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ABB drives in front line of fens flood defence

ABB drives are helping protect 20,000 homes and prime Cambridgeshire farmland, valued at over £3.6 billion by providing control of the pumps at a new pumping station at Wiggshall St Germans in Cambridgeshire.

The pumping station provides water management for the Middle Level District, an area of the Cambridgeshire Fens reclaimed during the 17th Century. Over the centuries, much of the area has sunk to below sea level due to peat shrinkage and soil erosion. The original pumping station was built in 1934 to pump land drainage and flood flows from the Middle Level into the tidal River Ouse. Aging equipment and a predicted need for a higher capacity meant that a new station was needed.

To provide increased capacity, six pumps were chosen instead of the previous four. Each of the six new pump sets can raise 16.66 m³/sec to a static head of 4.25 m, giving a total capacity of 100 m³/sec. This gives the new station the capacity to deal with extreme events, although no more than three pumps at a time are expected to run under normal conditions.

The Middle Level Commissioners, operators of the station, engaged Atkins to design an electrical system for the new station, including the variable-speed drives (VSDs) to control the six pumps. A priority for the customer was to have low voltage equipment. The electrical system chosen was to have an 11 kV incomer and use a transformer to step down to 690 V.

The drives chosen were six, 1.2 MW ABB industrial drives, fitted as a chassis mount in three Motor Control Centre (MCC) cabinets. The drives are controlled via a SCADA system that is fed data from level meters. This gives accurate control and adjustment of the flow. It is essential to avoid over pumping of water as the drains must be maintained at a minimum level to allow navigation by boats.

Andrew Heron, estimating engineer for MCC builders Technical Control Systems Ltd (TCS), was impressed with the level of support offered by ABB. "We got a lot of help from ABB throughout the project," he says. "We were not just given a kit of parts and left to get on with it. ABB gave us exceptional support, confirming that the ABB product was the right one."

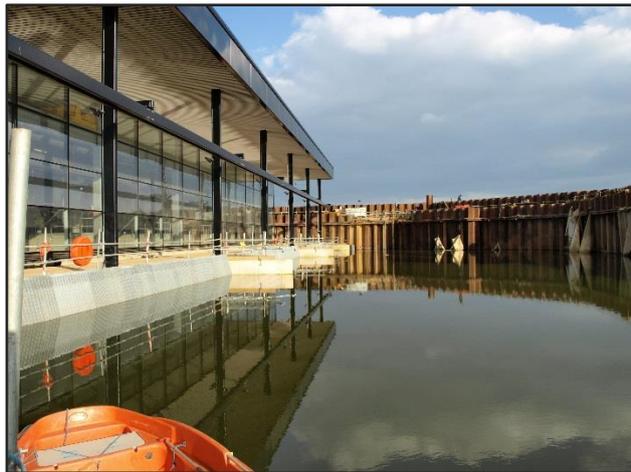
"The modules were very easy to install," Heron adds. "This means they can also be swapped out very quickly for maintenance or to replace a failed drive. Each ABB drive module is interchangeable and parts can also be swapped from one drive to another." If the ABB drives suffer a borderline failure, they can still run at a reduced power of 800 kW, allowing pumping to continue at a lower rate.

Brian Johnson, senior electrical engineer with installers BIRSE Water Ltd says: "Testing, installation and commissioning of the drives went very well. The string tests were conducted at the ABB Helsinki factory with the actual motors and we had use of an ABB technician who helped us resolve a problem very quickly. This gave the customer confidence as they had not used variable speed drives before. We also had ABB commission the drives on site, which worked well for us."

Although the project had budgeted for ten days of string testing, the process went so well that only five days were eventually needed. Says Heron: "Without the good two way process between the project staff and ABB and the unrivalled level of support they gave us, testing might not have gone so well. In the end, there were no surprises in the test results."

Don Lamont, project manager of Atkins, says: “Overall, we have been very happy with the way the project has gone. All the major contractors such as ABB have integrated well with each other to produce a successful outcome. Since commissioning the drives in April, we have had no major issues with them.”

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Caption: ABB drives are helping protect 20,000 homes and prime Cambridgeshire farmland by providing control of the pumps at a new pumping station at Wickenhall St Germans.

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