RAILWAYS AFRICA

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RAILNEWS - ROLLING STOCK - SYSTEMS - COMMENT

SATELLITE TRACKING

Africa is a unique region with many challenges when it comes to the transport of goods. Low network connectivity, limited numbers of skilled personnel, high costs, poor safety and security, and inferior information systems are some of the main issues that affect the transporters of goods.

For many landlocked countries like Zimbabwe, Zambia, Malawi, Botswana and the Democratic Republic of Congo, road transport is the most important mode of transport for long distance freight, as rail has historically not always been able to meet the logistics demands of the region. The challenges of the rail system critically affect the region, especially for the import and export of goods such as fuel, food and raw materials.

African Rail Company (ARC), a Swiss-based company with operational hubs in South Africa, Zimbabwe and Mozambique and provider of a highly integrated rail-focused supply chain management service, experiences the challenges of operating in the region on a first-hand basis.

As a transporter of fuel in and out of Zimbabwe, Zambia, Botswana and the Democratic Republic of Congo through the Mozambican port cities of Maputo and Beira, ARC wanted to find a way to provide more information and accountability to its customers, improve the efficiency of is operation and finally reduce idle times of its rail wagon fleet.

According to Dave Beek of ARC, "Railway wagons only make money when they are moving and carrying products."

MISSING EN ROUTE

Previously, ARC could not easily track and monitor the location and status of the fuel tankcars once they had left the station and were on route to their destination. Often location information provided by local rail operators of the status of ARC's wagons was received twenty-four hours later. ARC wanted to find a way to be able to assure their customers that their cargo was arriving on time. They also wanted to know the exact location of their empty wagons so they could quickly get them filled and carrying product again.

ARC first began by adding personnel en route, to keep its control centre informed on the whereabouts of each train. However, their only means of communication was via cellular phone networks which - according to Mr Beek – do not cover the lengthy rail lines comprehensively, there being few towns, all widely dispersed.

Unhappy with the results achieved using extra personnel, ARC decided to try monitoring vehicles using GPS tracking devices. Having previous experience with satellite tracking, Mr Beek knew that devices commonly employed in road trucking - which send information using the same communication networks used by cellphones - could not provide the reporting capabilities required by ARC. In addition, cellular network connection and roaming fees, which would be incurred every time wagons crossed cellphone network borders, would render typical tracking devices cost-prohibitive to operate. A more cost-effective and specialised solution was required.

TRUE SATELLITE TRACKING

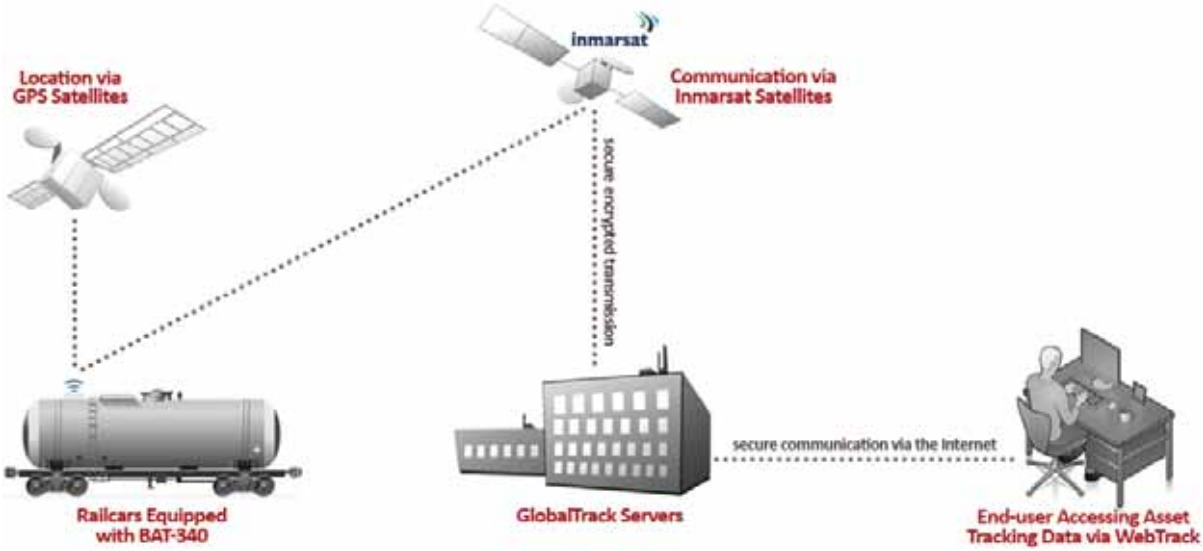
In early 2010, ARC started a trial project with thirty GPS tracking devices that used satellite communication networks instead of the land-based cellular system. The devices were installed on every other tankcar travelling between Maputo and the interior. All the equipent and web-based software was provided by GlobalTrack, a South African global-based turnkey solution provider for worldwide asset monitoring.

For the ARC project, GlobalTrack installed its BAT-340 tracking device that uses satellite communication technology provided by Canadian SkyWave Mobile Communications. The battery-powered equipment is specifically designed for remote asset management and has been used to monitor both fixed and mobile assets where external power is not available.

Each BAT-340 tracking device calculates its position using information from GPS satellites and sends the information to GlobalTrack's servers through satellites owned by UK-based Inmarsat plc. With an internet connection and a login ID into GlobalTrack's secure web-based application, WebTrack is able to pinpoint the exact location, speed, and heading of each individual tankcar.

In addition to current location information, WebTrack allows ARC staff to review historical data concerning all assets on a computer screen or from reports tailored to specific needs. Reports can be scheduled to be created at pre-defined times and sent to an unlimited list of e-mail addresses, or can be produced at any time as required. Information relating to current location, distances travelled, travelling times, and direction and speed is available around the clock with a couple of mouse clicks.

Based on ARC's requirements, the GlobalTrack devices were programmed to report their position every six hours, or at any time this information was needed or requested.



If ARC requires the reporting frequencies of the tracking devices to be changed, engineers can quickly reprogramme the units without leaving the office. Physical access to the devices - which may be located anywhere in a very large area – is not necessary.

BATTERY-POWERED DEVICE

In addition to the global communication capability, low cost and ease of use, one of the best features of the product – says GlobalTrack chief operating officer Hein van Spaendonck - is that it can be installed on unpowered rail wagons and remain in operation for long periods of time.

"The BAT-340 has built-in batteries that can last up to thirty-six months without recharging or replacement, based on four messages a day. The low power consumption of our units is essential, because we did not want ARC to be required to change batteries on the tracking units. Also, connecting to external power sources is not possible."

To instal the product, GlobalTrack designed and manufactured special brackets for the tracking devices. The brackets and the device were securely affixed to the top of each tankcar where they provide peak performance and are protected from tampering.

According to Mr Beek, by installing GPS tracking devices, ARC is now able to pinpoint the location of their wagons quickly on demand, thereby improving logistics operations meaningfully. 'They are also able to provide a service to their customers that sets them apart from their competition – the ability to proactively inform each client exactly when their shipment is going to arrive.

"One final benefit is that we are able to pinpoint the location of empty tankcars at all times, and get them back on the line transporting product," Mr Beek explains.

OPPORTUNITIES FOR ADDITIONAL SERVICES

The BAT-340 tracking devices are sufficiently powerful to provide a number of additional services for rail companies. With virtual perimeter fences or geofences, owners could be notified when wagons were within 10 kilometres, or any other distance, from rail stations. They would be able to proactively inform customers that their shipments were on the point of arrival. Geofences would also provide the opportunity to calculate how much time wagons spend at rail stations and border crossings – allowing the customer to optimise wagon use by reducing time spent at each of these stops.

With the on-board GPS accelerometer, owners could be immediately notified whenever their wagon started and stopped – alerting them to any unusual or unscheduled stops.

GUARANTEED RETURN ON INVESTMENT

The financial pay-back of the project has been very easy to prove. Hein van Spaendonck estimates that ARC recovered the cost of their initial investment of thirty tracking devices within four months, simply by being able to move the trains more quickly. The increase in customer satisfaction and value are an extra bonus when calculating the return on investment.

ARC was so pleased with results from the pilot project that they have agreed to instal another set of BAT-340 tracking devices on their tankcars, and other rail wagons in the near future.

Reflecting on the project, Hein van Spaendock says, "There are plenty of opportunities for satellite technology to increase the efficiency and productivity of companies transporting goods in Africa".