



Cargo Security

Practical Advice on Warehouse Operation Efficiency

White Paper

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1. Introduction

Not long ago aviation security was something we took for granted. Whether travelling for a family holiday or working as part of a company that ships consignments to all corners of the globe, security processes were usually basic and as unobtrusive as possible. However, aviation security needs and procedures have drastically changed since the 9/11 terrorist attacks and the truth is that security practices will probably never return to the way they used to be.

Aircraft have always been a prime target for terrorists and it is now becoming apparent that Cargo sheds are also being targetted. Security within cargo handling areas are not as strict as requirements at the passenger terminal and thus the appeal to the terrorist is obvious. The x-raying of cargo is now a very important part of the cargo handler's responsibilities. The process to regulate freight forwarders and shippers has meant a lot of cargo can now pass through the cargo handlers' premises without any need for a physical security check. However, the volumes of unknown cargo are still great and the need to fulfil airlines booking requests have not diminished. Identifying and dealing with unsecured cargo is now part and parcel of the everyday way of life for a ground handling staff member.

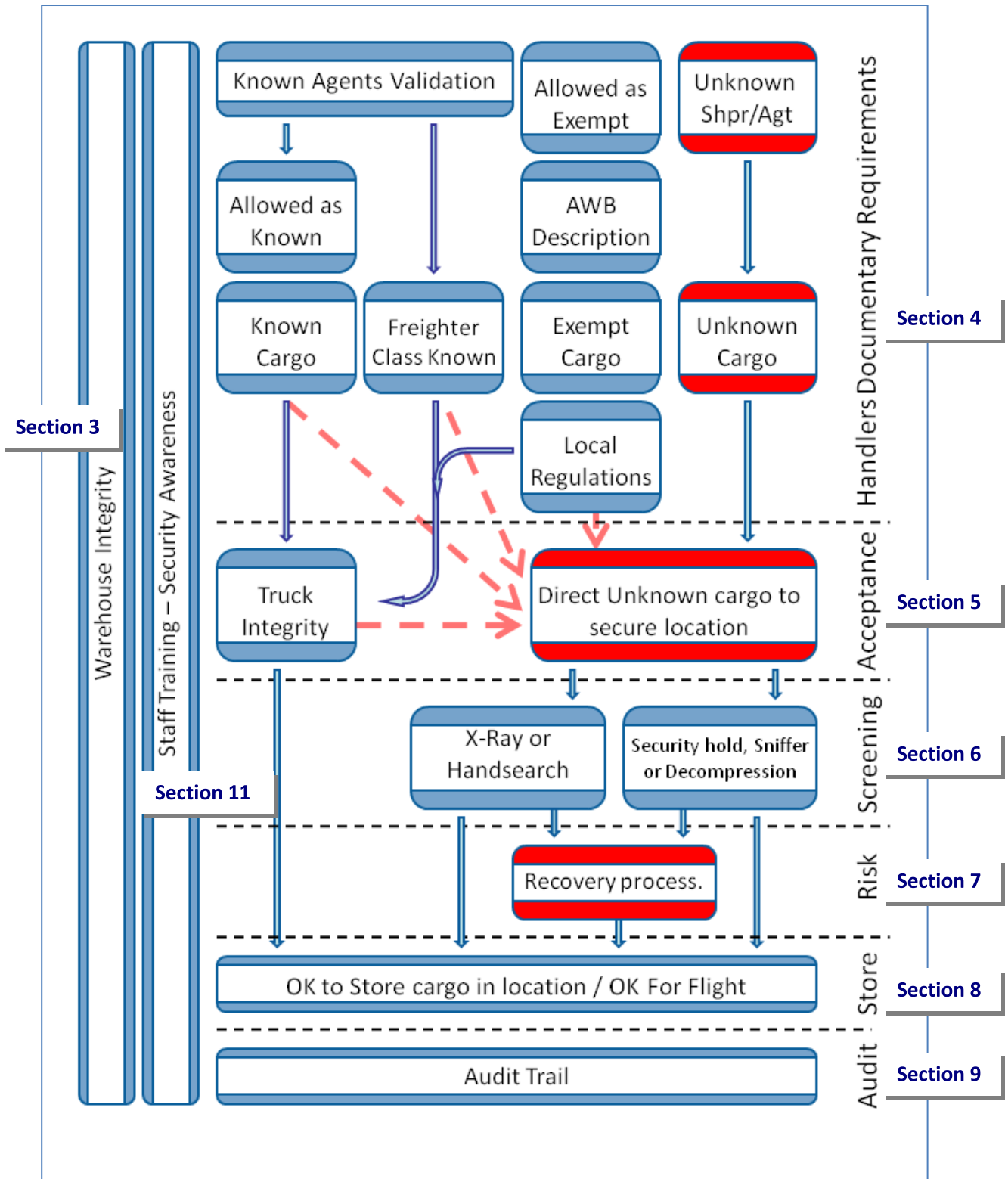
The terrorists are looking for new ways to get explosives on board an aircraft and all participants in the cargo security process chain must remain diligent and aware to protect against any kind of threat. Shippers, freight forwarders, airlines and cargo handlers' staff involved in the process of preparing cargo for a flight must be trained to know how to identify cargo that has not been secured for a flight and take the appropriate action to ensure all cargo is made safe. Any irregularities must be challenged and reported, if they are not 100% sure of a shipment's integrity then appropriate action must be taken.

Security is an elementary idea and unfortunately one that is taken for granted too often. It is the specific responsibility of every cargo handler and any of its employees to ensure that security processes and regulations are followed meticulously. If everyone concerned in the security process chain plays their part, it will become far more difficult for the terrorists to access and utilize the aviation industry for their own ends. Nevertheless, this presents significant challenges for the cargo handler.

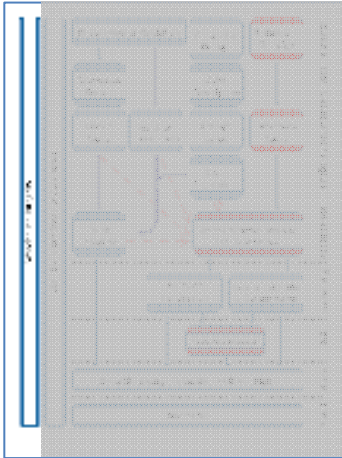
This paper details the main challenges encountered today by cargo handlers due to cargo security. The document attempts to describe how such challenges are addressed by different cargo handlers, and provides case studies and practical advice on how to run the cargo security process more efficiently.

2. Security Process Flowchart

This Security Process Flowchart was created to give an example of one possible process flow. It is not representative of all security environments and therefore intended only as a generic guide to a typical security scenario within an Air Cargo Warehouse.



3. Warehouse Integrity



The single biggest point of failure in the security of cargo must be the integrity of the warehouse. many warehouses are large areas with many people moving in and around the area. All staff MUST ensure that anyone inside the building that is not allowed to be there is challenged.

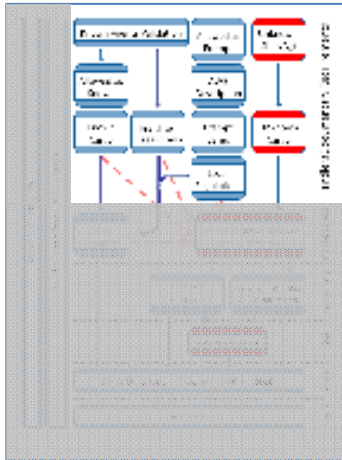
- Is it enough just to expel a person from the site?
- What if a person you challenge has already planted a device?
- What is the correct course of action in this case?

Every incident must be judged on the situation, but in reality if the warehouse is breached then every piece of cargo for outbound flights must be security checked before it is allowed onboard an aircraft.

The above solution may seem a little extreme but what if there was a device planted which caused a serious aircraft disaster and the cause was traced back to the cargo handling facility? The impact to the business would be catastrophic.

One area that can be particularly vulnerable is the delivery and acceptance doors. In many facilities this area is open to the main warehouse. There can be a number of drivers milling around this area and with busy staff members accepting and delivering cargo, it would be very easy to just wander onto the main warehouse floor and storage areas. This can be controlled very easily - consider placing a fence around the door area with a single point of entry controlled by a barrier. This makes for excellent security but the trade off here is the impact to the staff, they may possibly be required to travel further to get to the main warehouse floor and there would need to be some entry /exit protocol to overcome.

4. Handlers Documentary Requirements



The first port of call for any shipment arriving from a shipper or freight forwarder is, in the majority of cases, at the clerical acceptance reception. Here the clerk performs a check of the delivering driver's identification and makes a decision on the route of security for the shipment. Of course this step is not so important in locations where 100% of shipments are security checked but in countries that allow regulated or known freight forwarder deliveries, this is a fundamental step and the clerk must ensure that all the local regulations for the acceptance of such cargo are met.

All Cargo Handlers will need a tracking and recording process to provide an audit trail and, during this initial part of this process, Hermes provides a screen for the Clerk to collect all required information when the goods arrive at the warehouse.

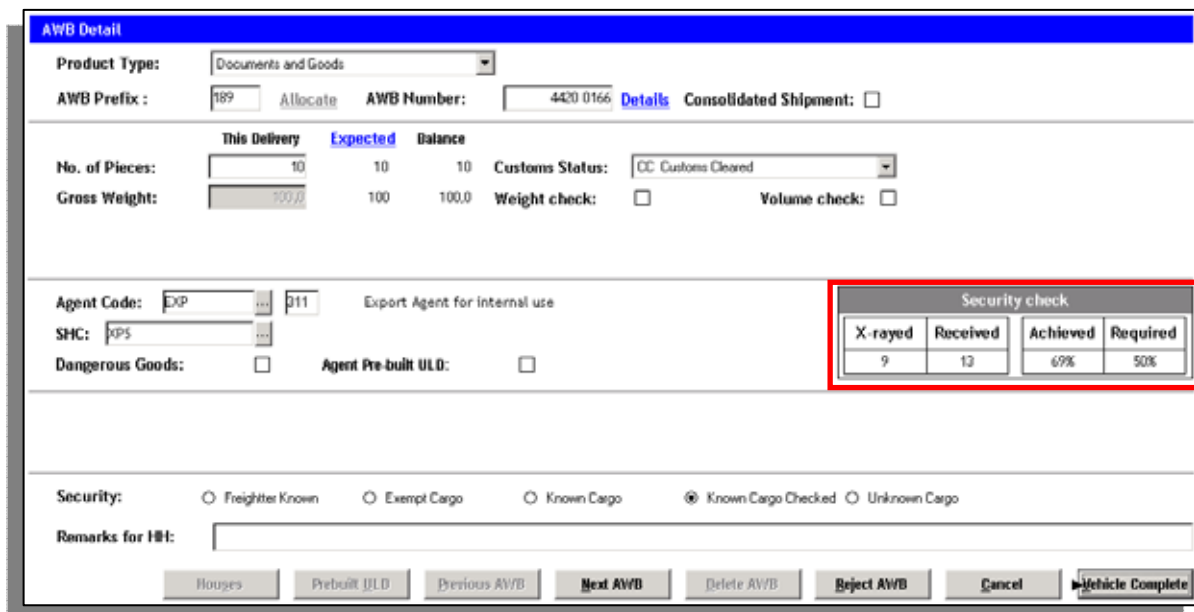
Driver Detail			
Driver Name:	Hoogte M.A.J. van der	Mobile:	0123456789
Driver ID.:	ACN 2195053396	Address:	The Cargo Agents Building
Vehicle Registration:	12345NL	Company:	Fast Forward Freight
		Zip/Post code:	NL12345

Ultimately it is clerical staff who will determine the route that a shipment will take on its journey through the warehouse. Are these staff members really aware that they are playing one of the leading roles in shipment security? When determining a shipments security route map the clerk has a number of options that need to be checked and verified:

- Unknown Cargo – The shipment is not secured for flight and must be security checked before the shipment can be considered “ready for carriage”.
- Known Cargo – Also known as regulated cargo. This cargo has come from a secure shipper and /or freight forwarder and has already undergone the required checks which make it immediately available as “ready for carriage”. In this case the AWB will be accompanied by a covering letter which details the shippers /freight forwarders regulated security information which may also include a regulated freight forwarder number. The receiving clerk must know how to read the letter and ensure it had correct validation which makes the shipment allowed as known cargo.
- Exempt Cargo – There are some shipments that cannot undergo security checking and therefore may fall under the remit of exempt cargo. In most cases the commodities that are allowed to be exempt are defined by the government department responsible for aircraft security.

- ✦ Freightier Class Known Cargo – This is a process for known cargo as defined above but the cargo has not undergone full strict security screening and therefore must only travel onboard a freighter aircraft; the cargo must not be allowed onboard a passenger aircraft.

There are some government departments that require cargo handlers to pass a percentage of known /regulated shipments through the x-ray. These shipments are selected randomly over a 24 hour period which ensures the known /regulated process is secure. The problem for handlers is identifying when the prescribed shipment numbers have been met and reporting the shipment information back to the authorities.



Security check			
X-rayed	Received	Achieved	Required
9	13	69%	90%

At this stage in the process, Hermes shows the possibilities for monitoring shipments for security. Certain security administrations require the cargo handler to x-ray a percentage of KNOWN shipments delivered to the facility in a 24 hour period. The screen above shows how this percentage is monitored by the Hermes system.

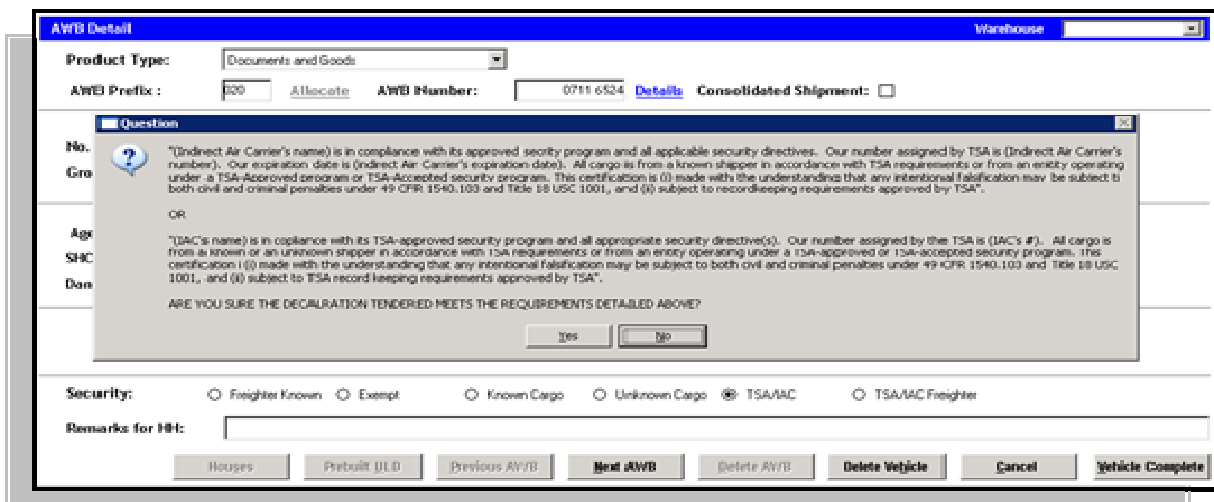
In the USA the documentary requirements are a little more complex. They differ slightly in the way the regulated freight forwarder's information is delivered, but in essence follow the same basic rules. When the clerk receives an AWB from a regulated freight forwarder there will be a security letter attached which determines how the shipment will be handled for security purposes. The content of the security letter is governed by the Transport Security Administration (TSA) and must be carefully checked by the handlers' staff to ensure it meets the required content specification. From this information the staff member selects the corresponding security route map through the warehouse. In some cases the staff member must also complete additional internal check sheets which are kept for historical audit trail purposes.

- ✦ Unknown Cargo, Known Cargo & Freightier Known – Same requirement as defined above. There is an additional requirement to complete and print an SSE checklist.

- Exempt – Same requirement as defined above. There is an additional requirement to complete and print an ID checklist.
- TSA/IAC – This is another variant of KNOWN cargo but follows the rules as defined by the TSA/IAC. There is an additional requirement to complete and print an ID Checklist.
- TSA/IAC Freightier – Same definition as defined in TSA/IAC but shipment is only allowed to fly onboard a freighter aircraft.

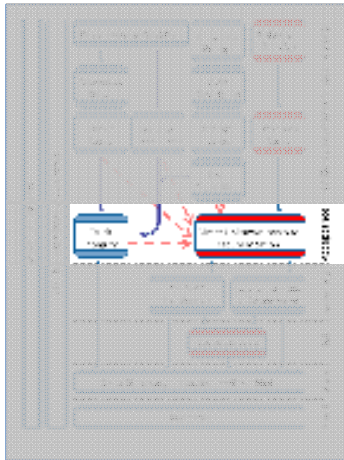
Hopefully the lesson learned in this section should be clear. Documentary requirements can be complex and therefore the staff member working the reception must be well trained and able to know exactly what type of documentation they are seeing. There are cargo handlers that will willingly place new or temporary staff members on the customer counter because it is deemed that they can easily handle drivers arriving to deliver cargo. It is not an acceptable practice to put incorrectly trained staff in this important area as, on many occasions, the information they are providing is used in the warehouse and determines how the shipment is handled.

To help in this process and at a relevant juncture, Hermes alerts the handler by providing prompts; the screen shown below, giving the required content of the Freight Forwarders security declaration according to the TSA/IAC requirements in the USA



The screenshot shows the 'AWTB Detail' window with a 'Warehouse' dropdown. The 'Product Type' is 'Documents and Goods'. The 'AWTB Prefix' is '000', 'AWTB Number' is '0711 6524', and 'Consolidated Shipment' is unchecked. A 'Question' dialog box is open, asking for a security declaration. The dialog contains two options: 'Indirect Air Carrier' and 'IAC'. Both options state that the carrier/entity is in compliance with TSA requirements and that the cargo is from a known shipper. The dialog asks 'ARE YOU SURE THE DECLARATION TENDERED MEETS THE REQUIREMENTS DETAILED ABOVE?' with 'Yes' and 'No' buttons. Below the dialog, the 'Security' section has radio buttons for 'Freighter Known', 'Exempt', 'Known Cargo', 'Unknown Cargo', 'TSA/IAC' (selected), and 'TSA/IAC Freightier'. There is a 'Remarks for HHC' field and a row of buttons at the bottom: 'Houses', 'Printout DLD', 'Previous AWTB', 'Next AWTB', 'Delete AWTB', 'Delete Vehicle', 'Cancel', and 'Vehicle Complete'.

5. Physical Cargo Acceptance



The acceptance process must be carefully controlled as it is not normally allowed to store 'unknown' cargo alongside 'known' cargo; therefore the security process must be completed as soon as possible after acceptance has been completed. Therefore the shipment security information supplied to the warehouse operative must be accurate to ensure the cargo is directed to the security area before it is moved into a general storage location.

Warehouse personnel operating Export reception doors must be vigilant at all times. The warehouse operative making the acceptance of the cargo also has a responsibility to ensure that any vehicle delivering cargo declared as 'known' is secure on arrival. If a truck arrived at the cargo warehouse door loaded with 'known' cargo but the doors were unlocked or the tie-cord not locked, or sealed on a curtain sided vehicle, then the warehouse operative must declare the cargo as 'unknown' and take action to secure the cargo.

Once the driver has pulled onto the unloading dock, and unlocked his vehicle in full view of staff, the warehouse person receives all the information he needs by scanning /looking at the control ticket created at reception. Providing the individual is fully trained in acceptance processes then identifying the shipments security status should be clear. Blocks can be built into cargo handling systems to inhibit movement of cargo to certain areas of a warehouse depending on its status e.g. 'unknown' cargo will only be directed to the x-ray screening area and blocked from further movement to a flight until the screening process is fully completed therefore making cargo 'known' and now ready for flight build up.

The warehouse personnel must always be aware of the cargo they are accepting especially 'unknown' cargo that maybe too big for screening. Alternative measures must be in place for such items. Items too dense to x-ray must be stored in separate locations and a plan in place for such shipments should be readily available.

With the introduction of NCTS processes, more detailed information will be required at reception and unloading /loading will not commence until Customs have given clearance to do so.

3. Security hold (used in some countries) is not used in many European locations. To avoid staff being subjected to possible bomb threats by storing cargo for long periods in the warehouses.
4. Decompression: The period of decompression incorporates one take off, one landing and various in-flight simulations irrespective of the actual flight stops (assuming a through flight with no aircraft change) to the final destination and lasting approximately 55 minutes.
5. Exempt cargo (regulation confirms no x-ray required – certain diplomatic cargo)

If the Clerk is unhappy with the cargo for any reason during Screening, Hermes gives them the option to move it to Service Recovery (SR) for further investigation. SR enforces a block on the shipment which must be removed before loading to any flight is allowed.



Sniffer dogs trained to identify the sweet smell of plastic explosives and are now regularly used in cargo warehouses to roam through racking systems to locate any possible explosive devices.

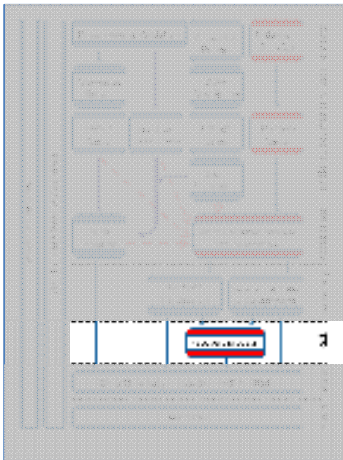
Freighter Class Known Cargo will only be carried on freighter aircraft and will be regarded as 'Known Cargo'. Freighter Class Known cargo must be clearly identified as such. Any cargo that is accepted as Freighter Class Known Cargo which will be transferred to a passenger aircraft must be treated as 'unknown' and normal security screening must take place. Where there is no written confirmation from the 'Known Consignor' or the co-loading freight forwarder, or there are any unresolved discrepancies in the certification of the consignment as a whole, then the consignment must be treated as 'unknown cargo'. At all stages of the cargo reception and processing, a responsible person should be checking to ensure that no prohibited items are inserted into the cargo.

Screening of cargo is possibly the most important role the cargo handler is going to play in the shipments security route map. By making cargo secure the cargo handler has made a declaration that the cargo in its possession is safe and ready for carriage onboard an aircraft. The potential revenue stream related to the security process can be significant. Therefore the personnel employed in this area must be dedicated to this function. Many cargo handlers use warehouse staff to perform the screening function, this is not a problem provided the correct level of training is supplied. A conflict can arise when the warehouseman is also tasked with other duties that can distract his attention from the security process.

Case Study: Cargo handler uses the acceptance warehouseman to also perform the duties of security screener. As the acceptance area became busier the warehouseman performing the screening process would place the cargo at the x-ray machine entrance and then move directly to the x-ray machine exit to collect the shipment. At no point did he look at the x-ray machine screen as the shipment passed through the x-ray machine. This is a clear case of the warehouseman receiving and not understanding the security training. The consequences of these actions are obvious.

A handler has to be sure that its security screening process is getting the dedicated attention it needs.

7. Risk



Risk is not only the carnage that an explosive device can do to an aircraft. What about the inadvertent trigger of a bomb inside the warehouse?

The risk factors are different for every situation and therefore each event must be judged on its own merits.

1. Does the cargo facility have standard processes that are known by all staff?
2. Will the staff know how to react on the discovery of a suspected device?

Case study: Staff members' effectiveness to correctly respond when a suspicious device is found can be easily tested:

- Prepare a carton for delivery; inside the box place a large electronic device (video camera) some electric cable and a bottle of water (link the cable between the bottle and camera).
- Send the box for x-ray.
- Watch the response of the security personnel.

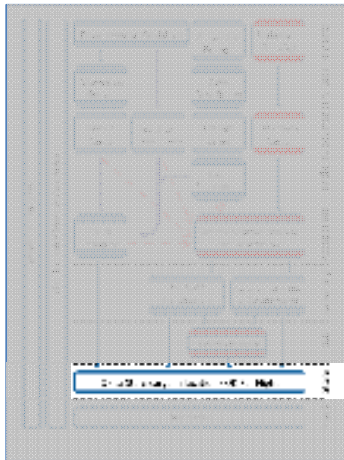
In many occasions, especially in the first time of running such a test, not all staff members know how to react safely.

If a suspicious device is discovered it is imperative that the area (even the warehouse) is cleared. Staff should be made aware of the incident so that they know which area to avoid and make sure others do not stray too close. All external doors should be shut and the emergency services contacted.

In most cases an incident report needs to be completed. It should be noted that this report, with one from the security manager, may be sent to the respective security government country control. Therefore there is a need to ensure it is completed in the following manner:-

- **Clear:** Use plain English and avoid any regional industrial jargon that will confuse the reader.
- **Concise:** All events **MUST** be recorded in chronological order and contain as much factual information as possible. However you should be brief and to the point.
- **Accurate:** Ensure that all the specific details are correct i.e. time, date, place, staff involved, actions /reactions and outcome.
- **Complete:** A report should have a start middle and ending in that order and contain recommendations if security was somehow breached. It should be signed and dated on completion and addressed to the Security Manager.

8. Store



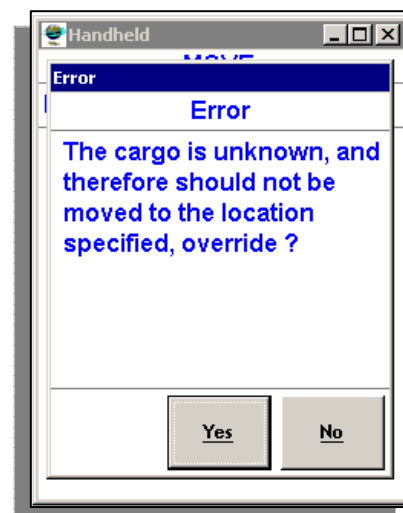
Cargo received from unregulated freight forwarders or shippers will be treated as 'unknown cargo'. In many security environments it is forbidden to store 'known' cargo with 'unknown' cargo therefore the warehouse staff member must have clear indication of a shipments security status.

Hermes gives a warning message such as this, delivered to a handheld device, to alert members of staff when shipments are incorrectly stored.

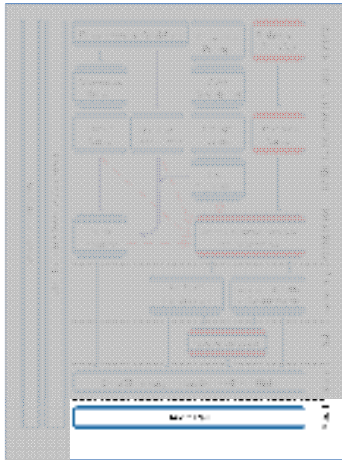
Note: Override is permitted because the system cannot know if the intended location is full therefore the operator has the option to store the cargo in an alternative location. All actions will be recorded to the AWB's history.

Once the cargo has been screened it must be stored in a protected controlled area where there is access control or where the area can be patrolled. This continuity of security must be maintained until such time as the cargo is handed to the carrier. If transportation is carried out by sub-contractors, it is the regulated freight forwarders responsibility to ensure their security process is to a level that will protect the cargo from having anything added.

It is not an acceptable process to keep a large number of insecure shipments waiting for security check. In some cases this is unavoidable as volumes of cargo and availability of security screening equipment may cause a backlog of cargo to be screened. All cargo handlers have a duty to protect the safety of their staff and must ensure shipments are security screened as soon as possible after acceptance.



9. Audit



An audit trail is of vital importance especially in the event of a suspicious package being found. This is generally a documented process giving arrival times, drivers details, acceptance times, screening, who carried it out, how long it took, etc. For additional evidence photographs may also be included in the document.

Any cargo handler or freight forwarder can be de-listed by the government authorities without a proper audit trail. So the consequences of non-compliance are severe.

Software solutions nowadays can effectively deal with this requirement and capture or at least offer the ability to capture important shipment information in real time automatically producing the required audit trail.

In the final Audit Section, Hermes shows a detailed shipment history with the option to use filters in order to show specific events.

History		All	
Message Type	Free Text		
Group created and placed in locz	Group 60000000211391 has been created using the Handheld with 1		
Group Additional Information	Group 60000000211389 update: DGR - CONTAINS DGR - Y		
Group Additional Information	Group 60000000211389 update: DGR - ISN - 3000877528192		
Group Additional Information	Group 60000000211389 update: DRIVER - ISN - 30025864463077		
Group Additional Information	Group 60000000211389 update: ISN_TYPE - RECEIVED - TICKET		
Group Additional Information	Group 60000000211389 update: ISN - RECEIVED - 30025864463077		
The AWB is not ready for	The AWB is not ready for carriage		
Group Additional Information	Group 60000000211389 update: CUSTOMS - STATUS -		
Group Additional Information	Group 60000000211389 update: DATE - RECEIVED - 2009-01-15 22:27:37		
Group Additional Information	Group 60000000211389 update: WEIGHT - RECEIVED - 4,8		
Group Additional Information	Group 60000000211389 update: PIECES - RECEIVED - 4		
Group created and placed in locz	Group 60000000211389 has been created using the Handheld with 4 pcs and weight		
AWB updated	Full Air Waybill updated		
Dangerous Goods:	User Set Dangerous Goods:		
Dangerous Goods:	Dangerous Goods:		
Export landside reception entry cr	Reception completed for Driver ID: [REDACTED] PANALPINA [REDACTED] Reg:		
Customs clearance set by...	Customs Status set at Export Reception: CC		
Export landside reception entry cr	AWB was set as DGR		
Export landside reception entry cr	Security [cargo type] set to: KNOWN		
Status 2 has been updated	Status 2 set		
SHC has been changed	Added DGR		
AWB updated	Full Air Waybill updated		
AWB has been created	AWB Created		

Note: user name hidden in accordance with data protection.

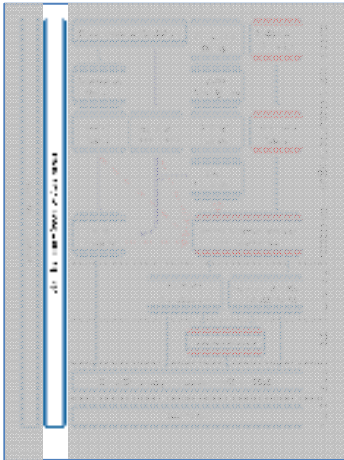
10. Planning to avoid security bottlenecks

Delivery of any type or export cargo is in most cases unscheduled, which makes planning of the acceptance process almost impossible. In the case of 'unknown' cargo this can place a huge burden on the operation when trying to security check a backlog of 'unknown' cargo.

Export delivery slots can help alleviate this problem, but although this sounds promising, it is not always easy to implement. Cargo handlers should consider potentially significant implications on their business before taking a decision to implement it. Scheduling delivery slots and rigid enforcement of the delivering freight forwarders is the first obstacle to overcome.

If successful, significant advantages can be achieved. With pre-arranged slot times and pre-advised loads the handler can plan staff more effectively. Many of the larger freight agencies know well in advance what shipments they are expecting and will have made flight bookings many days in advance enabling them to schedule the deliveries in pre-planned slots.

11. Staff Training – Security Awareness



In large scale warehouses keeping a secure warehouse is a very difficult task. There are many possible entry points and staff must be properly trained to keep doors closed when not in use and challenge anyone not authorised to be inside the warehouse. These are of course basic requirements that must be included in staff training. Security training itself is much more comprehensive; especially training in the use of security apparatus.

It is important to remember that clerical staff have a significant role to play in the security of shipments, even though they may never come into contact with the actual cargo. In many cases

the clerical staff members are the first point of contact for a shipment - they will screen the driver's security details and nominate a shipment as 'known' or 'unknown' so they effectively determine the route that a shipment will take in a warehouse. Warehouse operators are in many cases working from information supplied to them by clerical staff and therefore it is paramount that all clerical staff know what security related documents they are looking at and how to process the shipments correctly to ensure the shipment receives the correct physical handling.

All cargo handling operators must understand that they are playing a vital role in the safety of any aircraft carrying cargo loaded from their facility. Errors that in an extreme case result in the loss of aircraft and of life will affect everyone at the terminal. Investigations could implicate individuals if breakdowns in the process are identified.

12. Enabling Better Security & Preventing Revenue Leakage.

An IT software solution should help cargo handlers comply with today's security regulations, and should be of great benefit to individuals, companies and airlines concerned. A few real life examples:

- It enables a shipment to be blocked for loading until the correct security processes have been completed and more importantly complied within the requirements.
- It enables staff to start at the point of arrival – all drivers delivering to cargo sheds should have basic security awareness training relevant to the country where they work; that could be validated by a drivers' database within the system. The drivers list is potentially huge and is changing all the time therefore regular maintenance is key to the correct data stream.
- All regulated or 'known' freight forwarders and shippers served by the cargo handler must have the ability update their current security status. This ensures that everyone concerned has easy and immediate access to such company's current security status; for example are they regulated to deliver 'known' cargo? If so, as soon as a driver and company details are entered into the system, triggers within the system check and enter the necessary details at cargo reception arrival. This data, available at warehouse acceptance (and through the complete process) forces an unknown consignment to move directly to the x-ray area ready for screening.

Modern systems are designed to work alongside the practical x-ray processes and are not created to replace any practical procedure currently being used. It is vitally important that any system operates with the user in mind therefore keeping it as straightforward as possible with the data updated as soon as complete.

An IT software solution should also help cargo handlers prevent security related revenue leakage:

A substantial history is built up on the consignment from the point of arrival and charges automatically added if required for security screening. For example, if a truck arrives at the cargo warehouse door loaded with known cargo but the doors were unlocked. In certain countries, requirements state the driver cannot unlock /break his seal until the warehouse operative has visibly seen him do so. In this case all the cargo loaded on the truck is now deemed unknown as no-one now knows if this cargo has been tampered with. The customer would be notified of the situation and once prepared to pay for security charges the unknown process would begin for the complete consignment.

The possibility for large revenue streams for supplying security services to the airline is important to any air cargo handler. Any handler charging for making shipments secure for flight must ensure that all shipments that are secured are correctly charged; therefore an IT solution would assist in the collection of these charges.