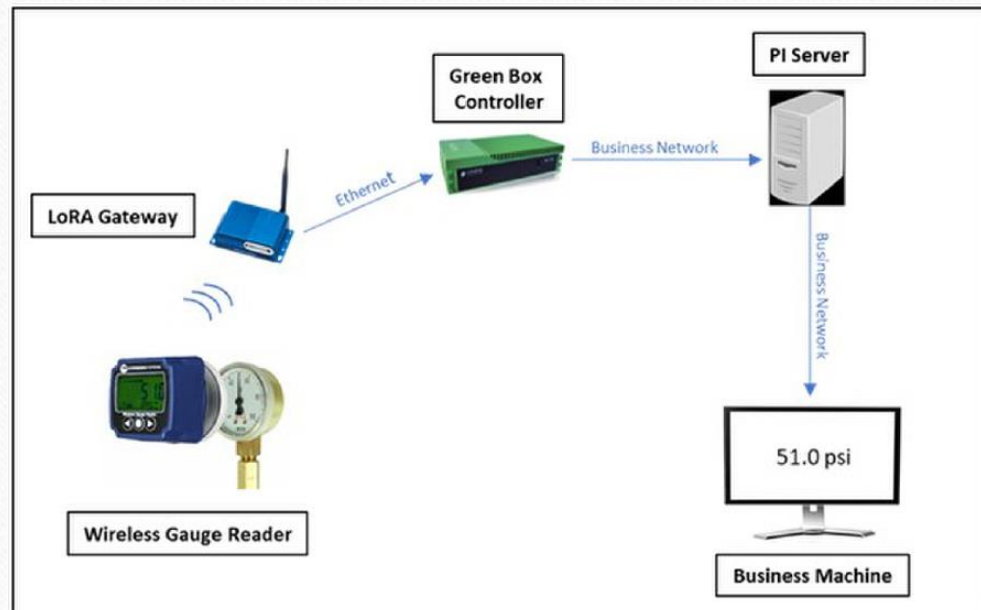


Wireless Gauge Readers (WGR)

Bobby Price

Duke Energy

WGR



- One of our fleet innovation initiatives involves the installation of wireless gauge readers (WGRs) to analog gauges in the plant. WGRs are small, battery operated digital devices that attach to the front of an analog gauge. These devices contain a small camera that takes a picture of the analog gauge, reads the value of the gauge, displays the reading on the front of the WGR, and transmits a digital signal to a receiver and controller; the controller will send the data to the PI servers. The network setup, as well as an installed WGR are shown in the attached pictures. The installation of these devices will make operator rounds much more efficient and in addition will enable remote access to the analog gauge readings (via OSI/PI) to be used for monitoring and trending equipment performance. MNS is the first site in the fleet to have the Wireless Gauge Readers installed! There are now 51 WGRs installed and transmitting (26 on Unit 1 and 25 on Unit 2)

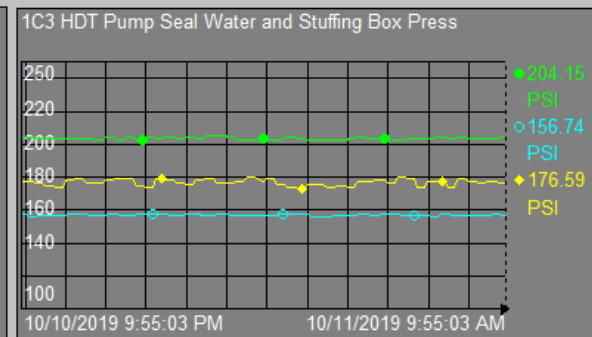
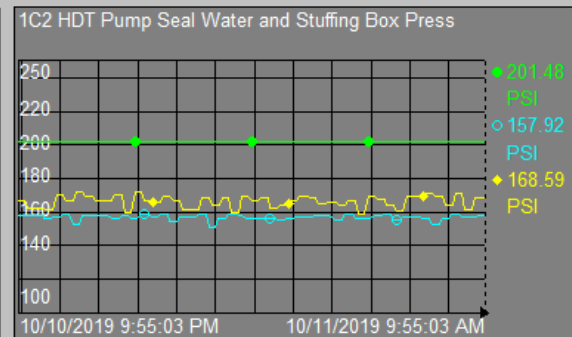
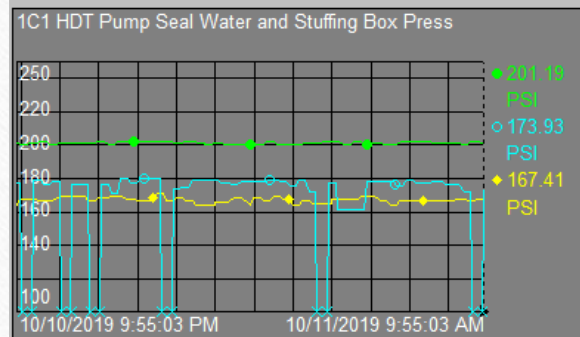
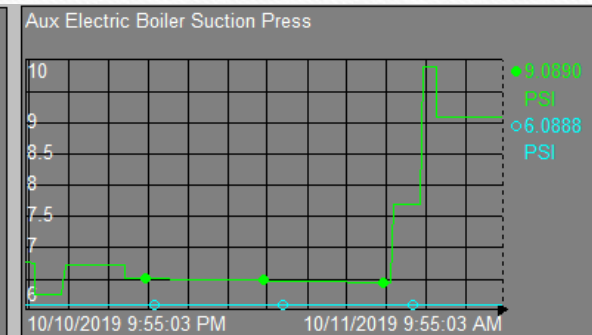
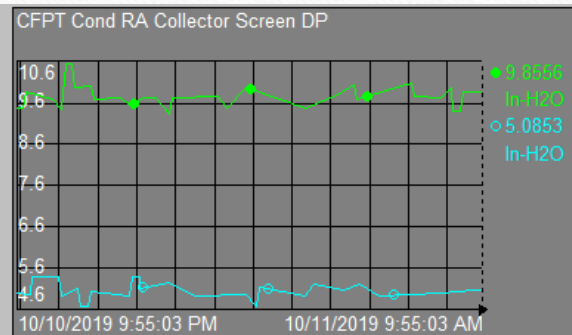
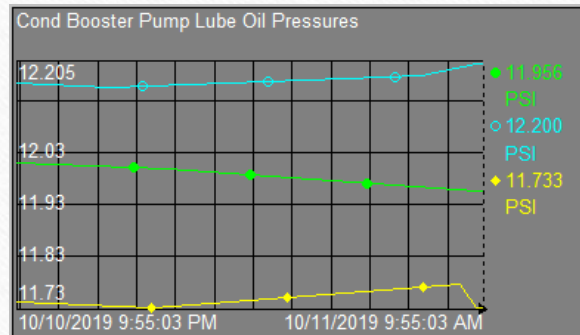
WGR Installed



WGR Installed



WGR OSI/PI Display



WGR Lessons Learned

- Pre-installation evaluations need to be performed.
 - Two WGR had to be temporarily removed due to EMF/RFI concerns. Identify sensitive electronic equipment and evaluate any potential effects of EMF/RFI prior to installation.
 - Security and Fire Protection walkdowns are required prior to installation.
 - Ensure that identified gauges will not be affected by work elimination efforts.
 - Identify and stage any needed materials prior to Cypress arrival.
 - Ensure that identified gauges have clean lenses. Two WGR fell off due to contaminated sealing surfaces. One was due to a thin layer of hydraulic fluid on the gauge lens.

WGR Lessons Learned

- Provide as much information prior to the installation as possible:
 - Linear gauges were installed and calibrated quick and easy
 - Non-linear gauges require advanced preparation by Cypress
 - Gauge face color can affect the WGR, communicate with Cypress to ensure all particulars are passed along and prepared for. When gauges are identified for potential installation, take pictures to send to Cypress to help identify potential issues.
 - Gauges with fixed indicators for upper limit indication will need to be modified prior to WGR installation. Fixed indicators will affect calibration.

WGR Experience

- My overall impression of the Wireless Gauge Readers, and the Cypress installation team, has been extremely positive.
- The installation and calibration only took two days for the 51 WGR that were installed.
- The Cypress installation team was professional, polite, and went above and beyond to ensure that they followed all of our policies and directives. They are extremely knowledgeable in what they are doing and they take great pride in their work.

WGR Experience

- Here at McGuire, we are excited at the possibilities that WGR brings. Monitoring plant parameters has traditionally been something that plant resources would perform, but with WGR we are now looking toward the future where parameters would be available on OSI/PI. Plant resources could spend more time performing sensory tours of plant areas and could focus more on identifying potential issues rather than documenting points.
- Data can be trended and evaluated at regular intervals and could make it more feasible to move from preventive maintenance to condition based or predictive maintenance in the future.
- We are extremely pleased with WGR and look forward to Phase II.