



A Yokogawa Commitment to Industry

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SUCCESS STORY

Water Management United Utilities PLC

Location: North West of the United Kingdom

Order Date: 1993

Completion: 1993

Industry: Water Distribution



United Utilities PLC (formally North West Water) provides water and wastewater services to 7 million customers in the North West of England with a total area of more than 14,000 square kilometers. The company is a private company which is responsible for water supplies, waste water treatment and disposal, and recreation on and around its reservoirs. The head office is in Warrington.

SCADA Solution for United Utilities

Water management and distribution networks are typically spread over large geographical areas, which creates a unique opportunity for solving the inherent management and monitoring problem by way of remote control systems. The fact that around 80% of such remote water control systems are sold with SCADA, implies that there are considerable benefits to be realised from the central management of entire networks of equipment.

FAST/TOOLS has this unique features inside their SCADA package for remote control and communication facilities for large geographical networks, and was therefore the perfect solution for United Utilities.

Central to the use of information technology inside United Utilities is the FAST/TOOLS software, which acts as a universal gateway between the physical equipment, the human operator and the advanced control software.

FAST/TOOLS will offer stable communications with the wide variety of front-end devices (RTU?fs) controlling the plant equipment.

But the main reason why Yokogawa was awarded the Water Management project was the strong capabilities of FAST/TOOLS for distributed systems and total performance of YOKOGAWA.

The Operational Control (OC) system allows United Utilities to monitor and control its plant at sites through the North West region. It does this by sending commands to and receiving information from computers that are based on United Utilities sites. These site computers, or are sometimes called outstations. However, the site computers that are used by OC are more sophisticated than traditional outstations and are called Site Executive Systems (SES).

The Site Executive Systems monitor and control sites according the instructions received from Operational Control. An Site Executive Systems monitors by taking readings from instruments (e.g. the flow through a pipe) and control by issuing control signals to change the state of plant (e.g. open a valve).

The three main plant monitoring functions of the Operational Control systems are:

- Alarms : Where the Site Executive Systems contacts Operational Control if a monitored value exceeds a pre-defined alarm level (e.g. a flow rate is too high).
- Current Values: Where the Site Executive Systems contacts Operational Control if a monitored value exceeds a certain threshold (e.g. if a value increases by 10% the Operational Control will be informed of the new value) or an operator requests the current value.
- Where Operational Control collects a set of logged values from the Site Executive Systems usually overnight (e.g. the Site Executive Systems will log a monitored value at 15-minute intervals throughout the day).

The two main control functions of Operational Control are:

- Targets : Where the Site Executive Systems is given a high level instruction (e.g. the flow from a pipe should be 100MI/day). The Site Executive Systems then uses this target to control several items of plant (e.g. remotely control valves or pumps).
- Plant Commands : Where Operational Control overrides the target and controls one item of plant (e.g. open a valve).

Data Acquisition

Data indicating the current status of the water system is gathered by the Site Executive Systems and transmitted to the Operational Control System. This includes both water related data (flow, pressure, level, etc.) and asset related data (pump failed, valve closed, etc.).

The mechanisms by which data is gathered and transmitted from the Site Executive Systems to the Operational Control system are configurable using the Operational Control system. There are two main mechanisms:

- The first is transmission of a monitored value by the Site Executive Systems when it has changed by more than a specified 'significant change' amount or percentage since the last time it was transmitted.
- The second is regular transmission of a log of historic data values at the end of a period; so that, for example, a log may be received once a day containing 1/4 hourly maximum, minimum and average values recorded during that day.

Data may not all come from the Site Executive Systems, there is also data which is manually gathered. Operational Control can be configured to enable data to be manually entered.

System: FAST/TOOLS SCADA
Total I/O: over 900.000 I/O signals
System Configuration: 2x Stratus fault tolerant UNIX system,
2x IBM RS/6000 Oracle server, 45x IBM RS/6000 Operator Control stations