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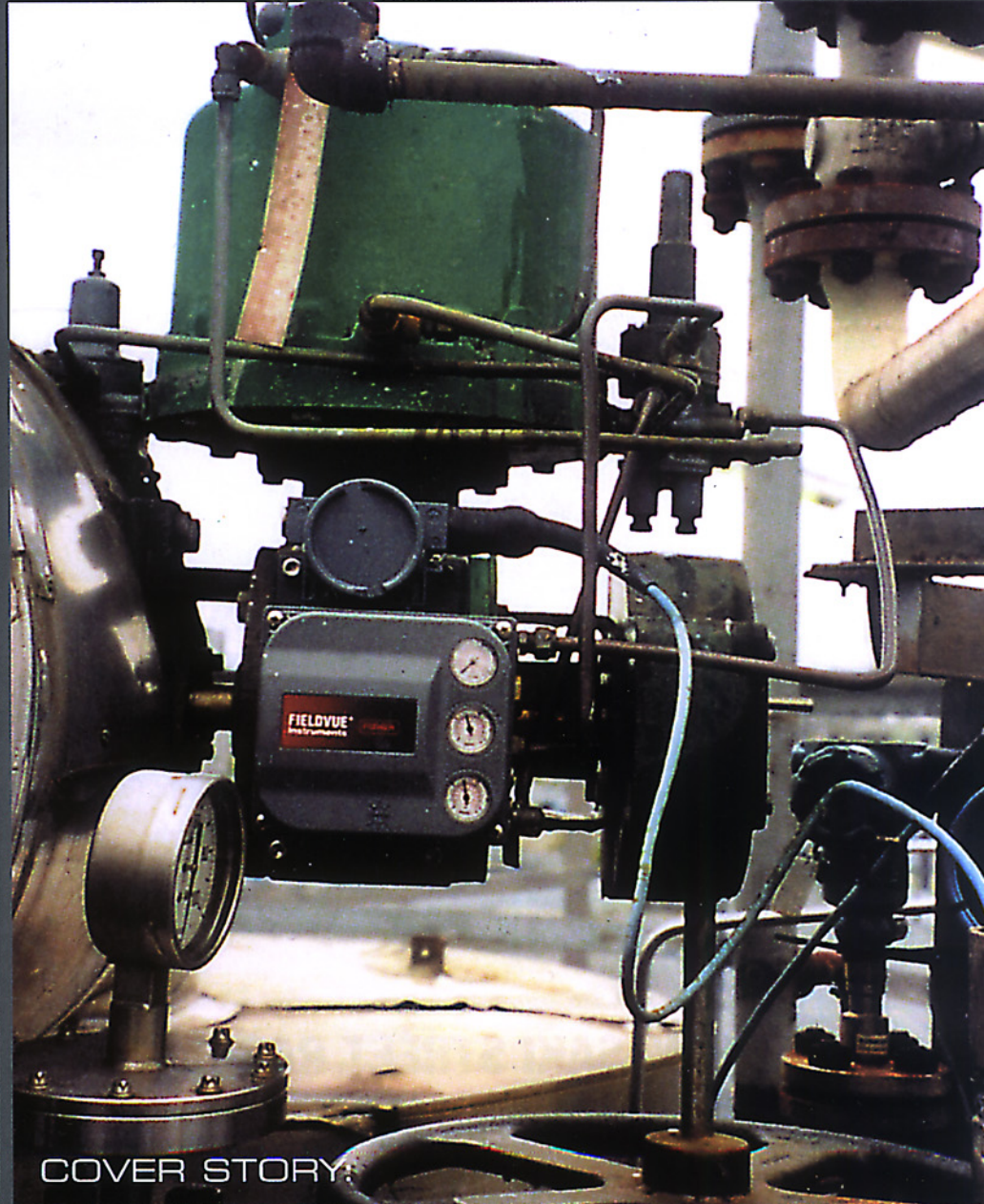
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COVER STORY:

Dow Chemicals achieves smooth control

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Dow Chemicals achieves smooth control

Cost savings and better product quality result from improved plant performance

Dow Chemical has used Fisher® FIELDVUE® digital valve controllers from Emerson Process Management to provide accurate valve control with minimal hysteresis in a polystyrene application, enabling improved process stability and control. By adding a FIELDVUE DVC6000 unit to an existing Fisher control valve, and using the built-in custom valve characteristic, Dow achieved control stability at low flow rates, improving plant versatility.

"Using the Emerson solution we probably saved £5,000 in direct costs this year, but there were further indirect savings in maintenance, from the smoother plant running. More significant has been the value of improved product quality, with no plant downtime or trips affecting production", stated Lucy James, process engineer at the Dow plant in Barry, South Wales.

The Dow plant produces high impact & general grade polystyrene. For best efficiency the plant must be able to run flexibly producing a wide range of products continuously over varying output rates. This need for flexibility places a significant challenge on the process control for the plant.

The process control scheme at the plant uses a pressure control valve to regulate

pressure in the reaction vessels. At flow rates as low as 10% of design maximum, the pneumatic positioners installed in 1987 were not precise enough to maintain smooth operation, and resulted in occasional overpressure trips. Automatic control was difficult over the wide range of operating conditions and instead an operator had to adjust the control valve manually, but even then could only achieve rather variable reactor pressure and product quality.

Faced with this problem Emerson engineers suggested the replacement of the original positioner with a modern FIELDVUE digital valve controller, to use the increased accuracy available from this unit. In addition, by using the 37 point custom trim characteristic within the FIELDVUE unit, the engineers were able to ensure improved control at the lower flow rates, while retaining the original performance at the higher flow rates.

Lucy James commented: "We needed to improve control at low flow rates, and the operators were finding this difficult to achieve manually. Variations in reactor pressure are reflected in variations in output product quality, and had even caused process reactor trips. Replacing the valve with a bypass smaller unit was

considered, but was very expensive, with the Dowtherm jacket heat tracing and the inevitable plant downtime. Changing the characteristic of the control valve by using a programmable positioner like FIELDVUE, so configuring the control valve to behave like a smaller unit when required, has solved the problem."

The improved automated control has resulted in smoother plant running and stable reactor pressures which in turn has allowed: the seals on the reactor equipment to require less maintenance, because pressure is maintained in a tighter control band and overall product quality has improved.

The Fisher FIELDVUE digital valve controller is one of the Emerson family of intelligent field devices that power PlantWeb digital plant architecture to improve plant performance, avoiding trips and improving product quality, as with this application at Dow Chemical.

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