Kuwait Oil Company is one of the world’s leading Oil & Gas companies. Belden successfully applied Hirschmann™ Ethernet technology and Industrial HiVision Network Management System to develop a robust and reliable pipeline control network.

The Installation’s Key Benefits

The engineering companies responsible for designing and scoping the control system project chose to work with Hirschmann™ network components and Industrial HiVision Network Management System, as Hirschmann™ was able to deliver – and guarantee – the following key benefits:

- High availability with double redundant Ethernet ring topology
- Harsh operating environment, with no single point of communication failure
- Flexible ring structure which can be expanded later
- SNMP based Industrial HiVision NMS tool with powerful diagnostics to ensure easy troubleshooting and maintenance.
- Fast commissioning due to Industrial HiVision MultiConfig™ for multiple simultaneous device configurations
- Maximized network availability through Industrial HiVision network status and threshold functionality
- Multiple pipelines network monitoring operation via Industrial HiVision fault prediction, detection and diagnosis functionality
- Automation oriented network field support and product training courses

Kuwait Oil company, one of the most modern Oil & Gas companies in the world was formed in 1934 by Anglo-Persian Oil company (now the British Petroleum Company) and Gulf Oil Corporation (now Chevron Corporation). In the year 1975, KOC was taken over by the Kuwaiti Government. Later in 1980, Kuwait Petroleum Corporation was established to bring all state owned Oil companies under one entity. The Mission of the Kuwait Oil Company is to explore, develop and produce to marketable quality the hydrocarbon resources in the State of Kuwait (excluding the onshore Divided Zone).

KOC has an important role in contributing to the support and development of the Kuwaiti economy, developing national manpower, maintaining superior commercial and technical expertise and proactively managing the environmental, health and safety aspects related to KOC’s businesses.

Kuwait Oil Company has a dynamic and diversified work force representing different nationalities. In accordance with the 2030 Strategy, KOC is exerting a great deal of effort to increase the production capacity of oil to achieve a total capacity of 4 MBOPD. Over the last year, crude oil production capacity levels amounted to 2.922 MBOPD.
Operating the oil pipeline control networks in Kuwait’s harsh environment posed various challenges. The automation equipment was spread over long distances and needed to operate over the network in very reliable and secure 24x7 operations.

Hirschmann™ with its vast proven experience was able to supply a comprehensive package that included all the relevant hardware, software and services. In addition field service engineers were required, who were well versed with the control system applications and industrial network pipeline infrastructures.

For the pipeline network design, key elements demanded fast double redundant switching, data communication and network monitoring and a control system based on Fast Ethernet. Gigabit Ethernet speed was required in the backbone ring. Ease of replacement of network components by field technicians was an important requirement.

All products were required to have a high predictive hardware lifetime, as well as a long Mean Time Between Failures (MTBF).

Finally, networking devices needed to be both robust and resistant to dramatic temperature fluctuation and foreign body intrusion. User-friendly and comprehensive network management software for the efficient configuration and effective status monitoring of this network provides a seamless solution from a single manufacturer.

The double network structure ensures that no single point of failure could interrupt the communication for the pipeline. All the nodes are monitored from a centralized Industrial HiVision NMS server located in the KOC Control Room. This facilitates system continuity and supports productivity optimization of the entire pipeline network operation.

Mark Cooksley, Product Manager for Hirschmann™ Industrial HiVision, states: "Companies like KOC operating long distance pipelines really benefit from the Industrial HiVision rapid fault location functionality. A clear topology map, color-coded status displays, and extensive event reporting ensure that the network operator is immediately aware of any potential issues."

Administration and maintenance of the pipeline networks using Industrial HiVision is not only done quickly and efficiently, but also with minimized operational risk."

– Shariq Khan
Technical Manager, ZMS Technology

The Installation’s Key Requirements

Typical Hirschmann™ Industrial Network Topology
Precise knowledge of the pipeline network topology is absolutely essential for the reliable monitoring of such critical infrastructure. The network administrator must know how and where components are connected in order to manage complex networks and perform maintenance work as necessary.

Even pipeline networks, specifically the end devices, evolve over time, and documentation can easily become out of date. The advanced Industrial HiVision auto-topology discovery function ensures that you always know what is connected where in your network.

Throughout a network’s operational lifetime, it is necessary to carry out repetitive but essential maintenance tasks. For example, the threat of cyber attacks means that responsible network administrators will change device passwords regularly. Of course, for a small network, this can all be done by accessing each device individually. But for both small and large pipeline networks, network security and high availability are the ultimate goals.

Hirschmann™ Industrial HiVision MultiConfig™ can fulfill all the above requirements with a few clicks of a mouse. For mission critical pipeline networks, operators need a real-time display of all network components. Industrial HiVision provides user friendly topology maps, so an operator can see the status of the entire network at a glance.

With Industrial HiVision, Automation Network Administrators can meet their daily objectives with the least effort and minimal risk.

“The Fiber Optic Communication Network is based on Hirschmann Industrial Ethernet Switches, which are suitable for the harsh environment of Kuwait. These devices enabled us to deploy a fast, reliable and secured backbone network for transporting SCADA, various control signals, security and safety services for the Oil and Gas pipelines in KOC. Industrial HiVision network management system provides an efficient and effective means of configuring and supervising the Communication Network.”

– Mohammad Al Ajmi
TPL Specialist –I, Kuwait Oil Company
Hirschmann™ Product Range

As a specialist for automation and networking technology, Hirschmann™ develops innovative solutions, which are tailored to its customers’ requirements in terms of performance, efficiency and investment reliability.

Hirschmann™ not only offers a complete range of products for company-wide data networks but also a broad support package direct from the product manufacturer. Customers receive support while their tailor-made communications solutions are being designed, and also throughout the subsequent planning, process, commissioning and maintenance of their networks.

Comprehensive seminars and workshop offerings, in which trends are evaluated and technical subjects are put into practice, complete the vast range of available services.

Product Details

**Industrial HiVision**
- Network Management System for Hirschmann™ managed products and other third party devices
- Automatic topology discovery
- Graphical topology display
- Real-time status display
- Alarms and events
- Asset management
- MultiConfig™ multiple device simultaneous configuration
- Long-term reporting

**RS20/RS30/RS40**
- Compact Fast Ethernet switch
- Fully managed switch (web, SNMP and CLI)
- VLAN, IGMP Snooping/Querier
- DIN-rail mountable
- Industrial fanless design
- With copper and optional fiber ports (multimode or singlemode)
- Dual power inputs
- Signal contact
- 0°C up to +60°C operating temperature (optional -40°C up to +70°C operating temperature and conformal coating)

**Author:**
A case study made in coordination with Mohammad Al-Ajmi, TPL Specialist, Kuwait Oil Company.