

Summary

This research is a feasibility study on the possibilities of a screening process implementation at shippers and expeditors, on the basis of an exploratory study on air cargo security. The air cargo security regulations, EU185/2010, became valid in April 2010 for the air cargo supply chain. A possible security measure is the application of the screening of the shipments. The regulations focus on security throughout the whole supply chain and the measures to be taken to comply to this security could slow down the process and increase the lead-time of the shipment throughout the process, as well as the shipping costs. However, members of Air Cargo Netherlands are exempted from these regulation until April 2013. Due to this exemption, the decision on how to implement these regulations has been postponed for a large group of companies. As the dead-line comes closer, the companies need to decide.

The goal of the research is to calculate and analyze the possibilities and costs for the implementation of a screening process under the condition that the lead-time of the shipments is not affected, for both shippers and expeditors (based on the required capacity for different cases and scenarios for a shipper and an expeditor). This is done through the development of a model, that simulates different cases with the application of different screening set-ups. These screening set-ups can be configured with three type of screening methods, namely; explosive detection dogs, explosive trace detection (ETD), and X-ray. All are available for purchase and the canines and ETD systems can also be hired from a third party. All methods have different characteristics, such as costs, limitations and screening capacity.

The overall objective of the research is to analyze the feasibility and the level of security of the security standards, based on EU 185/2010 (Europese Unie 2010), for screening and approval of unknown air cargo shipments at both shippers and expeditors. The main research question is as follows: *Is it feasible to implement a screening process for an air cargo shipper or expeditor?* The application of air cargo screening requires specific security requirements, such as the regulated agent status, the corresponding personnel training and facility requirements. In comparison to other industries, such as passenger aviation, the air cargo industry is relatively new in the application of strict security regulations. This is remarkable, because a large part of the air cargo is transported in the hold of passenger planes.

The model is developed in Delphi Tomas, on the basis of the process interaction method. The model simulates the shipper's or expeditor's process, with the focus on the screening process. Shippers do not have the ability to outsource their screening activities, due to the fact that the specialized screening companies are situated in the proximity of airports, and shippers are spread all over the country. Expeditors do have the ability to outsource due to their situation around airports.

Four different cases are simulated, namely; a small and large shipper, and a small and large expediter. Each one of those cases has multiple scenarios that are simulated. The shipper has three different scenarios, varying in shipment size distribution. The expediter has five different scenarios, varying the percentage incoming shipments to be screened, and the size distribution of the shipments. The performance indicators in the process are the cost of the process and the occupation of the applied screening units. The latter one is an indication of the flexibility of the applied set-up in respect to variances in the shipping schedule.

The implementation of a screening process at both a small and large shipper shows feasible, regarding the equipment and screening costs. Due to the long dwell times of the shipments in the processes, canines prove to be the most cost efficient. However, when large sized shipments are involved, an ETD unit is required. An ETD unit shows more costly, and for larger shipment volumes has more difficulties screening all shipments on peak hours. The model does not include costs regarding process changes, facility security requirements and personnel training. In case of shippers, the cost for these measures can differ significantly and could add respective costs to the results.

For expediters, all scenarios include large shipments, which consequently require ETD units. Although outsourcing proves more expensive for each scenario over the long run, it does prove a possibility for expediters. For the small expediter and for the large expediter with smaller volumes, single ETD units suffice. For larger volumes, a single ETD unit does not cope on the peak hours on Fridays. Therefore, additional screening units are required, either in the form of purchasing canines or outsourcing. From the result it can be concluded that an expediter could reduce costs, when it reduces the peaks in the shipping schedule. However, this is not an easy thing to do. Although the cost regarding process changes, facility security requirements, and personnel training are not included, the expediter is expected to suffice to most of the required measurements as they are expected to in current operations. Therefore, these additional costs probably have less effect on the calculated results.

In general, implementation of a screening process is feasible for an expediter, based on this study. For shippers it seems feasible as well, but the additional costs for the security requirements for the facility could have a significant influence on the feasibility. Especially, when shippers might have the possibility to leave the screening to their expediter. Therefore, it might be favorable for shippers to wait for the screen developments at expediters, when their own cost could be increased by these measures.