

Differential Pressure Flow Meters

The Verabar® handles a wide range of applications in the power industry, including steam, condensate, boiler feedwater, cooling water and combustion air. However, these types of applications are not found solely in power plants. One such example is at Nova Chemicals in Corruna, Ontario.

Application

Measurement was required for feedwater flow through three of Nova's feedwater pumps. The pumps operate at a suction pressure of 60 PSIG and a discharge pressure of 1500 PSIG. The water temperature is 300°F. Nova initially specified vortex meters for this application.

Problem

The vortex meters were to be installed at the discharge side of the pump. With a discharge pressure of 1500 PSI in the 10" line, a 900# ANSI rating would be required for the meter. Given the high cost of such a meter, the decision was made to locate the meter on the suction side of the pump instead.

Installing flowmeters on the inlet of a pump is usually not recommended because the pressure drop through the meter reduces the pressure available to the pump.

In a feedwater application, there is another factor to consider. With an inlet pressure of 60 PSI at 300°F, the **1.8 PSI pressure drop** through the vortex meter would push the pump perilously close to the point where the water could flash into steam, causing the pump to cavitate dangerously.

Fluid:	Boiler Feed Water
Industry:	Chemical/Power
Application:	1500# PSI
Specifications:	Low permanent pressure loss > 2" H ₂ O

Solution

The vortex meter was judged to be unsuitable for the application. After getting positive feedback from a Nova plant in Western Canada with a Verabar in service on a gas line, Nova agreed to consider the Verabar as an alternative for their feedwater applications.

The differential pressure produced by the Verabar in the 10" line was calculated at 18" H₂O. The permanent pressure loss through the Verabar is 3% of the DP or .54" (**.02 PSI**) in this case. It was this number that really got Nova's attention. When they discovered the Verabar could be installed and removed under full line pressure, Nova decided to purchase three V400 flanged hot tap models. Figure A shows one of the units installed.

Results

Even with a hot tap assembly, access valve and mounting hardware, the cost of the Verabar was significantly less than the vortex meter.

The three units purchased have been in service for over three years, and have performed flawlessly to Nova's satisfaction.



Figure A