Safety first

While automation gets people out of the way of dangerous machines, it can bring its own safety and environmental challenges. Maasvlakte II’s Health, Safety, Security and Environment Manager Gabriël Kierkels outlines the safety pros and cons of building and running a fully automated container terminal.

Most accidents at terminals are a result of people being hit or injured by heavy machinery – and the number one cause of fatalities is personnel being crushed under equipment carrying heavy loads.

At a fully automated terminal, keeping maintenance staff safe will also be the big priority. “A lot of people think that because you have an automated terminal, man and machine are separated so it’s completely safe. That’s true when everything works as it should,” says Kierkels.

Unfortunately, machines need maintenance and sometimes they break down. “Then people really get into harm’s way because they go into automated areas with no drivers with eyes to see them and to brake. These are very heavy machines that won’t stop if you get in the way,” says Kierkels.

For this reason, APMT put a lot of thought into safe maintenance of the automated cranes. One of the
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company’s requirements during the tender phase was that areas on machinery that needed maintenance could be easily reached. This included the electrical installations.

**Block off for maintenance**

At the new terminal, staff inside the operations control room will be able to put automated areas out of operation with the help of the fence control system. “Then nothing operates and no automated vehicles (AGVs) can drive into the area. This has to be communicated to all the equipment and operators have to confirm that they know this,” explains Kierkels.

This process takes only seconds. Once everybody has acknowledged the shutdown, the area concerned will be blocked off and the fence lock released. The maintenance engineer can then enter the area knowing it is safe to work there.

“That doesn’t mean he or she can just wander off anywhere. But that’s an aspect of behavioral safety that we have to manage – that people don’t think they can quickly go to another area,” says Kierkels.
Something APM Terminals did to mitigate the risk of people getting hurt by trucks is to leave the gates where the trucks drive through at the new terminal unmanned. At the existing terminals there are still gate inspectors who check things like seals and numbers. Cameras will now do this job. Instead of getting out of the truck, the driver will communicate through an intercom. And if anything, for example paper work, needs arranging, he or she must park the truck and go into a building via a safe pedestrian route.

**Vision for safety**

Part of APM Terminal’s vision for the new terminal was to “build it in the safest and most sustainable way. We communicated our safety vision at the tendering phase and chose our suppliers based, among other criteria, on safety and sustainability,” says Kierkels.

For the next few months, the main concern for safety is the erection of large, heavy quay cranes and other material in a relatively small area, where other equipment is being built and tested as well.

“The safe remote control of the cranes is on the plate of ABB. Some recent accidents involved containers being hit by the trolley coming backwards on the ship and then toppling containers off the ship onto the quayside,” he says. “So far we are lucky that no-one was underneath, but it could have happened.”

ABB has developed a system to make a scan of the build-up of containers on the vessel deck. Then the crane adjusts for a safe height and the correct time to start moving back.

“We still have crane drivers, they are just sitting somewhere else, so we have to help them by making it virtually impossible to move back too soon and hit something,” explains Kierkels. “That can be done with automation but you have to be 100 percent sure it is working, otherwise you will have the opposite effect – a false sense of security.”

**Environmental benefits**

An additional advantage of automated cranes is noise reduction. “Putting down containers on concrete or on top of each other can be pretty loud,” says Kierkels. “If the operator does it manually, it depends on his feel, judgment and experience.

“Automated systems are much smoother. It’s like landing an aircraft. If it’s a very smooth landing, the computer probably did it, not the pilot.” As an ex-Air Force pilot, Kierkels knows what he is talking about.

Increased traffic to the new terminal will bring more safety and environmental risks. The local authorities have already put plans in motion to heighten the capacity of the nearby A15 highway.

In a bid to reduce emissions from trucks, one of APMT’s commitments to the port authorities from which it leases the ground is to make it more attractive for customers of customers to transport by boat or train, rather than truck.

“We have agreed to eventually bring down the modal split for trucks to a 35 percent maximum. That’s low compared to some German ports, where the percentage is 89 percent,” says Kierkels. The present level for trucks is 40 to 50 percent at the port of Rotterdam. “It’s quite a challenge to bring that down, especially since we can’t tell them because they are not our direct customers.”

Whatever it takes to make a safe, sustainable terminal, a terminal operator cannot do it alone. Whether it is the central or local government, the immediate community, customers or the environmental authority for the port, all have a role to play in this mammoth task.

“We have a motto that safety doesn’t know competition,” says Kierkels. “We regularly meet with safety managers from other terminals to share accident information. That’s what makes us stand out at Rotterdam – the joint effort.”