

CASE STUDY: Lower Hall B - Pumping Station Refurbishment

Project Description

Lower Hall B is a clean water pumping station located in Chingford, Greater London and is near to the William Girling Reservoir. The purpose of the station is to pump water from Coppermills Water Treatment Works into the Sewardstone Reservoir. Currently, the station has three pumps arranged to run in Duty / Assist / Standby operation with the Duty pump operated on a continuous basis for 24 hours, and Duty / Assist during peak demand periods. The pumps are operated from Hampton LWCC, with consultation from Coppermills Control Centre. Previously the pumps installed were fixed speed; therefore no fine control of flow through to Sewardstone reservoir was available.

The main purpose of the project undertaken by Adsyst Automation Ltd was to modify the existing communications infrastructure to enable communication between the Lower Hall B PLC and both the London Water Control Centre (LWCC) and Sewardstone Reservoir PLC via Ethernet over routed serial modem links. The necessary PLC on Lower Hall B shall act as a data concentrator for hand-off of all data from both Lower Hall B and Sewardstone Reservoir sites to the London Water Control Centre.

As part of the refurbishment works at Lower Hall B, new PLC programming and mimics were created to monitor and control the flow of water to the reservoir and also to monitor the reservoir's water levels. These mimics were for the SCADA network and so accessible at the London Water Control Centre and also at Coppermills WTW (although with limited functionality).

Finally, in the process of upgrading the SCADA system, a new Allen Bradley ControlLogix PLC, Allen Bradley CompactLogix PLC and PanelView Local Operator Panel (LOP) were installed for control and monitoring purposes. Communications between sites involved the installation of a new Westermo ED20 PPP Router, Westermo TD36 Dial Up / Leased Line modem, Westermo DDW-100 Ethernet Extender, Allen Bradley RADES modems, Hirschmann Industrial Ethernet switch and Ethernet cables for connecting equipment within the Lower Hall B Pump House MCC ICA section. Further to this, communications equipment within the Sewardstone Reservoir and Coppermills WTW included another set of the Lower Hall B Pump Station equipment. Primary communications between all sites is by copper Ethernet and also PSTN lines.

As the new system included communications with the local MCC for manual override purposes, and the system required 24hr power supply, several UPS units and battery chargers were also installed in order to hopefully prevent power loss and system disruption.

Adsyst's scope included –

- Design assistance to Thames Water for the control system solutions
- Provision of all PLC, SCADA and communications hardware
- Provision of ICA control panel modifications.
- SCADA and PLC software development and factory acceptance tests
- On-site commissioning services and Site Acceptance Testing
- Final Documentation (Operator and Maintenance Manuals)
- On Site Operator Training



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Added Value Engineering and Innovation

Adsyst have contributed in the following areas to add value and innovation to the final solution -

- Involved as design consultants to Thames Water in scoping the technical requirements of the project
- Our open book policy when requested to detail prices for additional or variations of scope
- Flexible commercial strategy – delivering systems, on-time, to budget, and where cost savings were made in one area, off-setting this saving against increases in scope in other areas
- Engagement of Rockwell Automation software with use of the RSView packages for SCADA systems.
- Engagement of Westermo services to ensure that hardware functions correctly and security is configured in the best possible form.
- The new SCADA mimics were created with the same “look and feel” of the existing system to ensure that operators are familiar with the new system from day one. This reduces training time and potential process risks from delays in operator reaction times.

Benefits / Cost Reductions

The new system allows operators and automated processes to constantly monitor the water level of Sewardstone Reservoir and adjust the inlet flow rate accordingly rather than to have “full open” or “full closed” control of valves. The system also allows more advanced communications between Coppermills WTW, LWCC and the Sewardstone Reservoir with the use of serial links, PSTN lines, radio links and Ethernet networking.



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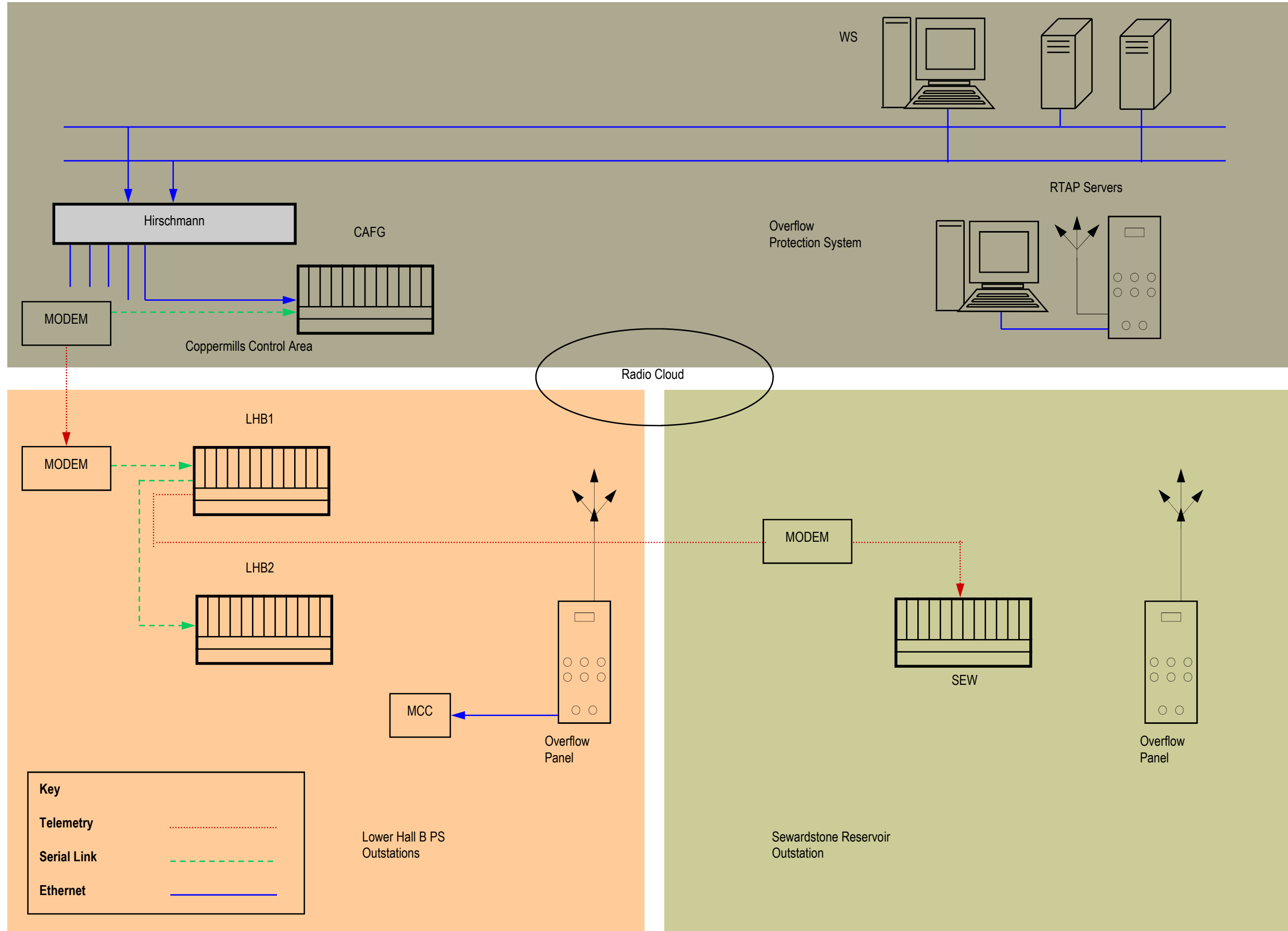


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ADSYST (Automation) Limited. Yateley Lodge, 1 Reading Road, Yateley, Hampshire. GU46 7AA

Tel: (01252) 860600 Fax: (01252) 872015 Website: www.adsyst.co.uk Reg. No: 2269680 VAT No. GB 492 8051 30

Lower Hall B PS And Sewardstone Control Architecture



Lower Hall B PS and Sewardstone Reservoir System Architecture

