

### Honeywell OneWireless Won

### Wireless Project in Shenergy Shanghai Port Gas Power Plant

#### Project Overview

In Feb. 25<sup>th</sup>, 2010, Honeywell (China) HFS Instrument Division won OneWireless project of Shenergy Shanghai Port Gas Power Plant. The fuel used in this project is LNG. The under sea pipelines are landing at planned valve chamber, about 600 m west of Donghai Bridge. Via gas valve, 9MPa natural gas is converted to 6.0MPa; one of the pipelines is connected directly into Port Gas Power Plant for gas supply. Via gas pressure regulating station in the power plant, natural gas is transferred to fuel interface point of gas turbine. There are 4 9F-grade 350MW-grade single shaft gas-steam combined cycle units equipped in the power plant, turbine island equipments are Siemens combustion gas turbine – generator – steam turbine with indoor layout and axial exhaust. Triple pressure, reheat, non-supplemental firing, horizontal natural cycle boiler made in Hangzhou Boiler Factory is used as HRSG, with outdoor layout.

The equipments provided by Honeywell for this project including 253 ST3000 wired transmitters, 4 wireless multifunctional nodes, 101 XYR6000 wireless transmitters and 1 set of wireless management platform for gathering process data of 4 gas turbine units, to implement data integration with Siemens DCS control system.

#### Solutions:

**Measurement points of wired transmitters:** All wired transmitters are used for measurement for HRSG system and water processing system. There are total of 58 wired transmitters are used in each boiler for measurement of steam pressure and flow, steam drum water level and pressure, flue gas pressure and egress pressure of supply pumps, condensate flow in water processing system, pressure and flow of deoxidize pump etc. Measurement point instruments of gas turbine-generator-steam turbine (unit) are already provided by unit manufacturer.

**Measurement points of wireless transmitters:** Wireless transmitters monitor the following key measurement point in each boiler and unit:

- (1) **Boiler:** flow, pressure and temperature of main steam, flow of middle pressure steam, flow, temperature and pressure of low pressure steam, pressure of high pressure steam drum, pressure of middle pressure steam drum, pressure of low pressure steam drum, pressure and temperature of reheat steam, high pressure water supply flow, middle pressure water supply flow, low pressure (ingress of low pressure steam

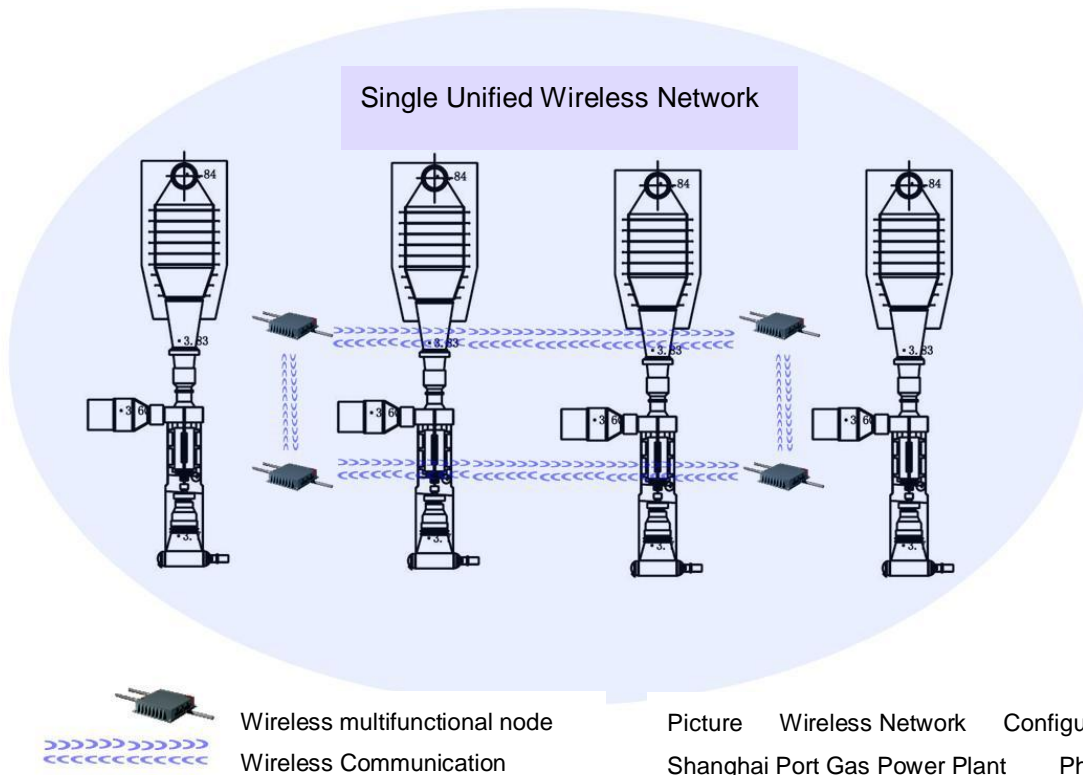
drum) flow, low pressure water supply (condensation water) flow. There are total of 16 measurement points.

- (2) **Unit:** steam turbine vacuum, lubricant pressure, control oil pressure, vibration 1, vibration 2, vibration 3, closed-type water pressure, generator power, speed – total of 9 measurement points.

There are 4 sets of boilers and units, each is equipped with its own DCS control system, so there are total of 4 sets of DCSs. DCSs of No.1 and No.2 boiler units are installed in the same control room, and DCSs of No.3 and No.4 boiler units are installed in the same control room. DCSs are separated from each other, with no physical connection, i.e. non direct data communication. If a control system fails, operator will lost monitoring of correspondent unit. Client wish to ensure the 25 most important measurement points listed above can still be monitored under this situation.

In wireless transmitter solution, every key measurement point is allocated with one wireless transmitter, and each set of boiler and unit is equipped with one wireless multifunctional node to receive wireless transmitter data in this unit. Wireless backbone network consists of 4 wireless multifunctional nodes, connected by wireless communication (802.11b/g), providing a unified wireless signal coverage area. Through correspondent multifunctional node, wireless data of each boiler unit can be transmitted to unified wireless database. Therefore, every DCS can acquire all wireless data of other 3 units via its own multifunctional node, and connect with DCS control system from its gateway via RS485 signal cable by using Modbus RTU protocol.

In this way, even the DCS of one unit fails, DCSs of other units can still acquire and monitor all important measurement point data of the faulted unit via their own multifunctional nodes.



Picture Wireless Network Configuration Chart  
 Shanghai Port Gas Power Plant Phase I Project  
 4x350MW Gas-Steam Combined Cycle Unit

If the above functions to be implemented by wired solution, then wiring of signal cable will be complex, and there are large amount of cables, bridges, cable sleeves to be laid. In contrary, implementation of wireless solution is very simple and easy: installation of wireless transmitters is simple and fast, the process connection method is identical with wired transmitters, communication supports up to 1 second refresh rate, battery life up to 4.5 year (1s refresh rate), no need for cable and bridge layout, no need for wiring, and installation workload, cost, installation time, commissioning time and future maintenance cost and expenditure can be significantly reduced.

The whole wireless network is managed by one wireless management platform, which is responsible for safety management and communication management of wireless network and online remote configuration, diagnosis and calibration of wireless transmitters.

### Value and Benefits:

Multiple wireless multifunctional nodes form a unified wireless coverage network, which makes reconstruction of plant, adding new measurement points and temporary measurement points during maintenance very simple and fast.

The structure of wireless multifunctional nodes backbone network ensures real-time performance with data reporting rate of once per second. At the same time, it makes wireless network extension simple and flexible, with ability to support expansion of future project.

It is not necessary for wiring, layout of cables and bridges, installation of I/O cards and junction boxes in wireless solution, therefore saving installation cost, installation time and commissioning time significantly.

As said by instrument control engineer of Port Power Plant, the reason to select Honeywell OneWireless solution is that this creative technology can bring technical advantages, and process parameters of gas generator sets reliably collected and monitored by wireless transmitters can help the plant to facilitate project installation and maintain optimum unit operation.

### **Time and Project Team:**

The planned installation time will be in June, 2010.

Learn more:

For more information about Honeywell wireless solution, please visit [www.honeywell.com/ps/wireless](http://www.honeywell.com/ps/wireless), or contact with your Honeywell customer manager. [www.honeywell.com/ps](http://www.honeywell.com/ps)

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