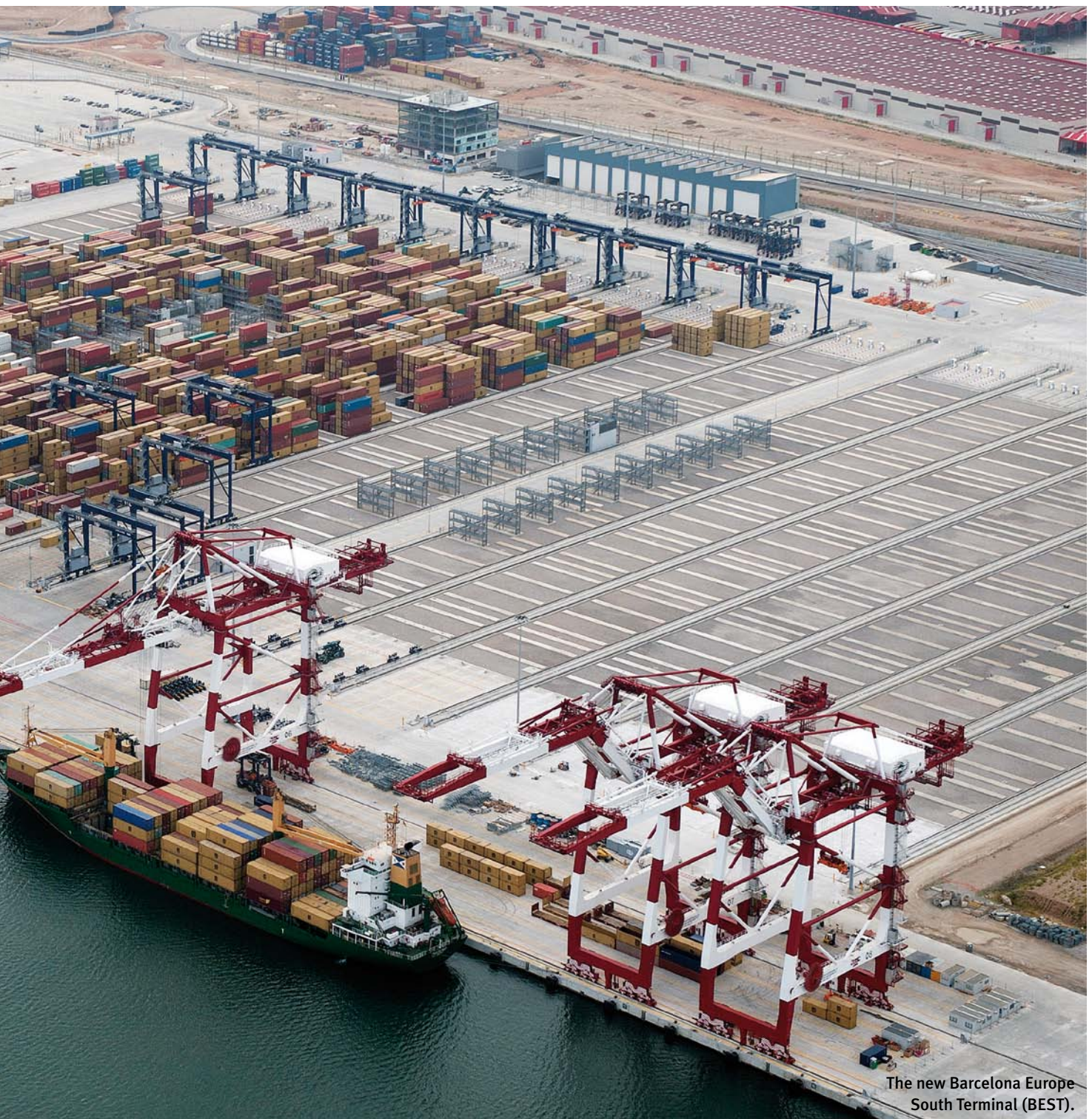# HPH Advances
through Technological
Innovations

The logistics and transportation industry has always been a complex industry, where numerous stakeholders' interests have to be taken cared of, be it the shipping lines, terminals, governments, security firms, end-users, along the whole supply chain. Hong Kong-based port operators have to be even more competitive, keeping its edge against the rapid development of ports in Mainland China, while maintaining the enviable reputation of Hong Kong's ports as the world's leading "catch-up port", where time lost on route is assured to be made-up at the facility. *Sphere* is going to tell the remarkable story of the growth and success of the Hutchison Port Holdings' (HPH) worldwide network of ports operations, which is driven by its relentless pursuit of technological innovation and improvement.

The new Barcelona Europe South Terminal (BEST).

BY INCREASING THE USE OF CUTTING-EDGE INFORMATION TECHNOLOGY across its global network of ports, HPH has succeeded in streamlining the global transportation supply chain. As one of the most advanced port operators in the world today, HPH is a sought-after partner by companies throughout the maritime and transport community.

When HPH, originally founded in Hong Kong, made its first investment overseas in the Port of Felixstowe (PFL) in the United Kingdom in 1991, it took its first step towards exporting its technical and IT expertise and using it to build a global port network.

Over the following two decades, the group has not only transformed PFL into the UK's largest and busiest port, but also built a global network spanning 52 ports in 26 countries across Asia, the Middle East, Africa, Europe, the Americas and Australasia. Moreover, it is now present in six of the world's 10 busiest ports. In 2011, the HPH global network handled a combined throughput of 75.1 million twenty-foot equivalent units (TEUs), comprising approximately 13 per cent of the world's container traffic, according to Drewry Consultants.

Award-winning Next Generation Terminal Management System (nGen)

Of all the innovations that HPH has pioneered through the decades of growth – including back office automation such as an eProcurement system and an eFinance system, and environmental protection initiatives – its proprietary terminal operating system, nGen, stands at the core of its commitment to endless innovation and developing and deploying state-of-the-art logistics technology.
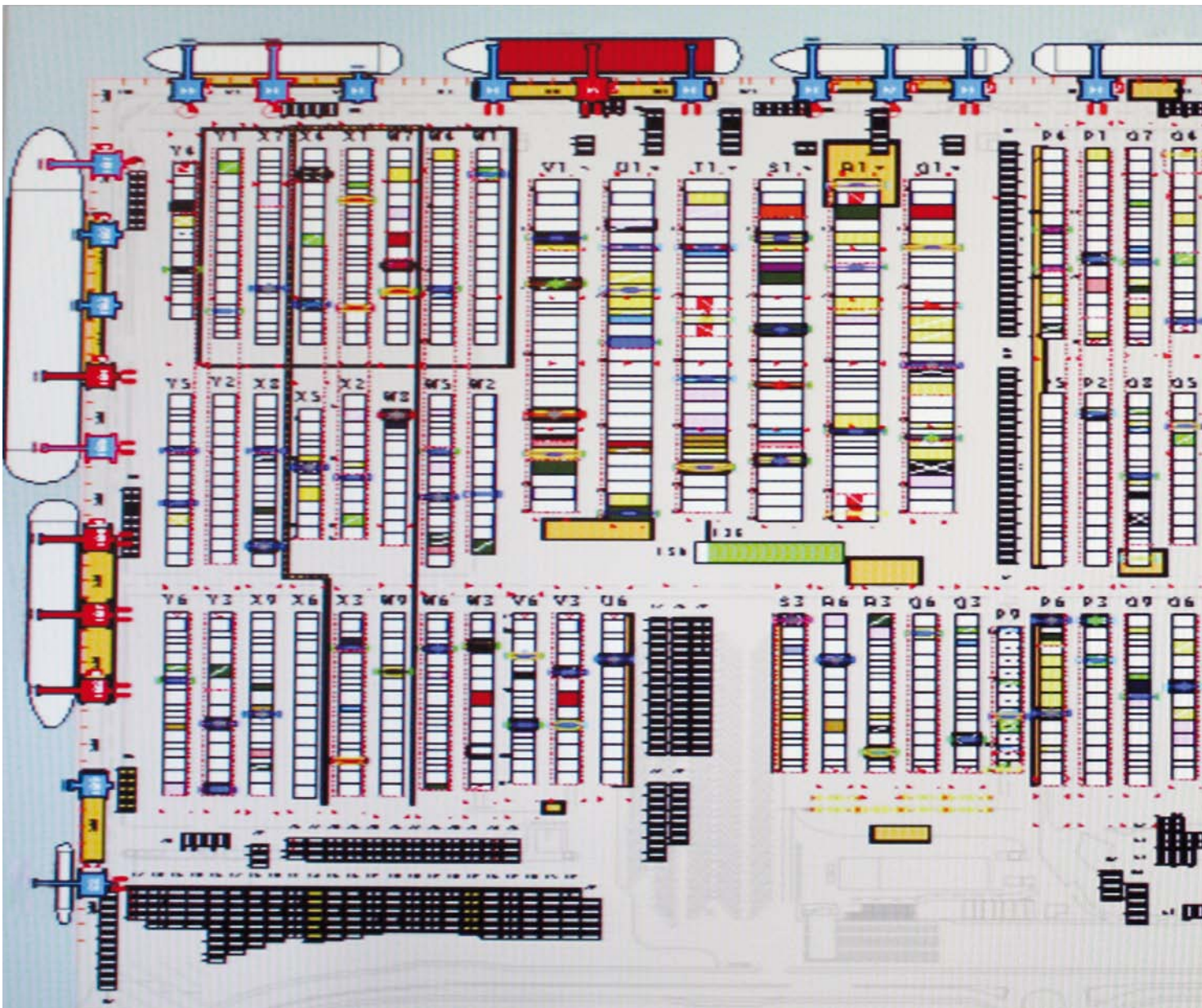
Unlike other commercially available management systems, nGen was initially developed by HPH in-house for Yantian International Container Terminals in Mainland China and Hongkong International Terminals (HIT) in Hong Kong. Following the resultant productivity gains' success, the system has been rolled-out to other ports in the group including Barcelona Europe South Terminal (BEST) in Spain, Tanzania International Container Terminal Services in Tanzania, Jakarta International Container Terminal in Indonesia, and Oman International Container Terminal in Oman. It is scheduled to be gradually deployed to other ports across the HPH network in the coming years.

nGen controls the entire scope of port operations including ship and yard planning, gate operations, vessel operations and interactions, yard configuration and performance, overall operations monitoring, equipment utilisation, productivity, and cost optimisation. The numbers speak for themselves, as nGen was so successful in streamlining these operations that HIT recorded a 28.5 per cent throughput increase three years after its implementation.

HIT exemplifies, par excellence, the operational efficiencies that can be achieved with a high-tech, highly-automated container terminal over a more conventional container terminal. nGen was designed, in part, to meet the unique challenges posed by the land constraints in Hong Kong.

HIT and COSCO-HIT – a joint venture that became operational in 1994 – have a combined berth length of 5,380 metres and a combined yard space of 141 hectares. Even spanning such a large yard space, the ports are still able to move a staggering 27,000 containers in a single day, reflecting the ability to handle nearly 10 million containers a year, which can

hardly be matched by any port in the region, and comprises testament to the success of the extensive use of technology to improve efficiency through innovation.
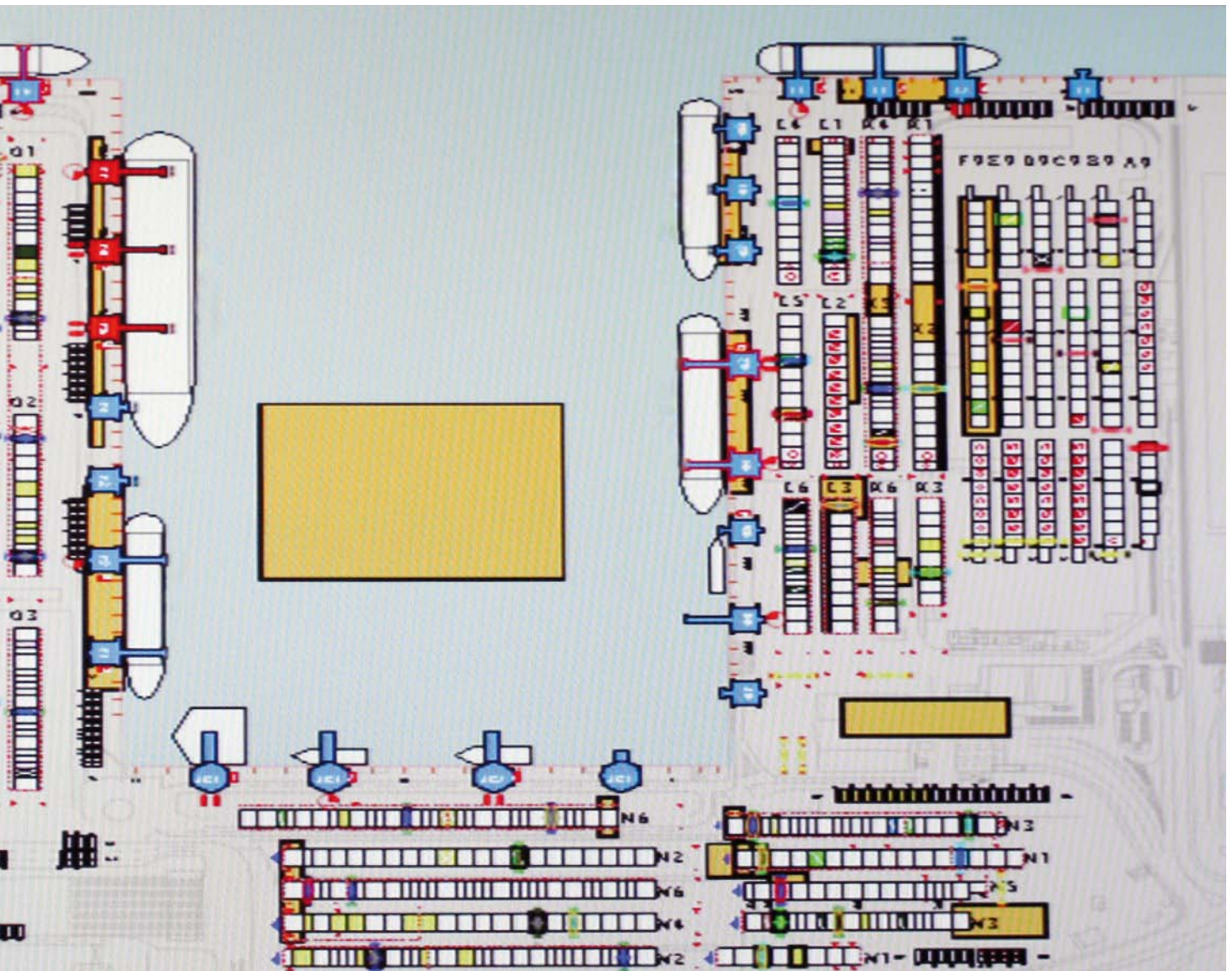
Most recently, nGen has been put to use at BEST, a new semi-automated deep-water container terminal in Barcelona, Spain. It is the first semi-automated terminal in the HPH network and will soon be followed by Brisbane Container Terminals in Australia, which will be operational by the end of the 2012.

Using nGen to run its fleet of Automatic Stacking Carriers and quay cranes, BEST is the most technologically-advanced container terminal in Southern Europe, and is sure to be a terminal of reference regarding productivity and efficiency in Europe. BEST also has the largest on-dock rail facility in Southern Europe and with 1,000 metres of quay and a 16.5 metre draught is capable of serving multiple mega-vessels simultaneously. The nGen operating system will increase both efficiency and productivity at BEST when servicing mega-vessels. In July 2012 the terminal successfully achieved a productivity rate of 30 moves per crane per hour.

Port of Felixstowe in the UK.

A screen shot of HIT's nGen Operation Monitoring System.

Inside the nGen Control Tower.

An RMGC at HIT.

Going green

HPH's commitment to using the latest technology to improve its operations nicely dovetails with another one of the group's pursuits: running green operations. For example, in the mid-90s, it was one of the first international port operators to use Rail Mounted Gantry Cranes (RMGC), giant highly-automated container handling cranes with an auto-stacking capability, made possible by precise laser guidance technology. RMGC cranes were also powered by electricity, unlike more traditional cranes, such as Rubber-Tyred Gantry Cranes (RTGC), which run on traditional diesel.

RMGCs have the flexibility of either full or semi automation similar to the situation in Europe Container Terminals in Rotterdam and BEST. HPH uses remote control booths, allowing the crane operators to work in an office environment and control several cranes at the same time from their desk. This improves safety, efficiency and working conditions. In Hong Kong, the company's IT specialists are currently retro-fitting its existing fleet of RMGCs, enabling it to take the operators out of the crane cab and into the office as part of its overall renovation of the cranes' existing automatic control system.

In regard to RTGCs, HPH has moved steadily forward with technological innovations and applications, striking a balance between operational needs and mitigating the impact on the environment. The company has also extensively deployed hybrid and electric RTGCs, reducing its reliance on diesel fuel and its generation of pollutants and particulate matter that are a by-product of diesel use. Innovative hybrid RTGC designs that use the energy generated by the crane to charge an internal battery have been developed and implemented at its ports, where a complete replacement of all its traditional RTGCs with hybrid and electric models is underway.

> "nGen recorded a **28.5 per cent throughput increase** three years after its implmentation."

Security first

The group is also a pioneer in cargo security and actively participates in numerous government-private sector initiatives to ensure the safe and efficient movement of cargo through its network of ports worldwide. It is continually responding to emerging and ever-changing market needs.

HPH has established its own cargo security subsidiary LoadStar (refer to the sidebar story), and all of its ports comply with the International Ship and Port Facility Security Code, developed by the United Nations after the September 11 attacks, a global framework that enhances the security of ships and port facilities.

Some of the HPH ports also work with local governments with radiation detection and imaging technology. In addition, HPH has long worked with advanced technology system developers to provide vital assistance in the creation of important advancements in the field of security. For example, in August 2012, Decision Sciences International Corporation, an advanced security and detection technology provider, announced the deployment of its first fully operational Multi-Mode Passive Detection System at Freeport Container Port in the Bahamas. This comprises a scanning device capable of locating unshielded to heavily shielded nuclear and radiological threats inside all types of cargo containers, vehicles and rail cars without impeding the flow of commerce and without generating harmful radiation.

Securing the world's global supply chain is vital. As John Meredith, HPH's Group Managing Director puts it, the company has a longstanding commitment to port and cargo security, and strives to make continuous improvements to supply chain security and product integrity. To monitor and ensure the highest security standards, HPH's Executive Committee is regularly updated on port security status from the HPH Security Committee.

The Guarding "Star"

Have you ever wondered how the food on our table, the television set in our living room, or the couch we are sitting on, managed to 'arrive' in our lives safely? Thanks to companies like LoadStar, which provides a range of products and services, shippers, freight forwarders, customs agencies, and so on are able to monitor and manage their cargoes and assets using the latest global positioning system and wireless technologies.
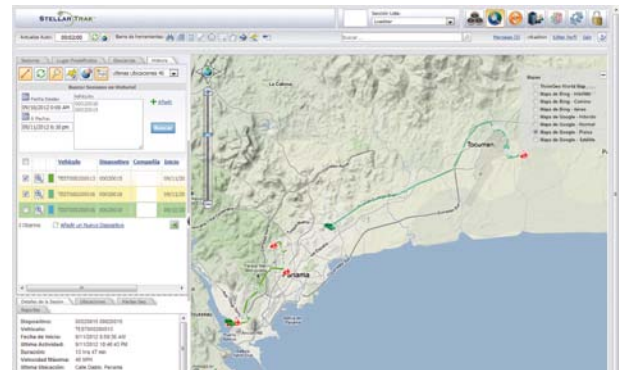
Neil Smith, CEO of LoadStar, a wholly owned subsidiary of Hutchison Port Holdings, said, "We provide a software platform called StellarTrak and hardware wireless services. The software is built specifically for real-time cargo and asset tracking, and we update and improve it on a regular basis through our team of software developers."

Smith pointed out that the technology is so sophisticated that customers can opt for tracking single or multiple shipments with automatic updates on asset location, information alerts. The tracking devices can withstand the tough transportation environment, and have sensors for temperature, humidity, shock and light to provide additional data to customers.

"These devices are specifically designed for ocean and air cargo, and personnel and vehicle fleets or plant equipment. LoadStar can customise the device to meet the customers' needs, including covert tracking or remote security monitoring," he explained.

In addition to tracking cargo, LoadStar can also track a company's truck, automobile, or bus fleets, through its StellarMatrics fleet management system, using the same StellarTrak platform. This means customers can know the status of their cargoes and other mobile assets in real-time, in addition to every cargoes' security status.

The StellarTrak platform can also be used to track personnel for safety, security and productivity purposes as well as giving visibility to improve utilisation of plant equipment, mining and construction equipment and materials, and other valuable assets.

LoadStar currently provides its range of products and services to customers globally. Smith emphasised, "Our products are very versatile. Customers from different industries, including major pharmaceutical and food shippers, have come to us with concerns regarding theft of their cargoes, smuggling of illicit drugs, and the integrity of their brands. If a shipment is compromised or spoiled due to unauthorised entry or high temperature, the company cannot put the product into the market without jeopardising its reputation for quality and security."

Smith continued, "LoadStar also has the advantage of knowing the transportation and logistics business first hand through the HPH Group, the world's leading port operator. Security and safety issues have become a top priority in our society and one day virtually everything will be tracked. LoadStar is at the forefront of this new world of real-time visibility, where ever-increasing efficiency and security are the norm. We are a one-stop shop where customers can get everything they need to track their cargoes, assets and personnel, with the assurance that they are getting the most reliable, cost effective and easy to use service available anywhere." [HWL]

One or more ...

Environmental Sensors
(e.g. Temp., Humidity, etc.)

The tracking devices at the container.