# REMAINING RELEVANT WITH AUTOMATION

**PTI SPOKE TO:**
Uno Bryfors, Senior Vice President,
**ABB Ports**

**"DIGITALISATION IS NOW ACCELERATING AUTOMATION AND AUTOMATION NEEDS TO RESPOND TO THE HIGHER CUSTOMER EXPECTATIONS CREATED BY THE DIGITALISATION."**

**WHAT HAVE BEEN THE BIGGEST CHANGES FOR PORT TERMINAL OPERATIONS TO DATE? HOW HAS ABB BEEN PART OF THESE CHANGES?**

Between issue one and 100 of the Port Technology International Journal, container terminals have gone from manual operations with papers and handheld radios as means of communication to fully integrated and automated operation where information exchange is digitalised pretty much everywhere in the terminal. We have also seen how everything has increased in size, speed and functionality. ABB has been the source of several innovations enabling these technological advancements.

Automation of container handling equipment actually started with ship-to-shore (STS) cranes. In 1987 we introduced sway and path control, and the functionality has since then been refined and expanded with skew control, ship profiling, crane OCR, vehicle alignment/identification, automatic landing on vehicles and fully automated portal trollies.

Yard automation took some major steps forward in Singapore and Hamburg between 1997 and 2001. From 2005 stacking crane automation really took off and has since then been spreading to all parts of the world with accelerating speed. Today well over 1,000 automated yard cranes equipped with ABB's automation systems are in operation or under delivery.

Remote operation is undoubtedly one of the biggest changes in terminal operations over the past 25 years. It has brought the human aspect of terminal operations into focus by providing safer and more ergonomic working environment for the crane operators. Since 2014 we even have completely cabinless STS cranes in operation in a number of terminals.

The remote operation of STS cranes rapidly became a standard feature in large, highspeed STS cranes since it was first introduced by ABB in 2010. Remote operation has also brought quay, yard and on-dock rail operations together and connected them to TOS and vehicle management systems, creating the fully integrated container terminal.

**WHAT DO YOU EXPECT TO BE THE BIGGEST ADVANCEMENTS IN CONTAINER TERMINAL AUTOMATION TO BE GOING FORWARD, OVER THE NEXT FIVE TO TEN YEARS?**

Lack of reliable data has been slowing down the evolvement of automation for decades. With the current rapid digitalisation of our entire industry, this will soon be no concern. Digitalisation is now accelerating automation and automation needs to respond to the higher customer expectations created by the digitalisation.

On-line real time information, precise scheduling, flexible and fast delivery at competitive cost is required – in spite of fluctuating volumes in quay side and gate/rail operations.

Automated equipment and systems will in the next years have to deliver significantly higher throughput for a given size terminal. Automation in various forms will also be deployed in greater extent in all types and sizes of terminals.

The fully integrated container terminal will provide many opportunities for rethinking how to operate in the future, including changing the roles of the members of the terminal's team.

It will also make operation more resilient for the external factors like the current pandemic.



**Watch PTI's most popular video**
Bryfors speaks about how automation helps container terminals to meet the challenges implicit with handling larger ships and bigger container volumes.

**https://youtu.be/SWfkurrfcW8**

### IN YOUR EXPERIENCE, HOW DO PORTS SUCCEED AT TERMINAL AUTOMATION?

Terminals vary a lot in size, physical limitations, cost structure, from 0 to 99% transshipment and different modalities. The task is to automate the most efficient configuration for each terminal.

The key is to avoid one-off solutions and complicated engineering projects.

Today we can offer proven automation packages for multiple terminal configurations and nodes (quay, yard, rail and gate). Using proven solutions and interfaces from our huge library together with proper testing and verification in a simulated environment enable fast project delivery and cut the ramp-up time to a minimum. Thus, the cranes can start moving containers as soon as the first work order is received.

### WHAT ARE SOME OF THE KEY TECHNOLOGICAL INNOVATIONS ABB IS WORKING ON OR LOOKING TO WORK ON? WHY ARE THESE A KEY FOCUS FOR THE COMPANY?

Crane and terminal automation are largely evolution not revolution. We are now developing the 12th revision of the ABB STS automation package and the 10th revision for yard cranes. These will deliver more autonomous operation, higher performance in speeds, accelerations, control and positioning and easier handling for operations and maintenance.

We now deliver automation systems optimised for cabinless STS cranes. Additionally, the remote operation capabilities of our system allow integrated operation of multiple sections of terminals, or multiple terminals in a port, from a single location.

### WHAT ADVICE WOULD YOU GIVE TO ANY PORT HOPING TO AUTOMATE IN 2020 AND BEYOND?

Consolidation is driving bigger calls (and ships) even in markets with low volume growth.

Many terminals now realise that to stay relevant they need to increase capacity and productivity, even more than anticipated just a few years ago.

Terminals increasingly introduce automation step by step as part of expansions and transformation of existing operations: a terminal can be gradually upsized by adding larger quay cranes, by replacing RTG blocks with cantilever ARMGs, or by adding intermodal cranes in the on-dock rail operation. The trend can already be seen for example in automatic stacking crane deliveries, approximately a third of our deliveries now go to originally manual terminals, a share that is increasing. We will also soon see automated horizontal transportation being introduced step by step.

A stepwise approach does not mean that a grand plan for the terminal is not needed.

On the contrary it is necessary to have a long-term vision for equipment, systems and processes to maximise return on investments. The process to introduce automation tends to be smoother and less costly for the terminal if it is started proactively, somewhat ahead of the re-

**Bryfors 100 Edition interview:**
successful terminal transformation

**https://youtu.be/mjKWI35eBAw**

### ABOUT THE INTERVIEWEE

Uno Bryfors, Senior Vice President of ABB Ports, is one of the most experienced professionals in the ports industry today. During his four decades long career at ABB and in the industry he has been a key person in driving the development of automation solutions for cargo handling starting from automatic grab ship unloader and automated yard operations to fully automated, integrated terminal operation. Uno Bryfors joined ABB as a Development Engineer after graduation with a Master of Science degree in Electrical Engineering. Since then he has headed the R&D department, led the Crane Systems unit in Sweden, and is now responsible for ABB Ports business- from ship to gate.

### ABOUT THE ORGANIZATION

ABB Ports develops and delivers intelligent terminal automation solutions and services to make container terminals safer, greener and more productive. The solutions include automation and remote operation for all types of container handling cranes, and complete OCR and electrical systems. With the track-record of the largest installed base, ABB's systems help to optimise container handling from ship to gate in greenfield installations and in existing terminals.