilities such as freight forwarders warehouses has undergone exponential growth in the past years the management systems necessary to keep track of the ULD have not kept up, leading to widespread inefficiencies.

The global ULD operating environment can be split into two very different worlds, the "on-airport" world and the "off-airport" world".

In the "on-airport" world, the management of ULD follows well-established standards and procedures and the airline owners/operators can to a great extent have an accurate, real time, view of the status of their ULD assets even halfway around the world.

But when it comes to the "off-airport" world the picture is far less clear. And far too often visibility of ULD assets disappears, as ULD move, at times, many miles from airports and into freight forwarders' facilities, where to all intents they are "off the radar".

Extensive ULD CARE research leads us to believe that every month, 50% of an airline's PMC fleet will move off airport and that at any point in time about 25,000 of these assets (roughly 10% of the estimated global PMC fleet) remain to a great extent "off the radar" presenting ULD managers with a very challenging job.

While the failure to adopt digital solutions to replace these legacy practices is a clear problem, adding to these inefficiencies is the extensive use of ULD, particularly PMC, belonging to asset management and /or rental companies and so not marked with the traditional airline 2 digit code (CX, BA, JL etc.) which now creates a whole new level of challenges in off airport ULD operations. Digital capture of ULD transfer data will go a long way to addressing this issue.

A very large contributor to this inefficiency is the poor quality of recording of transfers between parties, as with a few exceptions this remains a paper-based function, which leads to widespread challenges for ULD owners who, in the course of their day-to-day operations, rely on accurate ULD stock data.

There is in existence the ULD Control Receipt (UCR), covered by the IATA Recommended Practice RP 1654 and which, in spite of its age remains a very applicable standard, except for the lack of digitalization. No doubt cargo terminals do obtain some form of signed receipt when they issue a loaded or empty ULD to a 3rd party, but any paper-based process comes with inevitable delays and inaccuracies, and is simply not effective in today's high-speed, high-volume air cargo environment.

Waste and sustainability are also important factors here. With a typical air cargo pallet containing around 90 kg of aluminum, does it make sense for the above-mentioned 8% of the global pallet fleet to be simply lying stacked up at forwarders' warehouses instead of fulfilling their intended purpose of carrying air freight on board an aircraft?

Is this scenario unavoidable? Comparison with other freight industries such as maritime highlights that although there is no widespread adoption of "tagging" devices on their cargo assets they nevertheless achieve greater exercise of control of their assets than is found in the air cargo world.

Many aspects of air cargo operations have adopted varying degrees of digitization leading to improved efficiency, and there have been significant advances in the electronic tagging of ULD. However, the industry still relies predominantly on paper-based processes to record the transfer of ULD between parties.

ULD CARE has the view that by applying modern-day technology and providing a neutral online platform to display transfer data to the stakeholder parties in each and every transfer of ULD, loaded or empty, the ULD function can perform in a more efficient and sustainable manner.

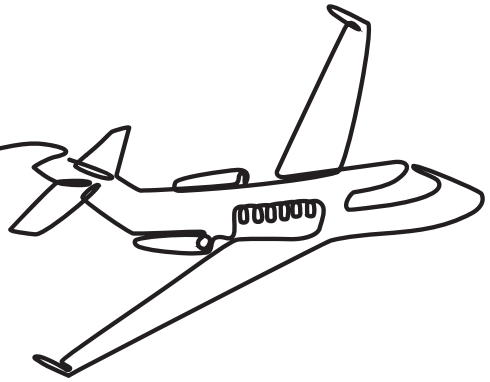
"The IATA ULD Control Receipt is the foundation for recording the transfer of custody between parties."

This white paper describes how the practice of off-airport buildup and breakdown have evolved, and proposes a road map to rectify the situation and introduce greatly improved levels of efficiency and sustainability to this critical component of modern air cargo operations.

Extensive research by ULD CARE reveals that up to **10% of an airline's ULD inventory may not be available for day-to-day flight operations** due to the equipment being off airport for extended periods.

The pandemic has highlighted how important our supply chains are – those supply chains include the equipment necessary to deliver goods from one part of the world to another. ULDs are critical to ensuring a smooth and efficient flow of air cargo and the goods carried. The inefficiency resulting from the use of outdated practices for recording the transfer of ULD between 3rd parties begs for attention.

Efficiency and Sustainability



Every business is under pressure to improve efficiency and sustainability, air cargo is no exception and ULD as a subsection of air cargo deserves focus on both these fronts. Just because ULD are found somewhere close to the lower end of the air cargo "ecosystem" should not exclude their operation from efficiency and sustainability initiatives.

The early days of air cargo did not involve containerization - all cargo was handled in bulk. ULDs were introduced with the advent of wide-bodied aircraft in the early 1970s. Since then, ULD have become indispensable to the efficient movement of air cargo and baggage around the world with a current estimated global fleet of 900,000 units[1].

As ULD usage grew, it quickly became apparent that transferring these assets between airlines was inevitable. At that time, a number of airlines formed a special interest group under IATA to develop a set of rules for the exchange of ULDs in the course of cargo interlining. This group put together a set of rules, the "ULD Control Manual," and subsequently created the necessary IT system running on the IATA mainframe in Montreal. This system provided the airline industry with a way to record and publish interline transfers. It is called the Interline Unit Load Device User Group (IULDUG).

The practice of airlines providing ULDs to freight forwarders and even shippers to build up or break down cargo consignments (known variously by terms such a pre-pack, shipper pack, shipper loaded, etc.) has gained popularity over the past 50 years. While in certain countries, this activity is restricted due to customs and security regulations, in many other locations this practice is widespread with large numbers of ULD being moved off airport to shipper facilities. In some locations, a ULD may travel hundreds of kilometers before reaching a final breakdown location. This is where the problem arises, as the system for keeping track of such movements remains firmly in the paper and pencil era.

[1] https://en.wikipedia.org/wiki/Unit_load_device

Efficiency

Airlines depend on having sufficient inventory of ULD at the right place at the right time ALL THE TIME. There is no alternative to loading a wide-bodied aircraft. And a ULD is not something you can nip round the corner and buy from the local hardware shop. ULDs are certified aircraft equipment, manufactured and maintained according to exacting aviation standards. And, furthermore, they do not come cheap. A typical ULD will have a replacement value approaching US $1000.

Airline ULD fleet sizes vary hugely, but as a rule of thumb an airline will provision 3-5 LD3 (AKE) containers and 7-10 PMC pallets for every "slot" in the aircraft hold. There is no "magic formula" that guides the airlines' ULD managers to come up with this number; rather they are based on years and years of experience, some of it unpleasant when stocks have come too close to the line. And indeed, there has been for many years an active ULD rental "industry" relied upon by many airlines to cater with unexpected shortages of ULDs, particularly PMC pallets.

There are many factors contributing to shortages of ULDs and any particular airport at any particular time, and some are more easily addressed than others. ULD CARE's focus in this white paper is on one particular air cargo function, the movement of ULDs off airport, typically between cargo terminals and freight forwarders or shippers/consignee, being an area identified by ULD CARE as having four significant inefficiencies.

1 - Poor quality recording of transfer of custody of ULDs between parties.
2 - Lack of visibility for all stakeholders in the off-airport cargo operations.
3 - Substantial growth in the quantity of ULD, particularly PMC, not belonging to a specific airline.
4 - Lost and Mislaid ULD.

Poor quality recording of transfer of custody of ULDs between parties.

Virtually every one of the 900,000 ULDs in use today are identified using the IATA standard ULD identification system. The global use of this standard greatly facilitates day-to-day management of ULD operations and all IT systems are built to handle IATA standard ULD identification codes.

Furthermore, many decades ago IATA established the ULD Control Receipt or UCR, under RP 1654. Despite its age this standard remains very much fit for purpose as the basis for recording the transfer of custody of ULD assets between parties. However, in spite of the universality of RP 1654 and while many cargo terminals have opted to create various modified versions of the UCR, which no doubt serves a local purpose of recording the issue or receipt of a particular ULD, the problem is that unless this information is made available to all stakeholders in any particular ULD transfer transaction in real time such documents serve little purpose except for retaining a historical record.

To quote the often-used business saying “if you can measure it you can manage it,” when it comes to ULD with very poor quality of measurement any kind of management is extraordinarily challenging, and from ULD CARE’s discussions with many of our member airlines this situation is a long-standing and ongoing pain point.

Lack of visibility for all stakeholders in the off-airport cargo operations.

In spite of the widespread practice of off-airport cargo operations involving ULD activity, there is no easily accessible platform to display the status of such off-airport ULDs to the stakeholders, being the airline owners, the forwarders, and to some extent the cargo terminals. The result is that all parties have to rely on spreadsheets at best and "back of the envelope" at worst. This is a situation that cries out for a modern digital solution, enabling airlines to have full-time real-time visibility of their ULD assets and providing forwarders and others holding ULDs they are responsible for returning to their rightful owners.

ULD CARE understands the value of such a system as the Interline ULD User Group (IULDUG) system has since its inception in the 1970s provided its airline members with visibility of ULDs transferred between themselves, back then by paper reports sent out weekly and monthly and for the past 15 years via an online system, providing real time reporting.

Substantial growth in the quantity of ULD, particularly PMC, not belonging to a specific airline.

A further development is now adding to the problem. This is the proliferation of PMC not having a specific airline ID code, eg not marked with a specific 2 digit airline code (CX, BA, JL etc.) in position 9 and 10 of the ULD marking code. This situation arises from the existence of both asset management company and/or rental company ULD being used by airlines. The expanded presence of these categories of ULD, particularly pallets, combines with the growth of off airport moves creates a perfect storm as once the cargo has been broken down and the pallet has been placed in some kind of storage facility at the off-airport location there is no obvious physical indication of which airline the ULD is assigned to. Airlines who are on one hand paying very significant sums of money on ULD rental end up not only not having the use of these assets but continue to pay significant amounts of rent and may even end up never recovering the ULD. Modern, digital recording of ULD transfers will address this issue very effectively.

Lost and Mislaid ULD

ULD CARE believes, based on surveys of its members, that the typical industry wide loss rate of ULD to be around 3% annually. Furthermore it seems very likely that such losses occur in the poorly controlled "off airport" environment where the reliance on paper based recording of transfers allows significant "leakage". 3% of the worlds ULD fleet is around US $25 million worth of ULD assets simply lost each year.

It is with these 5+ decades of experience of running the IULDUG that ULD CARE has the confidence to bring about long overdue modernization of this critical process expanding its function to recording all off-airport ULD transactions.

Sustainability

Every business today needs to be evaluating where it stands with regard to sustainability. And when it comes to ULD operations sustainability and waste are inextricably linked together. And what could be more wasteful than having a significant percentage of airlines ULD inventories unavailable for their design purpose of loading cargo to aircraft as they have "fallen off the radar"?

Given that the airline and air cargo industry cannot avoid making every effort to reduce waste and improve sustainability, improving the "flow" of ULD assets is a clear environmental "win" and one that can be achieved without massive investment or operational disruption.

Digitization - the solution

In today's world, where so many processes have migrated from paper to digital, there is no compelling reason to continue to manage the recording of ULD transfer transactions on paper. One may ask why digitalization has not already taken place. And to be fair there has been a good degree of progress in the field of tagging ULDs, creating the phrase "Smart ULD" in the past few years. However, there is a considerable resistance to the cost associated with the widespread tagging of ULD and 4 to 5 years after its initial introduction there is still a long way to go. Furthermore, while such tagging initiatives do enable accurate real-time location of a tagged ULD, this solution does not address the issue of obtaining a hard record of the transfer of the ULD asset between parties.

Furthermore, with the proliferation of connected hand-held devices, along with API's it is now both practical and economical to collect, transmit, publish and transfer data enabling all stakeholders in any ULD transfer, built up or empty to record and view the transaction in real time.

Benefits

There is widespread acceptance across all modes of transport that a reliable and smooth supply of freight assets, be they ULD, shipping containers or truck bodies, is essential for efficient logistics operations and as was experienced in 2020 thru 2022 when this supply fails to function the disruption is considerable.

All parties benefit from efficient ULD operations, airlines and ULD owners get a better utilization of their equipment and shippers and forwarders get better service in terms of availability. Efficiency and sustainability must surely be at the forefront of every well-run business and with the opportunity given by modern day digitalization the air cargo industry, from airlines to shippers is now able to enable a long overdue upgrade to the process of recording the transfer of ULDs between parties and place this essential industry on a sustainable long-term path.

Airlines depend on having sufficient ULD on hand to match their flight schedules. When a significant number of their ULD are somewhere off airport and so unavailable for use they will have to turn to either purchasing additional ULD or to the ULD rental market.

Background and Role of ULD CARE and IULDUG

The origins of ULD CARE go back to the 1970s with the arrival of wide-bodied aircraft and the containerization of cargo into Unit Load Devices, which lead to the formation of the ULD user group within IATA.

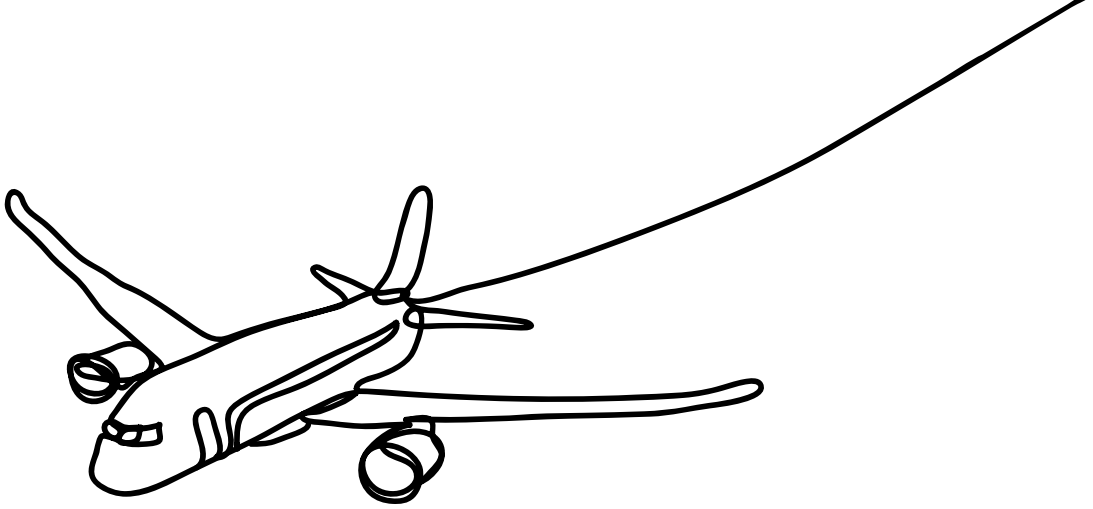
Over the years, membership of this group expanded to reach about 50 airlines. In 2009, the IULDUG was moved off the IATA mainframe onto a web server-based platform where it continues to operate today. At that same time, ULD CARE was formed to increase the participation of airlines in this group, as well as open membership to include other industry stakeholders. ULD CARE now represents approximately 50 airlines and a further 20-30 organizations having an interest in ULD activity, such as manufacturing, repair, rental or tracking solutions.

The software system processes interlining transactions from ULD CARE's member airlines on a daily basis and provides the members with the visibility of interlined units.

ULD CARE has some of the greatest expertise in the establishment and operation of an effective system for managing the transfer of freight equipment assets as a result of the 50 years of experience running the IULDUG system.

About 10 years ago, ULD CARE recognized that the industry had changed dramatically since the introduction of ULDs. A far greater number of ULD transfers now takes place between airlines and third- party off airport operators, such as freight forwarders. Taking the initiative, ULD CARE launched a study into how to adapt to this new operational reality and made a number of recommendations to the IATA ULD Board, which led to the establishment of the XML version of the standard IATA LUC and MUC[8] message formats. However, nothing was implemented for the industry from this initiative and the status quo still remains.

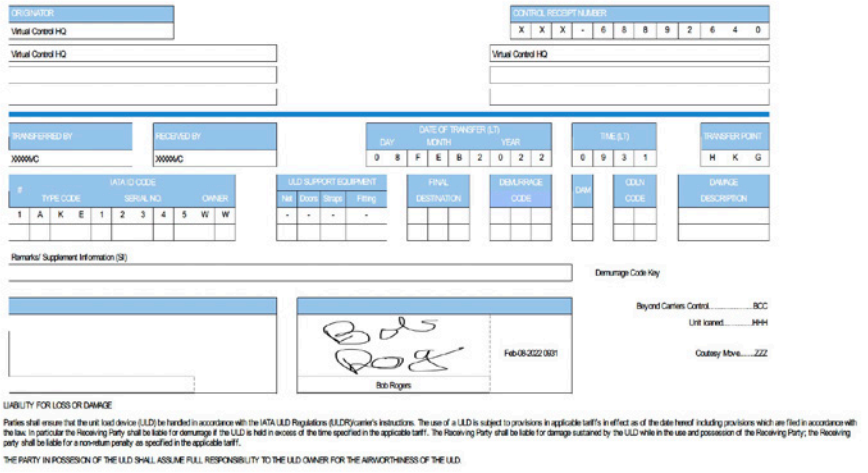
[8] LUC and MUC are acronyms for EDI messages relating to transfers of ULD between parties



ULD and Technology

For decades, ULD operations seemed to miss out on technological advancements. However, recent advances in technology are making tracking air cargo equipment more possible and easier. There are a number of new developments showing the potential to automate tracking and hand-off of air cargo assets.

- Bluetooth Low Energy (BLE) tags – allows asset owners to see 'Where is my ULD' in real time with an increasing degree of accuracy.
- Internet of Things (IoT) - Performs the same function as BLE but using a different technology. IoT systems use the existing mobile phone networks to transmit data from tagged ULD to a central processor
- Smart Phone Apps - Replacing the paper based ULD Control Receipt with an app-based data capture is now technically achievable. Replacing the 50-year-old paper-based process with a digital capture and sign off greatly improves accuracy and timeliness.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Bob Rogers
LIABILITY FOR LOSS OR DAMAGE
Parties shall ensure that the unit load device (ULD) be handled in accordance with the IATA ULD Regulations (ULDR)/carrier's instructions. The use of a ULD is subject to provisions in applicable tariff's in effect as of the date hereof including provisions which are filed in accordance with the law. In particular the Receiving Party shall be liable for demurrage if the ULD is held in excess of the time specified in the applicable tariff. The Receiving Party shall be liable for damage sustained by the ULD while in the use and possession of the Receiving Party; the Receiving party shall be liable for a non-return penalty as specified in the applicable tariff.
THE PARTY IN POSSESION OF THE ULD SHALL ASSUME FULL RESPONSIBILITY TO THE ULD OWNER FOR THE AIRWORTHINESS OF THE ULD.

Example of an app generated ULD Control Receipt

- Blockchain has shown great promise in many industries, including cargo and shipping. ULD CARE collaborated with SITA recently to build a proof-of-concept blockchain-based platform that would replicate the functions of the IULDUG system, while expanding its capability to handle transactions involving non-airline entities, such as freight forwarders. This proof-of-concept met all expectations, producing reports that mirrored the same transactions on the current IULDUG system.

- Application Program Interfaces (APIs) enable easy and instantaneous transfer of data between systems, allowing the potential integration of a demurrage platform into third parties IT systems.

Any technological solution also comes with some important considerations:

- The cost to develop and implement the technology must be feasible
- The technology must be easily integrated into existing industry practices.

The Solution

Given the global 24/7 nature of air cargo operations, with its many different operating environments introducing changes can be very challenging. This is where ULD CARE as an Industry Association specifically focused on ULD-related operations believes it to be best positioned to bring about an industry-wide change that will benefit all stakeholders in the ULD ecosphere.

ULD CARE is currently devoting its resources to developing pre-production level digital processes that can affordably replace the antiquated paper-based practices now used by the industry with a transparent, efficient system for tracking ULD transfers.

ULD CARE is taking the initiative to propose the necessary solutions to rectify this long-standing situation.

"An industry-wide issue that requires an industry-wide solution"

Conclusion

The long-standing practice under which ULDs are released off airport for build-up or breakdown works effectively from a physical perspective. But in the absence of a modern digital system to track these transfers accurately in real time the result will be operational disruption and lost efficiency as a result of ULD shortages.

While in the short term, this situation may seem to benefit shippers, it often results in widespread ULD shortages, which will impact every aspect of air cargo operations. These shortages create inefficiencies for both airlines and their customers.

Owners of ULD need unrestricted access to their assets. They may choose to issue these assets to third parties, but this does not mean they relinquish the need to know their whereabouts of these ULDs.

With decades of experience in running a ULD transfer system (IULDUG) for its member airlines, combined with its extensive subject matter knowhow, ULD CARE can present this document with a great deal of confidence.

The time is past for off-airport ULD operations to be an exception within global logistics. ULDs are simply too important to the fast and efficient movement of goods around the world for the current practices to continue. Airlines need to recover control of their ULD assets. ULD CARE can provide that solution.

For more information, click here for the Appendices.