



APPLICATION NOTE

INDUSTRY: POWER GENERATION

MARKET NICHE: FUEL OIL/POWER GENERATION

PRODUCT: DC-I POSITIVE DISPLACEMENT FLOWMETERS

FLUID: #2 FUEL OIL

SERVICE: CONSUMPTION MEASUREMENT • VISCOSITY: 3 cP @ 80° F

OVERVIEW

Away from coastal areas, #2 fuel oil is commonly used by many power plants as either a secondary fuel and/or as a light-off oil for coal which produces most of the BTUs consumed. Nonetheless, accurate measurement of this fuel oil is important as consumption may run into the hundreds of thousands of gallons per year.

SITUATION

A middle-Atlantic state utility was having trouble maintaining the three old positive displacement flowmeters used to monitor the flow of #2 fuel oil in one of its largest stations. The #2 fuel oil was used extensively as a light-off fuel, especially in the winter. The existing flowmeters were considered too unreliable to use for billing requirements. After meeting with their local Flow Technology representative, the utility elected to install a Flow Technology positive displacement flow measurement system backed by our standard "Flow-Thru" performance guarantee. The utility fully expected the new Flow Technology system would verify their previous estimates of consumption.

SYSTEM DESCRIPTION

The application parameters indicated that a 2", FD20I series industrial flowmeter was the best selection for this system. However, the existing supply line size was 3" and the end connections used were 3", 300# raised face flanges. The solution was to supply a modified 2" flowmeter with the mating 3", 300# raised face flange end connections. The flowmeter signal is sent to an RT80-A-3A-2-C-3 rate/totalizer with an optional 4–20 mA output signal. This analog signal, which is proportional to the flow rate, goes to a remote recorder where total fuel consumption is calculated and stored.



ANALYSIS

Shortly after installation and commissioning, the utility reported that the Flow Technology positive displacement flowmeter was indicating a consumption that was 15% to 20% greater than what had been anticipated based on the old meters and the tank level measurement. A Flow Technology service representative was dispatched to the power plant to test the flowmeter and electronic accessories. After conducting an extensive series of tests, the Flow Technology service representative concluded that the flowmeter was reading accurately and asked when the calibration of the level system and older flowmeter had last been checked. By examining old records, it was discovered that the calibration of the older flowmeters had actually been adjusted to match the results being seen on the level measurement system several years previous. The problem with this approach is that the level measurement system assumed the 1,000,000-gallon-plus storage tank was uniform and did not expand or contract with changing ambient temperature conditions. This was a very large assumption to make and a potential source of error.

In order to resolve this issue, the utility company arranged to have a tap in the fuel oil supply line installed downstream of the Flow Technology flowmeter in order to perform in-line calibration tests. Much to the surprise of the utility, the tests verified the Flow Technology flowmeter was indeed reading correctly and that the total fuel consumption was higher than previously thought. Even though fuel oil accounted for a small percentage of the total BTU production of the unit, the total dollar savings realized from correcting the fuel billing was more than enough to pay for the new Flow Technology system in under a year. Subsequent on-line calibration testing of the Flow Technology flowmeter has verified these initial findings. As a result, this utility installed a second and a third Flow Technology system on other units in this plant. Neither flowmeter on-line at the time of this publication have ever required any servicing by the utility.

TECHNICAL DATA

Flowmeters: DC20I-6115-5630-000 (was FD20I-6115-2630-000)

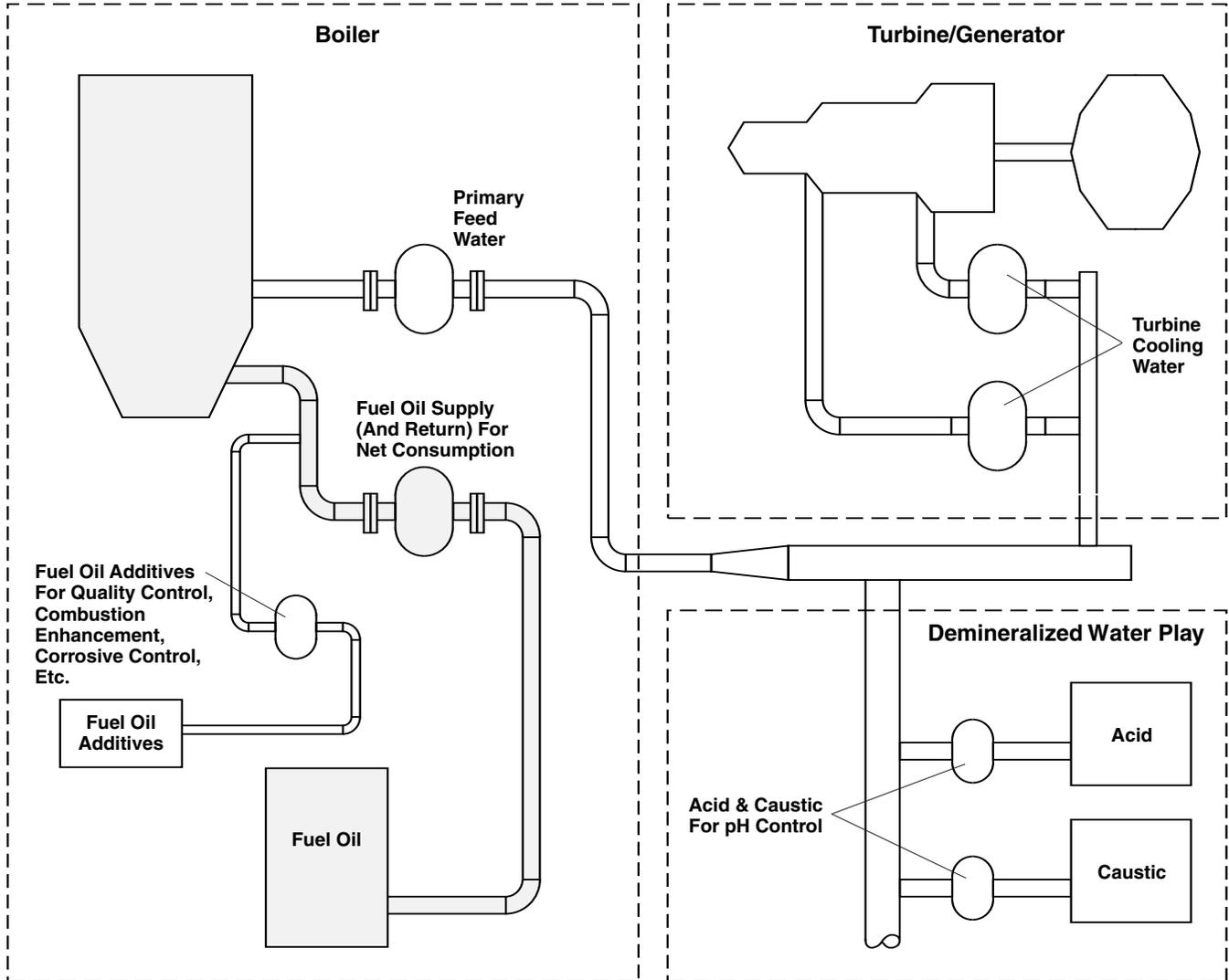
Flow Rate: 20 to 80 gpm

Fluid: #2 Fuel Oil, 3 cP @ 80° F



APPLICATION NOTE

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