Advanced Valve Solutions

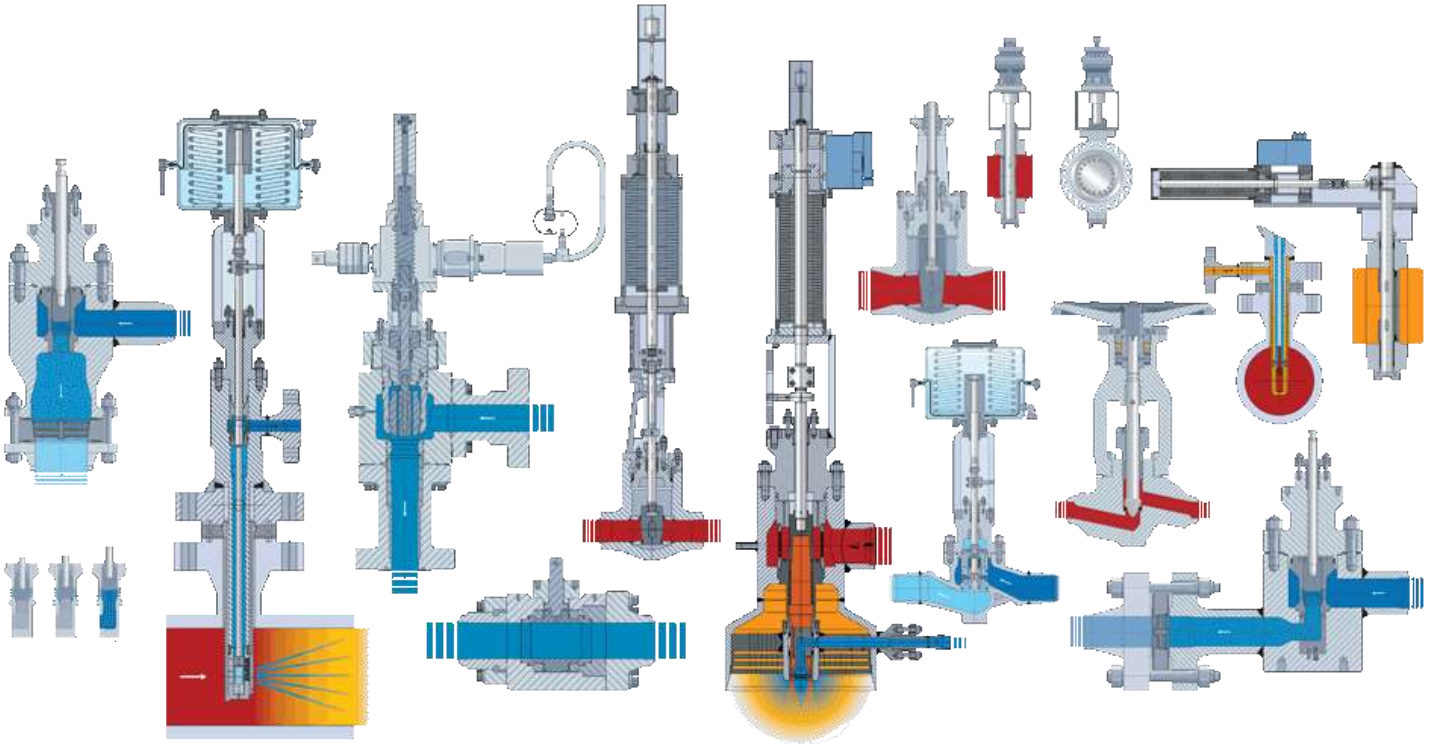
Advanced Valve Solutions

At the heart of your business

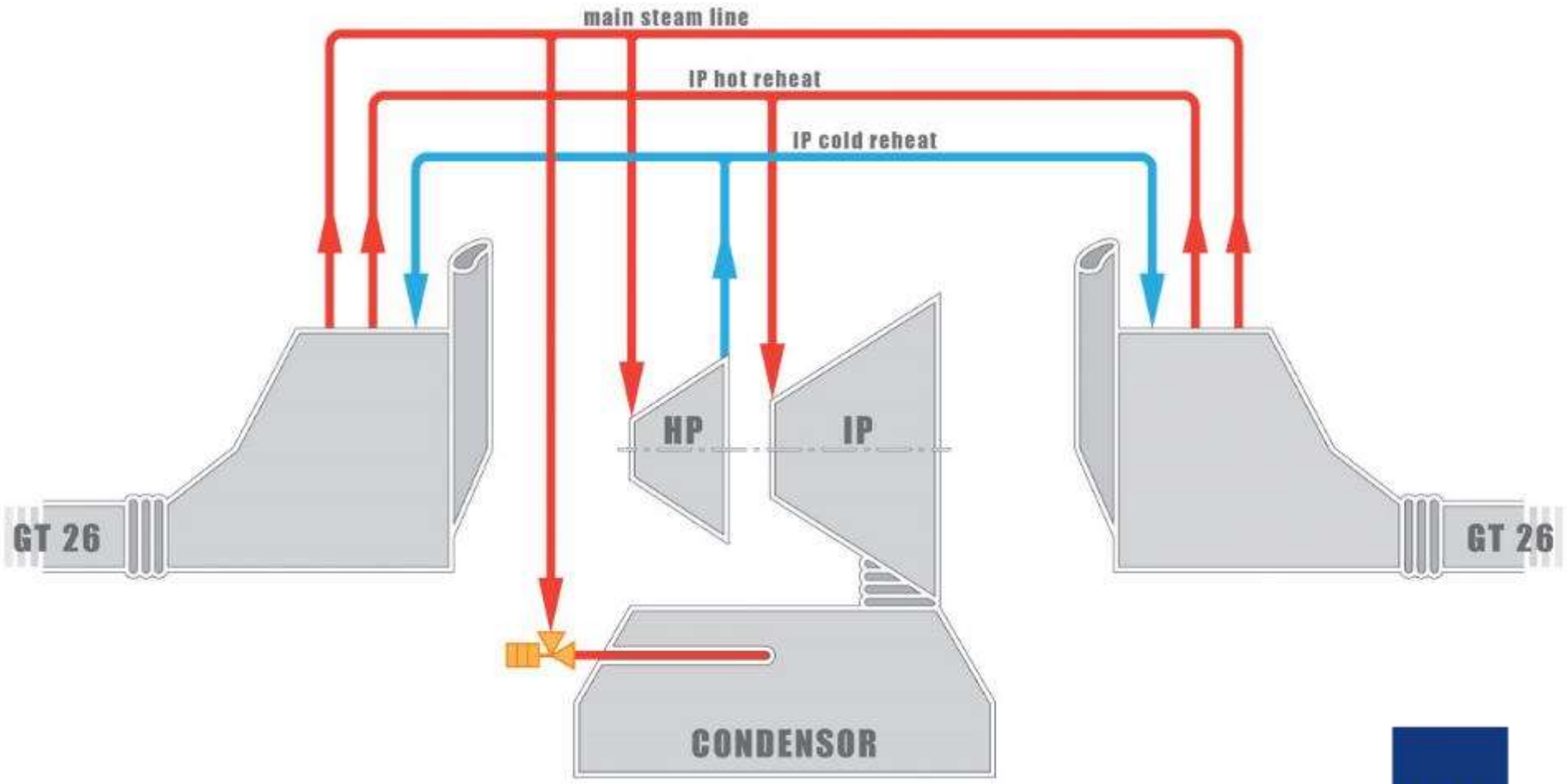
Advanced Valve Solutions

Not just a product

We provide a solution!

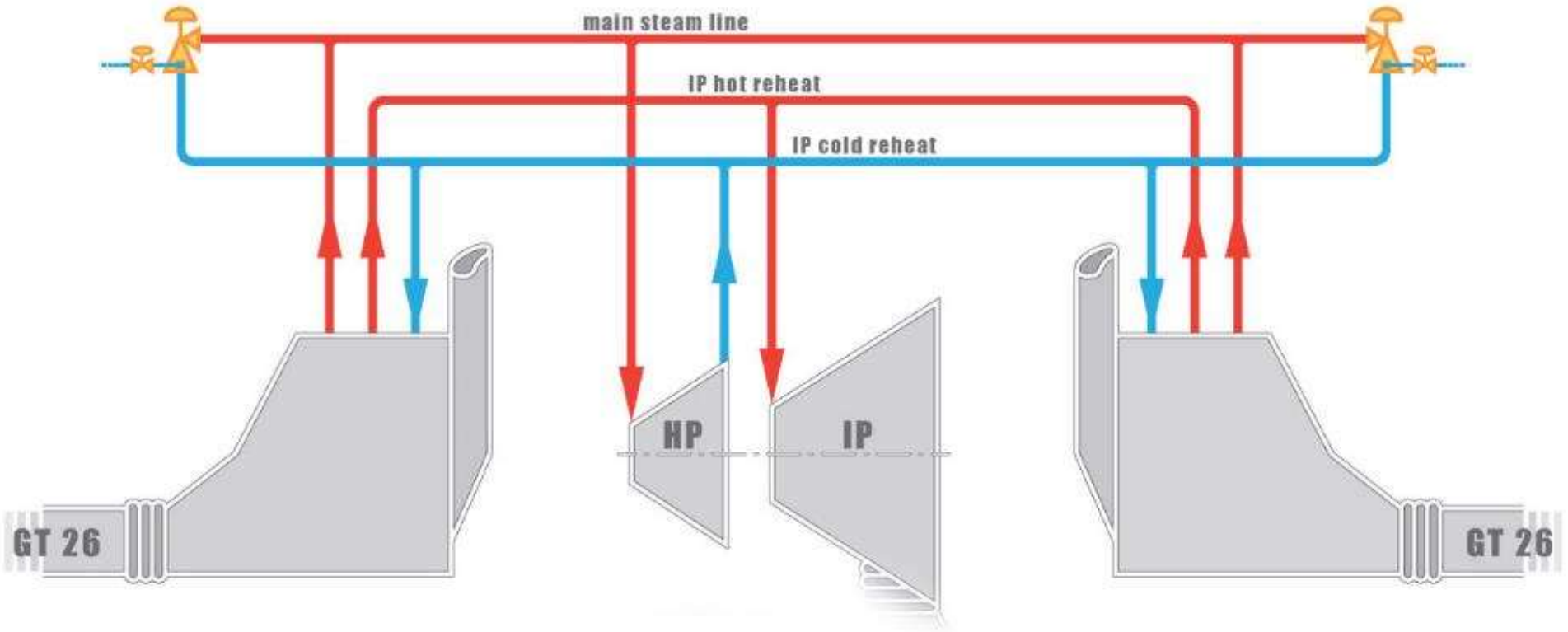


Rocksavage Solution



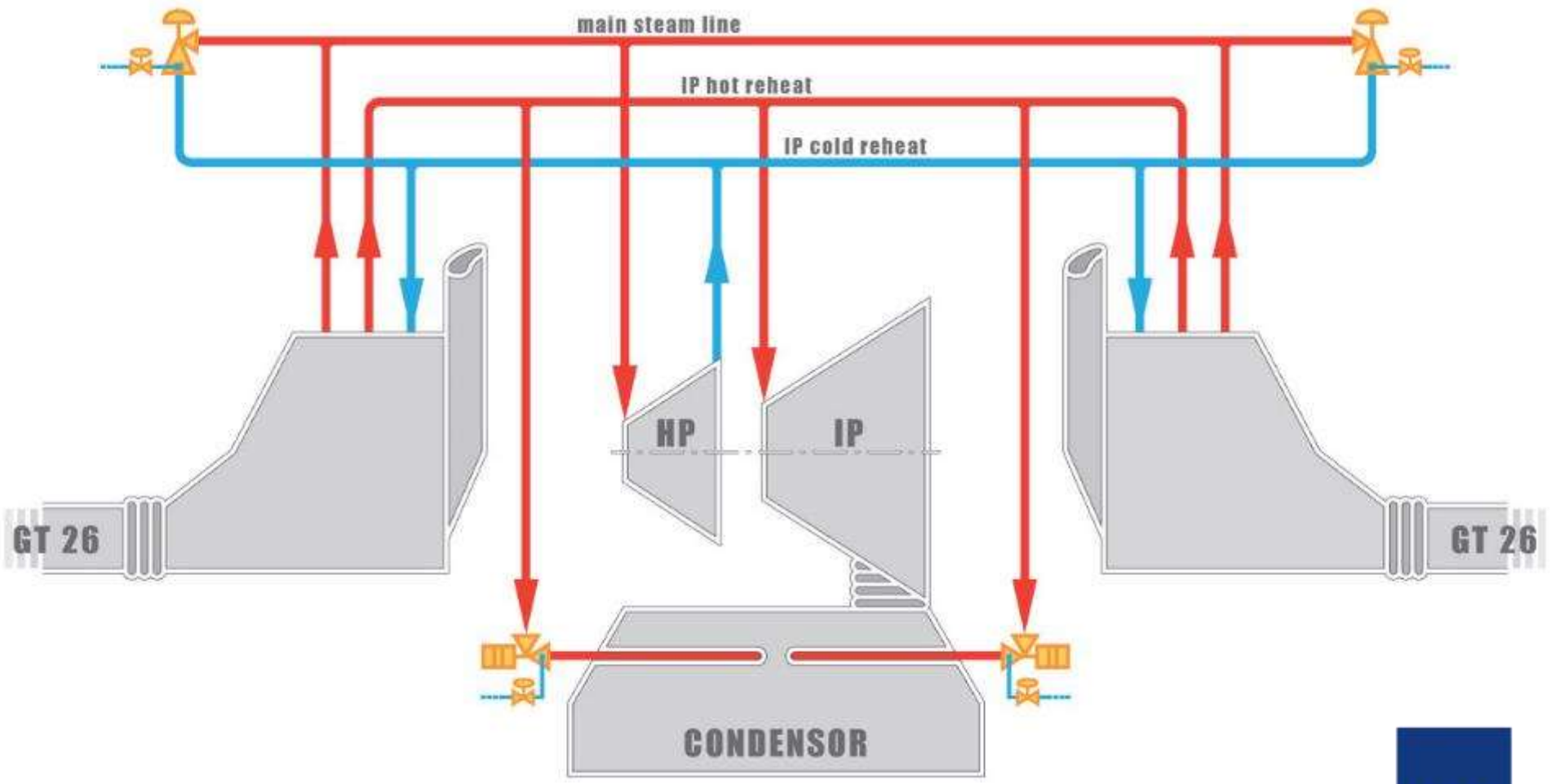
Original situation: 1 small by-pass HP to condensor

Rocksavage Solution



Modification:
2 full capacity HP by-pass stations, HP to cold-reheat

Rocksavage Solution



Additionally 2 Hot-reheat to condensor by-pass stations

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To start and stop

- **Level 1**
  - *Attemporators, HP and IP*
  - *HP by-pass, main steam to cold re-heat*
  - *IP by-pass, hot reheat to condensor*
  - *OTC control valves*
  - *Drain valves and condensate management*

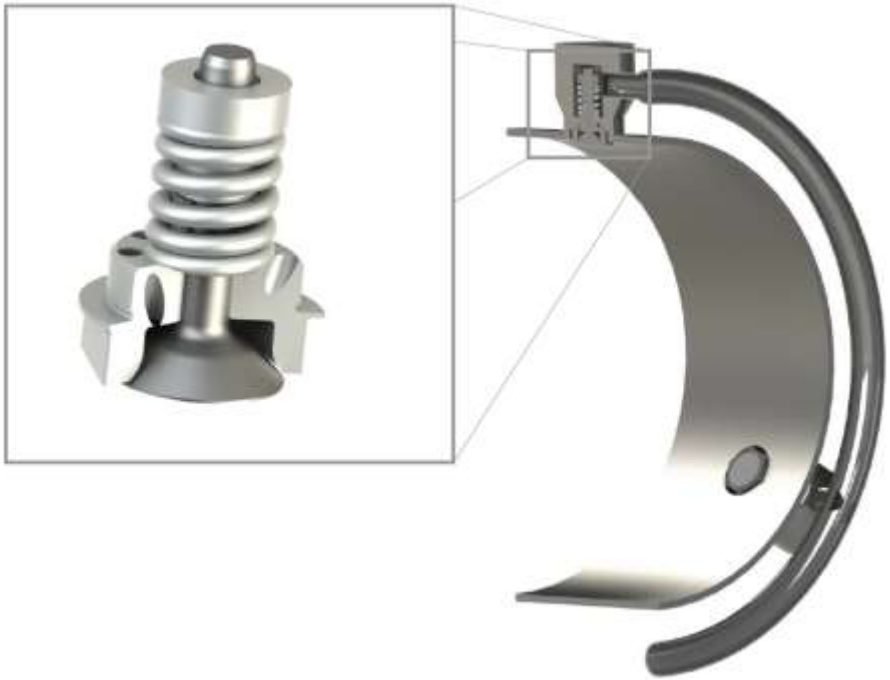
To start and stop

- **Level 2**
  - *Hot re-heat stop valve*
  - *Main steam stop valve*
  - *Main steam stop-check valve*
  - *All other frequent used valves*

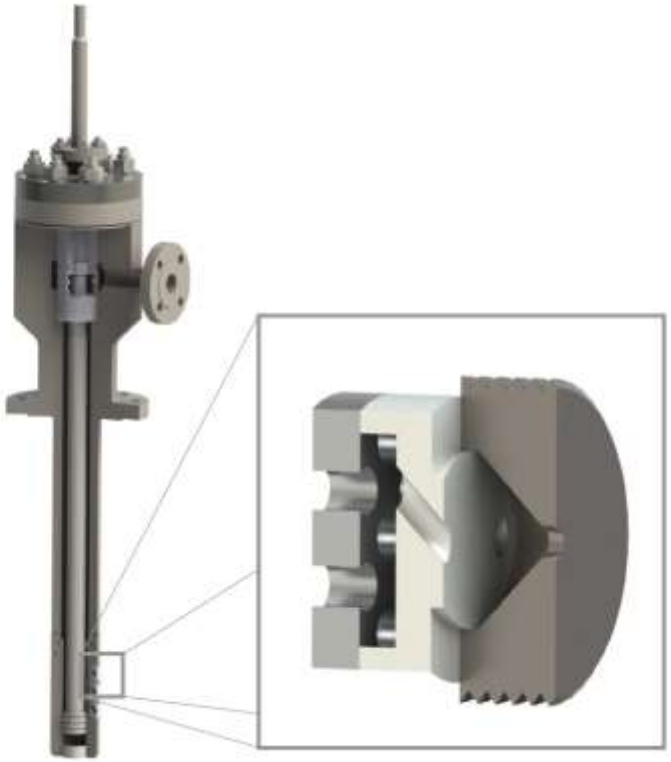
To start and stop

- **Level 3**
  - *parts with a limited calculated number of cycles*
  - *drums, headers*
  - *expansion bellows*

Ring type / nozzle type

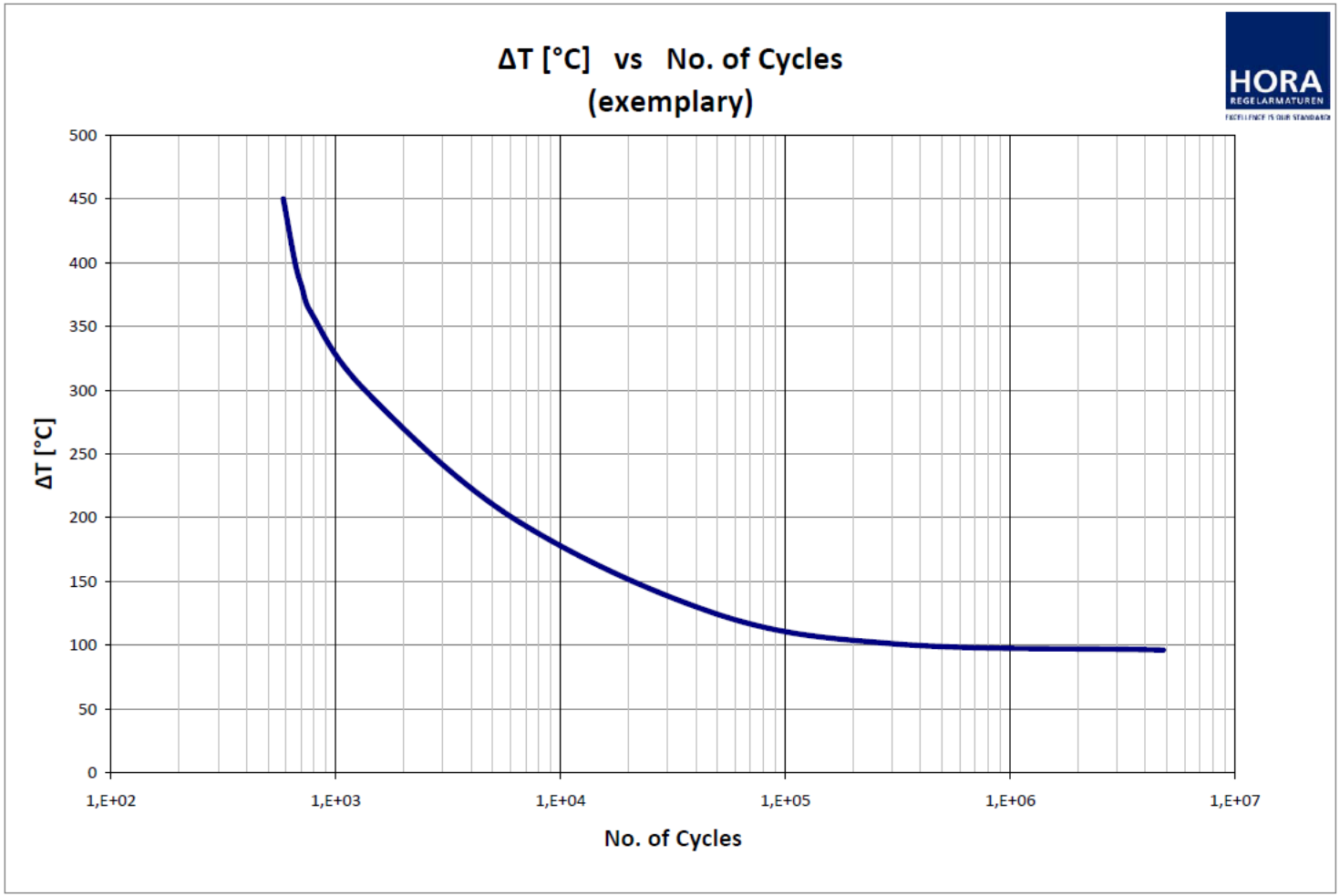


Radial Spring-Loaded Desuperheater



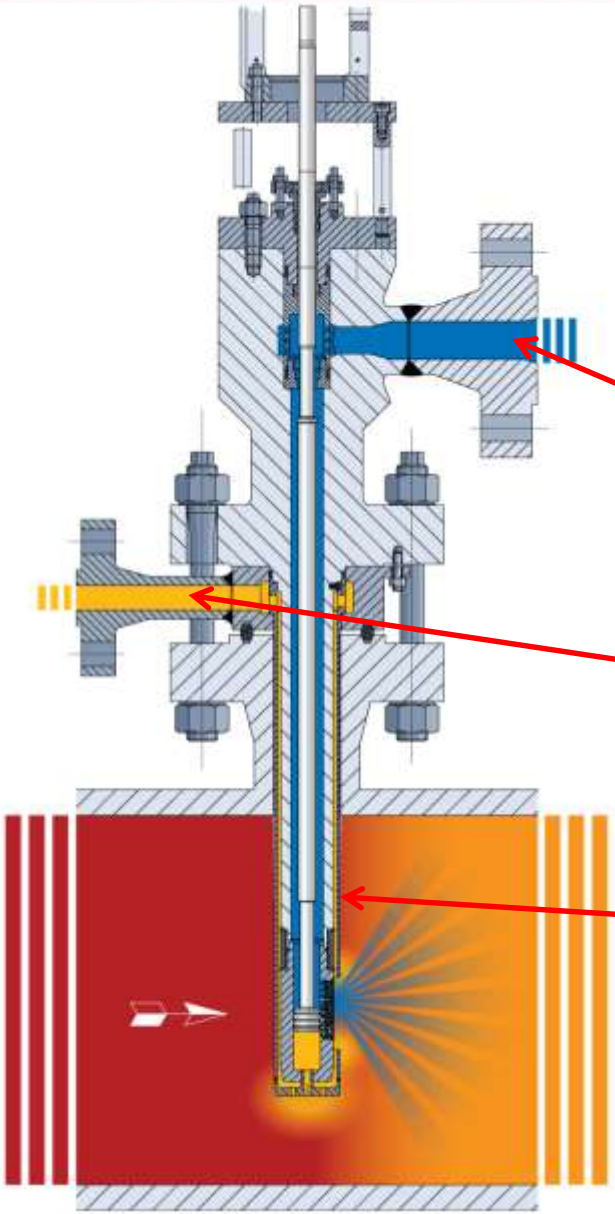
Multi-Nozzle Spray Type Desuperheater

Number of cycles



Number of thermal cycles ΔT versus life-time

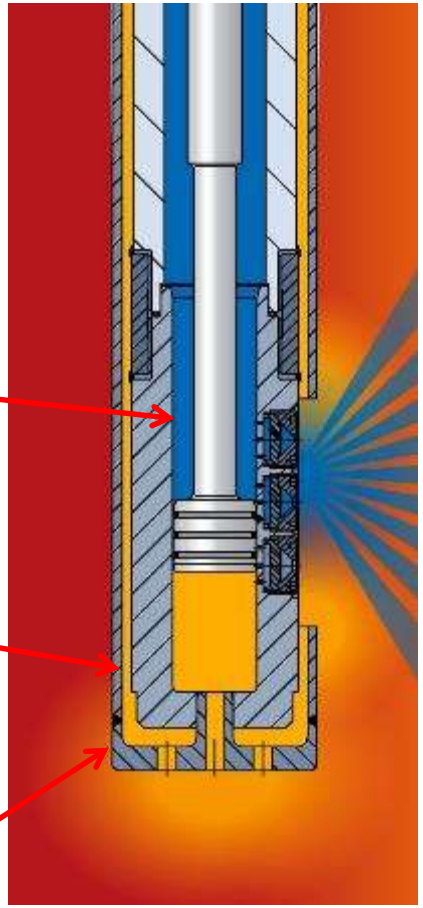
How it is build



Spray water

Cooling steam

Cooling jacket



Cooled de-superheater

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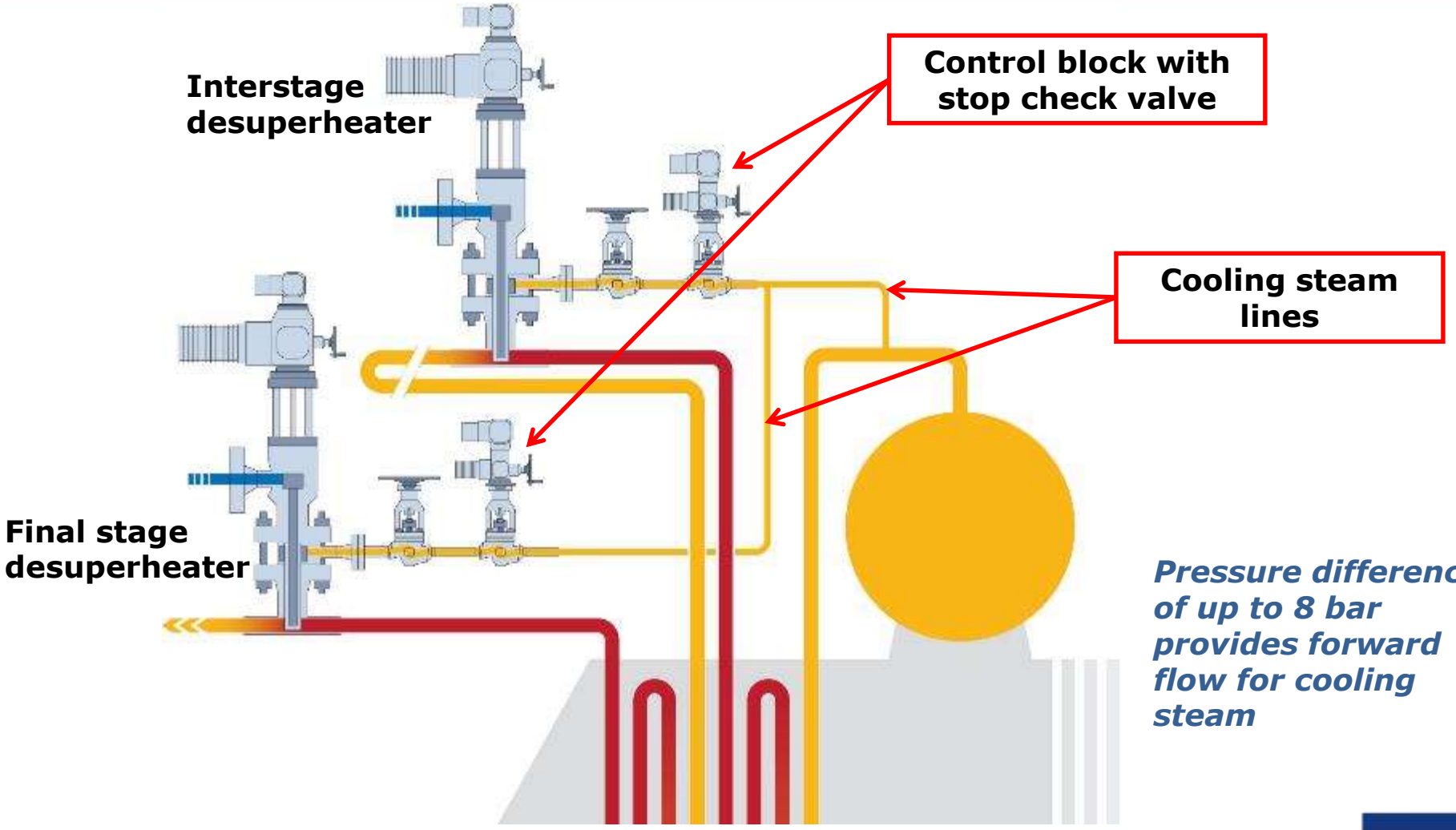
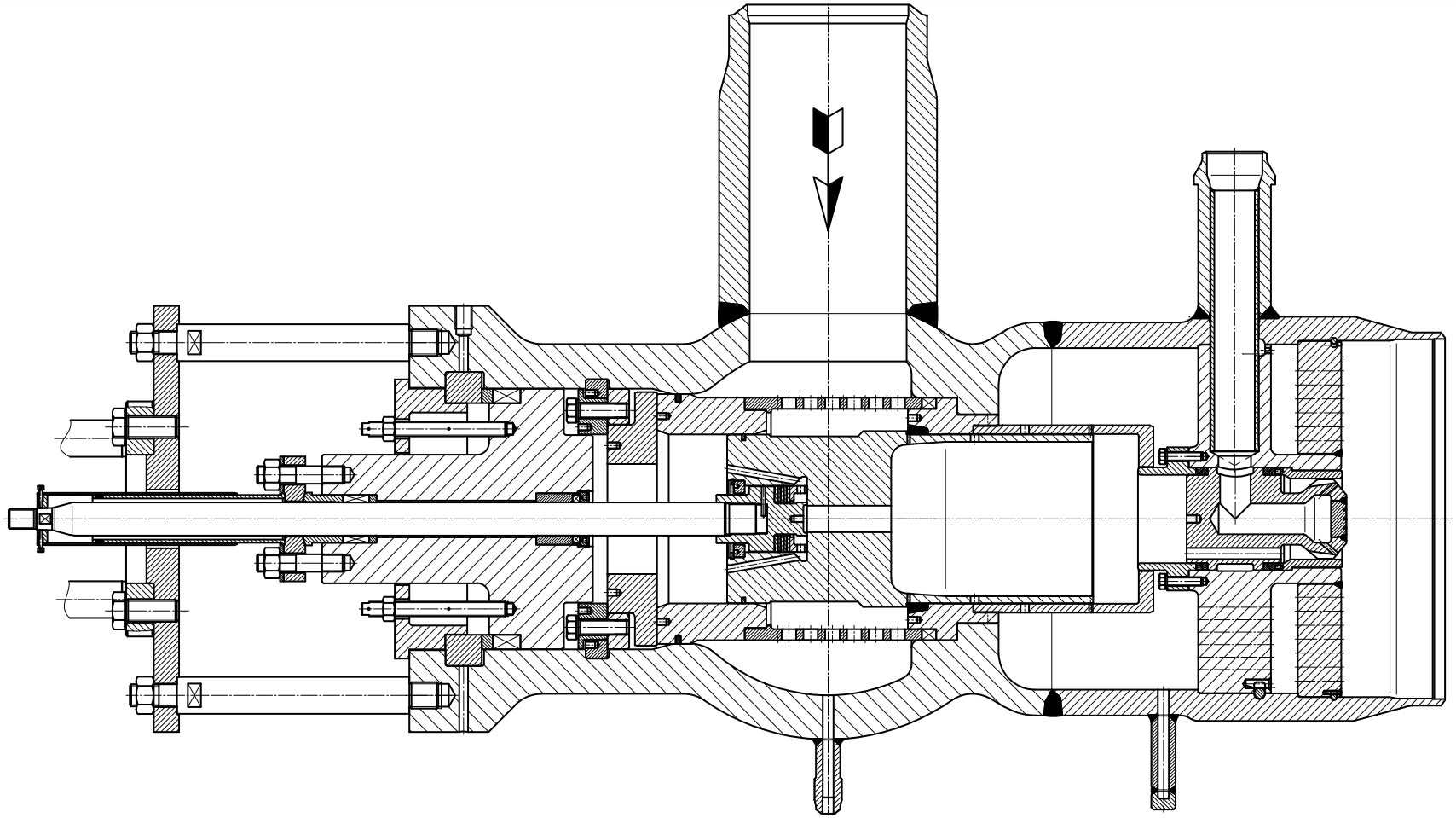
Desuperheaters positions



Pressure difference of up to 8 bar provides forward flow for cooling steam

Principle sketch of an HRSG with the different de-superheater positions

HP to cold-reheat bypass station



HP to cold-reheat by-pass station, pressure seal thin wall, forged body, F22 or P91 with steam atomizing water injection

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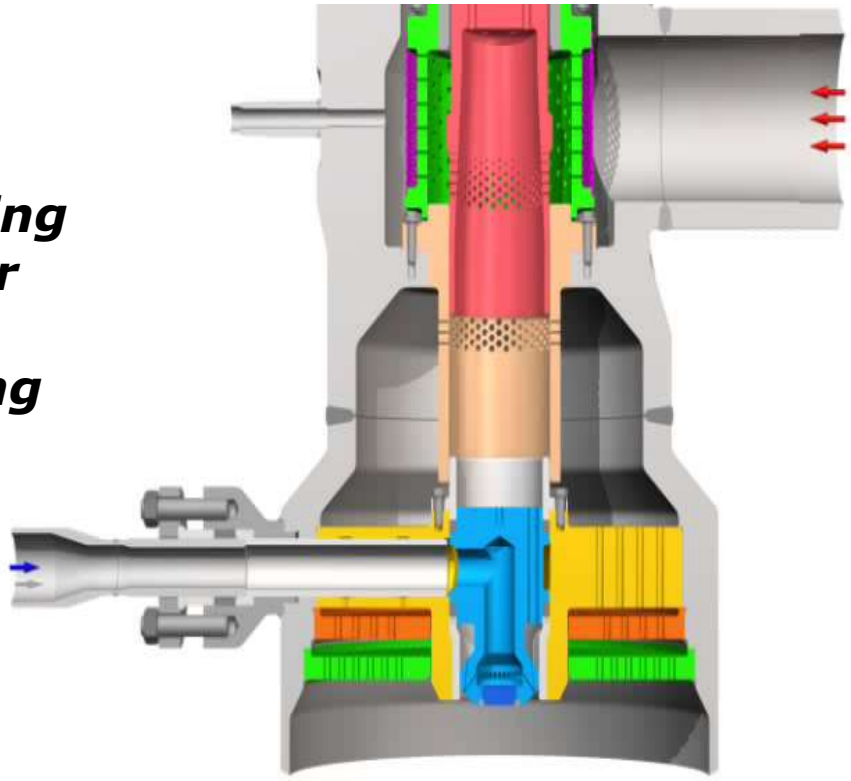
Fundamentals of Desuperheating

PRDS

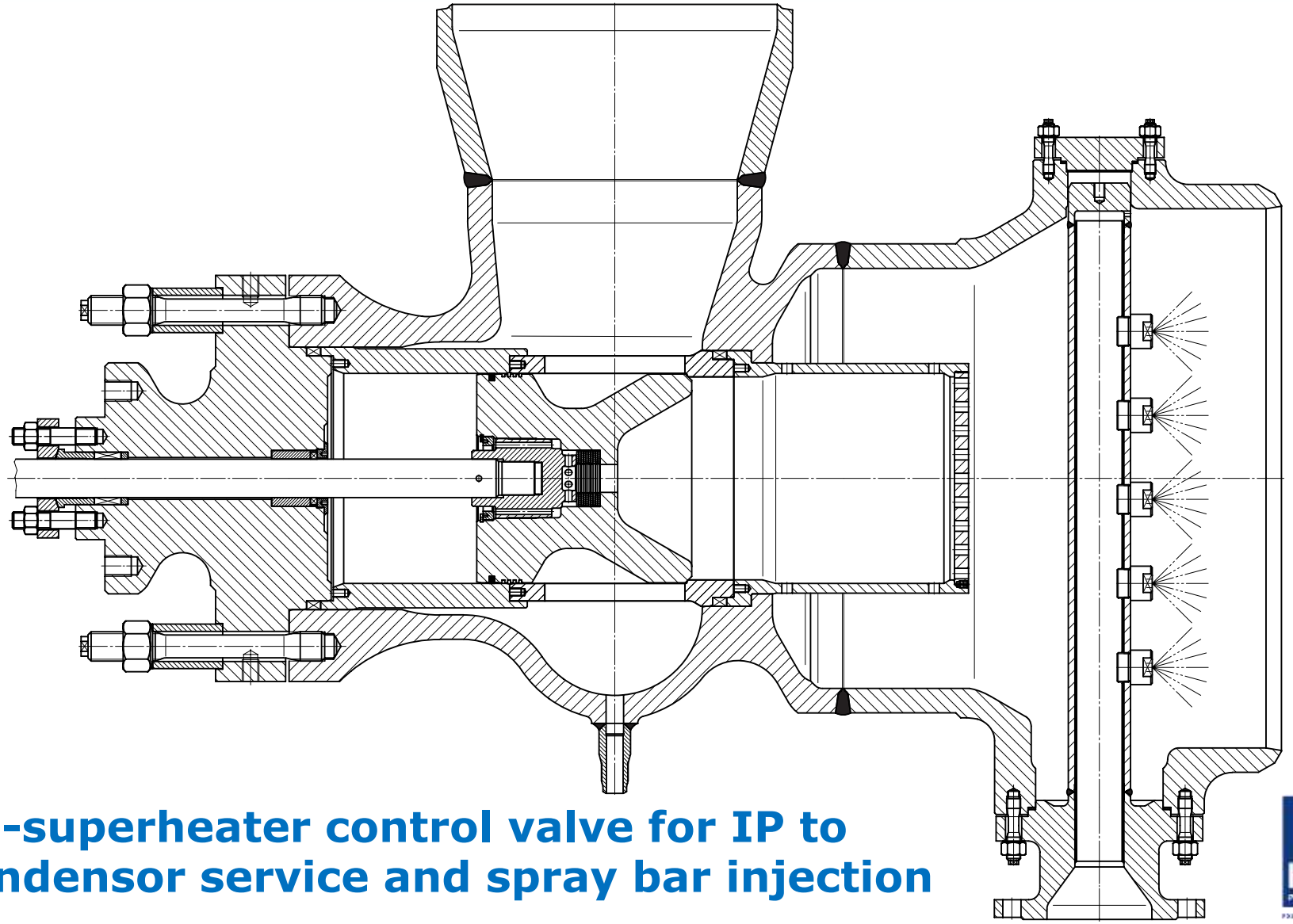
Pressure Reducing DeSuperheater

Steam atomizing



How it works

IP bypass station



De-superheater control valve for IP to condensor service and spray bar injection

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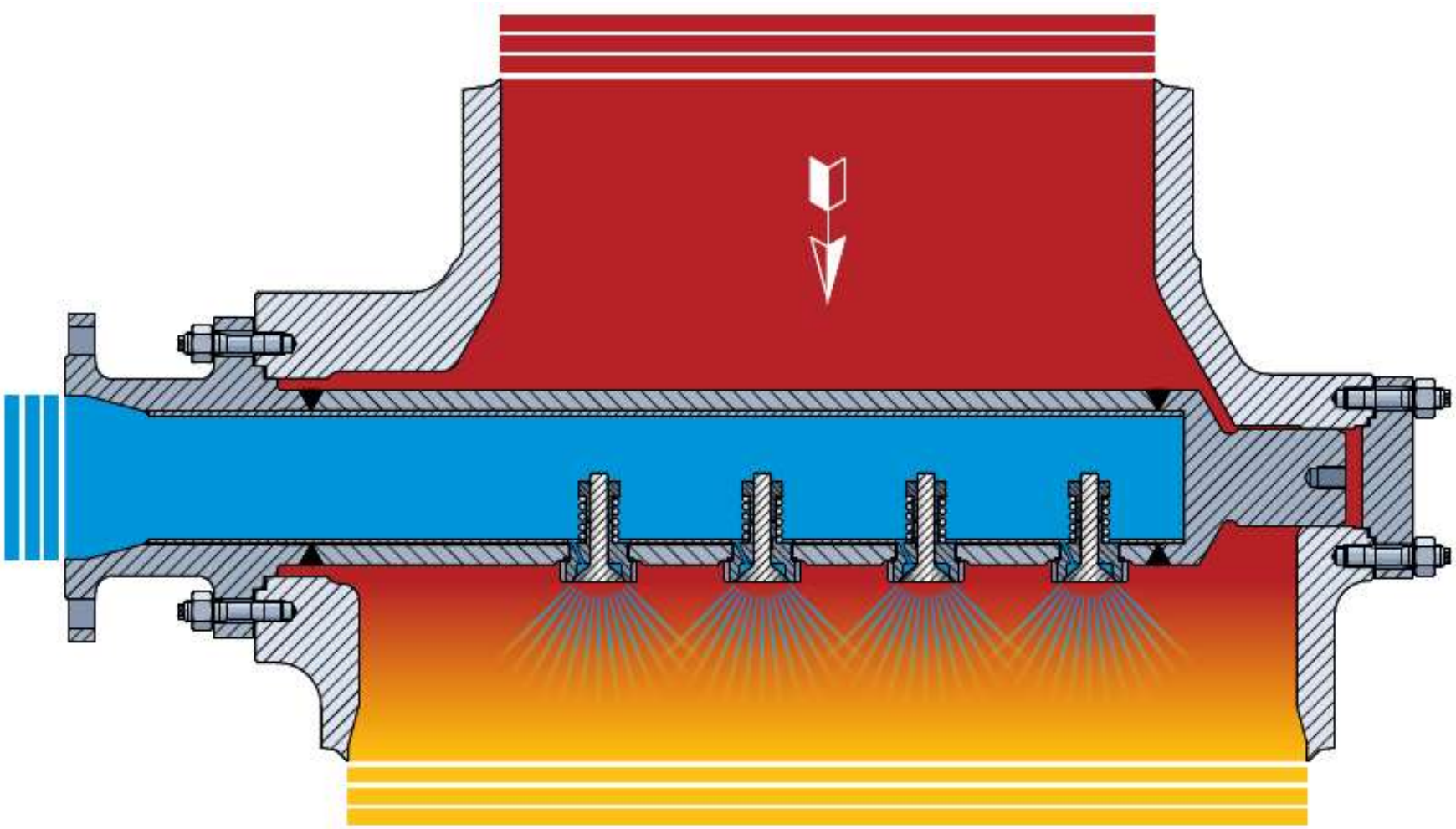
IP spray bar steam cooling



Spray bar injection, with thermal insulation and different spring settings

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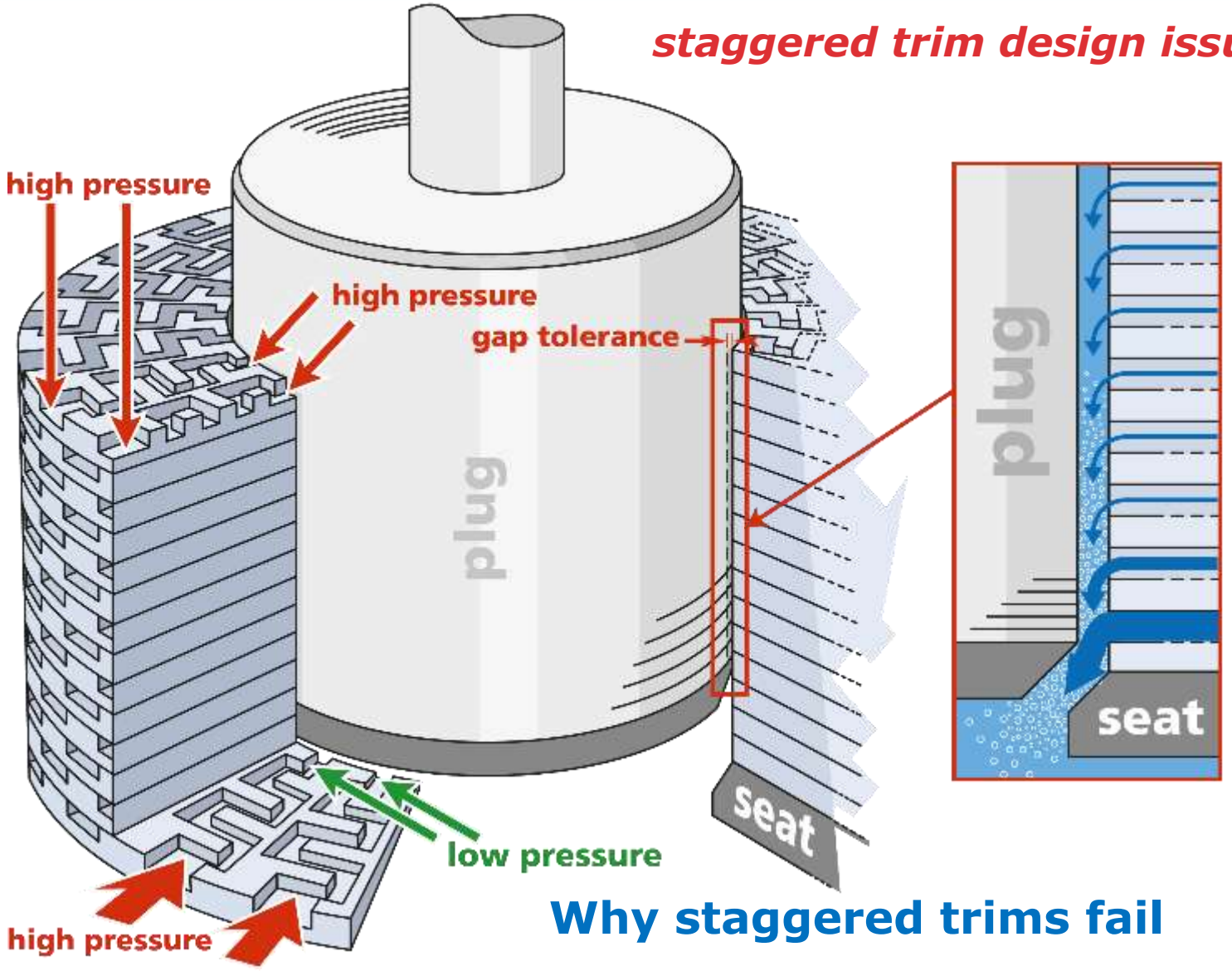
OTC valves

staggered trim design issue?



Why staggered trims fail

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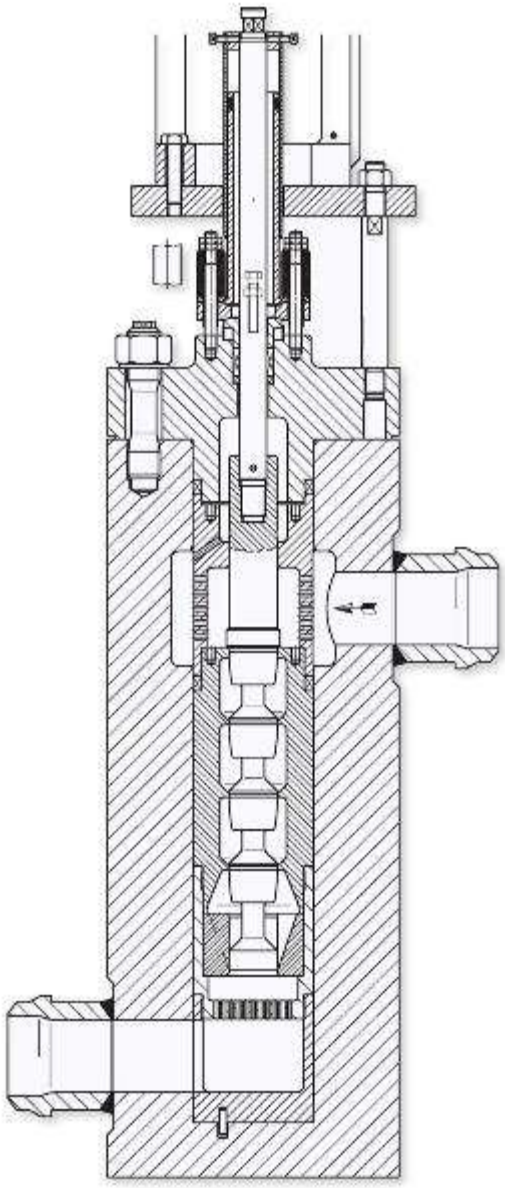
OTC valves

Valve Design

Cascade valve with 5+1 stages

- *5 stages controlled pressure reduction*
- *5 stages anti cavitation trim*
- *5 times pressure reduction at any case dp<35 bar*
- *5 parabolic stages not sensitive to particles*
- *5 stages without break point*



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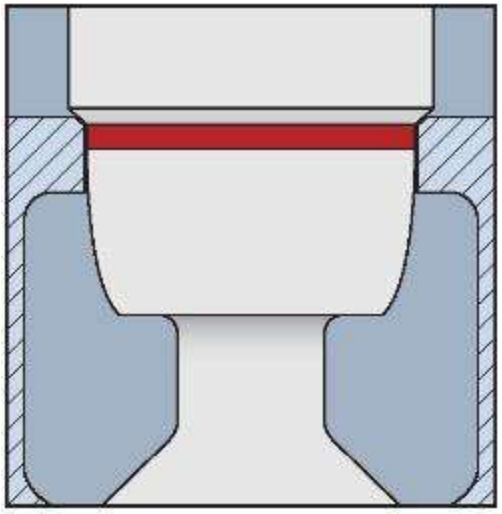
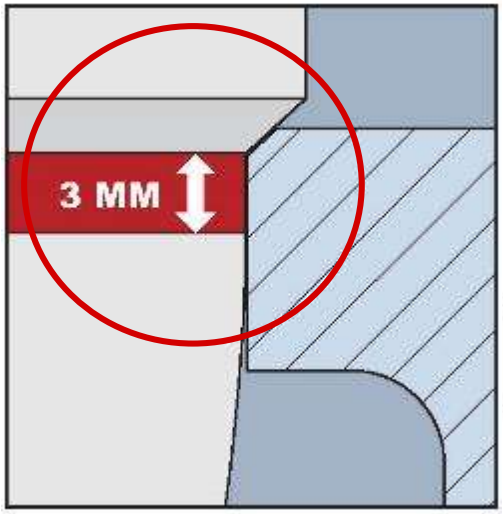
OTC valves

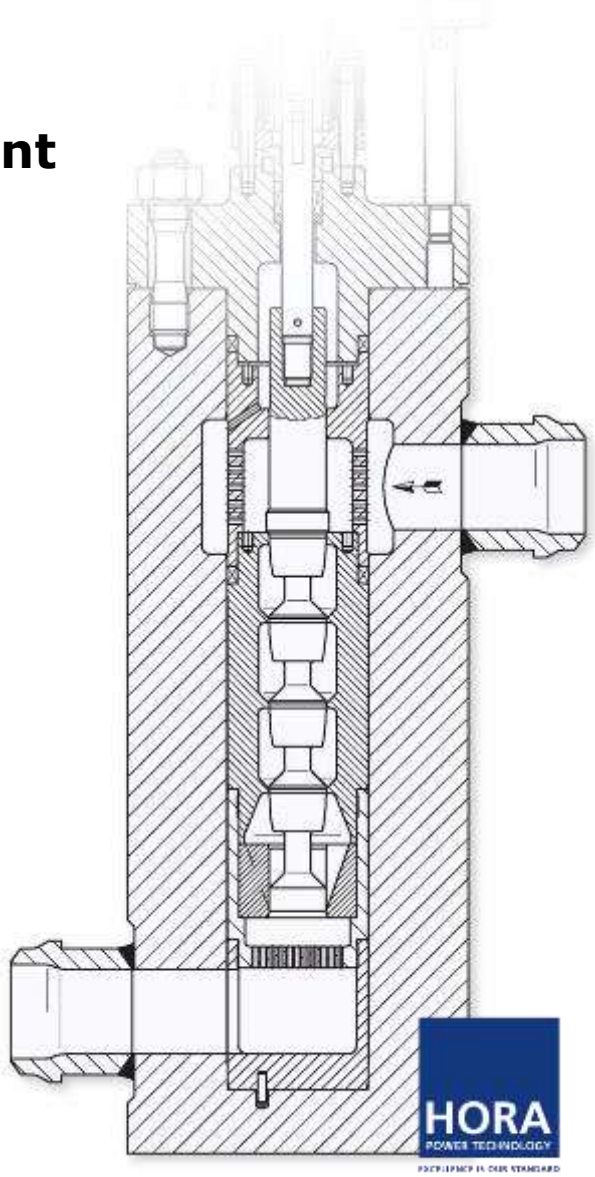
Valve Design

Special characteristics to achieve requirement

- *design with high utilised seat capacity (40mm)*
- *3 mm stroke for annular gap control*
- *Repeatable shutt off*
- *30 mm stroke to increase control accuracy*
- *pneumatic actuator with assessment factor 4*

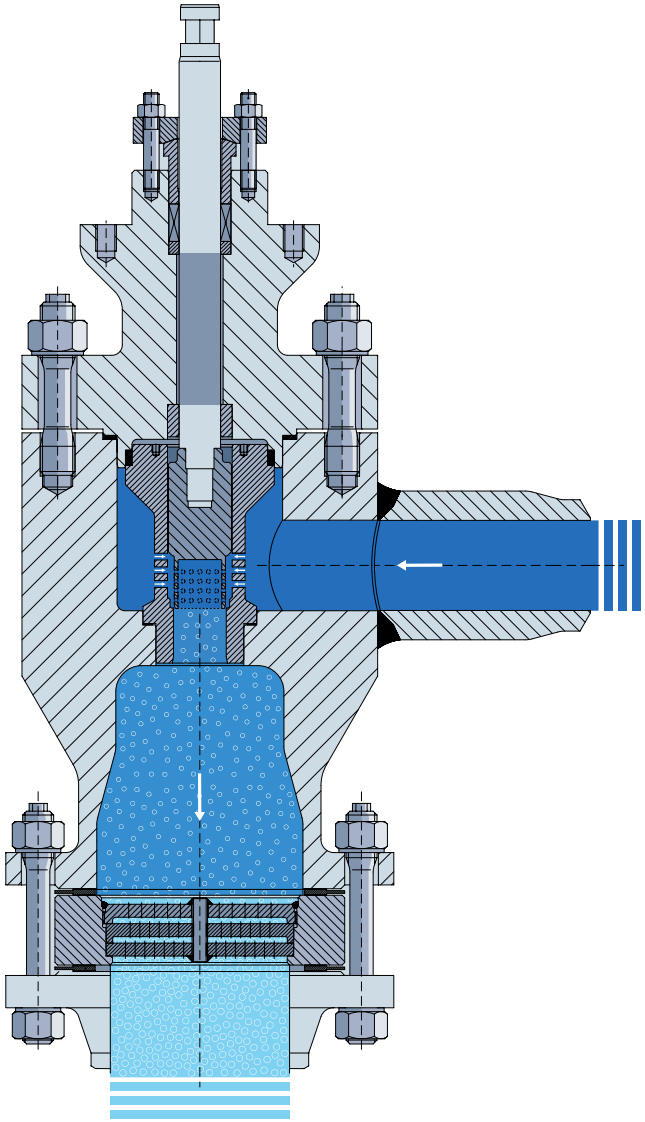






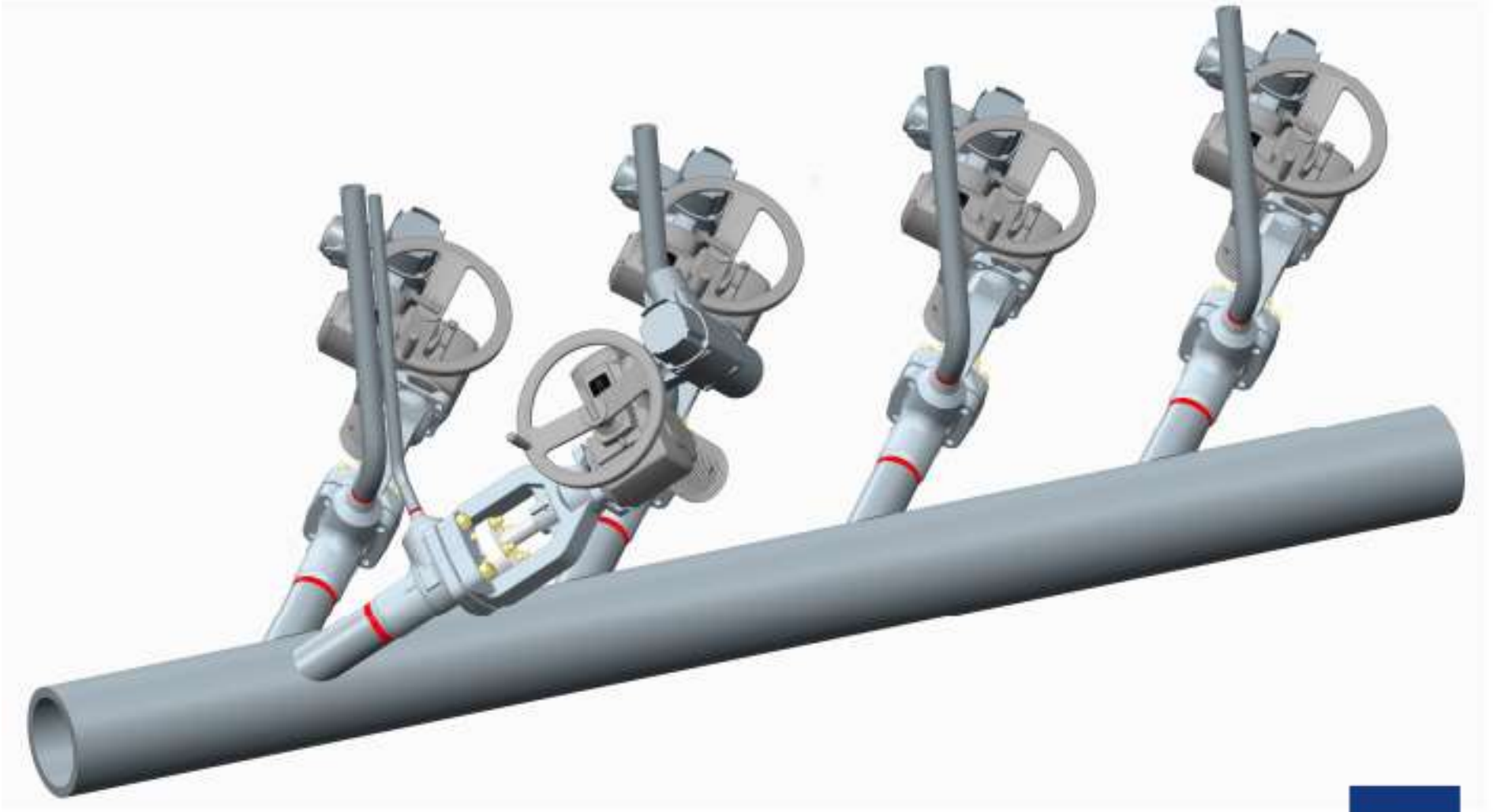
Fundamentals of Drain valves

De-Watering control valve Angle type



Throttling plates to be placed close to the draintank

Blow down header design

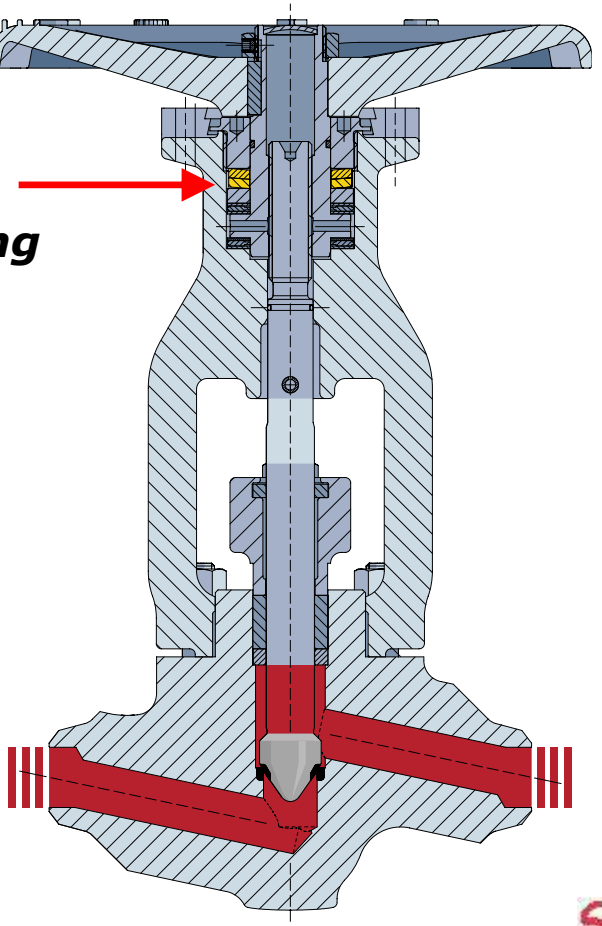


Arrangement of drain and blow down valves

Manufactured Valves

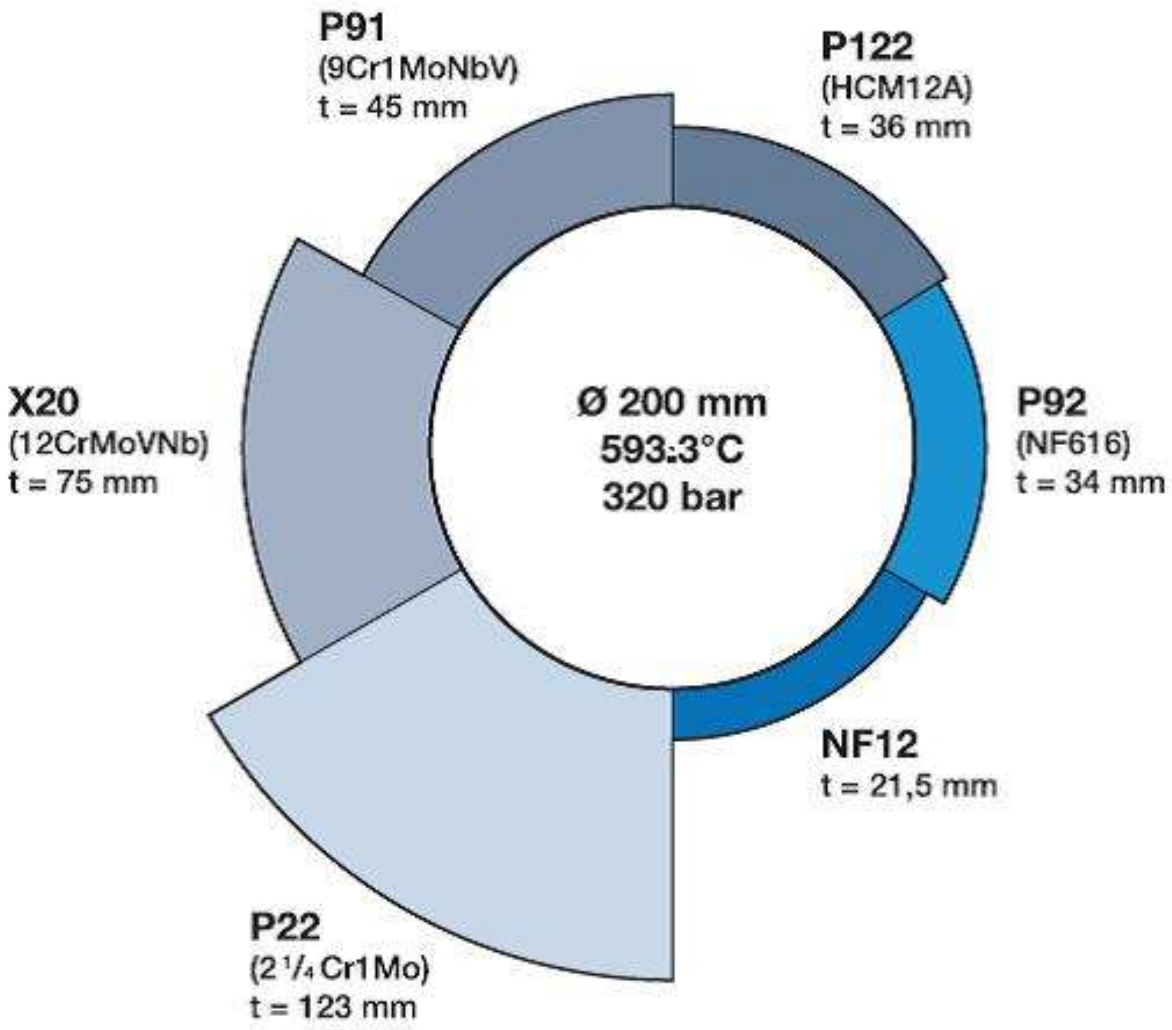
High pressure globe valves

Thermal effects compensator spring



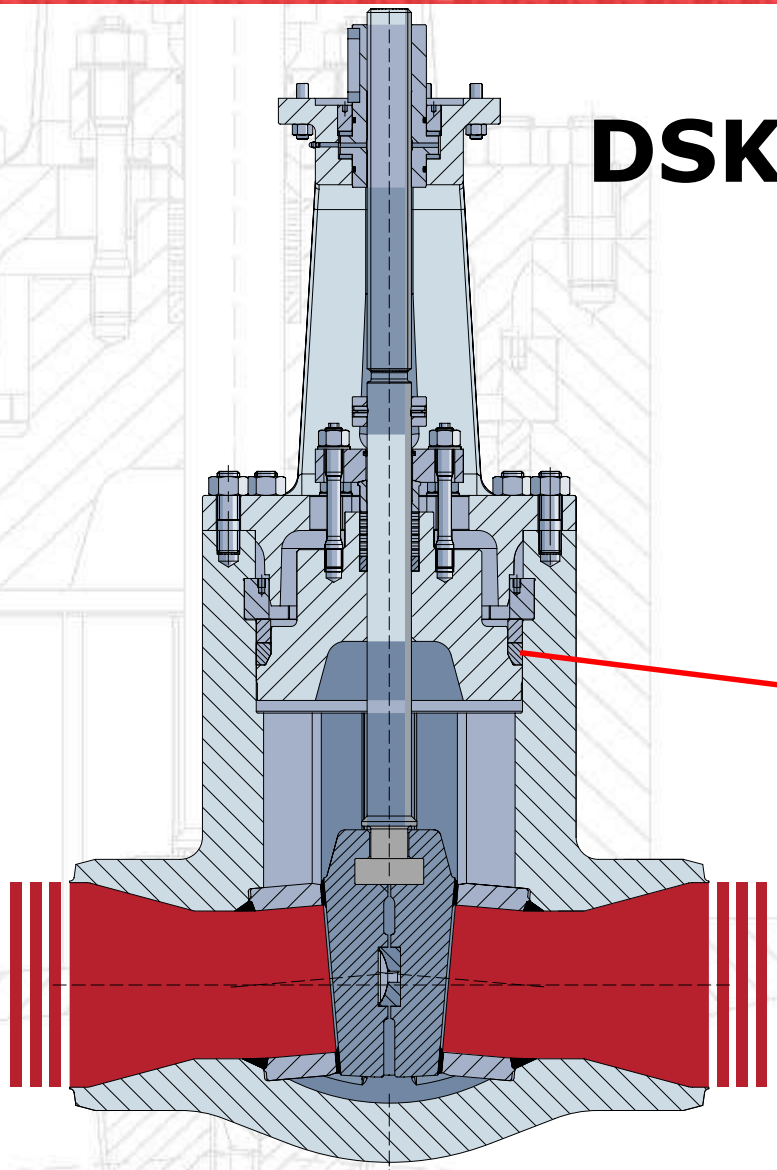
Forged globe valve, F22, P91, BWE

Material comparisson

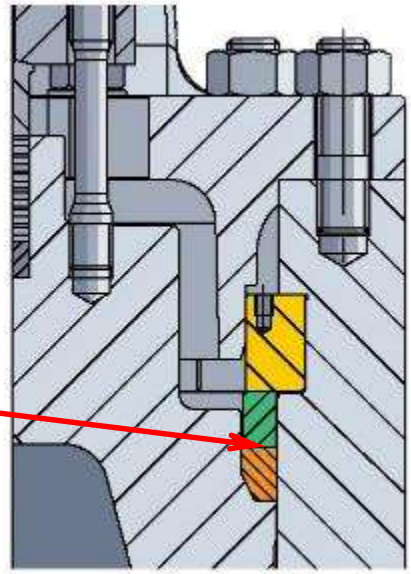


Wall thickness related to material.
Thin means less stress

Tapered parallel slide gate valve



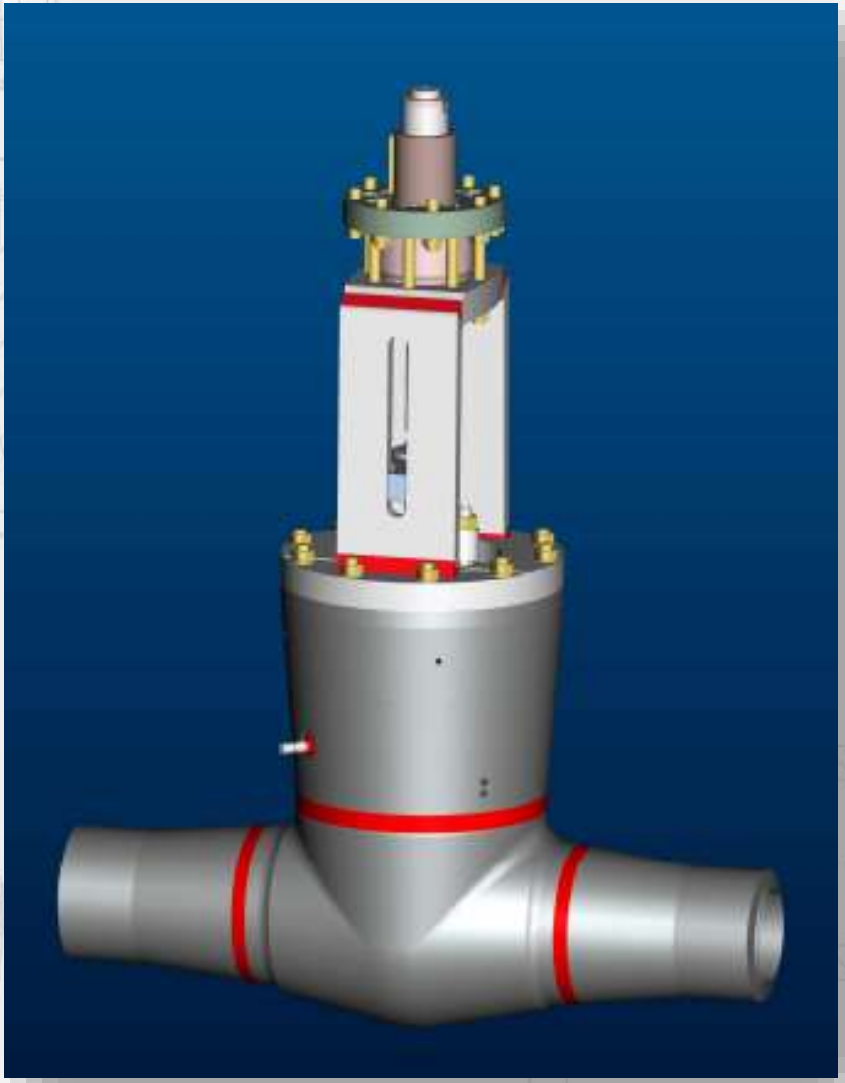
DSK 26/40



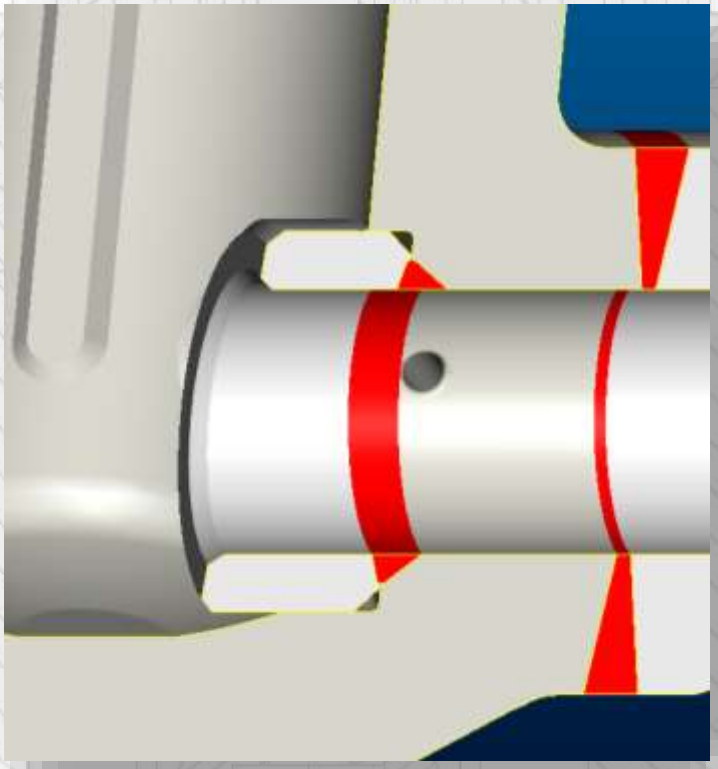
Pressure seal bonnet
with spacer ring

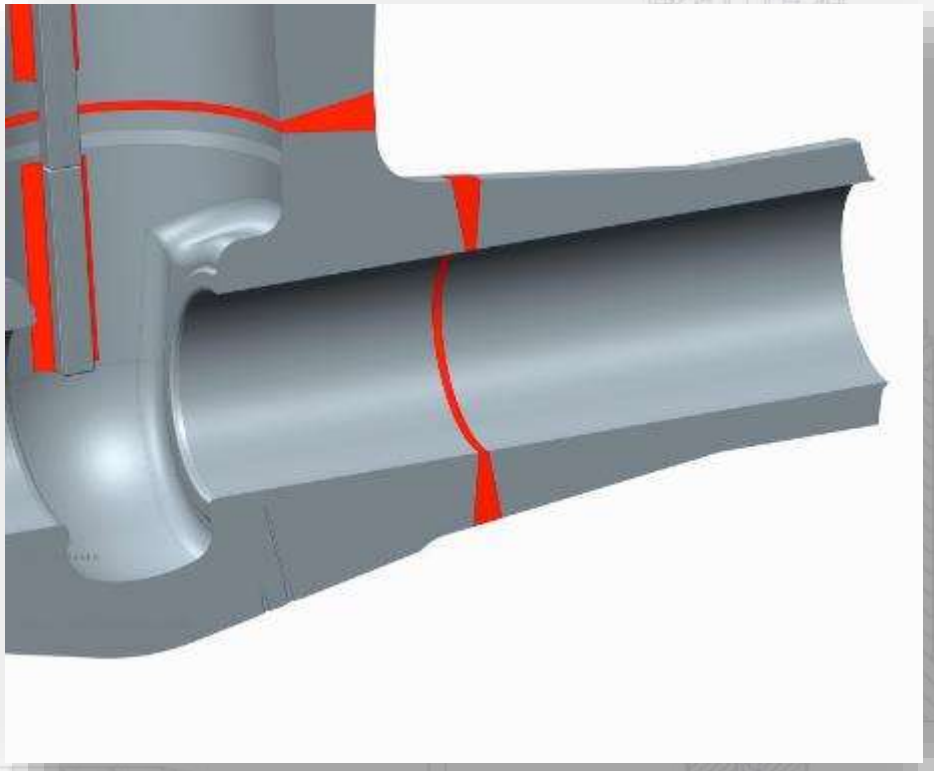
Forged body, F22, P91, P92, long seat retainers, hard faced

minimized material stress



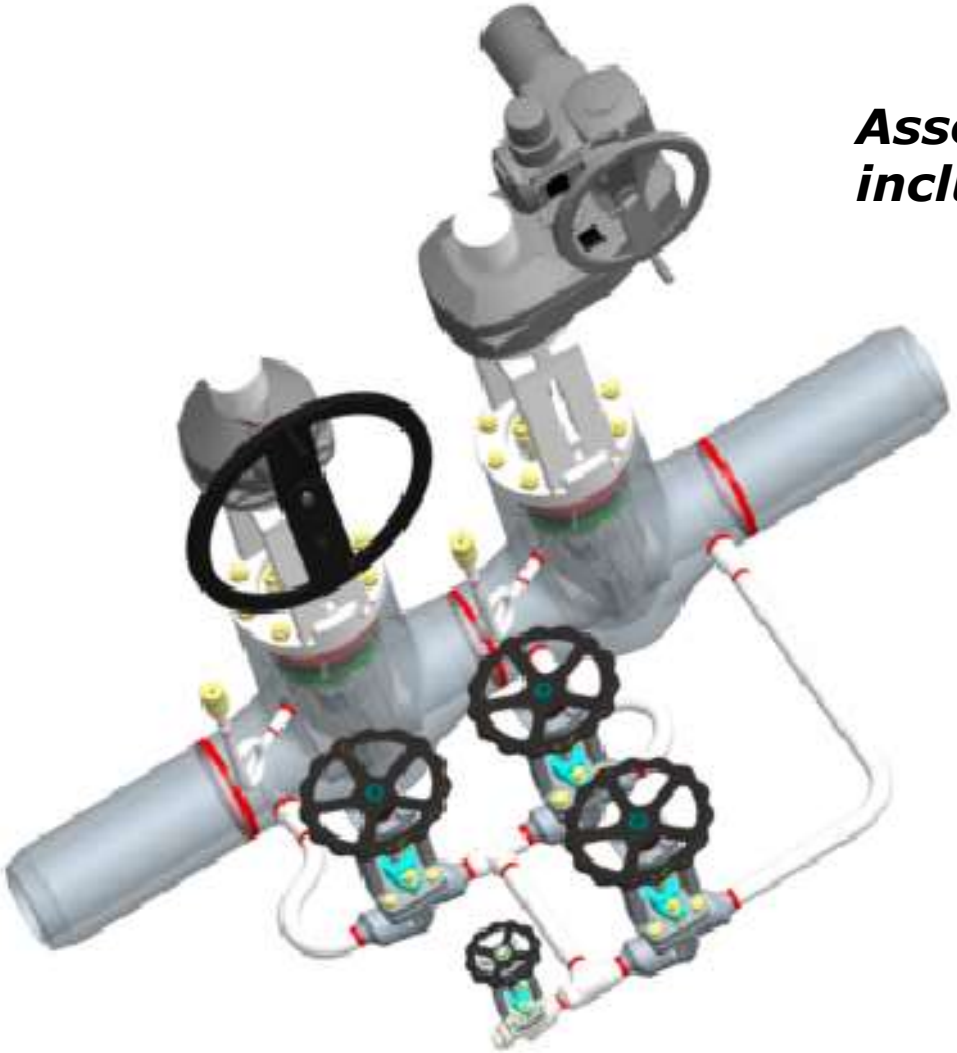
Comparison of variants





Forged bodies, stellited seats
standard seat retainer and
new, integral seated

Manufactured Valve assemblies



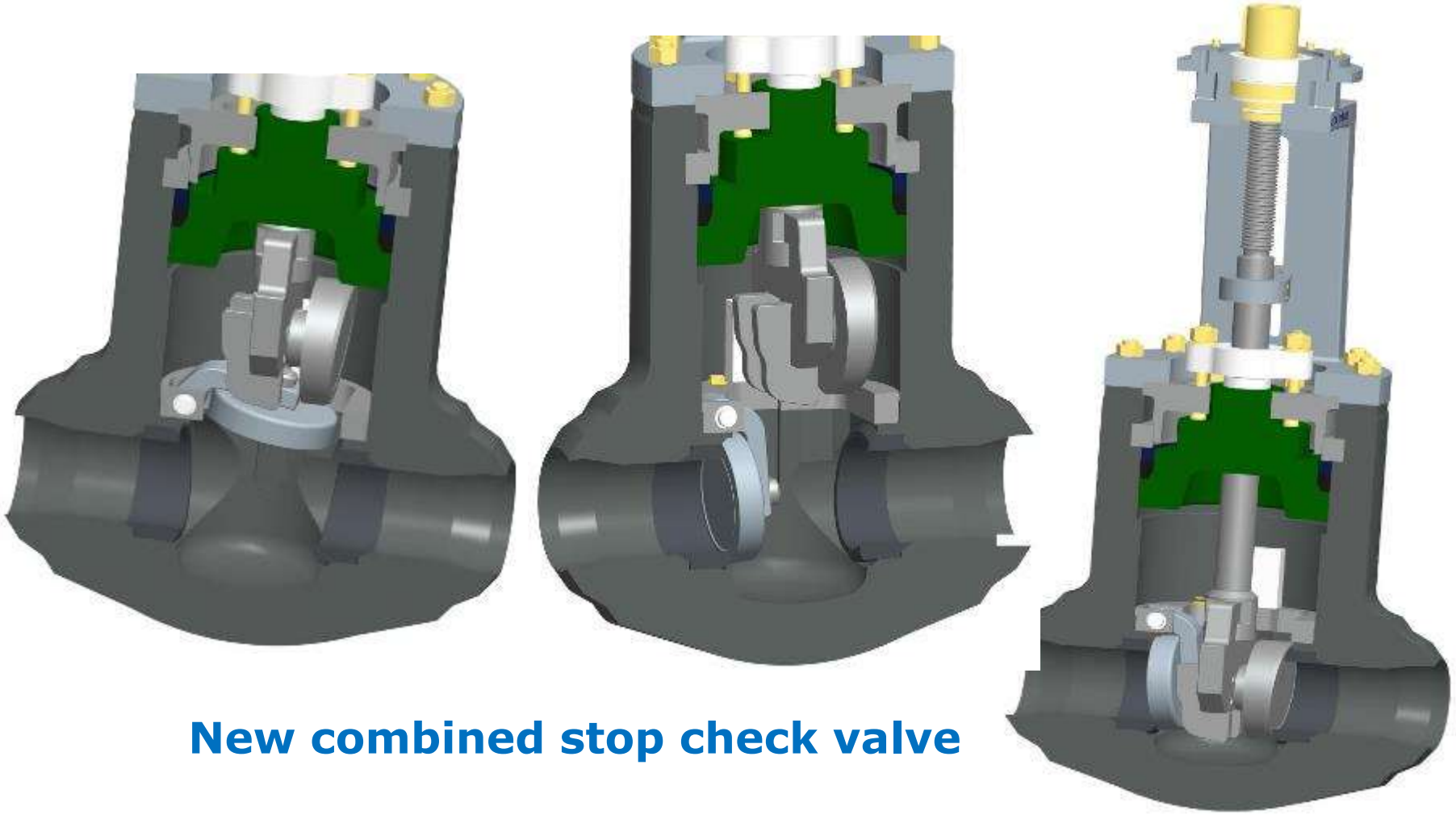
Assembly of valves including by passes

Assemblies, easy to install

Manufactured Valves

Manufactured from forged steel plate, F11, F22, P91

Stop check Valves (based on gate valves)



New combined stop check valve

- less pressure drop
- stable pressure
- less weight