Case Study
Honeywell Migration Against the Clock Extends Life for Critical Gas Plant in Oman

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Background
Yibal Government Gas Plant (GPP), in Northern Oman, is the oldest gas processing facility in the country, commissioned in 1978. Owned and operated by Petroleum Development Oman (PDO), the nation’s largest producer of oil and gas, it remains a key part of the energy infrastructure. Producing 18 mmscmd gas, the majority of PDO’s gas production, it helps power some of Oman’s key facilities, from Al-Ghubra power station in the east to Sohar power plant in the west.

Over the last three decades, Yibal has been continuously upgraded and expanded to increase production. In the course of these enhancements the plant’s TotalPlant Solution (TPS) was upgraded with Honeywell’s High Performance Process Manager (HPM) with Foundation Fieldbus at the start of the new century.

At the time, Foundation Fieldbus (FF) technology was in its very early stages. As a result, more than a decade later only a limited number of transmitters, devices and FF types were supported by the system, diagnostic data was poor and the system suffered from cumbersome engineering and support issues. Moreover, advances in technology meant that better solutions on the same platform were clearly available.

Benefits
Despite an incredibly tight time frame, Honeywell was able to migrate the existing TPS-FF solution to its C300 controller to give the plant best-in-class process control and support for a wide variety of process control situations, including continuous and integration with smart field devices.

A smooth migration—the result of careful planning before the shutdown and working closely with Petroleum Development Oman Automation System Engineers—resulted in a trouble-free transfer to the new system. There were no problems in the start-up, no surprises during the changeover and few network issues.

As a result, the plant can now support a much wider range of FF types and better diagnostics, and has firmly addressed the risk of obsolescence. Yibal GGP now runs the latest version of the Experion® PKS automation platform – R400 – on its C300 FF controller.

“In little more than a day we were able to secure the future of the control system for years to come,” said Jamal Balushi, senior system engineer at Petroleum Development Oman.

Challenges
The importance of Yibal GGP to the country’s energy supply was reflected in a stringent timetable for the work proposed: It was scheduled for a shutdown to last less than 40 hours.

The scope of work to be completed in that time was extensive:

- Migration of the legacy UCN (Universal Control Network)-based FSC® (Fail Safe Controller) system to Honeywell’s FTE (Fault Tolerant Ethernet) network
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- Migration of the HPM controllers to C300 (both FF and Non FF)
- Migration of Process Manager 11 to its updated equivalent HPM.
- Upgrading all graphics from Native Windows and Global User Station (GUS) console graphics to Honeywell’s HMIweb display.
- Modification of the existing the existing process control network.

There was no fall back option.

Added to this, the work broke new ground for the engineers. The project was the first global R400 Foundation Fieldbus upgrade, for example. It was also to be done without the benefit of a long lead time; engineering was initially done on R311, and only moved to R400 just before the migration.

Similarly, PCDI (Peer Control Data Interface) communication between the C300 controller and Honeywell’s FSC had never been tested before.

Solution
To ensure the stringent deadline was met, the project required significant preparation in pre-shutdown activities. These included installation of two new C300 cabinets, installation of a new server cabinet, and identification and marking of all cables requiring changing during the shutdown.

The preparations also included migrating a sample Foundation Fieldbus segment (one of six to be completed during migration) to Experion PKS. The performance of this segment was then analysed to pre-empt any issues the migration was likely to encounter.

Throughout this period the PDO and Honeywell teams worked closely together to ensure all risks and issues were properly identified and mitigated before the shutdown commenced. Proper planning and testing were key factors in the project’s success.

During the shutdown a number of activities had to be simultaneously worked, including:

- Modification of the existing HPM cabinets – removing Foundation Fieldbus modules in existing card files, upgrading the firmware and connecting FF and non FF IOs to the new C300
- Network activity, including installing the firewall and router, and changing IP addresses of the PCN according to the recommendations from the network audit
- Software migration and verification, and AM CL modification
- FSC Activities
- TPS Point Deletion – deletion of all migrated TPS points.

Despite the scope of the work, and new challenges faced by the team, start-up of the new system was completed without incident and all network issues were easily resolved. Most importantly for this vital plant, the work was completed successfully in line with agreed shutdown period: in just 36 hours.

“This was an incredibly tight time frame, but ensuring we were well prepared resulted in a smooth migration and a solution that means we can look to the next 30 years with confidence,” said Balushi.