



CONSISTENT TRAINING

KEY TO UNLOCKING PORT SUCCESS

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Today's trainee is Rory, and it's his very first time operating a ship-to-shore crane. Yet, in gusting 40mph winds in a cab 53 metres from the Liverpool quayside, he's already moved five stacks of 40ft containers from a mega-ship sitting in the River Mersey to a waiting trailer below on the new £400m Liverpool2 container terminal.

Okay, Rory might have been a bit slow and made a few mistakes, but that doesn't matter because he isn't actually perched 53 metres in the air, nor is he unloading one of the world's biggest container ships. He is in fact sitting in a crane simulator on the estate of the Port of Liverpool, about to embark on an intensive 14 day training course, which once completed will allow him to operate the newly built ZPMC cranes at the new terminal.

When Peel Ports, owners and operators of the Port of Liverpool, chose to build a new container terminal capable of handling the world's biggest ships, it also invested heavily in the facilities it uses to train its crane operatives. Peel Ports invested over £500,000 in developing the simulator and the associated software. With first

class facilities in Liverpool, the port offers some of the best, most consistent learning environments anywhere in the world.

As one of the training officers at the port, I spend a large amount of time teaching new and existing crane operators how to operate our new 134 metre high 'Megamax' cranes on Liverpool2. Situated next to the new terminal, the crane simulator is housed within a typical 40ft container offering an accurate simulation of all crane operations in a completely immersive environment.

Liverpool2, which opened in November 2016, is one of the most operationally efficient and modern terminals in Europe and the UK's largest transatlantic port and container terminal. The port is capable of handling two 380m vessels simultaneously and ultimately will have a capacity of over one million TEU. With semi-automated remote-controlled operation, the cranes reduce the time taken to transfer containers from ship to road or rail. They also have the ability to operate at speeds in excess of 30 moves per hour and wind speeds of up to 55mph (88kmph).

IMPORTING THE WORLD'S BEST TECHNOLOGY

The crane simulator reproduces the equipment layouts and behavioural movements of the actual Ship-To-Shore (STS) and semi-automated Cantilever Rail Mounted Gantry cranes (CRMG) which have been manufactured by Zhenhua Port Machinery Company (ZPMC) and are the tallest cranes built by the Chinese manufacturer to date. The custom-designed software package on the simulator incorporates highly visual, real-life landscape graphics depicting the Liverpool skyline, including the iconic Liver Building and the river Mersey.

Our training simulator was built and assembled by Swedish company ABB, one of the world's leaders in automation. The firm produced a customised, high-tech training simulator tailored to interactively test the abilities and skills of drivers by presenting them with realistic, operating scenarios. During the commissioning process I travelled to Sweden to oversee the process and how they map the screens with a digital version of Liverpool2, and the ZPMC cranes.

The simulator is as close to a real crane as you can get, and gives operators the chance to be trained in a safe and authentic environment. While it might be fun to sit in the seat and have a go for an hour, the simulator is essentially a step-by-step education product which is built upon a different methodology compared with other methods of training. One of the real draws of the simulator is its ability to record, store and playback every second of training, allowing whoever is in the hot-seat to review, consider and try again. I always say, a small error up there is a big problem, but a big problem in the simulator doesn't matter, providing lessons are learned – in actual fact, mistakes while learning are welcomed because they act to reinforce the importance of safety, proper technique and efficiency.

INTENSIVE TRAINING

Over the past two years, 36 crane operators and 16 maintenance staff have successfully completed the training course. The training we provide here in Liverpool is rigorous, and lasts between 10-14 days. This is split between the simulators and on the real L2 cranes and existing cranes at Royal Seaforth Container Terminal.

Whether the people being trained are new recruits with little or no crane experience, or experienced operators with 35 years behind them using different equipment, every single person is trained in the same manner in order to qualify to use the new cranes. The process is the same right across the board and the ZPMC instruction manual is followed to the letter because we need to ensure the highest levels of safety and efficiency. At Peel Ports, we are committed to a comprehensive health and safety programme which ensures our employees are able to develop their skillsets to the highest level of expertise.

The first stage of training involves a technical understanding of the equipment we are working with. This allows trainees to fully appreciate how the cranes work, particularly with different sized vessels and the importance of the maintenance teams which service, repair and keep the cranes performing each day.

For crane operators working 12 hour shifts on site and operating a crane for between 2-3 hours at a time, the specification which the crane's cabs are built to is second to none. The anti-sway system which prevents a container from following its natural inertia keeps the flow of moves consistent, even if the weather is adverse. The operator's chair is custom built to prevent back problems, the cabs are soundproofed, shock absorbent and heated in the winter and air-conditioned in the summer to provide a new level of comfort for operators.

From dock workers to seagulls, passing ships and Birkenhead across the water, every

detail has been accounted for to make the simulation as close to life as possible. Indeed, the simulator imitates life to such a degree that endless real life environments can be recreated – from punishing 60mph winds, snow and heavy rain. With the switch of a button, we create day-in day-out events, but in a safe and controlled manner. Operators are able to practice problem-solving in a safe and controlled environment, as scenarios cover incidents, equipment failures and extreme weather conditions.

THE SIMULATOR EXPERIENCE

It might seem monotonous but no container or move is the same on the port and this is something we try to replicate in the simulator. There may be lashings stuck to a container, or a damaged twist lock – all of these variables keep the operators alert and challenged.

A fully qualified crane operator is expected to make between 20 to 30 moves an hour – depending of course on variables such as weather, the location of containers on the vessel, the structure of the vessel itself and the container's exact contents. Moves are achieved by using two joysticks and a series of button sequencing to activate the twist locks and release containers onto waiting trailers on the quayside. Put simply, the left joystick moves the cab forwards and backwards while the right control lowers and raises the crane spreader.

The key to learning how to operate a crane is depth perception and excellent hand eye coordination with both right and left hands – technical skills which the younger generation are naturally equipped with, given their familiarity with video games and smart phones.

Ability is only one side of the story, as attitude and application are far more important in the long run. If someone has the natural ability but lacks the desire to learn and develop the skill, they won't make the cut. I can tell within a matter of minutes whether someone has the right attitude to sit in the operator's cab and the ability to carry out the job in hand. Given the sheer power of the cranes, and the risk they could potentially pose to other port workers if mishandled, selecting the best people for the job is an essential process. I always say any crane operator is only as good as their last job – and this rings true even amongst the most experienced operators here in Liverpool. Safety is absolutely paramount.

In recent years the port of Liverpool has undergone a great deal of expansion and investment. The new £400m Liverpool2 container terminal complements the existing Royal Seaforth Container Terminal, which is still fully operational and will continue to be so. Its cranes are roughly half the height of the new ZPMC cranes and have a much

shorter boom which can handle only one container at a time.

In order to save time spent in port by ships, the Liverpool2 cranes are able to handle two containers at the same time, increasing operational productivity. And instead of using straddle carriers to move containers on to their next location, either at the port or transported onward by rail, barge or road, Liverpool2 uses trailers to whisk the boxes onwards.

In any industry it is not uncommon to see significant amounts of money invested in new ideas, cutting edge equipment and clever infrastructure. What is often forgotten is the need to reprogram the behaviours and abilities of an existing workforce and new recruits to cope with such change. At the port, we have seen significant infrastructure investment but also a commitment to knowledge, time and space to teach staff. The crane simulator offers us the consistency which we lacked before, allowing us to train our staff to the very best of their ability. We fully recognise the importance of a highly-skilled and competent workforce to the continued success and growth of the port.

ABOUT THE AUTHOR

With over two decades of experience working in a variety of roles at the Port of Liverpool, Khalid Mahdy is a Training Officer at Peel Ports, tasked with training crane operators to use the new ZPMC ship-to-shore cranes at the Liverpool2 container terminal. Khalid has also worked and trained people abroad, notably in Trinidad and the Middle East. Here, he describes Peel Ports' approach to preparing its operators for one of the most demanding jobs on the quayside, and why a knack for playing video games might help.

ABOUT THE ORGANISATION

Peel Ports is the UK's second largest port group, owning and operating six of the UK most important ports (Liverpool, Heysham, Manchester, Medway (Sheerness / Chatham), Clydeport and Great Yarmouth). It also owns the Manchester Ship Canal and BG Freight shipping line, and operates a container terminal in Dublin. Peel Ports handles 65 million tonnes of cargo every year, which is around 13% of the total UK major ports traffic. Headquartered in Liverpool, it employs around 1,200 staff, and had revenue of £596m and EBITDA of £212m for the year ending 31 March 2016.

ENQUIRIES

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