

Salem

A u t o m a t i o n l t d

REMOTE MONITORING

APPLICATION PROFILE

Number 7

REMOTE MONITORING

Salem Automation Ltd
Sycamore Road
Rotherham
S65 1EN
UK

Phone 01709 538200

Fax 01709 376903

sales@salemautomation.net

www.salemautomation.net



FM 10695

Power Generation

Control and Monitoring Systems

Salem Automation has designed and implemented a Remote Control and Monitoring System for WRG's Landfill Power Generation sites, providing the tools to optimise power output and efficiency of their operations across over 30 UK locations

Landfill Gas

Waste Recycling Group (WRG) is Europe's biggest producer of energy from landfill gas. As the first company of its kind to build and operate a successful landfill gas plant in the UK, and in addition to its existing network of power generating plants, Waste Recycling is constructing ten new Energy-from-Waste sites during 2004/5. These will complement the recently acquired landfill sites from Shanks to provide a network of renewable power generation facilities across the UK.)

The new network of energy generation sites will help increase the company's contribution of energy to the National Grid from 92 to almost 120 Megawatts; enough electricity for 260,000 households. The future development of additional mini-generation facilities at other landfill locations will see capacity increase beyond 150MW by 2006.

As a by-product of de-composition of the waste at each landfill site, methane-rich gas is produced. This gas is used as the fuel source for a number of reciprocating engines to generate electricity locally on each site. Not only does this produce a valuable revenue stream from WRG but it reduces the amount of harmful gas damaging the environment: "Methane released into the atmosphere is 25 times stronger as a greenhouse gas than carbon dioxide" - **Graham White, WRG Development Manager**

Remote Monitoring

Remote Control and Monitoring

These latest developments will feature the installation of state-of-the-art generation facilities, including a computer-based, internet-linked, remote control and monitoring system, designed and built by Salem Automation.

SCADA System

The Supervisory Control and Data Acquisition (SCADA) system comprises a centrally located Master Control Station at WRG Operational headquarters in Nuneaton, which communicates with and gathers data from the Local SCADA Panels at each of the remote sites. The Master Control Station graphically displays key information from various plant items, such as generator sets, gas process modules and other miscellaneous equipment at the landfill sites. A limited amount of control is also provided for operators at the Central Control Room to perform some functions at the sites.

Local SCADA Panel

An enclosure houses the local SCADA – an industrial PC running RSVIEW32 mounted in the panel door- and a DIN rail mounted PLC configured as a communications gateway for Profibus to Ethernet media and data conversion. The PLC is fitted with I/O interface cards to collect data from the site and present it to the local SCADA.

Salem created a local Profibus network at each site, including connection to all generator sets, gas process modules and the miscellaneous I/O cabinet. Local SCADA units collect site data, via the PLC communications gateway from the various Profibus nodes and data is displayed on local SCADA Mimic displays. Each site has a single page overview mimic with an additional mimic per generator set / gas process module in addition to an alarm summary and historical trending facilities.



Master Control Station

The Master Control Station Computers at WRG's Control Centre provide similar SCADA functionality as that provided at the sites together with an overview showing essential data for all the sites on a single screen. Mouse driven commands then allow zooming into a particular site and the plant equipment on that site. The system communicates via Ethernet utilising the WRG Intranet.

The following mimic pages are configured:

- System overview
- One site mimic per landfill location
- One mimic per generator
- One mimic for the gas process module
- One mimic for the miscellaneous I/O
- Alarm pages
- Historical trend pages

For each **Generator** the following signals are configured within the SCADA mimics: Generator Status (Running / Off Line), Output kW, Total MWh, Total Operating Hours, Jacket Water Temperature, Jacket Water Pressure, Charge Water Temperature, Charge Water Pressure, Alarm Messages, Fuel Mixture Temperature, Fuel Mixture Pressure, Lube Oil Temperature, Lube Oil Pressure, Average Exhaust Temperature, Cell Temperature, Indication of Power Reduction.

For each **Gas Process Module**, the following signals are configured within the SCADA mimics:

- CH₄, O₂, CO₂, Ambient Pressure, Suction Pressure, Delivery Pressures (Power-Gen, Flare1, Flare2 etc), Flows (Power-Gen, Flare1, Flare2 etc), Total Flow

“At the sites where Salem Automation has installed the system, we have seen an increase in power generation efficiency of 15%” – T C Kundi, WRG Managing Director.

