



## Chemwork

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### Gas blow-by from high pressure vessel to closed drain sump vessel

**Jaganathan B**

Asst. Manager (Process) at Larsen & Toubro Limited

Dear all, High pressure vessel op. at 60 barg. At the liquid outlet LCV is provided to control the d/s flow rate (with out RO) and the outlet line is derated to 150# immediate to LCV. This line is connected to closed drain sump vessel which is floating with LP flare. My query is 1.How to find gas blow-by case from high pressure vessel to closed drain vessel using flarenet 2. Is it logical to restrict the gas flow (1 mmscf) across 2" line connected to CDSV (designed for 8 mmscf). 3. CDSV is floating with LP flare line (20") which is open to ATM. Do we really require to provide RO d/s to restrict the pressure to safeguard the derated line? please share your views. Thanks, Jagan.

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Mojtaba

**Mojtaba Habibi**

Process Engineer at Wood Group

Dear Mr.Kumar,

You mentioned that:

"Process engineers routinely make a mistake of taking a pressure break (HP/LP interface) immediately downstream of the globe valve in a typical 2" vent system - that has a ball valve upstream. That is ball and globe valve in series.

Whenever the source pressure is over 30 bar, fully opening the 2" globe valve with a CV of about 30++ will result in an instantaneous rate of about 100 MMSCFD that will reach choked flow in the 2" - 150# tail pipe d/s of the globe valve. In order to limit the velocity to sonic at this flow rate, the d/s 150# piping pressure will be higher than the design pressure of 150# piping, say 17 bar."

By this 2" line you mean the one which is usually installed as PSV bypass line? If so, is this reasonable to depressurise a vessel with operating pressure of 30 barg or more with this manual globe valve? Is this a real case during plant operation that operators use this manual globe valve for vessel blowdown? As you know usually pressure vessel with such high operating pressure meets requirements of emergency BDV installation criteria.

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S M

**S M Kumar**

Process Design Consultant

Yes - 2" vent across PSV or anywhere. Not used for blowdown. Usually used for venting vessel before entry after isolating the vessel. What is it is opened in service - Hazop/ High Pressure/ High Flow/ Low Temp query

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Mojtaba

**Mojtaba Habibi**

Process Engineer at Wood Group

Why not using the EBDV for maintenance venting?

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**Wilfredo Garcia**  
Process Specialist at Ecopetrol

Wilfredo

Mojtaba,

As far as I know EBDV are used for "EMERGENCY" depressurisation only while the 2" venting Mr Kumar is talking about is for maintenance venting, opened only after the vessel is depressurised.

Cheers,

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**Balakrushna Sahu, IPMA-D**  
Assistant Manager, Process at Larsen & Toubro Limited  
Top Contributor

Balakrushna Dear Jagan,

Please find this discussion which is related to your query.

RO will not be required as long as the downstream system is able to handle the full flow in case of gas blowby and the back pressure at LCV discharge does not exceed the design pressure of derated piping. The back pressure needs to be checked for full gas blowby and 2 phase blowby. Also check for hydrate formation which may block the downstream pipe resulting in increasing the back pressure beyond design pressure.

[http://www.linkedin.com/groups/Whether-Gas-Blowby-PSV-required-3822450.S.5879499042035105796?qid=d6ac0460-1199-417c-8ee7-e15f7d80a8c3&trk=groups\\_search\\_item\\_list-0-b-ttl](http://www.linkedin.com/groups/Whether-Gas-Blowby-PSV-required-3822450.S.5879499042035105796?qid=d6ac0460-1199-417c-8ee7-e15f7d80a8c3&trk=groups_search_item_list-0-b-ttl)

Regards,  
Balakrushna

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