



For **Severe Service** Control Solutions, Turn to Fisher Technology and Innovation

## **MITSUBISHI HEAVY INDUSTRIES RELIES ON FISHER SEVERE SERVICE GROUP'S EXPERIENCE IN SLIDING PRESSURE CONTROL**

Mitsubishi Heavy Industries in Tokyo modified the 600MW, Tohoku EPCO Higashi Niigata plant to take advantage of operating improvements given by sliding pressure control: increased turbine efficiency; reduced thermal cycle effects on the turbine; faster load changes; lower minimum load capabilities; improved overall plant heat rate. (For this project, MHI estimated that the plant heat rate was reduced by at least 0.8%.)

Modifying the plant, which utilizes a Combustion Engineering Combined Circulation® system, required special valve constructions for boiler throttle and boiler throttle bypass control. Critical control factors included high pressures and temperatures, tight shutoff as well as noise abatement capabilities.

The Fisher Engineered Products group met these critical control needs, supplying Design EHD valves, rated at ANSI Class 2500 and equipped with specially designed trim. Within the unit's CE system, these valves are labeled as BT and BTB valves.

The BTB valve is used to admit flow to the final superheater and controls the plant throttle pressure up to approximately 30% load. With an inlet pressure of 3500 psig and a pressure drop of up to 2500 psi, it typically requires noise attenuation. It is used in sequence with the BT valve to bring the unit online.

The BT valve performs the most critical function in the sliding pressure operation. For the BT application, the Fisher Severe Service Group developed a special control valve trim to handle conditions of low flow and high pressure drop. Low flow control is provided by specially sized and spaced holes in the lower portion of the trim's cage. This feature limits noise generation and protects against damaging vibration. An additional benefit is the reduction of turbulence within the valve, which improves its stability and mechanical integrity.

Large open windows in the noise-attenuating portion of the BT trim allow high flow rates at low pressure drops. This is especially important during normal operation when the valve is required to withstand pressures of 3900 psig while taking only a 25 psi pressure drop.

Before a decision was made as to the vendor for these valves, MHI personnel came to the United States to review the Fisher valves' sliding pressure capabilities. They visited three plants with Fisher valves installed in sliding pressure operation and analyzed the operation of each valve.

The results of this visit, combined with the fact that the Fisher solution provided 20 dBA better noise attenuation, were major factors in MHI's decision to utilize Fisher technology. The decision also was based upon the EH design's ease of maintenance and Fisher's startup and after-market service capabilities.

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