The Year of Freshwater

Automation Helps Prevent Natural Resource Scarcity

2003 has been declared the International Year of Freshwater by the United Nations Organization to encourage a more sensible handling of limited resources. The consumption of drinking water is constantly increasing in areas of high population density. Greater amounts of water must be transported over longer distances incurring considerable costs for the industry, as well as for the communities. Today, balancing and optimizing water resources can only be achieved by using processes which optimize the water supply systems.

Clear Facts About Water:

- 70 percent of the earth is covered with water,
- of which 2.5 percent is freshwater.
- Of that:
  69 percent is found in glaciers and ice,
  30 percent is groundwater,
  0.3 percent is renewable water in rivers and lakes.

Murky Facts About Water:

- 50 percent of drinking water in developing countries is lost due to leaks, illegal consumption, or pollution.
- 90 percent of wastewater in developing countries is not treated.
- 50 percent of the world's 500 largest rivers are polluted or overloaded by shipping.
- 2 million tons of trash a day are thrown into our waterways.
- 70 percent of African industrial waste is released untreated into the water.

Peter Schmid, the general manager of MSS Elektronik, has engaged in water treatment for the past 20 years. He is a renowned automation specialist in both community and industrial water treatment plants. Located in Eugendorf, Austria, MSS Electronic supplies control technology and automation systems for sewage plants, pumps, sewage sludge treatment and external sludge management.

Mr. Schmid, how can automation technology safeguard our vital water supply?
The reclamation of polluted water has to be accelerated. For this reason, it is necessary that the entire cycle is evaluated both quantitatively and qualitatively so that we can start carrying out the necessary steps. The complexity of these tasks require a technical uniform system consisting of everything from measuring points to operation levels and logging.

Peter Schmid,
General Manager
MSS Elektronik.

Why does it make sense for B&R and MSS Elektronik to work together?
It guarantees that we get the uniformity we require. This collaboration allows industry-specific user software modules to be applied to operating system software and quality high-end hardware platforms so that system-wide diagnostics can be carried out.

How is this cooperation valuable for the customer?
This partnership first and foremost safeguards customer investments. In the fast-moving electronics field that has a growing number of government regulations, system compatibility is assured through the life cycle of the plant. This compatibility can only be achieved through the close and continuous collaboration between the hardware manufacturers and the people who design the applications. This ensures that the plant is continually optimized. Costs are diminished through preventative maintenance, low need for replacement parts, reductions in electrical equipment and higher industrial availability.
In the long run, this cooperation benefits the entire population – quality reclamation of wastewater occurs and the unnecessary pollution of rivers and lakes is avoided. In this way even we can make a contribution to protect our water reserves.

Partnership for Efficient Wastewater Treatment Technology

In the field of community and industrial wastewater treatment a longstanding, proven and close cooperation between B&R and MSS Elektronik in Austria exists. Because of this, well-tested function modules are available to the wastewater treatment industry. This consists of quality automation hardware (B&R System 2003/2005), the accompanying software library for

the various steps of the procedure (e.g. pump station, intake regulation, monitoring systems, processing basins, biology including adaptive ventilation, sludge processing, etc.) and the corresponding documentation and logging. One substantial advantage is that the wastewater system is monitored in an object-oriented fashion and is maintained in this way from the start. This considerably reduces breakdowns resulting in expensive maintenance while noticeably increasing system availability. The automation system itself is subject to permanent and integrated system diagnostics using remote maintenance (modem, ISDN) and modern methods of reporting malfunctions (SMS, email). This substantially takes the work load off the system controller, who can still be reached around the clock and is able to react very quickly. The system controller is provided with additional support in his daily tasks by the system integrated management and operation processes.

The continuous logging of system conditions, energy and electrical equipment usage allows trends and error sources to be analyzed so that the system can be constructively optimized. All operation relevant data which has to be documented for legal purposes is automatically collected, logged, and saved in a long-term historical database. This substantially simplifies the verification processes necessary for the system controllers. Any potential actions necessary for quality assurance (environmental protection) is detected by comparing historical trend data with real-time trend date to determine process-technical "drifting" on the system.

The Sewage Reservoir Management Innovation

One important innovation for wastewater management emerged from the combined approach of drain networks and water treatment plants – sewage reservoir management.

In this context, it means that wastewater (storm-water runoff) is stored in the sewage network during small and medium-sized rainfall. It is then passed on slowly to the water treatment plant. In this way, the amount of wastewater can be regulated according to time and quantity. This allows cost savings both at the water treatment plant itself and for the entire sewage network.

Requirements for sewage reservoir management include an exact hydrodynamic and mathematical model of the network, a few rain gauge stations in the surrounding area, a series of online measuring point and control units in the network, and one high-speed process control computer.

Sewage room reservoir management is affected by the various parameters involved: in addition to static and dynamic parameters which are relatively simple (technically) to determine, there are also non-negligible disturbances. Therefore, data measurements have to be taken in the main collection drains to ideally manage channel reservoirs. This preprocessed data is then passed onto the treatment plant's main computer. This places very high demands on speed and the processing power of the remote and control units in the drainage system and the water treatment plant__a