



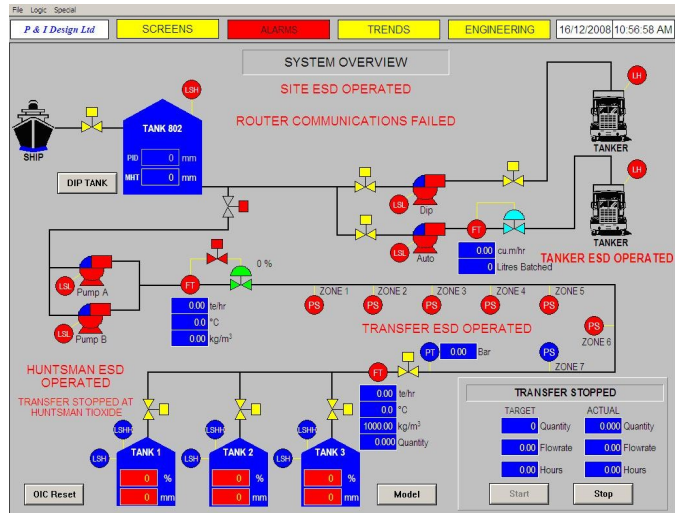
P & I Design Ltd

Process Instrumentation Consultancy & Design

Project Case Study Sulphuric Acid Storage & Transfer

ABSTRACT

This case study details a project where the requirement was to provide an automated solution to the transfer of sulphuric acid from an existing storage tank via a new pipeline to the end users site several miles away. Ensuring the containment of the product within the pipeline was paramount so a pipeline leak detection system was required. In addition to the pipeline transfer system, a backup road loading facility was included to ensure availability of supply to the end user.



AIMS

- To design an automated pipeline batch transfer system for sulphuric acid
- To provide an automated pipeline leak detection system
- To design an automated road tanker loading system for sulphuric acid

METHODOLOGY

The control system adopted was a Programmable Logic Controller (PLC) with Graphical User Interface (SCADA). Each transfer involved a large quantity of sulphuric acid where the flow rate had to be accurately monitored and controlled, this was achieved utilising a coriolis flowmeter. The operator selects the batch quantity to be transferred directly onto the graphical page and initiates the start. The control system, together with other safety protection systems initiates the operation of all necessary valves and pumps and controls the flow to provide the required batch transfer. The operator can see the quantity transferred and the quantity remaining together with the estimated time to completion. In addition the valves and pumps are animated showing their status.

Other non-programmable protection systems were employed to prevent against tank overfill and emergency shutdown.

The pipeline leak detection system employed tubing located along the length of the pipeline, the tubing was pressurised and zoned with several pressure switches monitoring the pressure. If a leak of the pipeline occurred it would melt the tube and the switch would provide an alarm. There was no power supply available along the pipeline so battery/solar powered radio transmitters were employed which interface with the pressure switches and the control system.

The road loading system employed a stand alone batcher and flowmeter with protection systems for road tanker overfill.

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