

## Woongjin Polysilicon Improves Operational Efficiency with Honeywell Control Systems, Fieldbus, CCTV and OneWireless



“With Honeywell’s support we were able to reduce our project window by two months which saved us time and money. In addition, Honeywell provided us with unique technology benefits such as CCTV integration with the DCS and wireless technology – all at the control systems level. That combined with their Foundation Fieldbus expertise changed our instrumentation life from analog to digital reducing our field work as well.”

JooTaek Lim, Electrical and Instrument Team Leader, Woongjin Polysilicon

### Benefits

Operating at the forefront of the solar technology revolution, Woongjin Polysilicon manufactures polysilicon, which is the base material for solar batteries. Construction at the South Korea plant began in 2008 and had a goal of a two-year start date in order to maintain its assertive jump on the competition.

The company had to find an ideal technology partner who could not only provide the proven experience and technology needed, but could also meet its aggressive timeframe for start up. Woongjin preferred Honeywell over other suppliers for its unique technology approach and the engineering team’s experience and confidence in meeting the plants’ difficult requirements.

Honeywell provided state-of-the-art systems that included Experion Process Knowledge System (PKS) control stations and systems, safety systems and an integrated Closed Circuit Television (CCTV) and wireless mobile stations among other products.

With Honeywell’s integrated approach, Woongjin was able to capitalize on the following benefits:

- Beat aggressive timeline with system in production in just one year and 10 months from start
- Applied strong foundation in Foundation Fieldbus technology for design, installation and commissioning to help reduce the project time frame by two months

- Ability to integrate CCTV with Distributed Control System (DCS) and wireless technology all at the systems level
- Leveraged Honeywell’s best practice process network design to provide more secure and high performing network environment
- Preventative maintenance ensured system healthiness
- Changed instrumentation life from analog to digital and able to centrally check instrument status
- Personnel more efficient and can operate more reactors simultaneously with less trips to the field
- Able to operate plant beyond expected production capacity with no downtime
- Advanced control system allowed personnel to operate more reactors than initially planned or expected



Woongjin Polysilicon, relies on Honeywell’s expertise to meet tough project deadlines for installing advanced control and wireless solutions for a secure and high performance network environment.

## Background

Woongjin Polysilicon was established in July 2008 and produces polysilicon, the base material for solar batteries. It is also used to manufacture semiconductors and is made of silicon, the most common material on earth next to oxygen. Woongjin Polysilicon construction started in December 2008 and production began in September 2010 after just one year and nine months. Located in Sangju city of Gyeongsangbuk-do Province, the plant produces eleven-nine level (purity level 99.9999999%) silicon. Woongjin Polysilicon continues its investment in development and training to become the number one solar power company in the world.

## Challenge

The major challenge that the Woongjin Polysilicon company faced was getting its plant up and running in a very short timeframe. In order to accomplish that goal Woongjin needed to work with a proven technology leader in next-generation control solutions, but also one that would work hand-in-hand to accelerate the decision-making process and reduce project engineering time if possible.

In addition, Woongjin also had to find a partner that was versed in Foundation Fieldbus since the company was forging a new path with the largest Fieldbus project in Korea. "We had quite a few challenges to get our systems up and running in time but knew if we found the right partner that could demonstrate leadership and expertise in the areas we needed we could reduce the installation and commissioning time significantly and help meet our deadline," said JooTaek Lim, Electrical and Instrument Team Leader, Woongjin Polysilicon.

## Solution

Woongjin selected to work with Honeywell as their technology partner to help establish the polysilicon plant. Honeywell proposed a variety of solutions that were well advanced and stable to help address all the startup and commissioning needs.

"Honeywell's approach was really different from other suppliers we talked with and its engineering team was well prepared to tackle our difficult challenges," continued Taek Lim. "We were very impressed by the project team's performance and innovative thinking when it came to the benefits of advanced control systems."

The Honeywell solution offering included the following:

- Three Experion PKS R311 System
- Eleven EPKS Console Stations
- Two Safety Managers
- One Process Historian Document (PHD)
- Sixteen C300 Controllers with Series C-I/O
- Ninety-five Foundation Fieldbus Interface Modules
- 165 Fieldbus Temperature Multiplexers
- One FDM Server
- One Digital Video Manager (DVM) Server with sixteen CCTV cameras
- Thirteen Wireless Mobile Stations
- Six Large Wall Screens for graphic and CCTV monitoring

With Honeywell's best practice process network design, Woongjin was provided with a more secure and high performance network environment.

Honeywell and the Woongjin project teams established a war room onsite at the plant to reduce the decision making process and project engineering time. "By managing this process on a daily basis we were able to come to quick decisions and take immediate actions that impacted our schedule in a positive way," continued Taek Lim.

Instead of installing field operator stations, Honeywell recommended its OneWireless mobile station solution. Operators were able to monitor process operations anywhere in the work environment allowing Woongjin to save installations and maintenance costs of an installed field station and improve the flexibility and efficiency of its operators.

Polysilicon CVD reactor sequences also presented a difficult challenge and with Honeywell engineering help, a best performance and optimized sequence was developed that provided operators with the ability to operate multiple reactors while also increasing their efficiency. "Honeywell provided a very stable and powerful integration solution for peer-to-peer communications as a Peer Control Data Interface (PCDI) and enabled lots of third party communications that we can trust," said Taek Lim.

One of the unique technology approaches that Honeywell suggested was the integration of CCTV with a DVM solution. Now, the CCTV along with the field sensors connected to the control systems easily transfer alarms to the EPKS system which can help trigger pre-defined actions.

“Honeywell was the only supplier who recommended integrating CCTV solutions with our wireless mobile stations – enabling us to take full advantage of these two technologies,” said Taek Lim. “The Honeywell project team consistently demonstrated their professionalism and enthusiasm and enabled this project to process quickly, smoothly and safely while at the same time improving our knowledge about the systems.”

**More Information**

For more information on Honeywell’s Advanced Control Solutions or any of Honeywell’s Products, Services, or Solutions, visit our website [www.honeywellprocess.com](http://www.honeywellprocess.com), or contact your Honeywell account manager.

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