How remote can 'remote' be?

TheOpinion

ABB's **Fredrik Johanson** considers the possibility of control centres for multi-terminal remote crane operation

ON SITE: the distance for remote operation of cranes is constrained for now
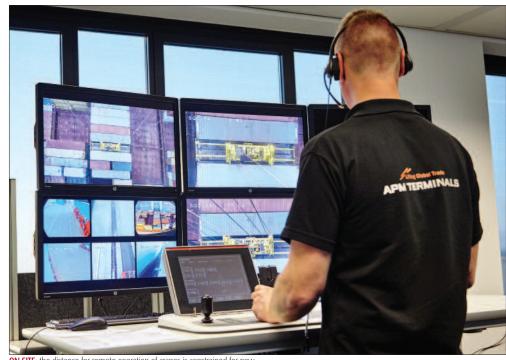
REMOTE CRANE OPERATIONS are gaining in popularity: in yard operations automatic and remotely supervised stacking cranes are now an industry standard, more and more ship-to-shore cranes are being fitted with advanced automation and remote control, and intermodal cranes are becoming more like stacking cranes. Let there be no doubt that automation and remote operation are the key trends for port operators today.

In our digitalised world physical distance is no longer considered an issue. Internet connections worldwide are getting faster increasing global accessibility. This progression leads us to ask just how remote can remote container terminal operation, and remote crane operation in particular, be in our digitalised and connected world?

The current concept of remote crane operations is based on moving crane operators from cranes to centralised control rooms within the terminal premises, but outside the terminal fence. This increases productivity since the ever-bigger cranes can operate faster, and considerable time can be saved through smoother shift changes, removing the need to transport operators to/from the cranes, for instance. Remote operation also dramatically improves the crane operators' working environment and alters the operator's role.

But can we go even further with remote operations? Can the distance between the cranes and their control be further than just outside terminal fence? Would it, for example, be possible to have one global crane operations team operating all cranes of a terminal operator no matter where the cranes are located? Ultimately, how remote can 'remote' really be?

The defining, or perhaps, the limiting factor for remote operations, is currently safety classified communication. The crane operator must, for example, be able to perform an emergency stop of the crane and the command must be able to be fulfilled at all times, and performed fast.

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Currently the communication between the cranes and the control room takes place in the terminal's own and controlled communication network, which enables safe and fast communication in a network that is fully under the terminal operator's control. Only in such a network – the so-called black cloud – are all the components and their quality known. The communication between the cranes and the control room has a guaranteed bandwidth and speed for operator commands, and long enough distances can be handled. Transmitting video image from the crane to the control center is a different story and requires substantial network capacity to avoid delays in transmission.

If the terminal operator wanted to operate cranes from a longer distance, it would need to extend the terminal's local network to cover several terminals, or secure an owned fibre in a telecom company's cable to build safe and fast communication between the connected terminals and the central crane control centre. Neither of these options are currently feasible.

In answer to the question how remote can remote be, we would argue that today the real-time and time critical process control functions, such as crane operation, should remain within the terminal to ensure safe operation and fast response. However, within other areas with no time critical functions, remote connection offers interesting opportunities. For example, it allows a terminal operator's headquarter to be able to monitor each crane in any terminal almost in real time. Data on crane and terminal performance can be collected from the terminals anywhere in the world for analysis and to facilitate improvement at each terminal's operations. Here, neither physical distance nor guaranteed speed of the communication are obstacles.

However, along with the advancement of automation, and with communication technologies for that matter, cranes will become even more autonomous robots with minimum human interaction. This will significantly reduce the need for time critical communication between the cranes and the operators; then, there will be no limit to how remote remote-controlled operations can be.

■ Fredrik Johanson is the general manager of marketing and sales at ABB Crane Systems.

> **'Cranes will become even more autonomous robots with minimum human interaction'**