Case Study

ABB upgrade gives improved control to Cardiff Bay barrage, Wales, UK

Operation of the Cardiff Bay barrage in Wales, a tourist destination in the UK, is now easier following an ABB upgrade of the control system.

Award-winning engineering project

One of the largest engineering projects ever undertaken in the UK; the Cardiff Bay barrage cost around $320 million and impounds two rivers creating a 500 acre freshwater lake.

Five large sluice gates prevent high tides entering and allowing the rivers to flow out of the bay to the estuary.

The barrage has three locks, one 40 meters long and 10.5 meters wide, and two 40 meters long and 8 meters wide, which allow 24-hour access to and from the bay, a great improvement on the previously tide dependent bay. Three bascule bridges carry the road across the locks and are raised to allow boats to enter and leave.

Operating barrage and locks

An ABB control system is responsible for the operation of the barrage and locks. Recently, ABB upgraded the original Satt control system to ABB's 800xA control system, and at the same, integrated it with other existing control equipment.

Benefits

- Integrated control
- Improved operator use
- Simplified expansion and replacements

Operator dashboard

There was also a need to establish a telemetry link, so the operators could send information on tidal conditions to the Environment Agency. Salinity monitoring was also required to provide a better way of capturing river flow data.

Installed on a server in the main control room, the system also has a back up at a remote station. This redundancy allows a switch over of control in the event of a failure of the main server, with a seamless hand over that goes unnoticed by the operators.

Data access

The 800xA gathers data including event histories, alarms and trends and provides a Graphical User Interface that allows the operators to control the sluices, locks and bridges. Data on the level of the bay is very important to the civil engineers managing the many building projects in progress in the area. It also allows easy control of auxiliary circuits such as outside lights.

Changing needs

The addition of the 800xA system to the SattControl system was part of a process to develop the control of the barrage as its operational needs changed.

Roger Thorney, Operational Manager for the Cardiff Bay barrage, says: "We were looking for a company that could not just upgrade the control system but one that would become involved in a process of improvement, with a regular review of our needs. We wanted a company that could make recommendations and give us the options, allowing us to cut our cloth to suit."

ABB now conducts an annual control audit to determine the current needs of the barrage. The latest audit identified the need for a better Human Machine Interface that would allow better monitoring of the barrage and also allow more detailed data to be gathered.