Crowsnest Pass SCADA Upgrade Case Study
BCWWA SCADA & IT Conference
Thursday, November 21, 2019
Overview

- Are the benefits of modernizing SCADA worth the effort of upgrading a currently operating SCADA system?
- How will the benefits of a modern SCADA system be realized by the different users?
- What functionality can be added to realize the full potential of a modern SCADA system?
Agenda

• What areas see improvement after modernization?
  – Process Control
  – Alarming
  – Visualization
  – Logging & Reporting

• Case Study
  – Municipality of Crowsnest Pass SCADA Migration Project
SCADA Migration Project Overview

- Migrate existing SCADA system to modern software
- Replace graphics with high performance standard
- Secure remote access
- Incorporate stations into SCADA system
- Automated reporting
Process Control

• Station Controls

  – All necessary I/O points for proper control brought to SCADA

  – What process areas are lacking I/O?

  – Could the entire control system be improved with more process visualization?
• Station Controls – Case Study

  – Two booster stations were integrated into the SCADA system

    • Steps to add sites included: radio installation/configuration, PLC Processor upgrade, SCADA configuration

  – Increased operators ability to monitor entire system

  – Future Improvements
Process Control

- Secure Remote Access
  - Allow operators to control / view SCADA remotely
  - Ensure proper cyber-security
  - AAA – Authentication / Authorization / Accounting
Process Control

- Secure Remote Access – Case Study
  - Operator secure remote access was made available
  - Proper cyber security put in place
  - Role Based Security
    - Unique Authorization Levels
    - Individual Operator Login Credentials
    - Detailed Logging and Accounting of User Actions
Alarming

- **Alarm Rationalization**

  - Are the alarms being generated necessary?

  - Which alarms are required to be part of the alarm notification system?

  - Applying different levels of alarm priority to each alarm
• Alarm Rationalization – Case Study

  – Developed a strategy on how to complete an alarm rationalization exercise

  – Does this need to be a callout?

  – Does the description mean anything to the operators?
• Alarm Notification Customization

  – Use alarm analysis to improve alarm performance

  – Change alarm priority based on a time of day

  – Group alarms together to reduce alarm notifications
• Alarm Notification Customization – Case Study
  – Used provided alarm reports and analysis to improve alarm notification
• Alarm Notification Customization – Case Study

  – Change priority on door intrusion alarms
    • Changed the priority from 1 to 3 during working hours

  – Where redundant equipment exists only generate an alarm when no equipment is available
    • Used primarily on booster pumps
Visualization

- High Performance Graphics
Visualization

- Colors for Alarm Indications Only
Visualization

- High Performance Graphics – Case Study
High Performance Graphics – Case Study
Visualization

• High Performance Graphics – Case Study
Visualization

• Standardization
  
  – All background colours to be the same
  
  – In general, process flows from left to right
  
  – All equipment displayed using the same symbol
Visualization

• Standardization – Case Study
Visualization

- Standardization – Case Study
Visualization

• Navigation
  
  – Ease of navigating to the different areas of the SCADA system
  
  – Alarms should be easy to find
  
  – Support pages that enhance control
Visualization

- Navigation – Case Study
  - Can navigate multiple ways
Visualization

- Navigation – Case Study
  - Alarms / detailed information found with 3 clicks of the mouse
• Navigation – Case Study

  – Support pages added to the system included:

• Totalizers

• Communication Status

• Operator Notes
Logging & Reporting

• Trending

  – Are the trends readily accessible?

  – Can tags be added easily?

  – Can custom trends be made?

  – Can the view of the trend be customized?

  – View of the summary of the data viewed?
Logging & Reporting

• Default Trending – Case Study
  – Default trends were created for each site
  – Custom Trends
  – Change Historical view easily
  – Synopsis Data
Logging & Reporting

- Trend Data – Case Study
Logging & Reporting

• Automated Reports

  – Determine which tags need to be reported

  – Using the data that has been gathered

  – Minimize operator input

  – Summarize information
Automated Reports – Case Study

- Tags to be included
- Determine calculations
- Number of reports required
### Coleman Water Plant

**Records for the Month of December 2018**

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*Note: Only selected cells are highlighted.*
Conclusion

- Modernizing a SCADA system can be challenging
- From operations to management many benefits will be realized
- Unique operation of the SCADA system can be configured