Yard automation for E-RTG’s operated terminals

Filippo Ninotti – Product Manager
Ahoy Rotterdam, The Netherlands - June 2018

Continue the conversation online  #TOCEurope  @TOCWorldwide  TOC Events Worldwide
Table of Contents

1. E-RTG Automated Terminal Yard Challenges
2. Technology Used
3. Yard Automation
4. Summary
E-RTG Automated Terminal Yard Challenges

- Optimizing operation plan and storage
- Real-Time
  - Scheduling
  - Control (yard monitoring and positioning)
  - Position and status of the cranes
- Operations
  - Ensure high operational continuity and flexibility (transfer lane and lane change)
  - Enhance the operations reliability
  - Improve operational safety in the yard
- Real-time
  - E-RTG
    - Automated ground yard operations (connection/disconnection)
    - Data & Video transmission to allow automated/Remotely controlled operations
  - Trucks
    - Internal truck traffic and remote handling operations control
Technology Used

Fibre optic via cable reel technology

Fibre optic is the fastest and most reliable bandwidth technology in the industry for Data & Video transmission between cranes and yard

Expanded beam with 8 channels, single or multi-mode, integrated in plug and socket
Technology Used

Automatic Plug-in System (APS) featuring cable reel technology

Push Plate (PP)
The PP is installed at the yard, hard-wired to the yard grid. It enables the connection to the E-RTG cable reel via a built-in socket.

Mobile Turnover Anchor (TOA)
The TOA is carried by the crane when not connected or positioned on PP when connected. It is wired to the RTG e-room and data network, via a built-in plug.

Telescopic arm (ARM)
The ARM is installed on the E-RTG sill beam. It performs automated connection and disconnection of the TOA on the PP.
Technology Used

APS Key Benefit

› Safer operations
  • Unmanned connection/disconnection

› Improved productivity
  • Fast and safe lane change
  • Reliable data and real time video transmission

› Fast lane transfer
  • Up to 1.000 meters of uninterrupted electrified travel distance via underground cables crossing channels

› Wide supply voltage range
  • From 400 V up to 7.200 V
Technology Used

Yard Supervision

◦ Remote visualization of Push Plates status
◦ Remote control of Push Plates status
◦ Possible integration with terminal TOS

IPC in remote control room for Push Plates supervision and control

ALL PUSH PLATES IN THE YARD
Yard Automation

Supervision and control of yard equipment related to E-RTG operations

Based on standard yard communication devices, and on Cavotec SCADA, specifically designed for terminals operating E-RTG with APS

- Remote visualization & control of Push Plates status
- Possible integration with terminal TOS
- Automated and optimized feed point selection
- Map stacking area with real time GPS crane position
- Automated association between Push Plate and crane
- Communication of crane yard information, e.g. disconnection and crossing consents
- Command and monitoring of switchgears
- Command and monitoring of barriers and traffic lights
- Integration of other yard devices, e.g. power meters, lighting etc..
Yard Automation

- IPC in remote control room
- SCADA for supervision and control
- IT architecture

- Push Plates
- Power Meters
- Switchgears
- E-RTG yard related signals
- Barriers and Traffic Lights
Yard Automation

Key Benefits

› **Safer operations**
  • No operators required on the yard for supervision
  • Fail-safe protocol for commanding devices operating manned vehicles

› **Optimized operations**
  • Faster crane deployment
  • Coordination of all yard devices from Cavotec SCADA

› **Continuous operations**
  • Full redundancy of the control system
  • Predictive maintenance on yard devices

Seamless integration with existing terminal IT architecture
Yard Automation

IT Layout Example

Control Room 1

Control Room 2
Summary

› RTG Electrification via cable reel is pre-requisite for E-RTG automated terminal
  • Broadband fibre optic communication

› APS is a key equipment for E-RTG
  • Crane automatic connection/disconnection
  • Push Plates status remote supervision and control

› Yard Automation
  • Ultimate SCADA for yard equipment related to E-RTG operations
  • Designed to ease E-RTG remote control
  • Partner of future E-RTG automated terminal
Thank you for your attention

cavotec.com

Come visit us at booth C22 for more information

The information contained in this presentation is subject to change, completion or amendment without notice. In furnishing this presentation, neither Cavotec any obligation to provide the recipient with access to any additional information or to update this presentation or to correct any inaccuracies therein, which may become apparent. This presentation does not purport to contain all the information that the recipient may require in its analysis of Cavotec.

This presentation is Cavotec’s property.