GPS TRACKING:

A SMART WAY TO TRACK AND TRACE GOODS

Ennio Zanotti, Owner, Zenatek Sarl, Monaco

There are many types of 'smart' containers or 'e-containers' on the market which can be tracked to provide real-time data on their movements. The tracking and tracing of containers and trailers is no longer a choice, but a necessity. This applies to commercial supply chains, as well as to the transportation of military or diplomatic cargo. As relatively few containers entering the US or EU are inspected, and national security is also an issue. It is paramount for good practice and security reasons to monitor containers from loading to unloading, and to have information about the contents of the cargo even before the container is loaded onto the vessel, just as there is a need for the tracking and knowledge of the eventual transshipment and any unexpected tampering thereof.

CURRENT CONTAINER REGULATIONS

In the US, a 24-hour advance manifest rule (AMR) is the tool used to officially inform the Customs and Border Protection (CBP) of the contents of a container 24 hours before it is loaded onto a US-bound ship.

Also in the US, firms certified by C-TPAT (Customs-Trade Partnership Against Terrorism) are those with green lane access, fewer inspections and lower-risk scores (ARS or automated risk system rating), but both CSI (Container Security Initiative) and C-TPAT are voluntary programs. Firms engaged in selling goods to the US apply for the certification, or become certified if they are controlled by a US C-TPAT-compliant firm, or are included in a related party importer's approved C-TPAT supply chain security profile that requires invitation from the US buyer.

The Smart and Secure Trade Lanes (SSTL) initiative is the most comprehensive regulation on container tracking so far. It tracks containers from point of origin to point of destination, across multiple global trade lanes and transportation modes, is a global network based on the US Department of Defense's Total Asset Visibility Network, deployed in 40 countries and 750 checkpoints. It requires three fundamental capabilities:

1. Capturing, storing, monitoring and transmitting essential data associated with ocean-containerised cargo, including: line item manifest data, container identification, sealing, shipper, consignee, booking, route planning, physical status, location, origin and bill of lading.
2. Making the container smart with automated anti-intrusion and tracking sensor systems, physical integrity and status of container, route planning, and deviations from plan and tampering events.
3. An automated end-to-end security audit trail that may be used by participants in the supply chain as well as international regulatory government bodies or agencies.

Certainly, container tracking needs standards, and much discussion surrounds this. However, arguably, the current standards do not adequately cover the inherent and actual risks associated with container transportation and there is still reluctance in the shipping industry to absorb and implement the benefits of modern technology.

MILITARY GRADE SECURITY

In the case of a military supply chain, tracking regulations fall under the control of military logistics departments and authorities. Hence, we could assume that cargo monitoring is at its best. But is it? Tens of thousands of containers per year remain unaccounted for in military

deployments and, more importantly, without a proper e-container tracking system, our combatants may suffer the consequences of improper logistics and not be as well protected as they should be.

Solutions may come more from the tracking and monitoring of containers, as opposed to the securing of them. The threat of terrorism can never be eliminated, but it can be mitigated.

The defence sector wants to secure and maintain the visibility of its goods, while companies in the commercial sector invest in solutions that provide such visibility.

RFID VS GPRS TRACKING TECHNOLOGIES

The latest trend in container tracking is the use of radio frequency identification (RFID) technologies, which require the acquisition of costly porticos and hardware, fixed sites and hand-held transceivers, as well as training and maintenance. But to meet all the requirements of global container security, using only RFID technology is inadequate.

Satellite signals also have limitations. The antenna in the container-tracking device is tuned to the correct frequency range and constantly picks up signals from the satellite. The modem understands the message protocol and answers; information is then transferred between the container tracking device and the satellite. The message protocol must be properly understood and deciphered to trigger a device as the mere presence of a signal is not enough.

However, the use of satellite communications is limited by the cost of data traffic from satellites. Since Zenatek's service is based on ground-based wireless networks, or General Packet Radio Service (GPRS), communication, it is a much less expensive proposition.

THE ZENATEK TRACKING SYSTEM

The Zenatek Tracking System (ZTS) was designed in line with strict cost controls in the aim of developing a container tracking device at an affordable price, which could provide most of what is needed by the end-user in terms of tracking and monitoring. The ZTS monitors containers in transit anywhere around the world, tracing their tracks while providing real-time information on the exact location of the containers at any time. It also alerts customers in the event of any tampering or temperature or humidity variances, which are communicated via GPRS to the internet to the customer's devices. It is a comprehensive service that includes a container tracking device (ZTD), which is a one-way disposable unit. It does not need to be retrieved at the destination, as all the information on the trip has been traced and is already in the system.

For users of ZTS, battery life is guaranteed to provide for several months of continuous service. Notification times and intervals, the number of positions per message and the quantity of messages per day, can all be remotely configured and reconfigured, even after the shipment has departed. The device will trigger alarms if the temperature or humidity inside the container goes under or over a predetermined threshold, in case the user has not taken immediate action, the system will send a reminder after two hours. The system alerts users when the parameters return to the threshold nominated at the starting of the service. Equally, an event such as a crash, capsize or disruption of assets will trigger an alert.

The web-based application has built-in technology to host all the files related to the documentation of the cargo such as the packing list and any certifications that the goods require for each transportation. Such certifications are simply retrieved, with the proper password, by the required authorities such as customs and port authorities, far ahead of the arrival of the containers. This enables a quicker transit process on arrival.

The EU authorities are worried that a container, for example, loaded in France and leaving from Marseille bound to Antwerp, may have been unloaded, shuffled and the position reallocated in the ship's storage hold in a port in North Africa, where it may have been tampered with, and nontheless, on arrival in Antwerp, the container is not properly checked as it is considered fully handled in the EU.

Zenatek's tracking device has a geo-fencing capability, meaning that if the container is moved to another part of the port, the device will "wake up" and trigger the corresponding alarm. The system also has a capability to send an alert message when the container doors are opened, providing geo-coded proof of delivery information to the consignee, along with the comfort of knowing that the shipment has reached its destination, and that there has been no unauthorized opening of the container doors.

These alerts are sent by the web-based system designed by Zenatek, via e-mail to the user's devices. The user can then log in with an encrypted password and user ID, and view the position of the container and the nature of the alert. The system pinpoints the position of the tracking devices to within a few meters anywhere in the world by using multiple mapping solutions via Zenatek's web-based tracking portal. Each user having access to the ZTS portal can use it to find both real-time and historic locations of the container or trailer.

In less than a few minutes, and without the requirement for installation using tools, ZTS container-tracking device can be attached to the container doors by the use of powerful magnets or adhesive pad for un-magnetic surfaces, and real-time data will be available from the moment of installation.

ABOUT THE AUTHOR

Ennio Zanotti is an Army Major holding a Bachelor of Sciences. In understanding the complexity of locations and environmental situations, Zanotti developed a concept of tracking goods, shipped in any part of the world, giving security and certainty to the goods owner, whilst caring for the quality and safety of products towards their own clients.

ABOUT THE ORGANIZATION

Zenatek is based in Principality of Monaco, New York, US and Genoa in Italy. Zenatek specialise in custom made high quality software programmes. We also sell a tracking service monitoring the activities of forwarded goods, this has been upgraded and developed to reach the high quality desired by clients.

ENQUIRIES

Email: egzanotti@zenatek.com