HIPPS

Leila Hassanzadeh
Oil & Gas Process Engineer

Regarding HIPPS(high integrated pressure protection system, Usually two ESD valves are installed closed to each other as double block and bleed valve, but in offshore platforms due to space limitation, is it possible to install two shutdown valves in two different deck.

regards,

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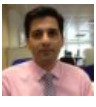

Saeid R. Mofrad
Principal Process Engineer at Petrofac (P.E.)
Top Contributor

Two SDVs are usually provided to meet the required SIL level which should be high in your case as you are talking about HIPPS system.

I have almost a similar system where high-high liquid level on propane storage tanks closes two HIPPS valve on inlet line. The same signal trips the propane export pump which is 130 KM away.

Valves are very close but the signal is transmitted a long distance to shut the pump down. I am not sure if pump tripping was considered as the Safe State / Success Criteria in the SIL study or not because the system has been designed to operate under shut off condition. If pump tripping is just done for housekeeping reason, most probably its location and reliability of transmission system was not critically reviewed in SIL. In this aspect, my case is a bit different from yours.

However, I guess as long as both ESDVs are fed from the same ESD system, it should be OK.

November 16, 2012

Fahad

Fahad Al-Sadoon
Process Engineer at Petrofac

Saeid you might also need to consider that pump trip is done to mitigate surge pressure that might happen due to valve closure. I find this is the most plausible explanation

November 19, 2012

Saeid R. Mofrad
Principal Process Engineer at Petrofac (P.E.)
Top Contributor

Fahad,
You are perfectly right. That would be the reason not just housekeeping.

Leila,
With this input from Fahad, I am sure that pump tripping was considered as the Safe State. Now, it is quite similar to your case. Therefore, I don't see any problem of putting the second SDV in different deck as long as ESD system is the same.

November 20, 2012

S M

S M Kumar
Process Design Consultant
Top Contributor

Leila: The query has an erroneous statement - "close to each other as double block and bleed valve". 2 independent valves in series - not necessarily as double block and bleed. They can be spaced apart and there i no bleed in between. The purpose is if one fails to close the other is likely to close.

November 20, 2012

Saeid R. Mofrad likes this

S M

S M Kumar
Process Design Consultant
Top Contributor

Adding more: DBB is for isolation while HIPPS for overpressure protection in lieu of a PSV. Usually 2 valves next to each other and may give an erroneous DBB feel. 2 can be located farther apart as long as they are in series. See analogy from electrical circuit later.

The first need not be single valve. Can be a group of valves upstream of the second valve. Example: Wing valves of flowlines; second valve is either Prodn Sep inlet SDV or riser SDV as the casew may be.

Analogy from electrical circuit is ELCB. If you muck it up, the section ELCB may trip or if it fails, master ELCB may trip. Both act independently with independent inputs. In case of HIPPS both valves have independent inputs and both are made to trip.

November 20, 2012

Leila

Leila Hassanzadeh
Chemical Engineer at SADRA (Iran Marine Industrial Company)

Thanks for all efficient replies.

Mr.Kumar, regarding DBB , in my project pressure is high (>100 bar), so DBB valves is used for any isolation. as two shutdown valves are located on riser and isolate pipeline from platform, a drain valve has been considered between two shutdown valves.

Regarding location of valves, I agree with you but unfortunately , I have to prove this issue with famous design practices , standard or any reference for our client.

regarding,

November 21, 2012

Vinay

Vinay Singhal
Process Engineering Manager at McDermott International Inc.

SM Kumar has nicely explained the issue, but perhaps the intent did not become clear completely. The high SIL rating may call for 2 SDVs in series. This is to ensure that the probability of failure of BOTH Valves at the same TIME is low enough to meet SIL requirment. As SMK said, this requirement has nothing to do with DBB. In your particular case, it is by chance that your project isolation philosophy requires a DBB at a place where you need 2 SDVs in series to meet SIL. The main point is Where you take the PRESSURE SPEC BREAK. The pressure spec break from high pressure to low pressure will be downstream of the second SDV; and the entire system upstream will be rated for HIGHER PRESSURE, against which HIPPS is required. Again note that SIL and HIPPS requires ONLY ONE SDV to close. 2 SDVs are provided to reduce probability.

November 23, 2012

S M

S M Kumar
Process Design Consultant
Top Contributor

Thanks Vinay.

November 23, 2012