

Temperature Monitoring on PID loop at Steel Process

Region: Middle East
Industry: Steel Plant
Products: YTA510 (Temperature Transmitter)
 YTMX580 (Multi-Input Temperature Transmitter)
 YFGW410 (Field Wireless Management Station)
 YFGW510 (Field Wireless Access Point)



Introduction

Direct Reduction Iron (DRI) is one of the processes to reduce oxygen from iron oxide pellets for steel plant. More than 90% of DRI processes use heated LNG as process gas where PID control for temperature or interlock control is of vital importance.

Requirement and background

Reliable temperature measurement without frequent cable replacement is needed. One of the major problems faced by the user is frequent replacements of cables as those gets degrade faster because of high ambient temperature and process vibrations. These cable replacements increases the operational cost as well

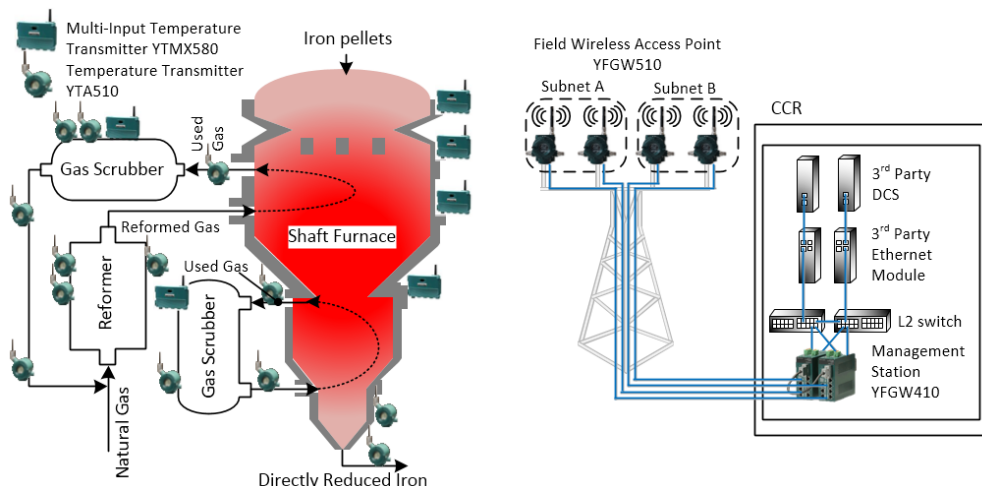
as cost of man hours.

Solution

Temperature measurement over the radio as part of PID control loops, Interlock control loops and monitoring at DRI process were introduced. (For shaft furnace, gas reformer and other process pipes)

Highly reliable and full redundant wireless system realized this control loop application.

Two pairs of Redundant Access Point YFGW510 with a Duocast¹ wireless communication were connected to a pair of Redundant Management Station YFGW410. Redundant Modbus TCP interface for non-Yokogawa DCS² achieved stress free interoperability.



Result

The installation was completed in 2013 and the measured results for 120 temperature inputs were found satisfactory.

In dense area, out of line of sight devices up to 50m communicated successfully with less than 5% Packet Error Rate.

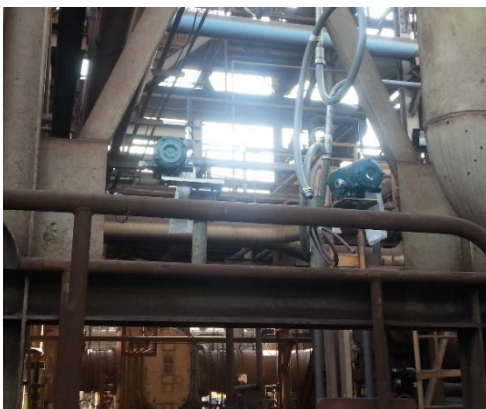
Benefits

- **Higher uptime of process**
- **Operational cost reduction**
- **Risk reduction:**
 - cable degradation, noise interference**
- **Less installation costs and time:**
 - wiring, cable rack, junction box and etc.**

Conclusion

This result proved that Yokogawa's high reliable wireless is very effective for DRI process. Deterministic routing algorithm makes the communication latency shortest and fully redundant system with Duocast^{*1} system can provide robust control loops. The High Performance "Radio Chip" embedded in these wireless devices helps to achieve High Quality Communications even in dense areas.

After 12 months or more operation, now the customer is considering expanding wireless applications in their site.



*1) Duocast: wireless redundant communication system standardized at ISA100 wireless[™] on double active access points with minimum wireless latency.

*2) The Yokogawa's CENTUM VP R5 or later supports dual-redundant network configuration with YFGW410 field wireless management station. It enables entire system full redundant.

Please consult Yokogawa regional sales in case of engaging full redundant ISA100 wireless network system with 3rd party DCS.