UWC 2021

Nuclear Sustainability: Leveraging an Evolving Workforce and Workplace

Operator Remote Monitoring

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Session Abstract:

This session will provide information on how Duke Energy is currently using innovative devices to automate some of the data collection during operator rounds. This session will highlight the use of wireless gauge readers, video cameras, and other technologies and methods to enable operators to monitor the plant more effectively and efficiently. We will discuss how these technologies and methods can work, how they can be installed and calibrated, and how the data can be used by operators to develop better plant control and monitoring practices.

Problem – Pain Points

- What are some pain points associated with manual data collection from equipment in the plant?

- What are some possible solutions?

Wireless Gauge Readers

- What are they?
  - Relatively inexpensive method of digitizing analog gauges
  - Small digital device that attaches to analog gauge, reads the gauge, and transmits data to data historian
- How do they work?
  - Take a picture of the gauge on a set frequency
  - Turns picture into a reading
  - Sends reading to a receiver and controller which is connected to business network

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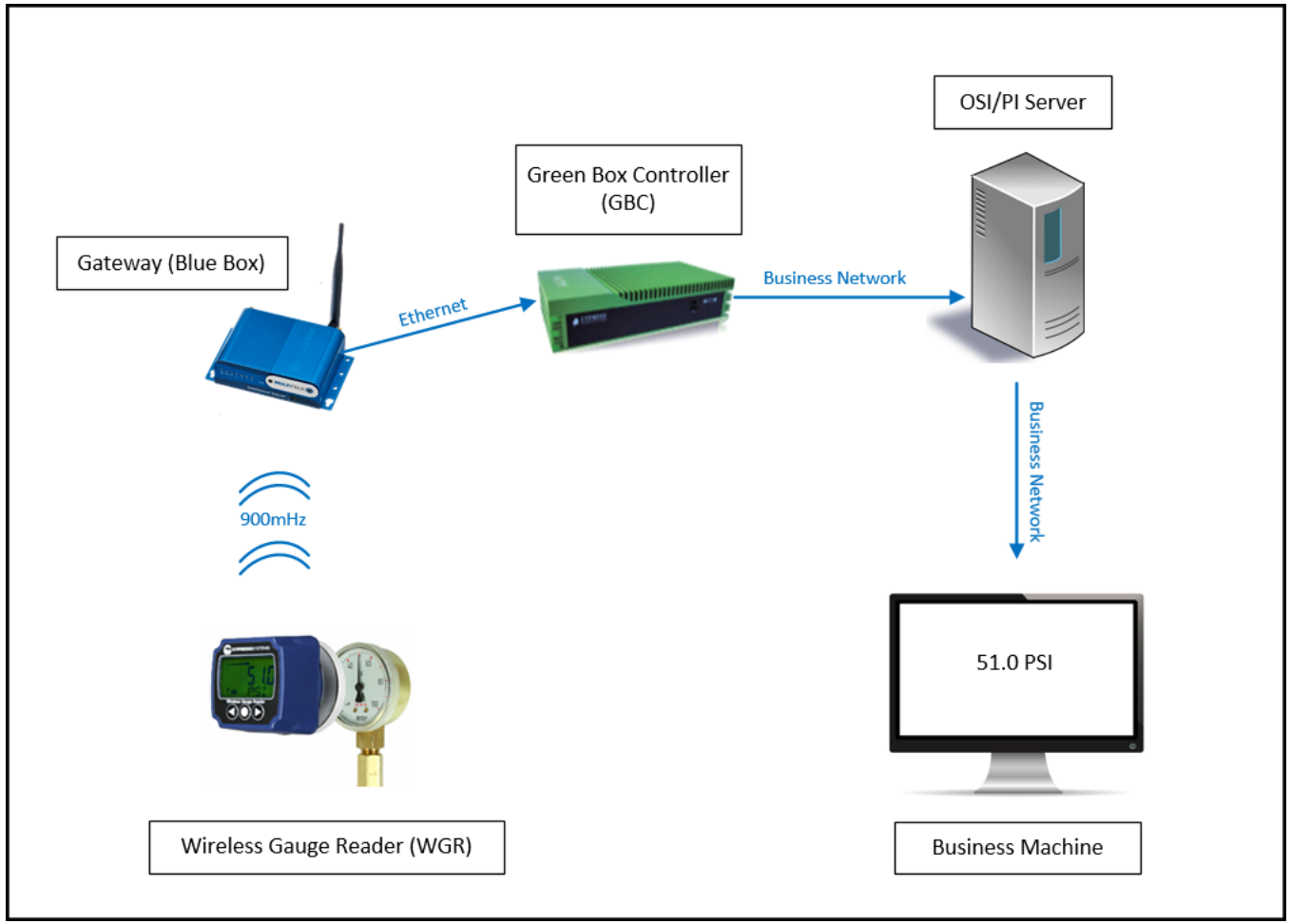
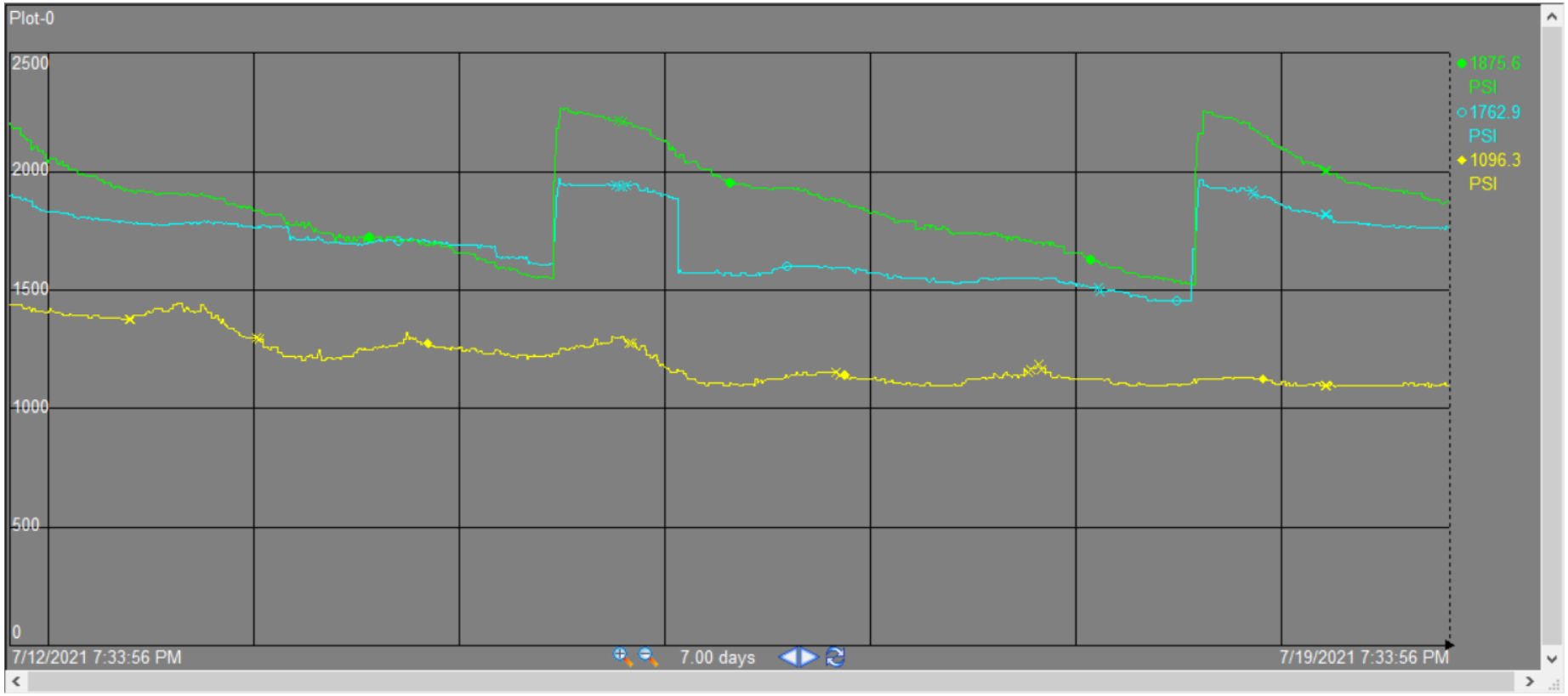
Wireless Gauge Readers



Wireless Gauge Readers

- WGR data viewed from OSI/PI server:



Wireless Gauge Readers

- Now that we have more data, how can we use it?

Wireless Gauge Readers

- One tool an operator developed is an Excel spreadsheet that analyzes the WGR data
  - Data will be flagged if outside of normal operating band
    - This would require further investigation
  - If reading is within band, no requirement to look at the analog gauge and record a reading
- Engineering is using WGR data in advanced pattern recognition models for monitoring equipment performance
- Anyone can now pull up WGR data and use it for monitoring/trending since it is stored in our data historian

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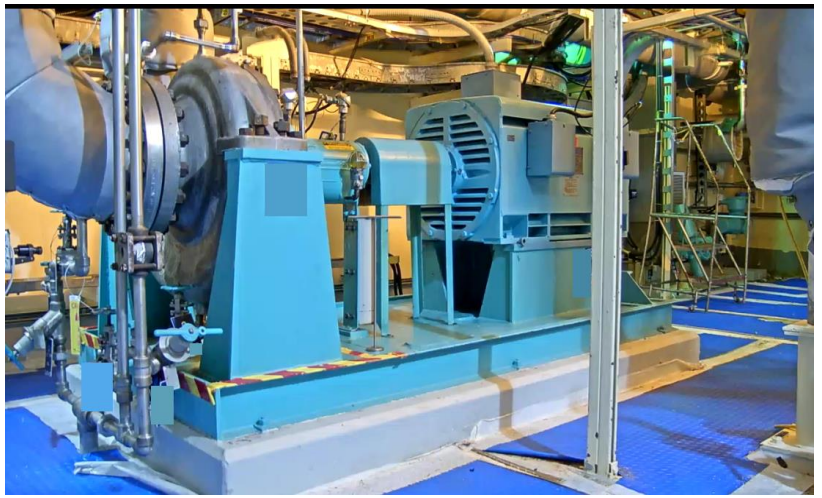
Wireless Gauge Readers - Summary

- Relatively inexpensive method of digitizing analog gauges
- Reduces time spent gathering data
- Provides more data for monitoring/trending
- Data is more easily retrieved since it is stored on the PI historian

Cameras

- At Duke we are expanding our use of cameras for monitoring the plant
  - In contaminated areas to prevent operators from dressing out daily
  - To view remote alarm panels
  - To monitor remote / unsafe areas of the plant



Cameras

- What are some specific use cases you have seen at your plant?
- What other use cases are out there?
- How are you addressing cyber security concerns?