



CORUS DAWES LANE COAL HANDLING PLANT

CONTROL UPGRADE

SCOPE

The complete design, specification and supply of a Replacement Control, Blending and Tracking System. Included was the refurbishment of the Control Room and the existing Weighfeeders. The System Change-over had to be carried out in a phase manner to allow continuous plant operation.

EQUIPMENT

1 off Allen Bradley PLC 5/80 with distributed I/O.

Allen Bradley Control-Net Network via Dual Redundant Fibre Optic System.

4 off PC's running Allen Bradley RSView Active Display Server Client.

Refurbishment of the existing 18 Belt Feeder and 4 Belt Weighers.

INTRODUCTION

Corus, formerly British Steel Scunthorpe, have recently undertaken a project to upgrade the control of their Coal Handling Plant and have contracted the Electrical Control, SCADA and MMI systems to HG Systems, Chesterfield.

Built in the late 1970's the Coal Handling Plant handles 6 million tonnes of coal per annum. Coal is received from trains, stored and blended for use by the two coke oven complexes and for direct coal injection of the blast furnaces. The correct blending of the different coal types is critical to the efficiency of the Blast Furnaces. The plant was controlled by a hardwired control system based on relay logic and analogue electronic weighing equipment. The operator interface being a traditional hardwired mimic.

The objectives of the project were namely:-

- * To replace the outdated and difficult to maintain relay and electronic systems with modern PLC based control.
- * To upgrade the weighing equipment to give greater coal blending accuracy.
- * To provide a system which will eliminate errors coal movements and blending.
- * To provide facilities to track coal deliveries, movements within the coal handling plant and exports (i.e. Blended coal to coke ovens and blast furnaces).
- * To overcome maintenance problems with ageing technology.
- * To provide flexibility in the available control strategies using current technology.
- * To refurbish the existing control room producing a 'clean' working environment.



SYSTEM FUNCTIONS

The Control System

The Control System consisted of a single Allen-Bradley PLC 5/80C PLC with associated remote I/O. I/O is distributed between 5 substations and interfaces to the existing MCC motor starters and field devices.

The refurbished control room now houses a new control desk and weighing equipment fitted with new air conditioning and ventilation systems. Also the control room has a new floor and ceiling and has been completely re-decorated.

The new control desk contains a Pentium 300 PC Server running the Rockwell RSVIEW SCADA system and Microsoft SQL Server database. The server communicates with the PLC via ControlNet and also communicates with the rail weighing equipment and British Steel's site wide computer system. The operator interface is via 4 Pentium 266 PC's running the RSVIEW Active Display Server client.

In addition one of the client PC's can be rebooted as a standalone RSVIEW system to allow plant control in the event of the failure of the server PC.

Weighing Systems

The existing 18 belt feeders and 4 belt weighers were retained mechanically with the exception of the replacement of out dated load cells. The electronic system was completely replaced by modern microprocessor based control system supplied by Westerland using Ramsey Microtec controllers. The modifications will give much greater accuracy of weighing and provided simpler calibration facilities than at present. The Ramsey weighing controllers communicate with the PLC via a Remote I/O link providing status information and setpoint adjustment via the SCADA system.

Implementation

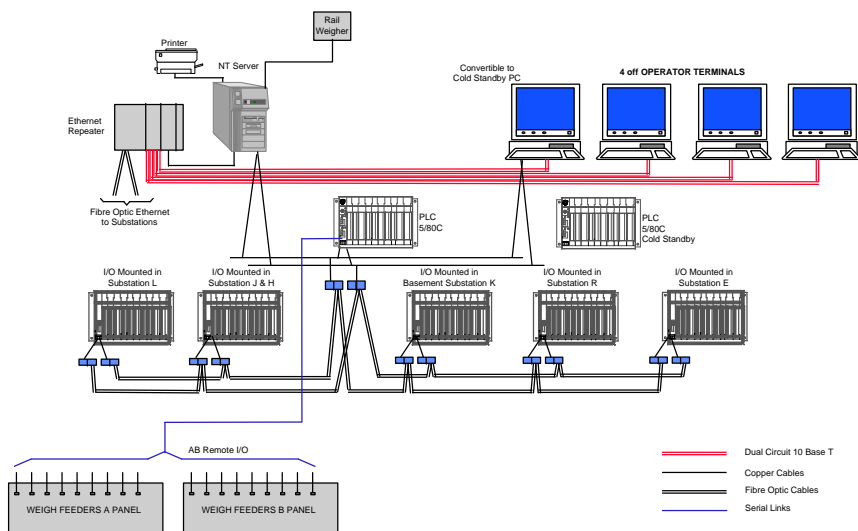
Because of the nature of the operation of the plant the changeover to the new control system had to be done a section at a time while retaining the control from the existing system for parts of the plant not yet under PLC control.

Communications

The chosen PLC utilises the Allen-Bradley ControlNet network, which carries both PLC remote I/O and PLC to SCADA communications via a dual redundant fibre optic system. The dual ControlNet system was chosen because of the long runs of fibre optic cable principally along conveyor routes to give protection against accidental breakage of a single cable. The operation of the dual ControlNet is completely transparent.

The same fibre optic cables also carry Ethernet LAN (Local Area Network) to each substation this will allow maintenance staff connect to the RSVIEW server as an Active Display client and view the status of the plant. This is essential given the widespread nature of the plant.

SYSTEM OVERVIEW



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