

Reliable Emergency Shutdown Adds Safety to Shale Oil and Gas Production

There are an estimated 240 billion barrels of technically recoverable tight oil resources and 200 trillion cubic meters of shale gas worldwide.

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The proliferation of gas and liquids extraction from shale formations in recent years has led to rapid development of the infrastructure to include processing and transport the hydrocarbons. Often the well pads and processing facilities are located in remote areas where there is a lack of dependable external power sources – clean line gas, air, hydraulic power units or electricity – hampering emergency shutdown (ESD) procedures to shut in the wellhead or flow valves.

Complex federal, state, local and industry regulations are not always clearly defined. Increased shale production in jurisdictions unfamiliar with managing oil and gas resources have added new regulations to help address growing concerns for safety, emissions and contamination.

These conditions can influence the necessary emergency shutdown equipment used in oil shale applications.

What if...

- You could have a single source for a 6A wellhead gate valve with an integrated Emergency Shutdown System (ESD)
- You did not have to rely on an external power supply to activate your ESD system
- You could shut down the wellhead or flow lines remotely if pressures got either too high or too low
- You could shut down your flow immediately in case of a fire or high temperature

At every stage of the process- from wellhead to final distribution – valves and their automation play key roles in providing emergency shutdown for flow equipment, assuring safety for operating and civilian personnel, protecting assets, and preventing or mitigating any possible environmental events. Choosing the best and most suitable ESD solution for your shale application is often a challenge.

MY WELLS, FLOW LINES AND FACILITIES ARE LOCATED IN REMOTE AREA

There is a significant challenge for any operator providing emergency shutdown of production and process valves when they are located in remote areas where there is no reasonable way to supervise their performance and no reliable power source. Even if these power supplies are available, they have to be operating continuously over an extended period of time.

I HAVE TO CERTIFY MY 6A VALVES AND ESD SYSTEMS SEPARATELY

API 6A reverse-acting gate valves are available from numerous suppliers. They uniformly bear the monogram, most recently from 20th edition of the 6A standard. Similarly emergency shutdown systems have to be certified separately as conforming to 6A mandates for pressure handling capabilities of the bottom flange of the actuator acting as the valve bonnet. Where does the responsibility for quality and service come from when there are multiple manufacturers and integrators involved?

I NEED RELIABLE LINE SHUT DOWN FOR ANY REASON

There are various reasons that a wellhead valve, flow valve or process valves need to be shut down immediately and reliably. To minimize the risk of a major incident, line pressure and temperature are closely monitored. Adverse changes to pipeline norms require an ESD system that is reliable and operates without question. The ESD system needs to be reliable and operate without question.

SHALE ESD VALVE AUTOMATION

SHUTDOWN IS AUTOMATIC

The Emerson PressureGuard Wellhead Protection (PWP) self-contained ESD is set initially by a manual hydraulic pump attached to the 6A valve at the wellhead. If the valve shuts in for any reason, after the event is investigated the PWP system, unlike other ESD devices, can be immediately restored to operation by resetting the pressure with the hand pump. This can reduce operating cost enormously when the device is determined to have been triggered erroneously. With some other shutdown devices, the event has to be positively identified and fully repaired before the line is returned to its minimum operating pressure and production can be reactivated.



At a shale play in western Utah, the operator is drilling for shale liquids from a location so remote that it took technicians a full day to get to the site for troubleshooting. Power to the wellhead was limited and extremely costly to provide. The solution will provide a cost-effective, reliable means of emergency shutdown in the event of a power loss.

THE PRESSUREGUARD WELLHEAD PROTECTION UNIT IS LICENSED UNDER A SINGLE API 6A MONOGRAM

The entire PressureGuard Wellhead Protection unit is licensed by API as a single 6A monogrammed product under its 20th edition stamp*. There is no need to worry about actuators that themselves carry the 6A standard being matched to a 6A valve bonnet by a separate manufacturer or integrator. Emerson offers the complete wellhead ESD solution.

CLOSURE CAN BE FOR HIGH OR LOW PRESSURE ABNORMALITIES

The 6A PressureGuard Wellhead Protection or 6D PressureGuard flow line are activated by a high/low pressure pilot that is installed on the pipeline. The pressure pilots are available to initiate the valve shutdown when line pressure rises above or falls below a preset high/low threshold. These will indicate leaks, blockage or ruptured pipe conditions. Pressure pilots are also available for either high or low pressure abnormalities.

A separate LineGuard device is also available. It monitors pressure drop in the line. If pressure drops or elevates outside of a pre-configured set-point for a specific time, the device will activate the valve shutdown.

*API 6A assembly by OMNI Valve Company

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