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Hydraulic Double acting actuated valves

Leila Hassanzadeh

Oil & Gas Process Engineer

On/off valves should move to their safety position in case of any failure. Regarding on/off valves with hydraulic double acting actuator, in case of the hydraulic supply fail, the actuator remain in position because the Hydraulic Valve not switching (piloted by air supply). However in case of "power" or "instrument air" failure, actuator moves to close for "fail to closed". Is there any solution about hydraulic failure?

It should be noted that a pressure switch is located on hydraulic line and initiate a shutdown in case of low low pressure, but it is a command.

regards,

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Azhar

Azhar Ali

Process Professional at Aker Engineering Malaysia

Instrument group will specify to put a hydraulic accumulator (pressurized gas/oil pressure vessel) for it to either fail open or fail close, as required.

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Leila

Leila Hassanzadeh

Oil & Gas Process Engineer

Ali, There is a hydraulic accumulator in hydraulic supply line. As I mentioned above, air is available in case of any hydraulic failure so valve can't switch.

regards,

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Saeid Rahimi Mofrad

Senior Specialty Process Engineer at Fluor

The double acting actuator is the actuator that uses a piston as its element to operate the valve and both sides of the piston is pressurized with hydraulic oil and air alternately to operate the valve.

In a "failed to close" valve, the hydraulic oil acts as a closing force against the instrument air which keeps the valve in open position (I assume on/off valve is open during normal operation). With this arrangement if instrument air fails, the valve will close but if hydraulic oil fails the valve will remain open but unresponsive to any ESD action.

but as you have also mentioned failure of hydraulic oil system itself cause ESD which is supposed to bring the system to the safe state.

so the question is that why you think about additional provision?

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Leila

Leila Hassanzadeh
Oil & Gas Process Engineer

Thanks all for useful reply.
But about additional provision, It should be noted that fail safe means that valve with out any command moves to its safety position in case of any failure (power, air. hydraulic). As you mentioned above, ESD is a command.
I want to know about any additional provision if any and I don't know.

regards,

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Saeid Rahimi Mofrad
Senior Specialty Process Engineer at Fluor

From safety view point, failure position is of no significance. Even if a failed to close valve does not close on instrument air failure, relief system should be adequate. As you know the relief system is designed for both fully open and close positions of valves irrespective of their fail safe position.

For a double acting valve there is no way to force close the valve unless air flow is cut. so you can put an hydraulic operated on/off valve on instrument air supply which will be closed when hydraulic oil fails.

From ESD view point also, I am sure you have adequate measures in place to protect the system in this situation.

if you are concerned about the position of valve when actuating system fails, you can use single acting actuated valve where spring closes the valve on the similar failure case.

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Leila

Leila Hassanzadeh
Oil & Gas Process Engineer

Thank you for your useful reply.

Regards,

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