GEO-INFORMATION CRUCIAL FOR IMPROVING FACILITIES

Port of Rotterdam Authorities

Rotterdam is Europe's largest logistical and industrial hub and its port is the gateway to a European market of 450 million consumers. It is accessed by five competing modes: road, rail, inland shipping, coastal shipping and pipeline. Goods arriving in the morning in Rotterdam can be in Germany, Belgium, France or Great Britain the same afternoon. The port's location on the estuary of the rivers Rhine and Maas enables efficient and economical waterway transport deep into Europe. Preserving this position requires continual upkeep and improvement of port facilities, and here geo-information is crucial.<P>

After our visits to a geo-data acquisition instrument vendor (October) and an airborne data-acquisition company (November), we now focus on a user of geo-information, the Port of Rotter-dam Authority (HbR: Havenbedrijf Rotterdam NV). You might think port authorities would use only data about water, currents, depths and the like, and they do. But there is more to a port than these areas of knowledge, subjects you can read about in our sister magazine Hydro International . To guide countless ships from a North Sea inlet into the heart of the harbour the Traffic Control Centre uses an advanced positioning system. And the Spatial Service Centre (RSC: Ruimtelijk Service Centre) creates a variety of digital and analogue map products to serve a wide range of users. We visited both departments.

New Waterway
Fourteenth-century Rotterdam was a small fishing village near a dam on the River Rotte. Today, six hundred years later, it is one of the most important cargo junctions in the world and the leading port in continental Europe. Development has been fast, particularly during the twentieth century, boosted by the construction of an open link, the "Nieuwe Waterweg" or "New Waterway" to the North Sea, the most heavily navigated sea in the world. Work began in 1863 and by 1872 the Nieuwe Waterweg was a fact. Today it offers unrestricted access, 24/7, to the largest ocean-going vessels. A depth of 24m (75ft) means the port can handle even the biggest, mammoth-sized ships. Rotterdam's central location allows short transit times to most destinations in the world.

Emergency
The HbR office is a high-rise building in the centre of the old harbour area on the south bank ofNieuwe Waterweg, a district undergoing urban renewal. We are welcomed by press officer Tie Schellekens, and we travel by elevator to the ninetieth floor. Here we find the Traffic Control Centre, a hall-sized room with two video walls, each three by two metres, and windows all round giving a magnificent view over the old harbour. The video walls are so high they extend via video to the twentieth floor. Tie tells me his time is limited, 'I have to attend a suddenly scheduled meeting on a disaster-management exercise,' he explains. He goes on swiftly, 'Each year thirty thousand sea-going vessels and 130,000 inland navigation vessels call at the port and over five hundred scheduled services link Rotterdam with more than a thousand ports worldwide. Throughput in 2006 amounted to 378 million tonnes. In addition to vessels, numerous freight trains and a continual flow of trucks have to be controlled and directed every day. Today is a normal day and it is therefore quite quiet here, but you can imagine how hectic it can get in an emergency.' He checks his watch edgily, 'That reminds me, I have to join the meeting; former US president Clinton is in town...' With this Tie leaves us in the company of one of the operators.

Mammoth Ships
'What yousee on the video walls is all the maritime traffic in the harbour area, up to 52km offshore,' our new guide tells me. 'Vessels have to report their presence 24 hours ahead of entering the port. We give them a label so that we can follow them all the time and know where they are. Before entering the 52km-long offshore corridor they report their arrival. Their position is determined by radio location from three coastal stations and by radar systems (Figure 4).' We interrupt to ask, 'Is this not somewhat outdated in this GNSS era?' and are told in reply, 'It might seem so, but the reason is that we want to have the control process completely in our own hands. Using GNSS would mean relying on positions determined at the vessel and transmitted to us by radio. The risk of getting potentially incorrect information with GNSS is simply too high. Of course, we use the onboard GNSS positions for our vessel-traffic services, but only as backdrop. Using mainly our tracking system, the vessel is guided to its final destination by information from the vessel-traffic operator controller.' 'You mean your guidance system helps avoid river traffic jam?' We ask. The operator responds with a laugh, 'The situation on water is much better than on asphalt. The inland flow of goods suffers from congestion and has to be improved. The new railway to Germany specially constructed for this reason helps, and studies are underway to build "Container-Transferiums" east of the city to reduce the number of trucks using the city's ring roads. This is definitely necessary because new port facilities to the west of the present port are being studied.'

Map Products
The twentieth floor houses police, fire brigade and other emergency services. They share the video walls with the floor beneath and thus see the same information as their colleagues in the traffic-control centre. This assures availability of the same information for all, all the time, essential in the case of emergency. The next halt in our tour is the HbR Spatial Service Centre (RSC). Here all kinds of (geo-) information is used to control the port and its surroundings. About twenty personnel carry out this task, coming from a variety of backgrounds including geography, cartography, civil engineering, ICT and design. 'We collect and produce all types of (geo)information,

not only for use by the Port of Rotterdam Authority. City planners and other local and regional authorities also make use of our products,' Anja van de Peerle cartographic designer in the geo-information and visualisation group says. She continues, 'Often the basis for our products is captured in close co-operation with the city's public works department and consists mainly of annually captured aerial photography. In 2007 this was done by the Dutch company Slagboom en Peeters BV using a Cessna C310R, bi-engine aircraft (PH-LAW) at nearly 1,400m (4,600ft) altitude. The plane was equipped with the Vexcel Ultracam-X camera, 216 megapixels and resolution 10cm. She indicates a big overview map on the wall, two-and-a-half metres long and a metre high, at scale 1:25,000 but also available at scale 1:15,000. 'This is one we are proud of,' she says. 'This map is hanging on walls in more than two thousand offices and is updated every two years. Another widely used product (ten thousand copies) is the port route map used by truck drivers and others to master the harbour area. We also produce the "vademecum", which contains a great range of information about the port. Besides these mass products we produce, on demand, highly specialised products such as 3D-animations, diagrams, maps and tables concerning the environment, air pollution, traffic flow, draft for new roads or industrial areas, and sometimes even a simple overview map for elementary schools. Designers are responsible for layout and a well-equipped printing office produces the final results."

Final Remarks
The visit to the harbour authorities is nearly over. Some of fellow lift-users are discussing the issues involved in organising an emergency exercise. At the same moment a cruise vessel with several thousands of passengers onboard is expected to moor right in front of the building, a tricky exercise. And hazards never come in ones. Strict security measures are being taken thanks to the visit of former US president Bill Clinton, who is due at the nearby "Las Palmas" centre to launch his new book. No wonder the press officer was on edge.