



CASE STUDY

INDUSTRY: FOOD & BEVERAGE

CUSTOMER: First District Association

LOCATION: Litchfield, Minnesota, USA

BACKGROUND: First District Association (FDA) is a dairy cooperative that manufactures wholesome dairy products from high-quality milk supplied from their family farms located in Minnesota. The association has a network of over 800 dairy farmers making it one of the nation's largest dairy processing plants and operates 24/7 - 365 days per year. In 2017, First District Association was processing 5 million pounds of milk into 550,000 pounds of cheese and was looking to expand capacity.

SCOPE OF WORK: Armstrong International's local representative, Campbell-Sevey, was asked by First District Association to lend their expertise in upgrading their outdated boiler system. The design that Campbell-Sevey developed included four new 800 BHP energy-efficient Johnson boilers capable of 27,600 lbs/hour steam flow. An integral part of the efficiency calculations is the flow measurement of boiler feedwater, fuel system, and steam output. This provided some unique challenges due to the difficult requirements that include accuracy & repeatability, short straight runs, and serviceability. Based on this criteria, they selected the VERIS Accelabar®, as the flow meters checked all the boxes.

As part of the upgrade to the boilers and steam system, efficiency was an important aspect and facilitated the requirement to provide a fully metered system. Based on this requirement, Campbell-Sevey incorporated a total of 25 Accelabars for the project, 16 of the Accelabars used directly in conjunction with the boilers. One each for the boiler feedwater, one each for the primary gas supply - natural gas, and one each for the backup fuel supply – propane, and finally one each for the steam outlet on four new boilers. The other nine were placed off the steam header providing the ability to determine steam usage for various processes. These measurements are necessary to determine process efficiency as well as determine if any losses are happening in the system.

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SOLUTION: **Armstrong's Solution—VERIS Accelabar®**

Campbell-Sevey and Armstrong International - VERIS Flow Measurement Group supplied the VERIS Accelabar for limited straight run, accuracy, repeatability, serviceability, and safety. The VERIS Accelabar was ideal for this project for many reasons, the primary benefit is the zero straight run requirements for both upstream and downstream piping as well as the improved flow turndown. The zero straight run advantage facilitated the reduction in footprint as well as the serviceability issue. Since zero straight run is required the meters were located at a height between 2 - 6 feet off the ground allowing plant personnel to perform any necessary operations without the need for ladders or scaffolding.

Although this operation is not needed often, any operation is much easier and safer with the installation location. The repeatability of the meter has proven to be an invaluable feature for the system as they are integral to the boiler efficiency calculations. They also provide critical measurements such that plant personnel can change operating parameters using the data that is obtained from the flow meters. Another benefit of the data is the ability to trend boiler operations that can be used for predictive analysis.

BENEFITS: Significant Results/Advantages

- Ability to trend the Efficiency of each boiler
- Consistent measurement of the critical boiler inputs and output
- Tracking steam usage for individual process lines
- Quantitative data significantly simplifies troubleshooting operations
- Ability to track the costing of fuel with utilities



Figure 1. Steam Header Accelabar Meter (Installed on the boiler against an elbow)



Figure 2. Steam Header Accelabar (Installed against a gate valve and elbow. No straight run required.)



Figure 3. Boiler Feedwater Accelabar Meter. (Small piping footprint and easily accessible location.)

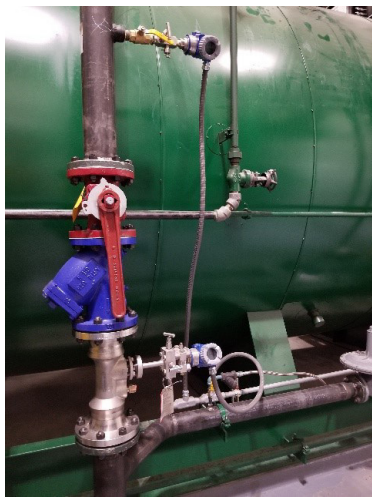


Figure 4. Natural Gas Accelabar (Flow going down and easy location for maintenance and service.)



Figure 5. Propane (Backup Fuel) (Flow going down and easy location for maintenance and service.)

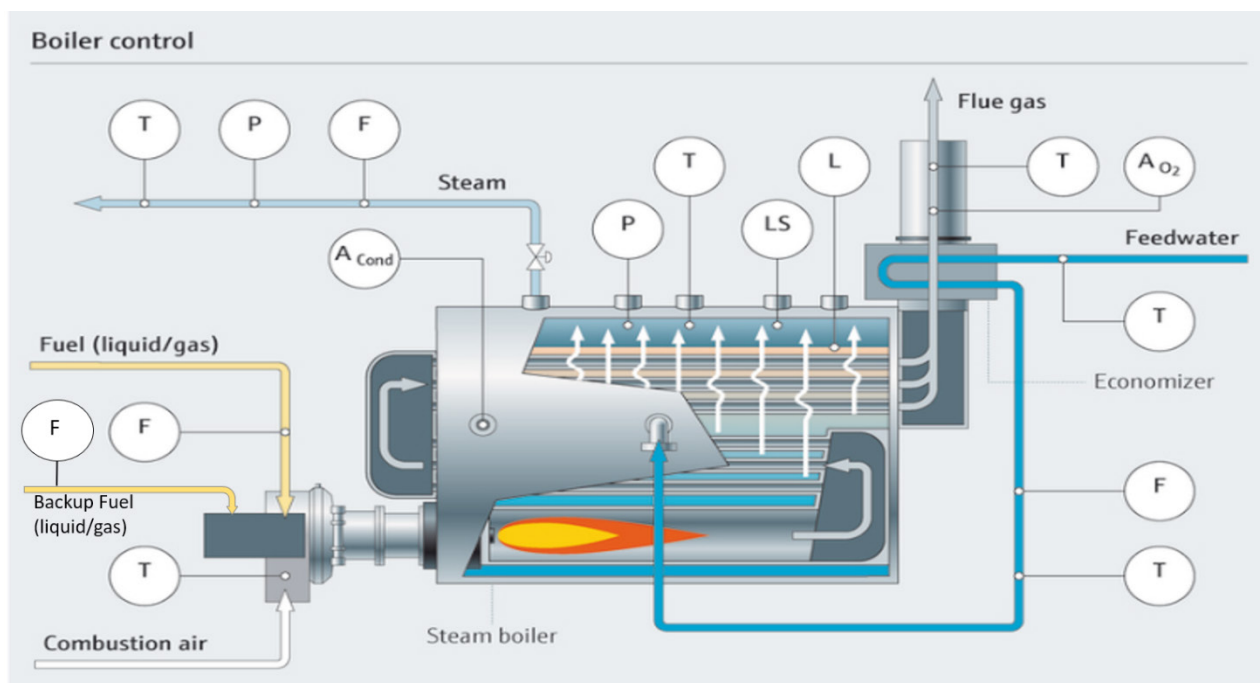


Figure 6. Fully Metered Boiler