Temperature-controlled Shipment of Vaccines

A Humanitarian Outreach from Toronto to Tashkent

Fragile Wares – When establishing logistical processes for the global transportation of life science products, careful measures must be taken to ensure the viability of the product while in transit.

Each unit of each product transported is not merely representative of the high-value of the product itself; the fact of the matter is that each unit of product transported potentially represents a patient's life. Successful global transportation of life science products requires the establishment of integrated processes between the manufacturers, forwarders, airlines, ground handling agents, packaging companies and other members of the supply chain. A quality agreement must be reached with acknowledgement of all parties in order to encompass such intricacies as airport warehouse storage and holding specifications, tarmac exposure time, government import and export regulations, etc.

This case study addresses the details and necessity of having an end to end temperature controlled transportation solution in place to rigorously coordinate and measure all partners involved in the supply chain.

Synopsis

Origin to Destination: Toronto, Canada (YYZ) to Tashkent, Uzbekistan (TAS)

Product Description: 50 pallets (approximately 18 t) of a life saving vaccine used to help prevent whooping cough, tetanus, diphtheria and polio.

Logistics Challenge

When approached by a non-profit organization who advocates the protection of children's rights, Lifeconex agreed to manage this temperature sensitive vaccine along the above

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indicated transit route. With over three years of experience in assessing and providing solutions for life science companies, this was not the first time the company had been challenged with devising how to get delicate products to remote areas.

The timeline and expectations for this humanitarian effort were clear: With the onset of winter weather and the holiday season fast approaching, this vaccine had to be delivered as quickly as possible and failure (i.e. loss of vaccine) was not an option. The challenging move required temperature-sensitive truck and air transport from Toronto to Tashkent with control and visibility from point of pick up to point of delivery – ensuring the viability of the vaccine upon reaching final destination.

Lifeconex began coordination with the integral parts of the supply chain: the suppliers, the freight forwarder, the airlines, as well as the airlines ground handling agents at the airports in Toronto, Frankfurt (transit stop) and Tashkent. Tashkent, Uzbekistan, is not

Unicooler in transit.

a widely serviced location for most airlines. The list shrinks dramatically when one considers airlines servicing Uzbekistan that offer cargo planes capable of transporting vaccines in the type of bulk required for this particular move.

Airlines offer different levels of expertise in the handling and storage of life science products. This vaccine required an environment of +2 °C to +8 °C from end to end. The company carefully evaluates airlines and has agreements with preferred partner airlines in place that possess industry leading standards in the shipping and handling of life science products. For this particular shipment, an airline was chosen that offered a service level that – when coupled with the built-in synergies Lifeconex shares with the preferred airlines within the network – assured that safe guards would be in place such as: special storage for the vaccines while in transit at a stopover on its way to Tashkent; regular temperature checks of the vaccines along the entire route; and pro-active escalation procedures in the event of any unforeseen circumstances.

Proper Packaging Is Key

Packaging was an integral part of the initial analysis conducted by the company – considering the volume and the small window of allowable temperature range. Lifeconex chose an active heating and cooling container. Twenty-six of these LD3-sized containers were necessary to transport the intended volume of vaccines. This type of container was the best available solution for this particular shipment because it operates utilizing a calculated amount of dry ice, while simultaneously possessing the capability to be plugged in due to its rechargeable batteries. In effect, the power provided by the batteries enables the container to maintain a set temperature that will not fall below the indicated mark. This also lessens the impact of varying temperature conditions on the outside of the container while in transit. For instance, the recorded average temperature in Toronto for November is a high temperature of +7 °C and a low temperature of –1 °C. The potential for deviating below the allowed set point of +2 °C for this vaccine would be increased had the container solution not been chosen from the outset.

Another consideration to take into account was customs regulations involved in transporting vaccines into a remote country such as Uzbekistan. The majority of airlines would not allow for special containers to be transported into areas that are still considered to be emerging markets. This is primarily due to the fact that many of the airline hubs in these emerging markets are not equipped to handle or store such special equipment. This was the case with Tashkent, Uzbekistan. Leveraging relationships and working with integral partners would be the only means of realizing this particular transport. Because of the humanitarian nature of this project, Lifeconex was able to negotiate with the airline to lift the ban on transporting the heating and cooling containers into Tashkent for these shipments.

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Loss of vaccines through logistical mistakes is never an option.

Coordination: Toronto To Tashkent

Securing the capacity for 18 t of vaccines was attained with support provided by the airline. The company assured that blocked space across a scheduled four flights over four weeks would be provided for the 26 LD3-sized heating and cooling containers for lots of 6, 6, 7, and 7 containers.

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For each of these shipments, Lifeconex coordinated with the forwarder in Toronto to dispatch temperature controlled trucks set to +20 °C to pick up the already pre-conditioned (set at +5 °C) containers from the airline in Toronto. This same temperature controlled truck was then utilized to transport the containers directly to the manufacturer's warehouse in Toronto. The pre-conditioned pallets of vaccines from the shipper's warehouse in Toronto were then strapped inside the containers to protect the vaccines from the physical hazards involved in the movement itself. Temperature sensitive measuring devices were placed inside the pallets containing the vaccines to ensure that the temperature of the vaccines was constantly measured. These same devices would have to be verified before the vaccines could be released for distribution in Tashkent.

Upon arrival at the transit stop for this route, the company checked with the airline to ensure that the containers were removed from the aircraft as quickly as possible and stored properly in +15 °C conditions. The containers were then connected to outside power sources and dry ice was replenished as necessary as the flight to Tashkent was not scheduled to leave until the following day.

Uzbekistan's Role

From the start of the process, Lifeconex had been working with a non-profit organization in Uzbekistan as well as the local government authorities in Uzbekistan to lessen any delays in clearing customs upon arrival of the vaccines at the airport in Tashkent. As a result of these negotiations, the local governing authorities offered to provide the temperature-controlled trucks necessary to deliver the vaccines directly to the end user's warehouse in Uzbekistan. These same temperature controlled trucks would also act as temporary storage facilities for the vaccines during the customs clearance process, because the airline in Tashkent did not possess a temperature controlled facility.

The company worked with the airline to allow for the temperature-controlled trucks to have access to the tarmac directly underneath the plane. The pallets of vaccines could then be unloaded from the containers directly into the temperature controlled trucks on the tarmac, keeping handover risk and temperature exposure to a minimum.

Once the vaccines were delivered to the end user's warehouse in Tashkent, the temperature monitor readings were read and found to be within specifications for all 4 lots of vaccines transported to Tashkent. The 750,000 vaccines sent, allowed the children of Uzbekistan to be immunized properly throughout the remainder of the winter season.

Lifeconex was the decisive factor in creating this tailor-made solution. Successful execution of critical temperature sensitive life saving vaccine shipments relies on dedicated people focusing on developing, implementing and process managing a customized cold chain logistics solution.

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