CIRCOR Injects Savings with Innovative, Integrated Fuel Oil System Solution



Challenge:

Mitsubishi Power Systems Americas (MPSA), like other major gas-turbine suppliers, had to incur expenses each time it specified, ordered and provided separate equipment for fuel oil pumps, motors and other crucial components for end-user power generation facilities.

Solution:

CIRCOR Americas Engineered Systems responded with an integrated fuel oil system designed and built specifically for the power generation marketplace. By packaging the equipment into one unit, CIRCOR was able to deliver more value to MPSA.

Results:

CIRCOR supplied an integrated system – with fuel fi ltration, injection, pump, piping and motor components – that decreased installation requirements at the utility and provided the kind of built-in savings benefits that come from dealing with a single supply source.

The Need for a Better Fuel Oil Delivery System

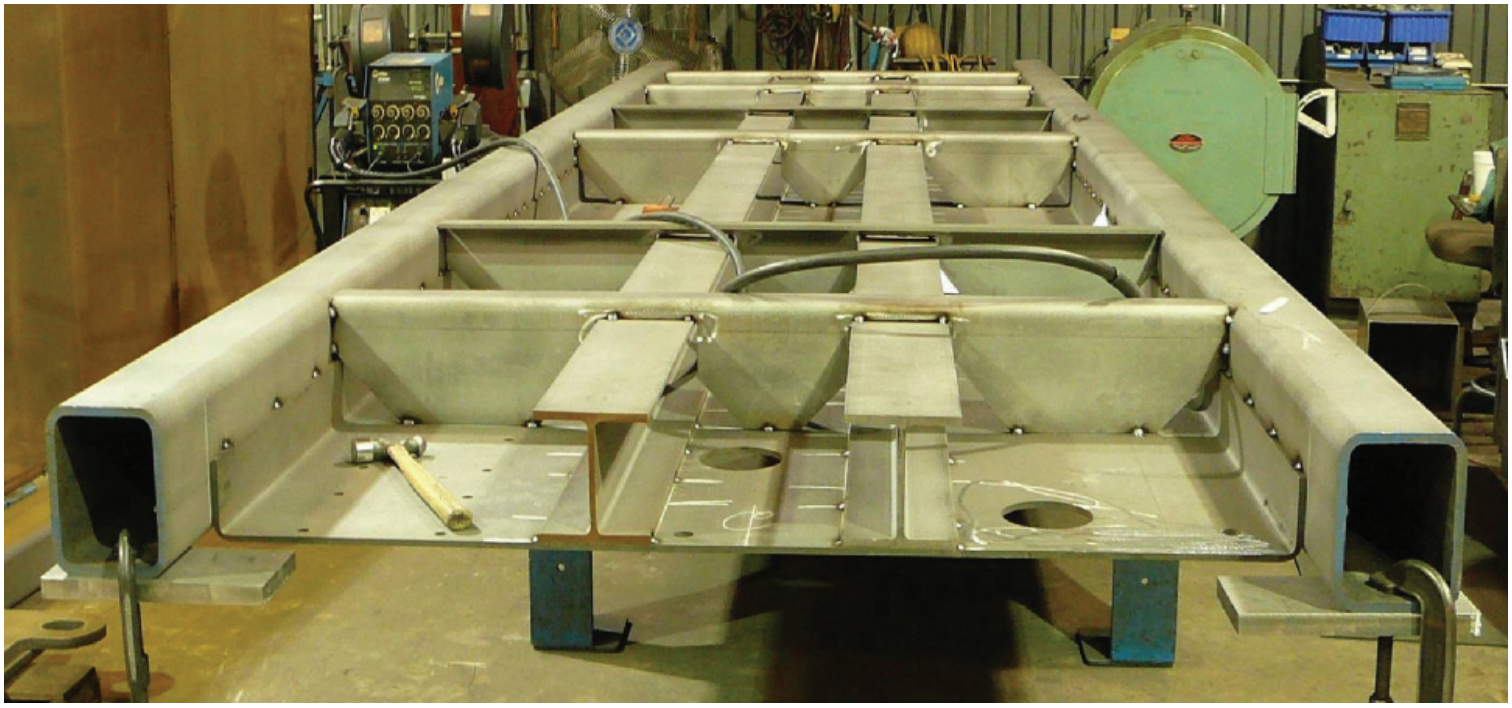
Most large gas turbines are designed to operate with both gas and liquid fuels, including natural gas and No. 2 fuel oil. This need for fuel flexibility can present challenges. For example, the more pieces of equipment Mitsubishi Power Systems Americas (MPSA) has to send to a job site at different times, the greater the logistics challenges, including timing delivery of components.

MPSA – needing to determine the fastest, smartest and lowest-cost way to deliver fuel pumping and filtration equipment to its customers' power generation plants – turned to CIRCOR for help. Company experts tasked with fi nding a solution were impressed with CIRCOR's more than 60 years of experience working with fuel-injection pumps for a variety of applications and markets. They were also familiar with the worldwide reputation of CIRCOR's IMO® three-screw pumps.

Designing and implementing an entire fuel oil system, however, was a new undertaking, and MPSA relied on CIRCOR Americas Engineered Systems to design and create an integrated solution. Throughout the process CIRCOR worked closely with MPSA engineers in the United States and Japan.

"We maintained constant communications with MPSA to keep our client contacts updated on progress and seek feedback on our work," said Jim Healey, design engineer for CIRCOR Americas Engineered Systems. "We wanted to make sure our solution was tailored to their needs and straightforward to install."

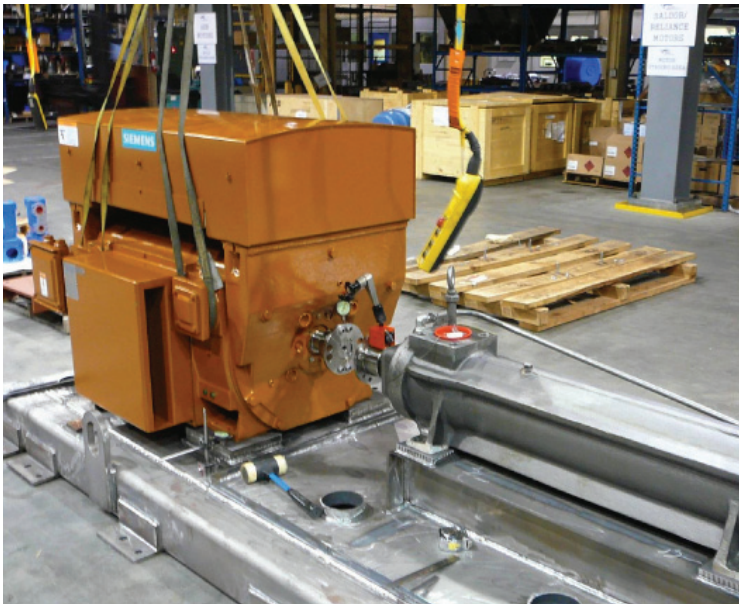
The fuel oil system CIRCOR developed for Mitsubishi Power Systems Americas (MPSA) was installed on this 20-foot base, which occupied less space than the equipment power generation plants typically use.



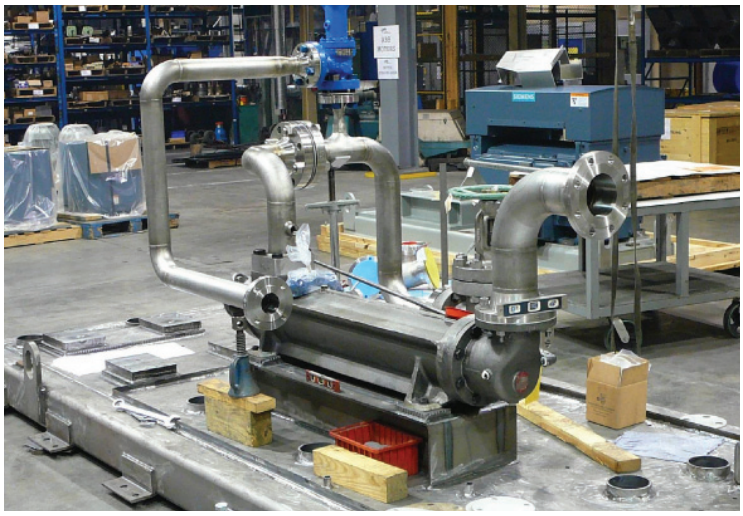
The CIRCOR Americas Engineered Systems Solution

CIRCOR experts engineered a solution to deliver fuel oil to the liquid fuel system under low pressure, typically 25 to 150 pounds per square inch gauge (psig). The fuel oil solution was an integrated unit containing a fuel fi lter, high-pressure screw pump, motor, base plate and piping – all in a single package. Installed onto one 20-foot base plate, the system used less than 15 feet of stainless steel piping to connect HILCO® fi lters, regulating controls, a pressure-relief valve and an Imo AK12DHZ-350G pump. It was capable of delivering more than 350 gallons per minute, at a maximum pressure of 2,300 psig.

A significant benefit of having a positive-pressure fuel source is supercharged pump inlets, which allow operation at faster two-pole motor speeds. This gives the customer the advantage of higher-pressure/-viscosity performance and the ability to apply smaller pumps at higher speeds. The result is a more robust pump at a lower price to the turbine manufacturer, which keeps CIRCOR competitive in this very diffi cult application.



CIRCOR's **Imo AK12DHZ-350G pump is on the right.**



The fuel oil system CIRCOR **developed used less than 15 feet of stainless steel piping – a signifi cant achievement allowing the unit to fi t into a small space.**

CIRCOR provided several value-added benefi ts that substantially improved the MPSA offering, including assigning an engineer-manager to manage the project. "We were able to go directly to him for all technical questions, order updates, quality inspections, etc., which greatly improved our communication and effi ciency," said Tim Shore, project manager for MPSA. "It was much easier for us to have a single contact, unlike our previous system of having to engineer our own solution and work with various suppliers."

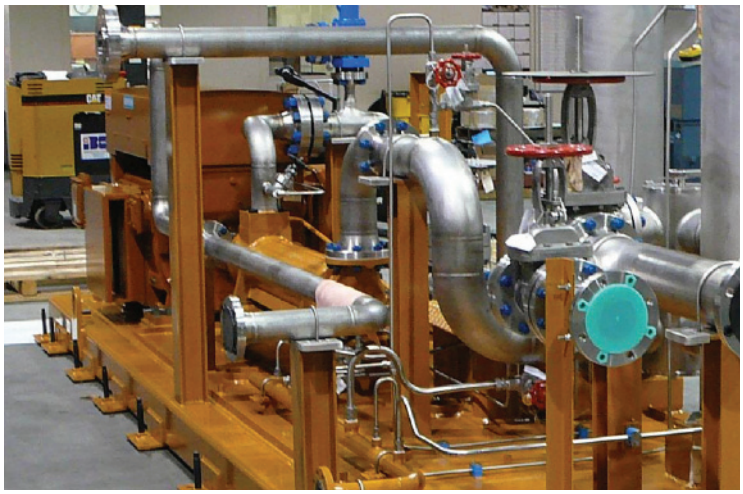
He continued, "Also, CIRCOR had an 'open-door' policy and invited us to visit its facility as often as necessary to check on design, manufacturing and inspection, which gave us peace of mind. CIRCOR engineers were very receptive to us in discussing system design options, which assured that the system would meet MPSA's requirements."

Across-the-Board Savings

The CIRCOR team significantly reduced costs associated with component design, arrangement and installation. Additionally, it cut product footprint by 30 percent. Moreover, cost savings extended beyond the system for procurement, engineering testing and validation, and energy consumption.

"Working with CIRCOR has been a very positive experience," said Shore. "The company's knowledge of fuel oil systems and technical expertise helped us combine multiple system components into a single skid that meets our customers' needs. CIRCOR's fl exibility and responsiveness have proven invaluable."

The initial success of the CIRCOR integrated solution has already led to the adoption of the engineered design in other MPSA projects.



The fuel oil system CIRCOR developed was an integrated unit containing a fuel oil system, pump, motor, base plate and piping – all in a single package.

About CIRCOR International

CIRCOR International is a global leader in critical fluid-handling products and technologies. Through its global operating subsidiaries, CIRCOR manufactures positive displacement industrial pumps and valves used in oil & gas, power generation, commercial marine, defense and general industrial markets. CIRCOR's operating subsidiaries supply products under the well-known brands Allweiler, Fairmount Automation, Houttuin, Imo, LSC, Portland Valve, Tushaco, Warren and Zenith. Additional information about CIRCOR is available at www.circorpt.com.

About CIRCOR Americas Engineered Systems

CIRCOR Americas Engineered Systems collaborates with customers around the world and other CIRCOR divisions to design and deliver custom skids and packaged systems that solve unique and often complex business challenges. Headquartered in Monroe, North Carolina, the group of engineering and hydraulics experts stands ready to produce the drawings, designs, documentation and made-to-order packaged solutions for oil & gas, general industrial and other applications.

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