CASE STUDY

How Simulation Training is Helping the Port of Halifax Keep Up with Surging Demand of Terminal Operators



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Executive Summary

Like many ports around the world, the Port of Halifax in Nova Scotia, Canada, saw a surge in demand for terminal equipment operators in recent years due to a retiring workforce and an increase in shipping traffic.

In 2022 alone, the port moved 601,700 TEUs through its two containerized cargo terminals, PSA Halifax Atlantic Hub and PSA Halifax Fairview Cove. Some ships had a carrying capacity of more than 10,000 TEUs, representing thousands of containers that needed to be loaded and unloaded.

To address the growing demand for terminal operators to manage those loads, the port's training partner, the Halifax Employers Association (HEA) , began using simulation training to teach new hires how to operate cranes and other heavy machinery more efficiently and effectively. This was critical for increasing the safety of its operators, ensuring damage-free containers, and keeping the supply chain in motion.

In this candid interview with HEA Training Advisor Robert Bonnar explains how the HEA prepares new operators for work in the field every year using simulation training. This includes how:

- New hires are fully vetted and have the required skills to operate cranes on the first day on the job safely;
- New operators complete their training program faster and with less stress; and,
- The number of accidents and damaged containers caused by operators has decreased.

Read on to learn more about the Port of Halifax and how simulation training has been making a difference.

Q1

Tell us a bit about yourself and how you support the Port of Halifax with its training of terminal equipment operators.



“I’m the Training Advisor at the HEA. I’m a long-time service longshoreman with 42 years of waterfront experience. I’ve done just about every job on the waterfront except for operating a ship’s pedestal crane—although I’m very familiar with it. The HEA is a strategic partner and stakeholder in the Port of Halifax. We do all the hiring and training of longshore-men in the port.

Nova Scotia has a popula-tion of approximately 1,000,000 people, of which nearly 50% live in Halifax, its capital. The port plays a big part in the economic growth of Nova Scotia. We’ve got some big terminal operators here. I essentially give advice on the training being done.

My duties include writing training manuals, overseeing, scheduling, and assisting the trainers.

I also make sure that machinery is available to train on and our fleet of vehicles is prepared to be used.

Q2

Why is training operators using simulators so critical for the Port of Halifax?

Location: Halifax, Nova Scotia, Canada

A natural harbor and one of **Canada's top 4 container ports** by volume of cargo handled

Provides connections with **150 countries** for cargo imports & exports

One of the deepest and **largest natural, ice-free harbors in the world**

"The world of transportation is ever evolving, and you have to stay on the cutting edge. Shipping companies don't make money while sitting idly. So, the faster we can unload and load, the better. That being said, there's a lot of moving parts and logistics surrounding the shipping industry. So, we have to make sure that our training is at the cutting edge and our employees are producing safely and efficiently.

We eliminated subjectivity using a CM Labs' simulator. We can now measure every trainee with the same yardstick. We would bring people into the training who may not have an aptitude for it, the trainers would have to make a judgment call if they felt the trainee could not handle it.

You need to be objective and let people through [to the real equipment] only after they meet a certain criteria. That criteria is reinforced, tested, and validated through the use of simulation.

Currently, we are now using our simulator to vet people, selecting the right people that have the aptitude and helping to eliminate issues like accidents or damages.



Q3

How are you addressing employee attrition and keeping up with the surging demand for terminal operators?

Annually, the Port of Halifax handles **over 1,100 vessels**

2+2 Two modern **container terminals** & two **breakbulk terminals**

Gate truck wait time and service time of **less than 60 minutes**

In 2022, the port generated **$4.87 billion** in economic impact as well as 25,300 jobs

“It took me ten years to work my way up to becoming a member of the container terminal workforce, then another 12 or so years to becoming an STS Gantry Crane operator. The workforce at the time was older. Recently, the face of the industry has been getting younger; through the attrition, we have been recruiting constantly. We hired about 138 people between the end of 2021 and 2022. We gave them some orientation and basic skills training on ITV or chassis/yard tractor, as we call it here in Halifax.

With the surge in the amount of work, we've had to increase our numbers even further. We are hiring another 75 or 80 people this year.

Terminal operators want people right away. For example, last year we trained a new hire, and within one year, he's going to be in the terminal working on an RTG. This person had the aptitude, and I'm very confident he will continue to advance and someday become an STS Gantry Crane Operator. That's unprecedented.

Thankfully our CM Labs training simulators helps us to keep up with the demand.

Q4

What were your first thoughts about using simulators for training, and how did that change over time?



We use the simulator and the software for training operators on ship-to-shore gantry cranes, rubber tire gantry, and some pedestal cranes. I have to be honest: When I first learned that they bought the simulators, I was really skeptical about whether this was going to be some toy or a real tool.

I'm an older guy, and us old guys don't like change.

But in retrospect, I was wrong to think that—and I have to say, it's a seriously good tool. The realism is amazing. It is easier and faster to vet and train operators.

It also helps us to highlight exactly where operators are struggling—and why—and then give them immediate feedback to help correct their performance.

I can't say enough good about it. It has really helped us to develop our operators here.

Q5

How has using simulators to train operators helped reduce the risk of accidents and damage?



“We always start in the classroom to review the theory and different scenarios. We then move to simulation before beginning the hands-on training on the machines. Prior to the simulators, it meant training new hires on the actual cranes under the close supervision of a trainer. They would then learn how to maneuver the equipment and containers in real-world conditions, like wind, rain, and snow.

The last part of the training was always the most challenging. Once the trainer was satisfied and confident with the operator's skills, they would then remove themself from the cab. The operator would then be on their own for the first time. Risks were high. What happens today, the first part of the training takes place on the simulator before the practical real-time training. So, some risk is eliminated. However, you can never eliminate all risk.

The simulator prepares the trainee through the use of exercises and scenarios written by experienced operators like myself, by supplying realistic events and shipboard experiences.

Introducing things like wind, rain, snow, and fog—as well as daytime and nighttime operations—helps the trainee experience the real-life training they are about to experience without risk.

The practical training covers the same information, but the confidence level of the trainers is higher using the simulators. Plus, the fact that we vet the potential trainees to ensure we have the best possible candidates makes it much less stressful on the trainers.

Q6

Why are you now able to schedule more timely training compared to before?



“The preparation for a new training cohort involves creating manuals and other documents for trainees. That hasn’t changed.

When we didn’t have a simulator, we had to schedule the start of training on days when the vessel was not in the port. So, we were at the mercy of the shipping schedules. A 14-day training course could sometimes take a month to complete just because we had to wait for a vessel to become available.

That added delays to when new hires completed their training and were available to fill those much-needed positions.

Today, a 14-day training course actually takes closer to 14 consecutive days. The increase of cargo and vessels has made a huge difference.

As I said before, vessels don’t make money sitting alongside the quay. They make their money steaming. So, it’s important that we move operators through their training on time.

The simulator is a key ingredient to our success now.

Q7

How has the time and stress of learning how to operate equipment been reduced?



“Using simulators, combined with the trainers being on top of the process with the operator throughout their training, makes it easier and quicker for trainees to absorb the material and move through the practical, hands-on training. So, it reduces the time it takes for trainees to take control of things like spreader swing. That ability is capital.

What’s more, it reduces the stress of damaging any equipment. In the past, the training was effective but much harder on the nerves.

The leap of faith when you remove yourself from the operator’s cab. That is one of the hardest parts of being a trainer.

Keep in mind the trainee may never get a chance to experience what to do when something goes wrong while training in a practical, real-life situation. These issues just may not happen.

But with a simulator, you can build those different scenarios into the training. So, it puts the trainee into the fray without the chance of anything bad happening in the real world.



Q8

Can you give an example of how the simulator's realism leads to more effective training?

"While training operators on an RTG, for example, they need to get used to steering the machinery and not just trusting the GPS; anything can go wrong. So, it's a matter of practice and repetition. And what I did was build exercises around what can go wrong. Using faults to prepare trainees for unexpected issues.

And it's not just the simulator that teaches you. During simulator training we also have a continuous discussion at the same time. So, right away I can let them know what the problem is. 'OK, what did you think you did wrong here? You need to watch your gantry line. You need to bring your numbers up. You're hitting containers. You need to improve your ARC.'

In one exercise, I had containers piled up pretty high on the deck of the vessel. We were loading offshore of the pile; I listed the vessel so much that the containers shifted and rolled. The operator was in the process of loading a blind cell below, and the shifting containers affected his load.

Unexpected things may and will happen.

You can do so much more with simulation. Some issues you may never encounter during the practical training session.

The simulator is a good tool and mimics the crane very well. Things like slack rope, the way a container reacts when still locked to the stack, and the environment (snow, rain, fog, and wind) —the simulator does a very good job introducing these issues to the new operator at no peril.

Q9

What KPIs will you be using to track the effectiveness of your training programs?



“We’re still early in our deployment, so I don’t have any metrics to share just yet. But I am a numbers guy. So, I’m going to have a close look at things like the final evaluation times and their practical cycle times on a simulator. As a final evaluation exercise, as soon as you lock on to a container on the ITV, we start a timer. You then take it aboard the ship and if we hear of any problem that causes the spreader to stop moving, like a stuck lock, we stop the time until that container can move again. It’s all real-time. It’s all smooth. It might take an operator four minutes to put that container aboard, but his movement cycle time might only be a minute or 40 seconds.

Q10

Some ports are on the fence about whether they really need a simulator for training. How do you justify the need?



That's easy. Very easy. The ability to instruct trainees on things like ARC Tracing, keeping the load low, and mitigating the time it takes to load or discharge a container, is a serious benefit. To be able to show the trainee where his deficiencies are. I've had feedback from my trainers that say they see a difference in handling the spreader movement alone.

The trainees don't chase the spreader/load nearly as much.

The number of containers a well-trained operator can move, alone is incredible. You see improvements made fairly fast with the simulator, even from one session or exercise to the next. It's as simple as that.

In the end, it's all about the operators and the quality of their skills—how quickly and safely they can load and unload. Because, like I said earlier, a vessel doesn't make money just sitting next to the quay. They have to load, unload, and get back to sea to make money.

So, the need to train operators to be efficient and safe is very important.

In my opinion, CM Labs has a great simulator for that. I endorse it 100%.

Q11

Do you have any other advice for ports that are looking for ways to improve their training or operations?



“A simulator is only one part of the equation. You also have to get the right people to use and understand it. Technically, you can pull anyone off the street to learn how to operate a crane, or an RTG, or whatever, using a simulator, but you have to understand the industry to get the most out of it. Try to find people that have some prior industry experience.

If you can’t find people with industry experience, then at least look for forward-thinking and proactive people.

Someone who wants to make a difference. Get out and watch the operation. When you have the right people in place and give them the right training tools —like a CM Labs simulator—you have a winning solution. You’ll come out on top almost every time.

About CM Labs

Developer of Vortex Studio, the industry-leading platform for creating real-time interactive simulations within virtual environments, CM Labs provides capabilities for training simulators, mission rehearsal, serious games, virtual prototyping, and testing.

CM Labs' vision is to be the leader in digital transfor-mation, from machine design to training.

As the leading vendor for simulation-based training in the construction and ports industries, we focus on bringing industry expertise and a holistic view of operations to all our market segments.

Based in Old Montreal's innovation hub—and with extensive physics, engineering, and project manage-ment expertise—CM Labs has a proven track record of delivering robust, innovative, and market-focused solutions that foster success as well as collaborative relationships.

With over 1,000 simulation installations in 39 countries, our markets are global. Our customers include DP World, PSA, Port of Tilbury, and the Pacific Maritime Association.

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