Valve selection criteria to minimize downtime and increase productivity

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REFCOMM GALVESTON
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SchuF - Fetterolf - LaTecnovalvo

SchuF Group

SchuF Germany
Est. 1911

SchuF UK
Established 1972
Production 2011

Fetterolf Corp.
Est. 1968

SchuF Ireland
Est. 1991

SchuF India
Est. 2000

LaTecnoValvo
Est. 1956

Sales offices and representations in over 65 countries world wide

SchuF USA
Est. 1982

SchuF China
Est. 1999

SchuF Benelux
Est. 2005

SchuF South East Asia
Est. 2010

SchuF Middle East
Est. 2015

Valve section criteria for handling heavy feeds at high temperatures and pressures

- Dead space free design to eliminate coking and clogging
- Integrating supplementary start-up and shut-down connections into the equipment
- Design and layout flexibility to allow for compact designs with optimized piping arrangements
- Planning for redundancy by using 1-in-1 and 2-in-1 control valves
- Eliminating the need for continuous flushing
- Improving erosion resistance by use of inner protection
- Keeping the process safe with quick closing isolation and emergency depressurising valves

The dead space issue

This arrangement can lead to…

- *Coking*
- *Clogging*
- *Solidification*
- *Crystalisation*
- *Flow restrictions and, ultimately, blockages*

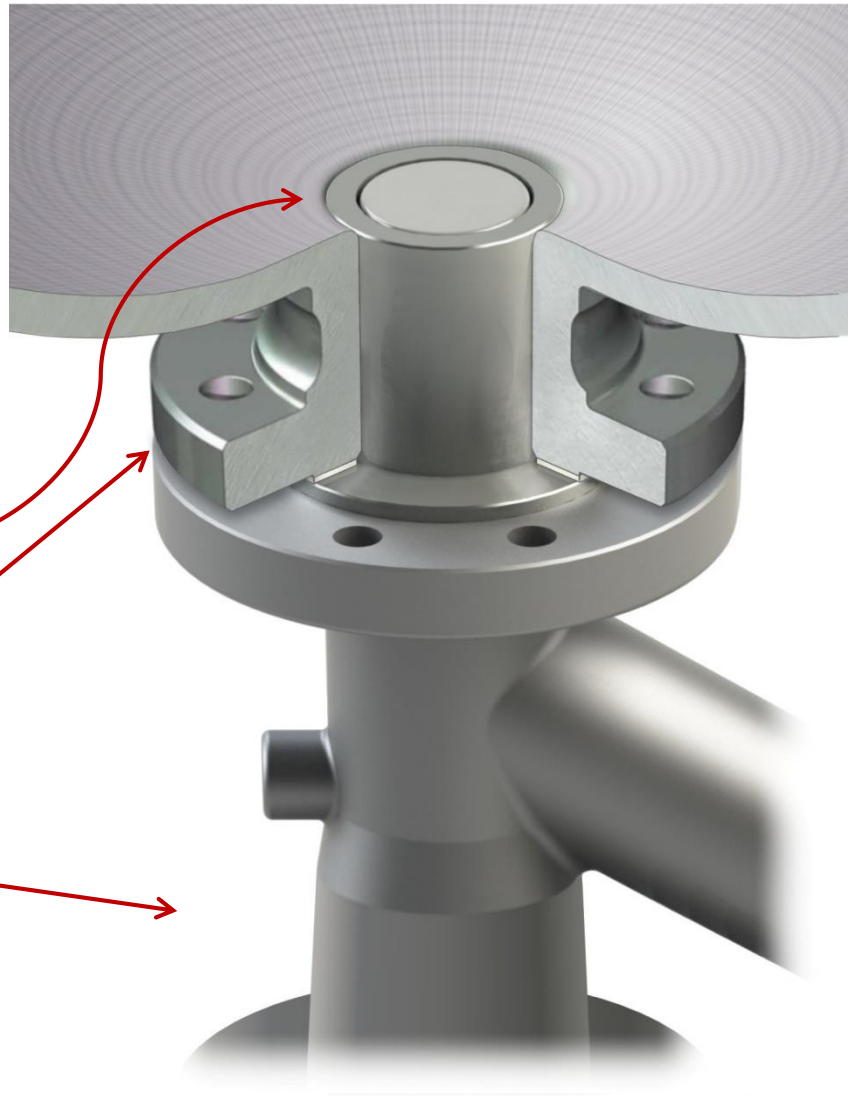
The dead space issue

Extreme clogging…

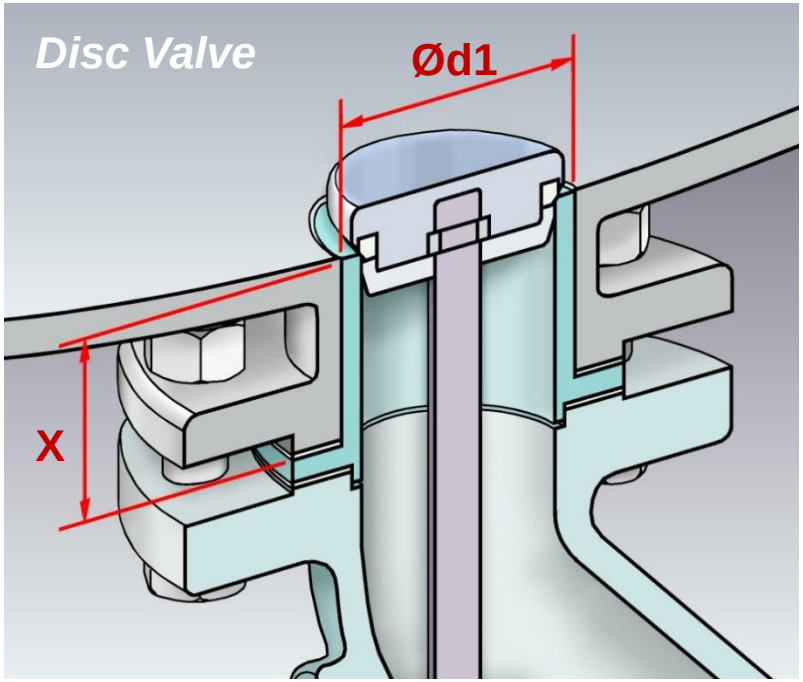
…and this won't clear it!!

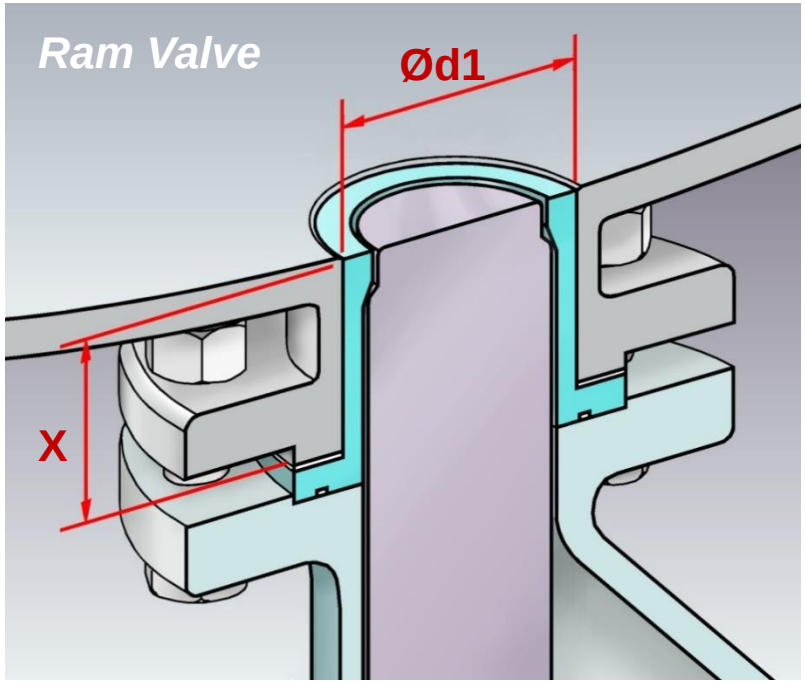
The dead space free solution

Custom, flush-fitting mating of the valve flange to the vessel nozzle dimensions



Custom, flush-fitting of valve to vessel nozzle

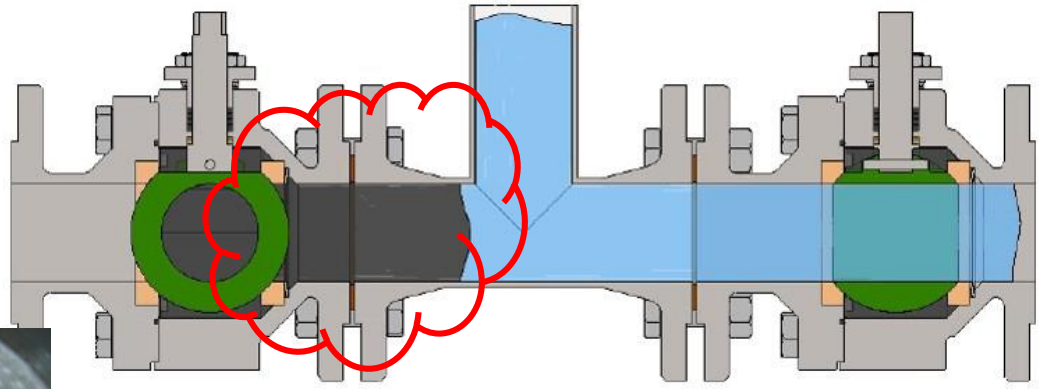


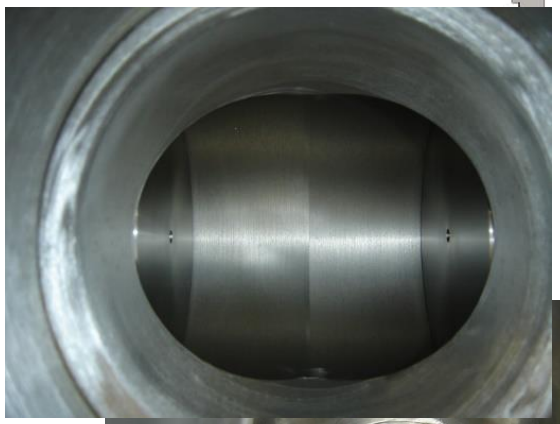


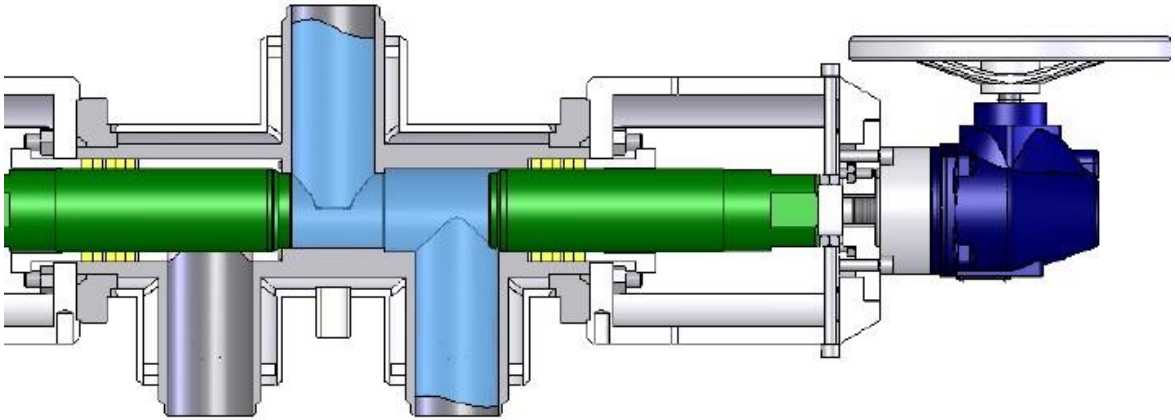
The seat dimension is matched to the nozzle

!! No dead-space !!

Conventional line splitting





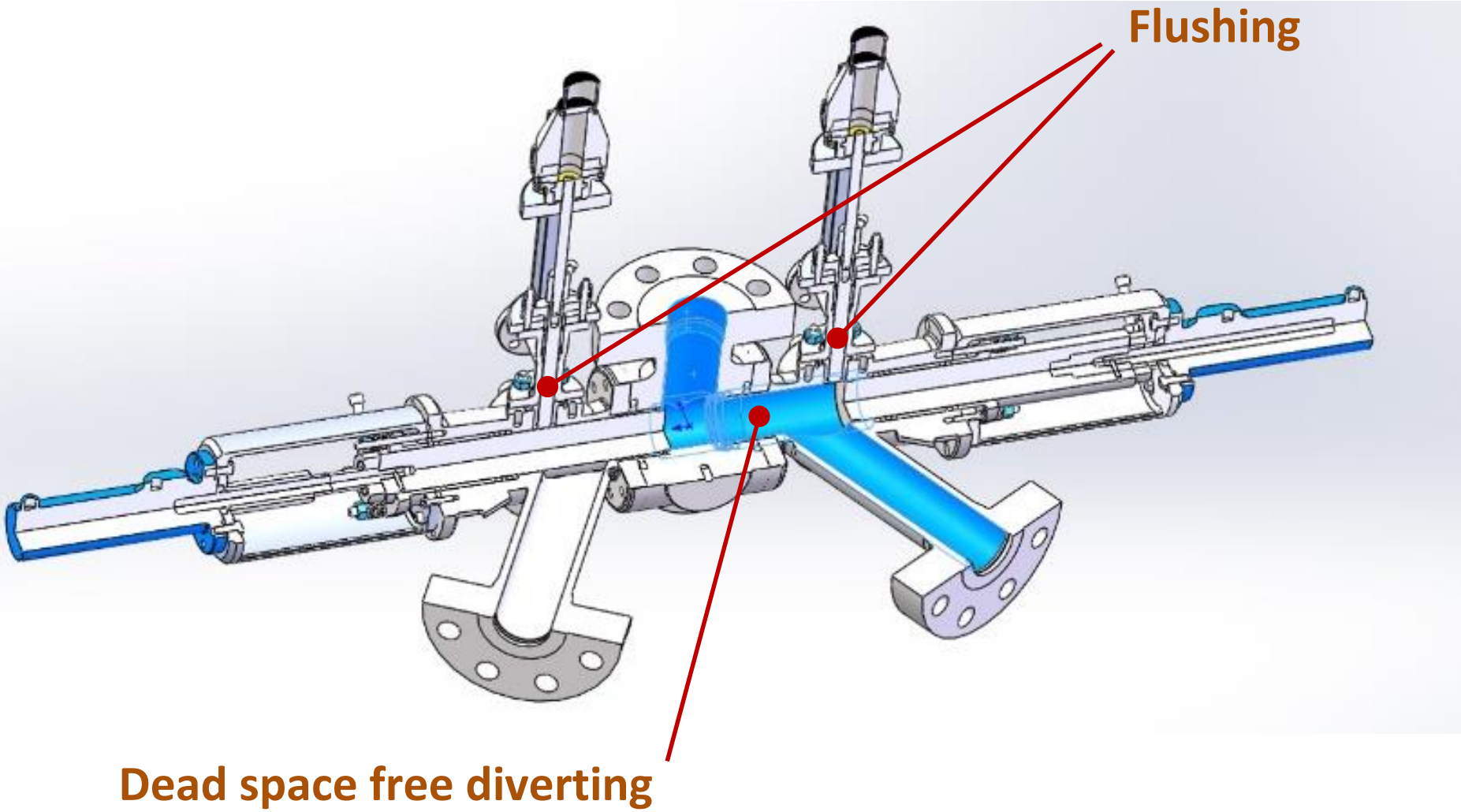


Dead space free line splitting

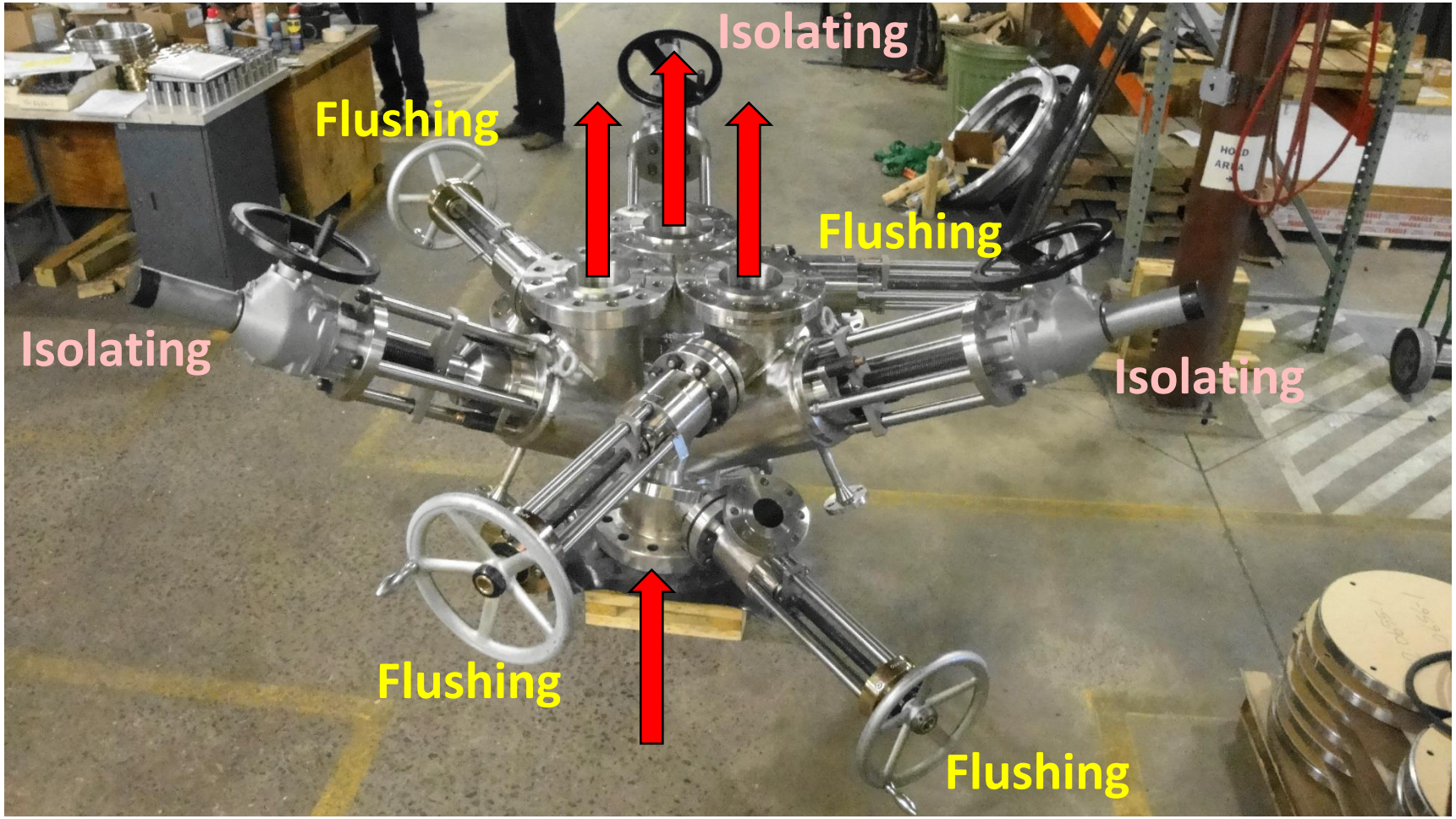
Advantages

- Flushing/draining direct at point meaning that flushing of pipelines from end-to-end becomes possible
- Eliminates dead space normally associated with flushing systems
- Connections can be heated/insulated as part of body
- Flushing can be fully automated

3-way valve assembly

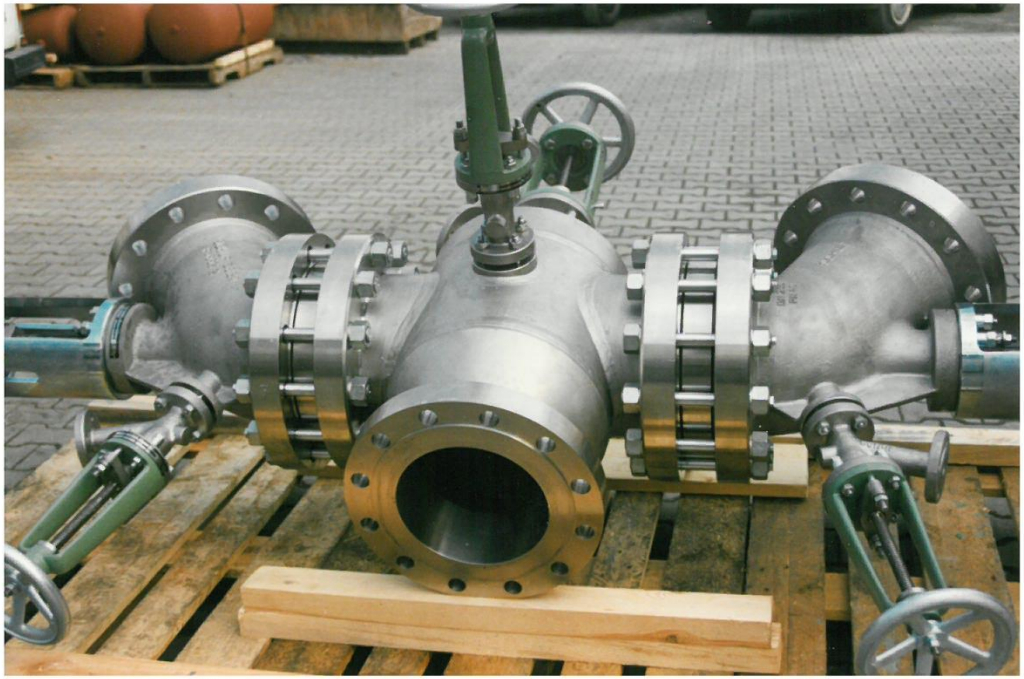


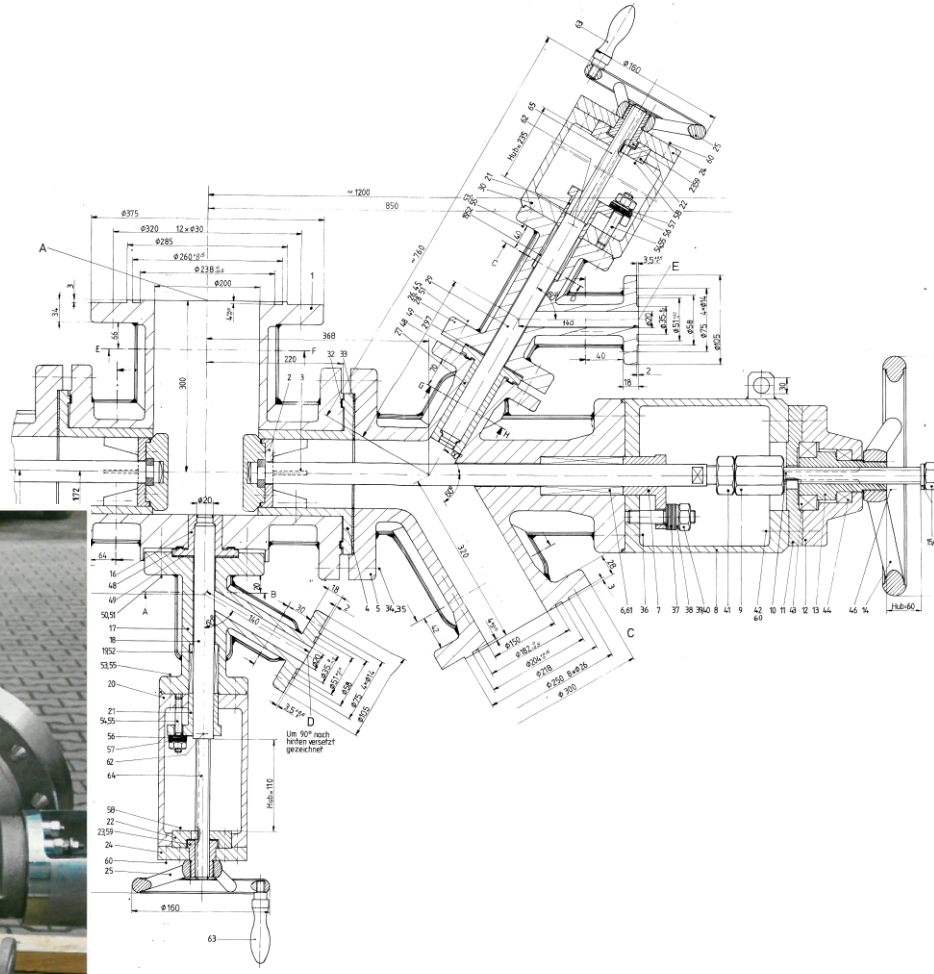
4-way valve assembly



RAG

VEBA OEL





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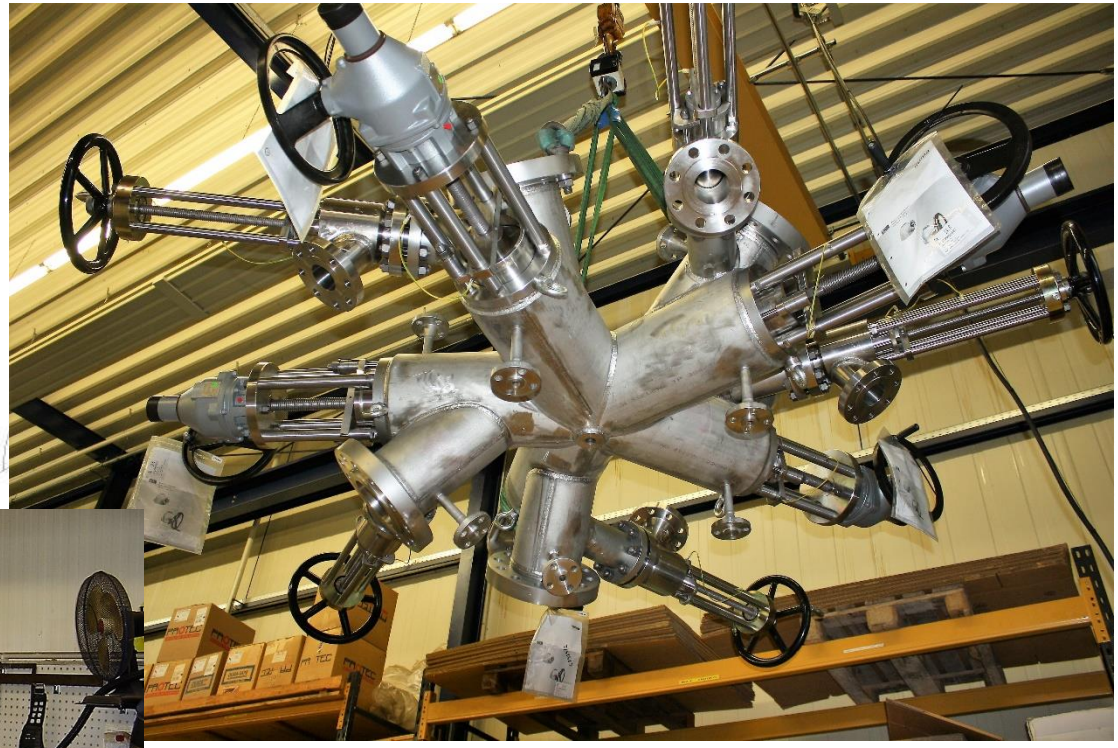
Any customer can have a car painted any color that he wants, so long as it is black

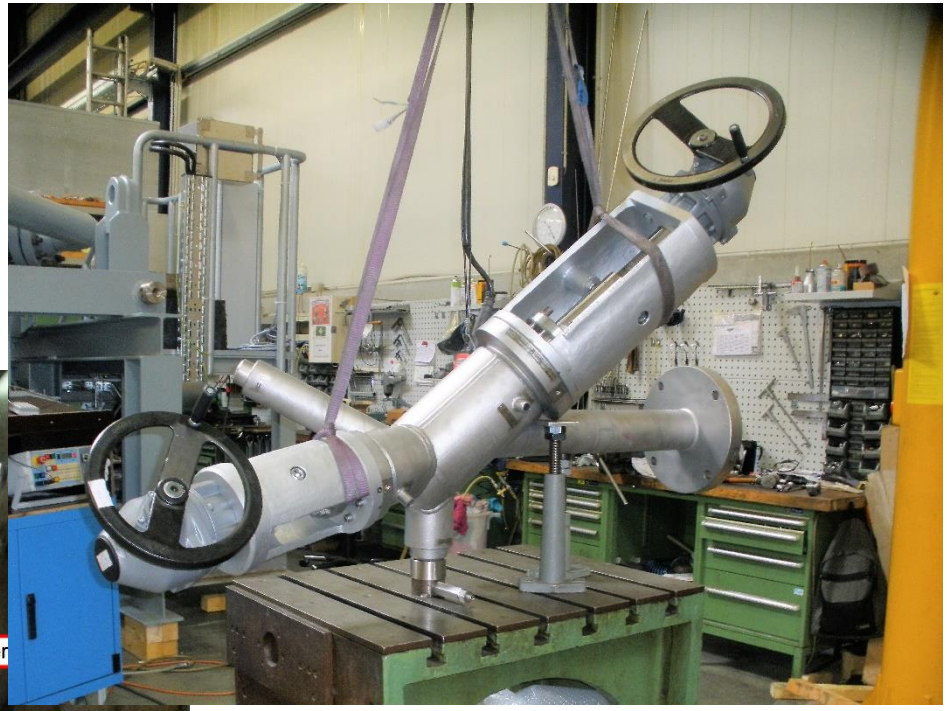
Henry Ford

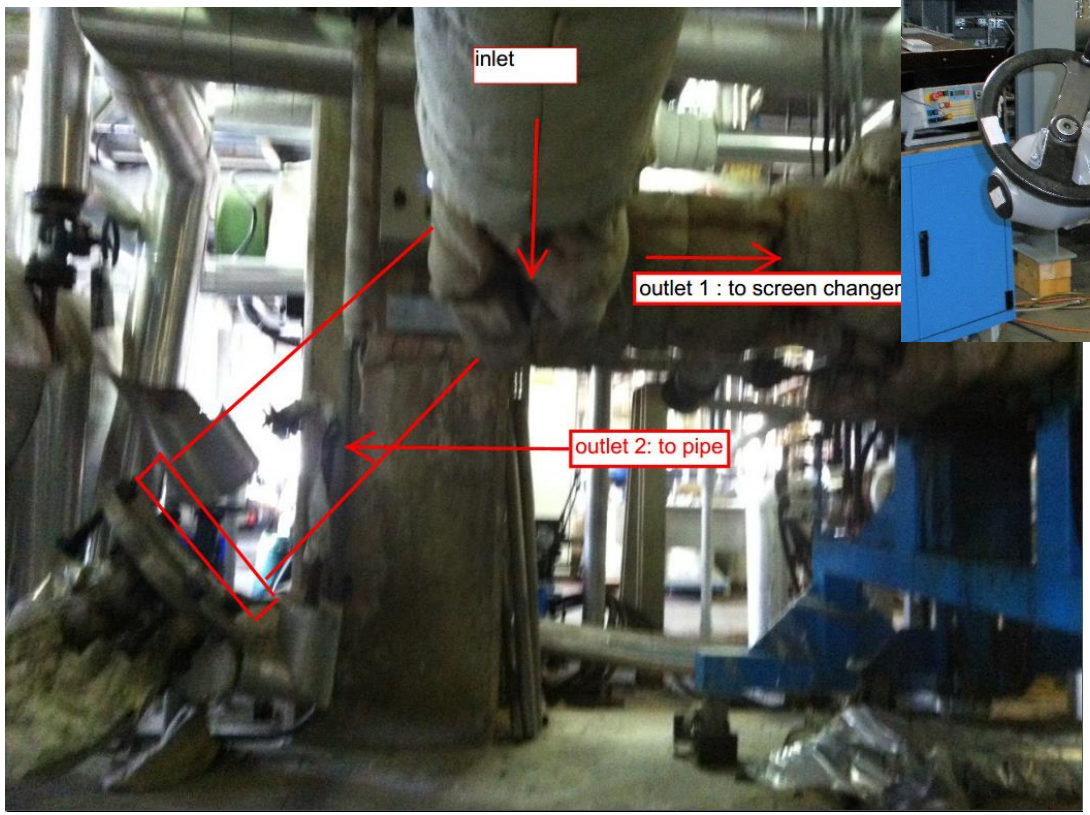
(taken from www.flickr.com/people/21612624@N00

Not every plant needs a “complicated“ solution, but one can often eliminate many potential problems!

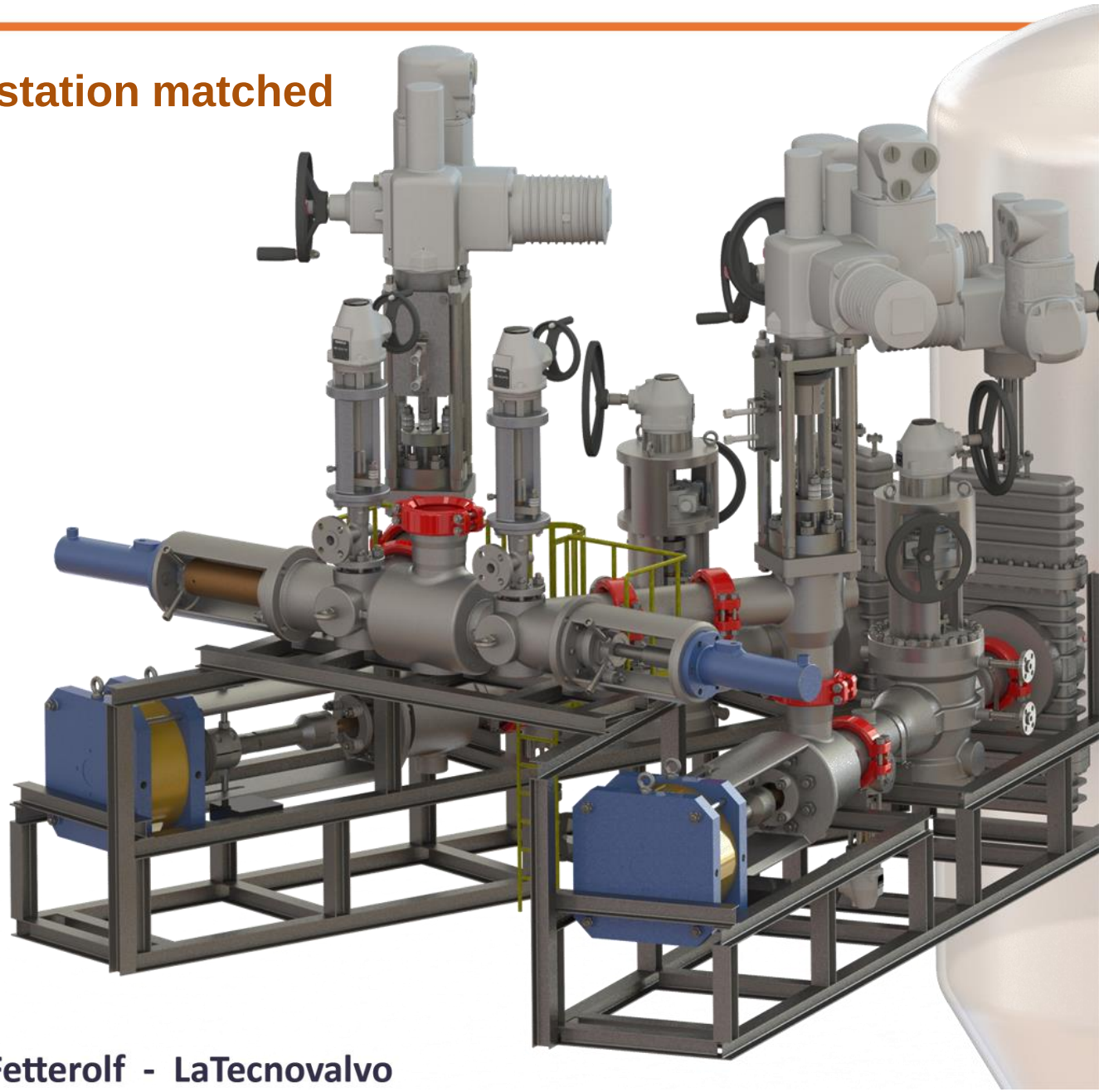


Valve matched to limited space

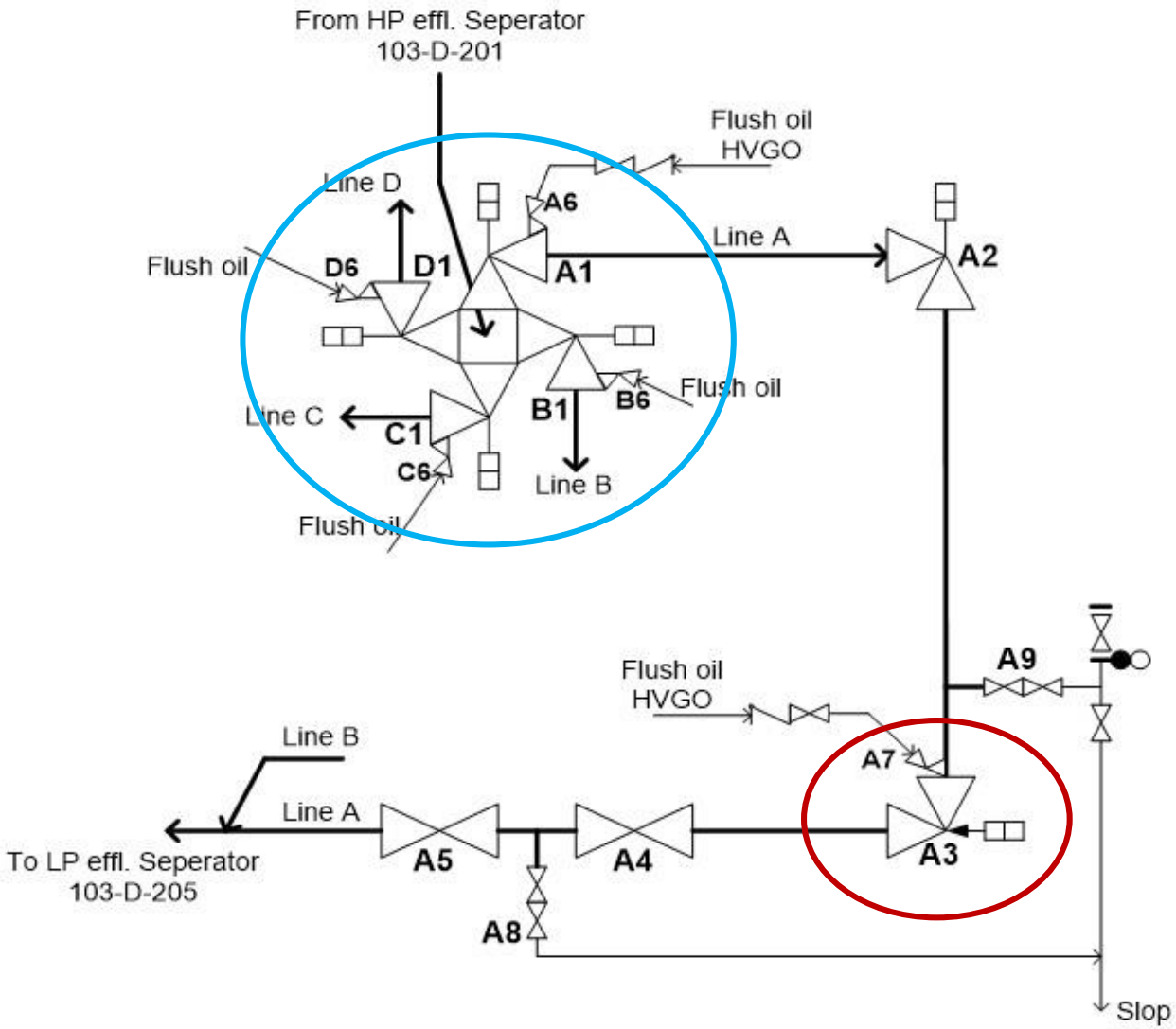




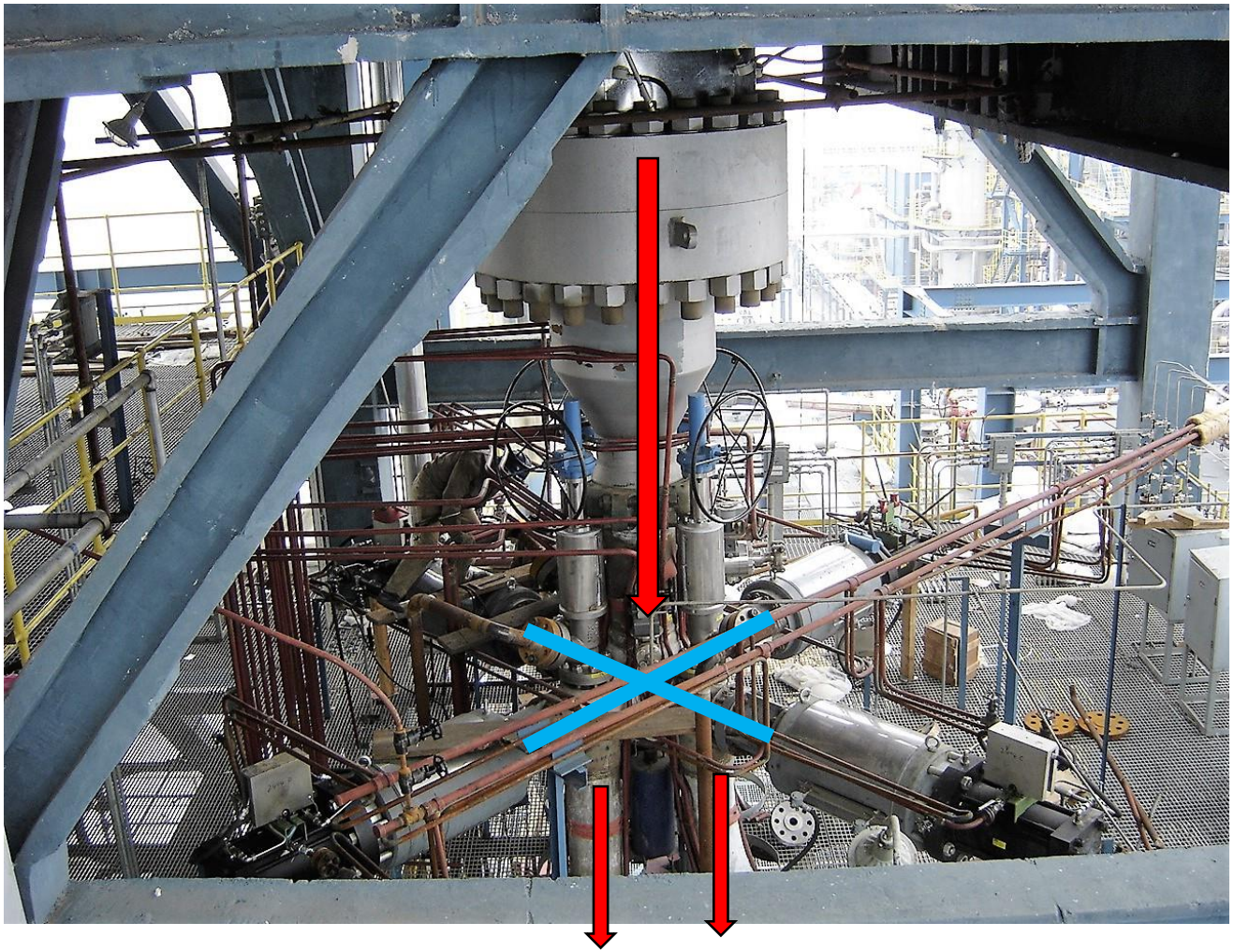
Skid mounted valve station matched to limited space



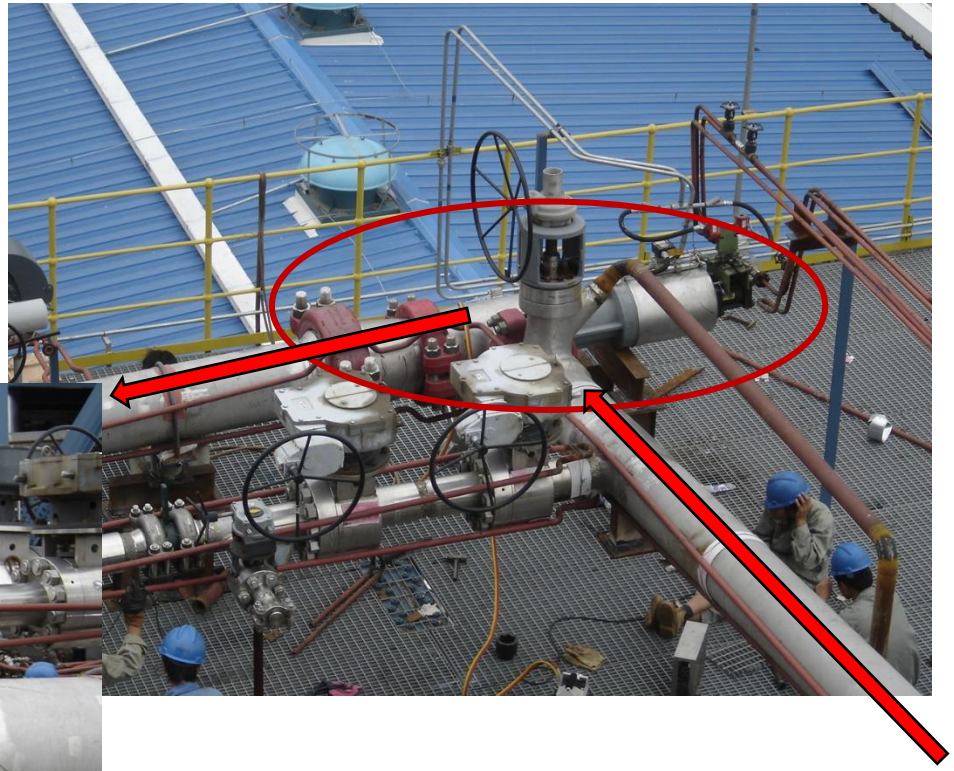
Planning for redundancy



5-way diverter valve underneath HHPS

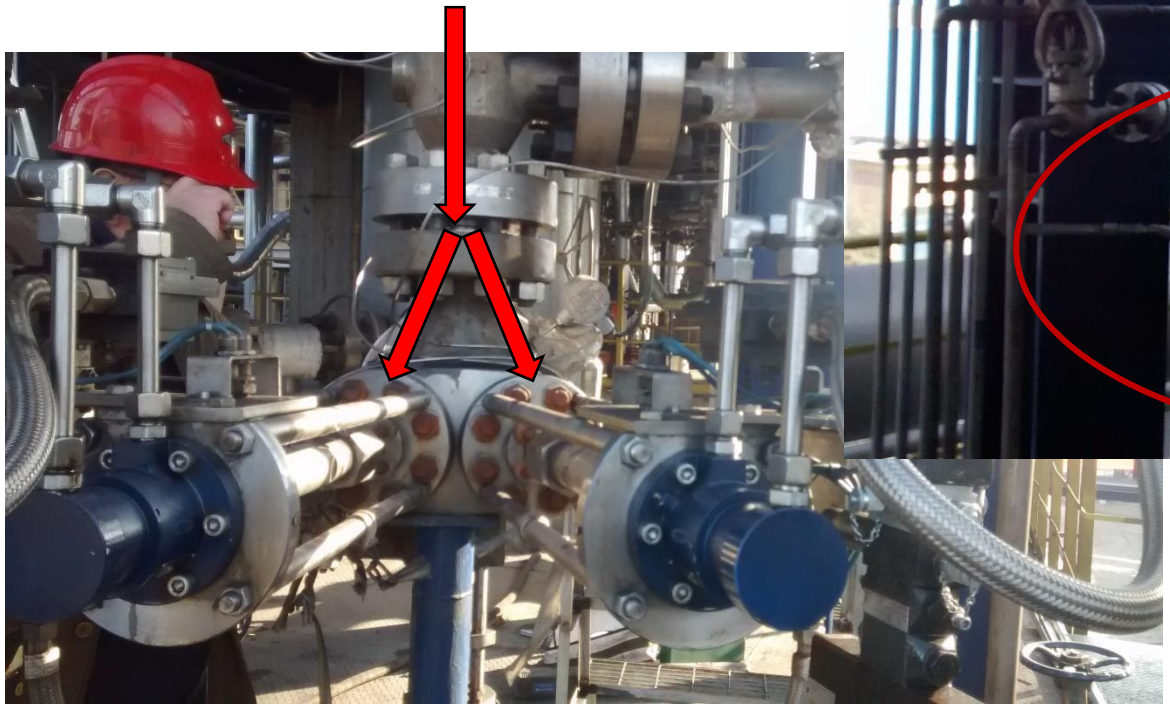


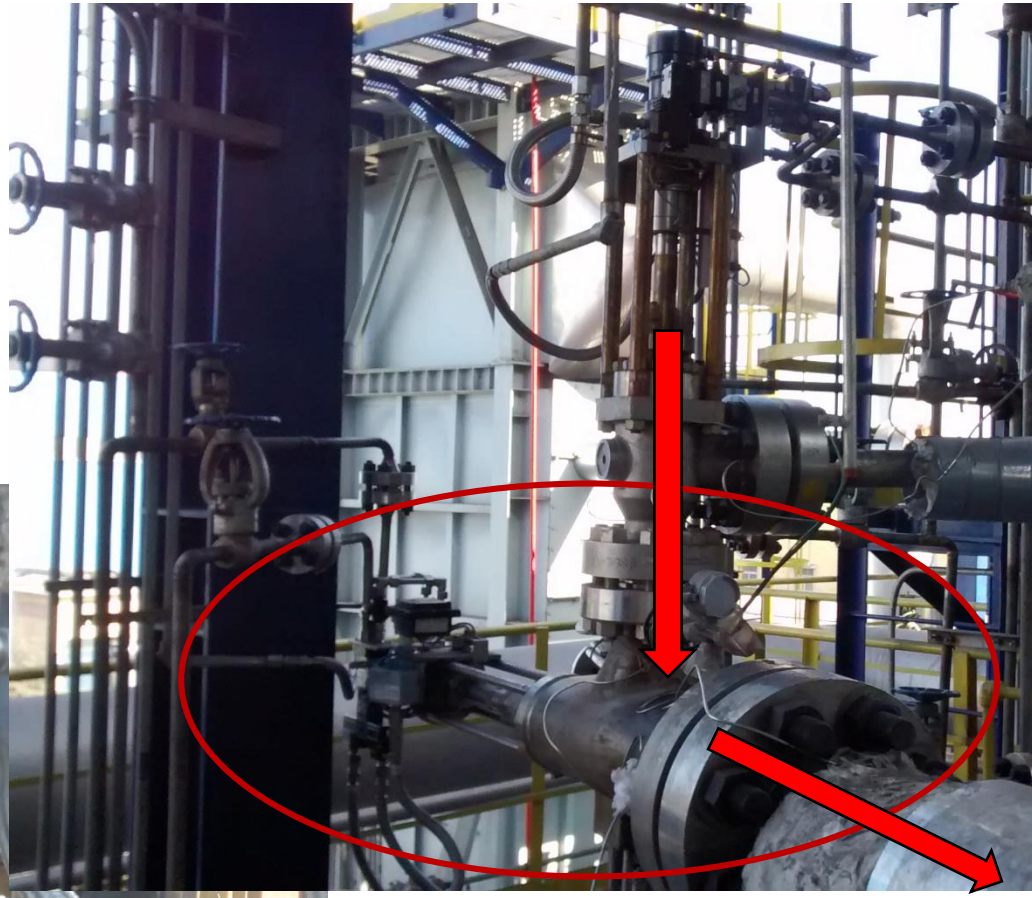
1-in-1 LDV in 4 line



Clamp connections

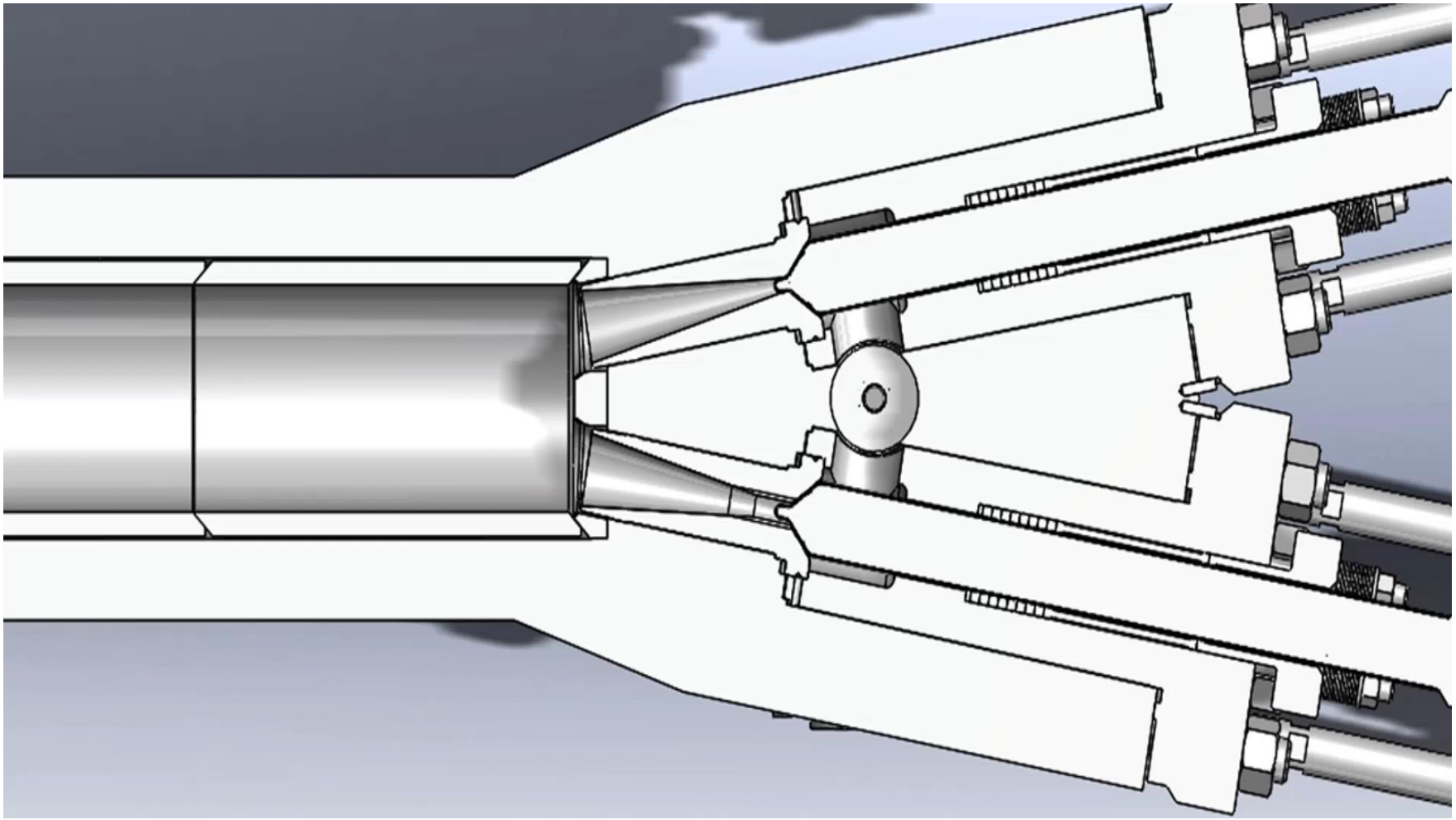
2-in-1 LDV in parallel





2-in-1 LDV

2-in-1 LDV



What's wrong with continuous flushing?

- Conversion rate of residue upgrading is reduced, as it is diluted with clean flushing media
- A constant supply of flushing media is required to operate the process
- If flushing fails, then valves requiring constant flushing can fail
- The flushing system itself is more prone to wear (constant flow), and thus more prone to having to be maintained

This then means:

- Higher operating costs
- Lower yields
- More maintenance and thus more interaction with the system

How do you eliminate continuous flushing?

- Avoid dead space and cavities in valves and equipment
- Optimise piping layout to avoid slow space
- Flush and drain directly where you need to

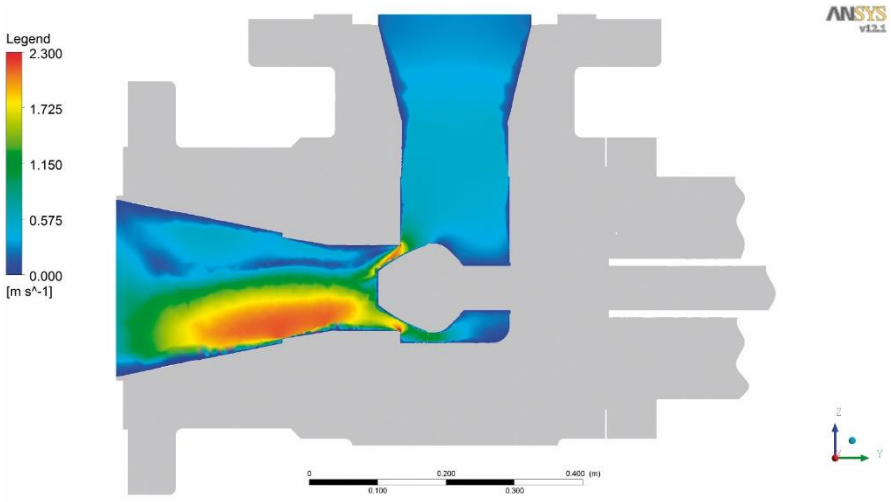
Selecting the appropriate valves and equipment allow you to develop operating procedures which use discontinuous flushing.

This then means:

- Lower operating costs
- Better yields
- Low maintenance requirements and thus less interaction with the system

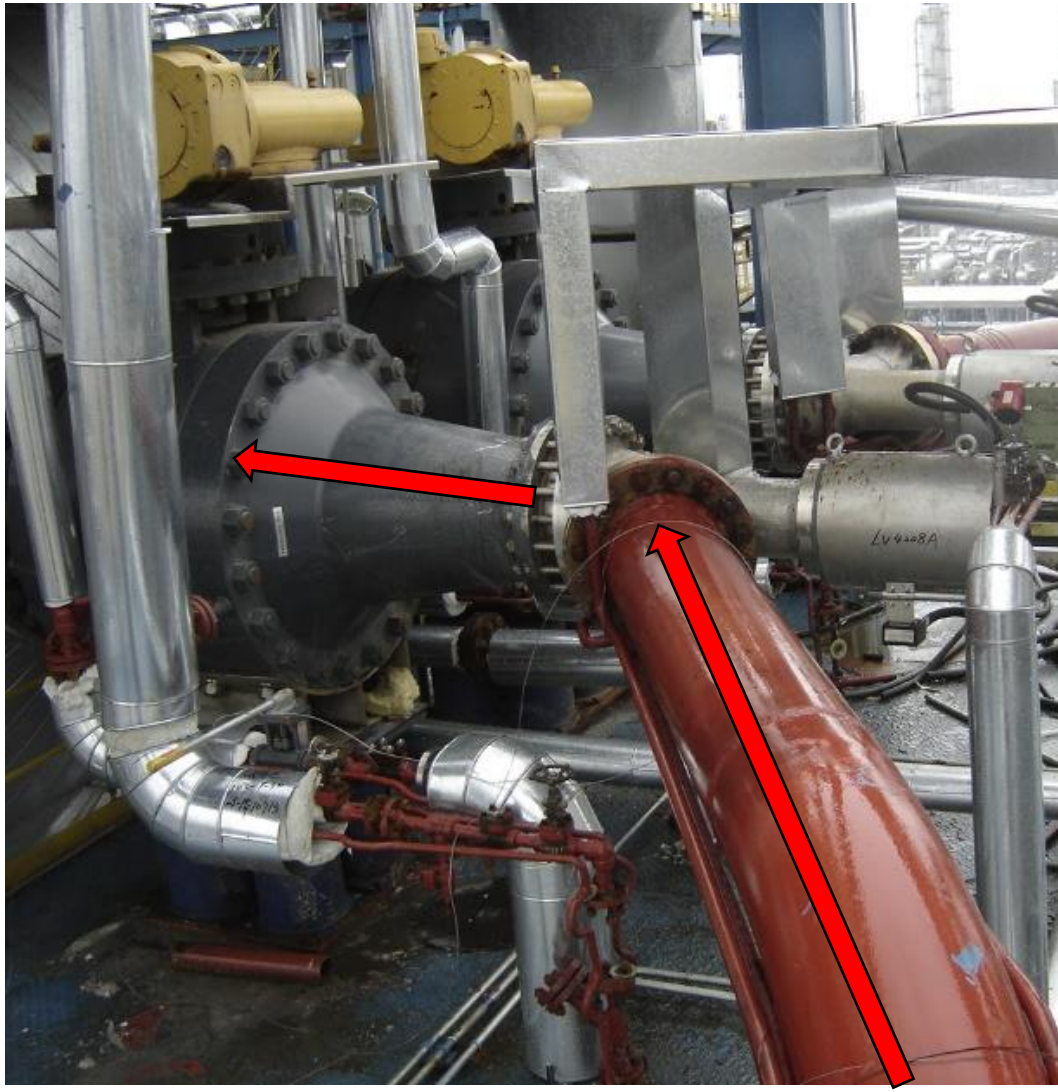
Improving erosion resistance

- Nature of the process means erosion is **certain**
- Simulation can help identify where erosion protection can be focused
- Protection should be designed for ease of maintenance, and preferably economical to replace



Improving erosion resistance

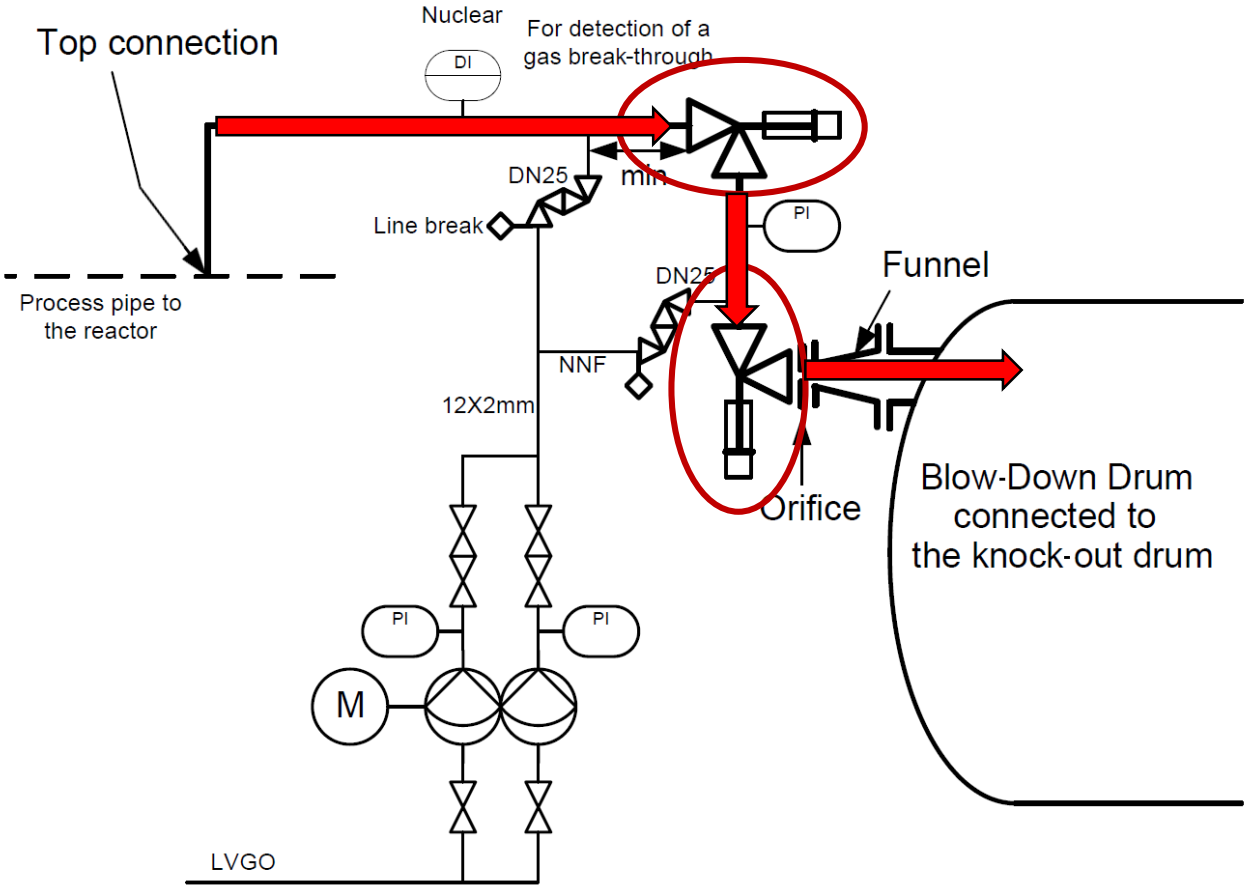
Trim shown includes a hard metal top which is additionally surface treated



Focussing on valves

- Positive isolation, both to the process and to atmosphere
- API 624 and ISO 15848
- Reliable valve performance, both function and sealing
- Quick acting actuation where needed

Example of critical area: ESD Station



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