

# IPPT&T

CANADA'S PROCESS  
NETWORK

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INDUSTRIAL PROCESS PRODUCTS & TECHNOLOGY

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## MAKING SAFETY COOL

**FOCUS ON TEMPERATURE**  
GETTING A BETTER  
SENSE OF THINGS

**FOCUS ON SAFETY**  
SELECTING SMART  
TEMPERATURE  
TRANSMITTERS  
FOR MULTIPLE SAFETY  
APPLICATIONS

**FEATURES**  
Keep It Simple: How to  
Replace Safety Shutdown  
Assemblies in Oil and Gas  
Heating Applications



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## The Editorial Desktop

## Over a century of tradition

The chemical processing industry will once again gather this month in New York City for the 104th annual Chem Show.

Since the show began in 1915, more than 5,000 of the industry's most influential professionals will come together for three days of networking, educational seminars and best practices learning.

**"One of the great values of the Chem Show is the touchpoints. Interfacing and collaborating with a variety of end-users at a single venue... it's powerful."**

Exhibitors, educators, plant managers, engineers and executives will discuss and share ideas on smarter, cleaner and more efficient solutions to optimize production and research operations.

It is far and away the largest event focused on processing technology.

For the more than 270 exhibitors on hand, it promises a rich field of potential clients, with 73 per cent of attendees reporting a direct role in purchasing, among 26 of the top 50 chemical manufacturers in attendance.

Attendees have a wide selection of 30-plus free industry seminar sessions and more than 35 product presentations when the doors open on October 22.

Previous attendees like Hugh Jackson of King Industries says that the Chem Show "gives me the opportunity to meet directly with vendors and interact with their equipment hands-on."

Al Lee of Emerson adds that "one of the great values of the Chem Show is the touchpoints. Interfacing and collaborating with a variety of end-users at a single venue... it's powerful."

Others find solutions to challenges that many of their counterparts are experiencing, like Patrick Bier of Lord Corporation, who says that he attends to the show "to find suppliers with potential solutions to some of our current processing issues – and also to meet with contacts at the suppliers we currently use."

The segments represented from the chemical processing industry are many, from adhesives and sealants to cosmetics to food and beverage, plastics and synthetic resins, textiles, rubber products, pulp and paper and petrochemicals... and on and on....

Looking beyond the products and new processes, safety is always a popular topic.

This year, a number of safety experts will be on hand to answer questions regarding chemical safety, dust explosion and fire protection, and the various regulatory compliance requirements.

As Janet Persechino, technical manager of chemical process safety with Engineering Planning and Management Inc. points out, "attendees at (the) Chem Show are the people responsible for managing the manufacturing processes and the equipment maintenance; therefore, they play a key role in safety and business continuity."

And like many of the demonstrations and seminars, the advice is free.

The Chem Show is the granddaddy of all shows, and its continued success is built on this collaboration and sharing of knowledge – which can only make the chemical processing industry better.

Donald Horne

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# The Simple Approach to Replacing Safety Shutdown Assemblies in Oil and Gas Heating Applications

By Naresh Kumar

One of Canada's largest refineries was facing a decision: replace the aging actuated ball-valve safety shutdown systems on its crude oil furnaces with in-kind technology? Or move away from the industry standard and install solenoid gas shutoff valves at much less complexity and cost?

In today's oilfields, refineries and petrochemical plants, there are thousands of fuel gas heaters that require safety shutdown equipment. Many of these shutdown systems are nearing the end of their effective service lives and must be replaced. In the past, most safety shutdown systems have relied on ball valve, actuator, and switchbox architecture to provide on-off control of the fuel gas to the heater's burner. While this technology is proven and reliable, it is space-intensive and requires tubing and a compressed air source. The complexity and expense of this package has led plant and refinery managers to consider alternatives.

One approach gaining popularity for three-quarter-inch and one-inch pipe sizes is the use of a single fuel gas solenoid shutoff valve to replace the ball-valve/actuator assembly. These robust valves require much less space, are less costly, and eliminate the need for tubing and an air supply.

## Actuated Ball-Valve Assemblies: The Industry Standard

For years, the oil and gas industry has incorporated actuated ball-valve assemblies for fuel safety shutoff applications. These assemblies were installed on fuel trains for line heaters and flare gas applications in upstream production, plus tank heaters, incinerators, and furnaces in refineries and petrochemical plants.

The technology package consists of a ball valve, actuator, pneumatic pilot valve, top-mounted limit switch (switchbox), and linkage kit.

These components must be assembled by a valve integrator, then delivered to the work site. The actuated ball-valve assembly also requires the

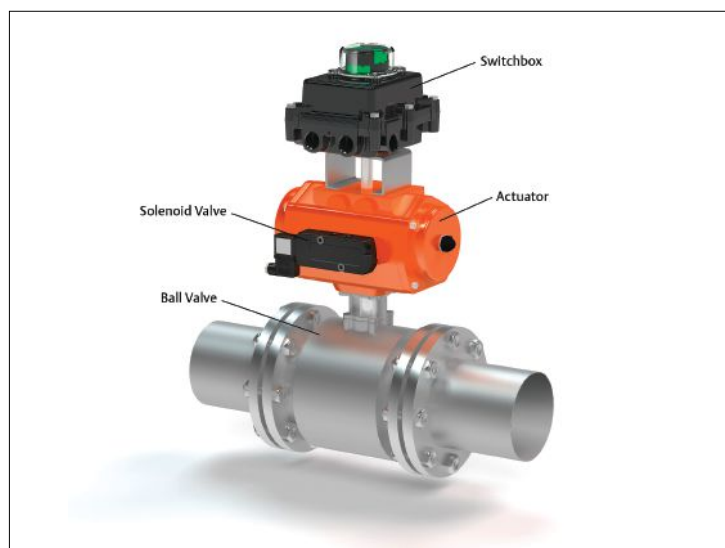
installation of an electric line, tubing and an air supply for pneumatic actuation. Air preparation equipment is needed to filter and regulate the compressed air.

This technology has served the oil and gas industry well for fuel safety shutoff applications. Its components are readily available, proven, and reliable. The ball-valve assembly can fit a variety of pipe sizes. Plus, maintenance technicians are familiar with their functionality and operation.

However, ball-valve safety shutoff technology also has some drawbacks. A collection of multiple devices that must work together, the assembly's complexity requires considerable labour and cost to install, configure, and commission. Maintenance costs are high, since its required CSA certification means a broken assembly must be replaced or sent out to a CSA-authorized repair shop. In addition, the assembly occupies a much larger footprint in the fuel train. Perhaps most important, the ball-valve safety shutdown technology and its installation are up to two-and-a-half times more expensive than an alternative: the fuel gas solenoid shutoff valve.

## A New Option for Fuel Gas Safety Shutoff Systems

Oil and gas facilities are embracing a new approach to fuel gas safety shutdown applications that promise benefits in simplicity and cost. In applications using three-quarter-inch and one-inch pipe sizes, a single solenoid gas shutoff valve replaces the more complex and expensive actuated ball-valve assembly — yet offers the same



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## Solenoid gas shutoff valves are easily installed with minor pipe fitting modifications. Company maintenance technicians can replace the devices in the field, saving time and expense.

functionality. These compact valves meet the automatic gas valve CSA 6.5 C/I safety standard and well as the Class 1 Division 1 certification for hazardous locations. Their wide ambient temperature range, -40° F to 125° F (-40° C to 52° C), enables reliable operation in a variety of conditions. Proof-of-closure functionality can be added by installing a switchbox on the bottom of the valve. Or, models with proof-of-closure are available.

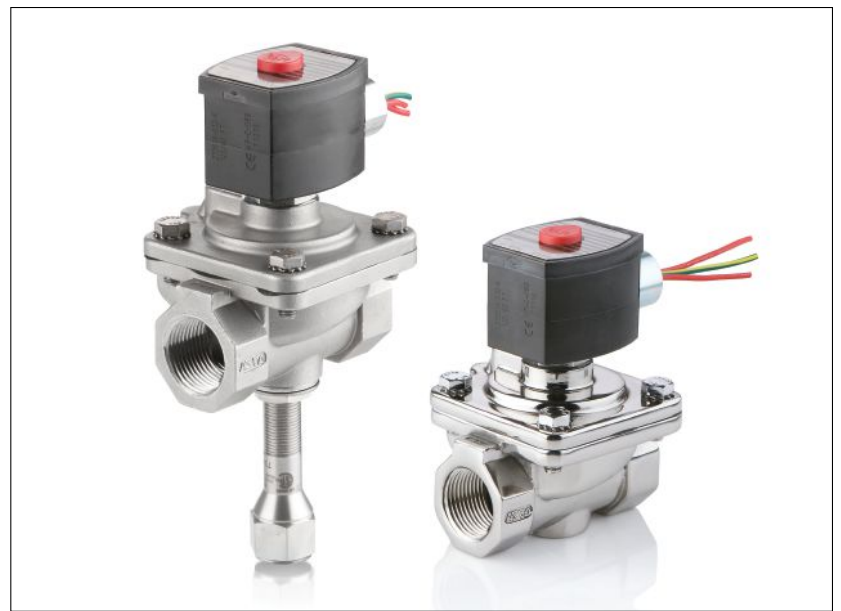
Solenoid gas shutoff valves are easily installed with minor pipe fitting modifications. Company maintenance technicians can replace the devices in the field, saving time and expense. Many of these devices offer peak-and-hold designs that can reduce energy consumption to 0.85 W. They are ideal for remote locations with limited energy supplies or for facilities desiring reduced power consumption.

### Lessons Learned in a Refinery Installation Application

The Canadian refinery cited above was replacing the aging actuated ball-valve safety shutdown systems on the burners of its crude furnaces. The ball-valve assemblies required too much space, and the long tubing runs from the plant's air supply to the actuators were problematic. As a result, project planners began looking for alternatives. The refinery's engineering contractor recommended replacing the ball valves with ASCO Series HV298 and ASCO Series HV434 solenoid gas shutoff valves on two fuel trains with three-quarter-inch and one-inch pipe sizes.

The project went smoothly and confirmed the technology's value.

- Product lead times were reduced since third-party valve integration was not required;
- Engineering time to specify the ball-valve assembly's components was no longer needed;



**HV298 and HV434.**

- Installing a single solenoid valve required less than half the time of the actuated ball-valve assembly;
- Eliminating the compressed air requirement dramatically reduced installation time and cost; and
- Maintenance was simplified with little technician training required.

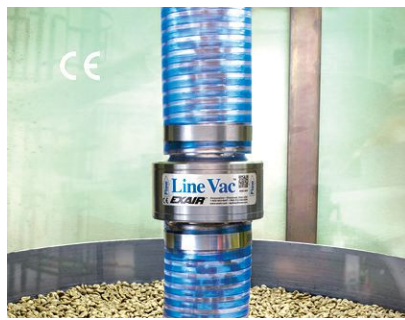
Since project completion, the refinery has not reported any operating problems with the solenoid gas shutoff valves. Overall, installing the new safety shutdown technology on three fuel trains saved the refinery \$120,000 versus a comparable actuated ball-valve package.

### About the Author:

Naresh Kumar is product marketing manager for fluid control and pneumatics at Emerson ([www.emerson.com/en-us/automation/solenoids-pneumatics](http://www.emerson.com/en-us/automation/solenoids-pneumatics)). Contact Naresh at [Nareshkumar.Kannathan@Emerson.com](mailto:Nareshkumar.Kannathan@Emerson.com).

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### Upgrades for industrial control system

Opto 22 has announced the release of firmware update 1.4.1 for the groov EPIC Edge Programmable Industrial Controller, expanding the capabilities of this next-generation industrial control system. Engineers and developers will find helpful new networking options and tools, plus new software choices for their automation and industrial internet of things (IIoT) applications. For secure remote access to the groov EPIC, the system now offers VPN client technology to connect to an OpenVPN-based VPN server. This option allows users to create secure data communication architectures.



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