



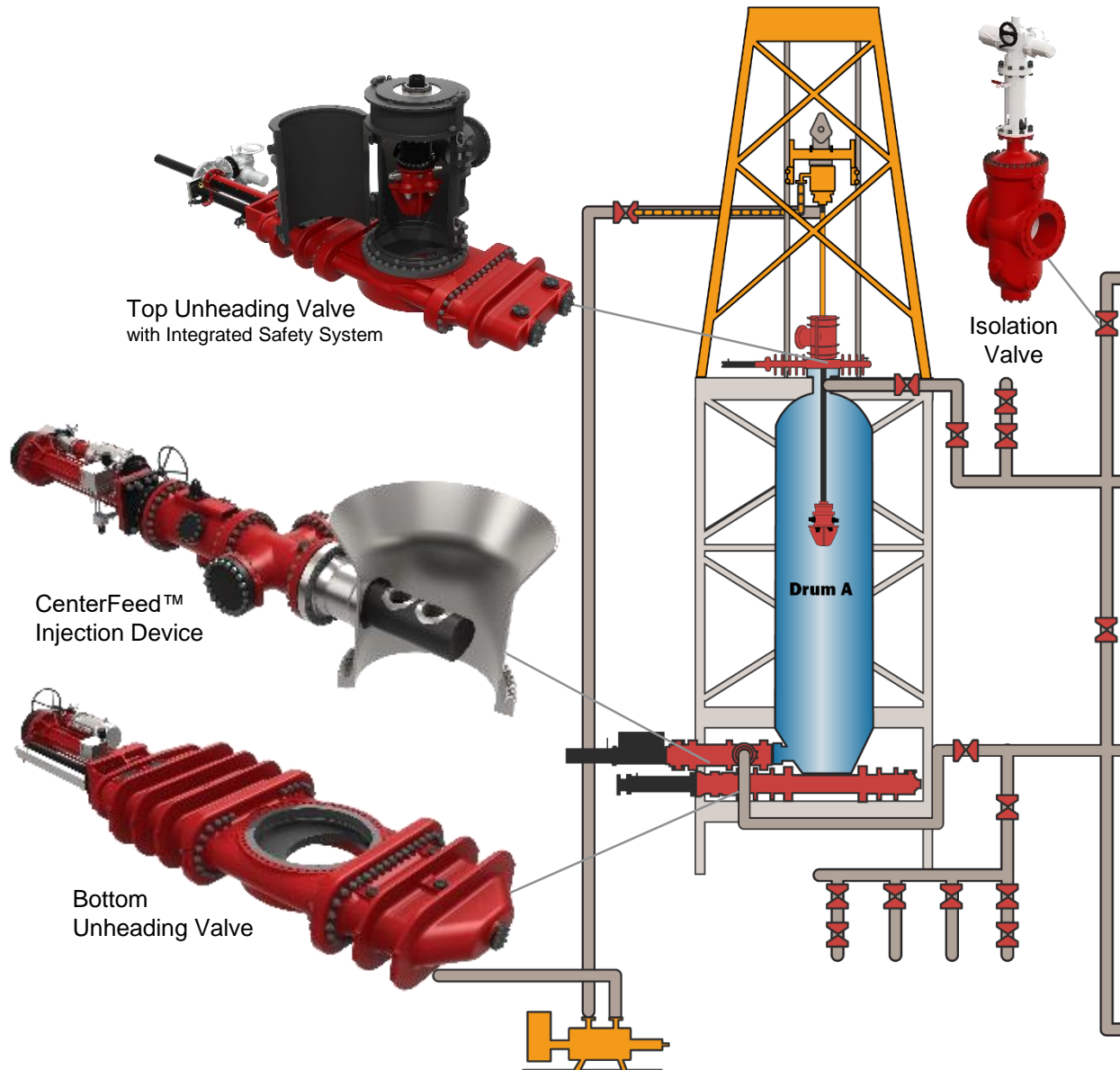
Continuous Innovation

Of Products and Services

Stefan Jansen
Senior Sales Manager, Europe/Russia

October, 2019

Innovation and Experience



**1,000+
Units Sold**

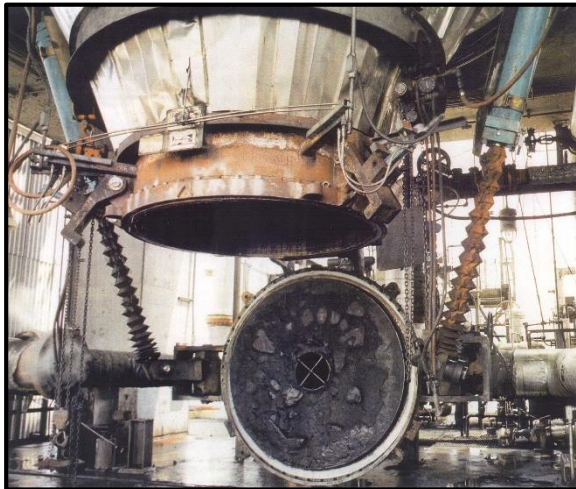
**100+
Refineries
Satisfied**

**20+
Countries
Served**

**Millions of
safe cycles**

**Leading
Global
Supplier**

DeltaValve Solved Major Industry Problem



Manual Unheading

- Unsafe for Operators
- Longer Cycle Times
- Higher Maintenance Expenses
- Lower Unit Throughput

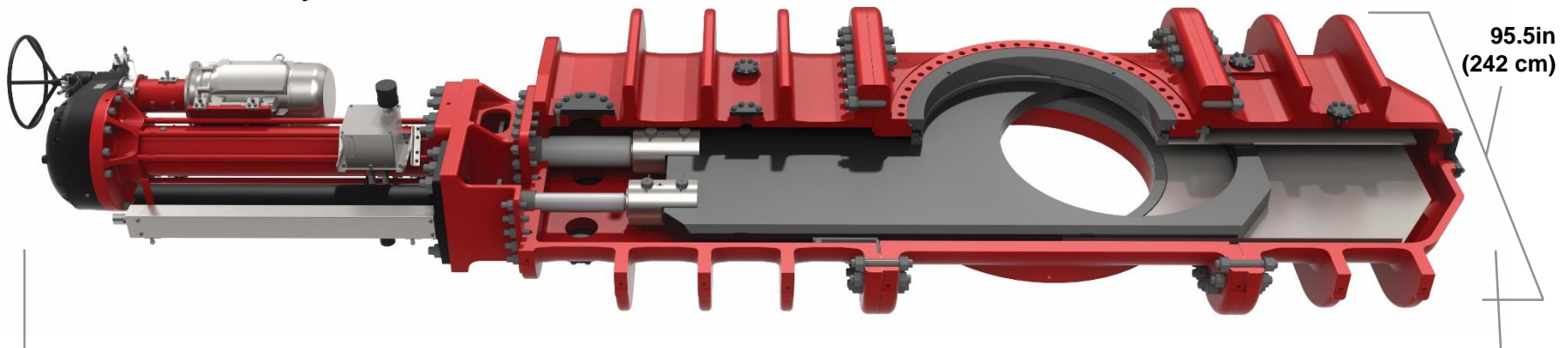
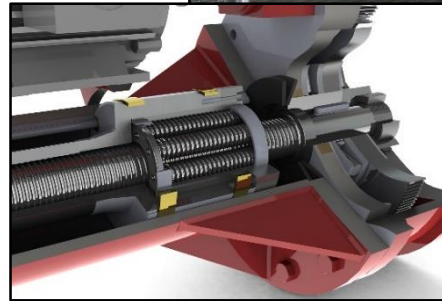
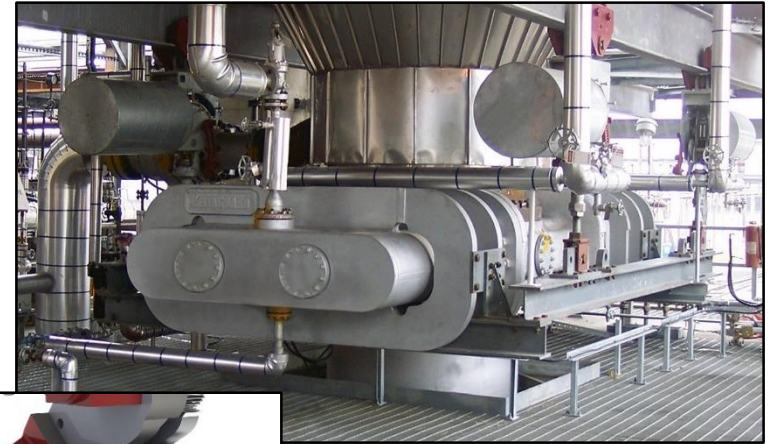


DeltaValve's Bottom Unheading Valve Solution



DeltaValve

- Invented Bottom Unheading Valve in 2001
- 400+ Units Sold World-Wide
- 100+ Refinery Installations
- Safe, Fully Automated, Simple Design
- Efficient Planetary Roller Screw Actuator
- Ultra-low Steam Consumption
- Zero Recordable Injuries
- Zero Incidents
- No Downtime
- 2+ Million Cycles



351.7 in (893 cm)

95.5in
(242 cm)

Traditional (Manual) Coke Drum Top Unheading



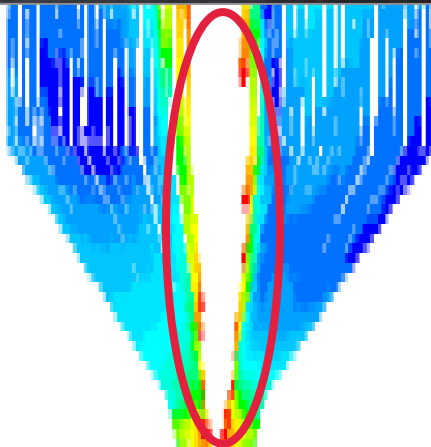
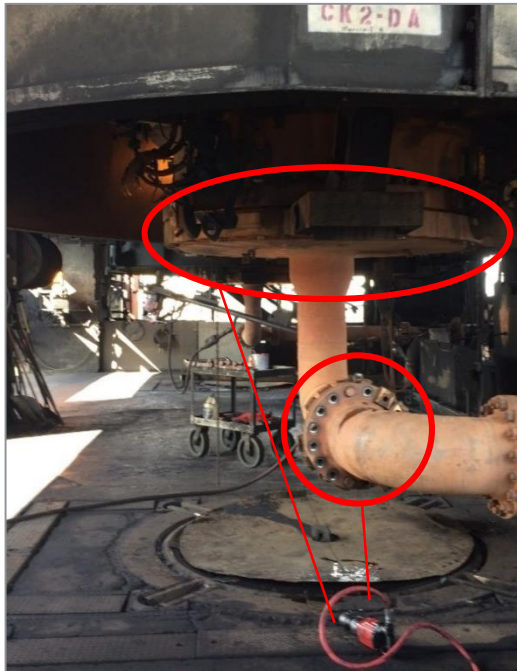
DeltaValve Top Unheading Device/ Integrated Safety System Solution

- 270+ Units Sold
- Electric and Hydraulic Actuation
- Built-In Drill Stem Guide/Blowout Diverter

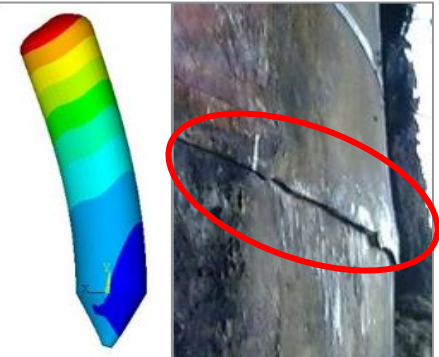
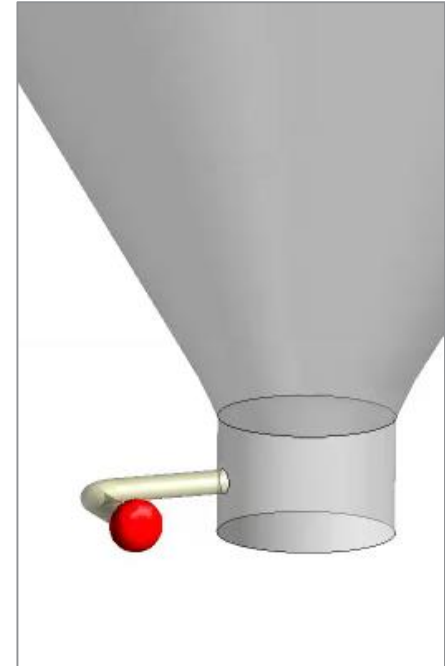
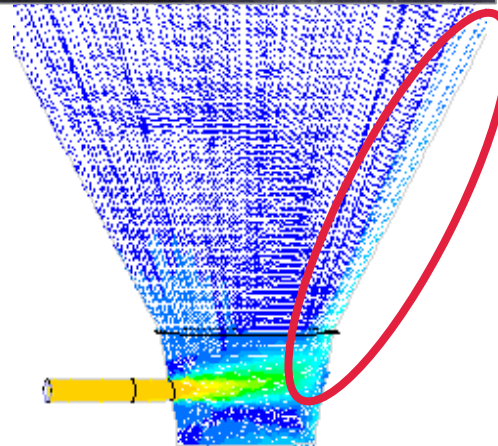
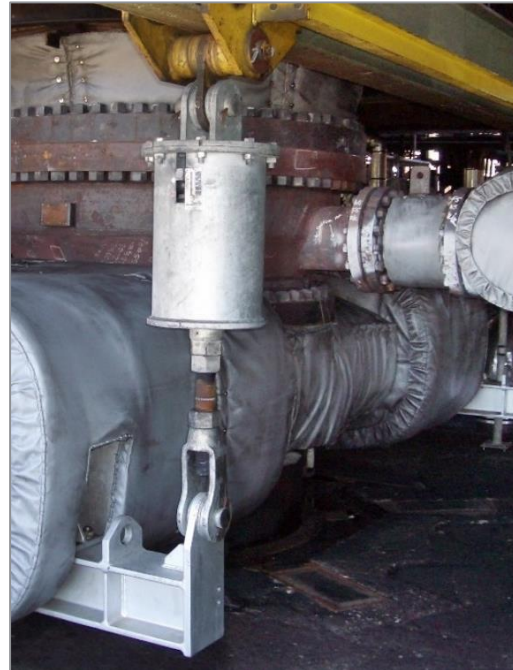


Transition from Bottom Feed to Side Feed

Bottom Feed Entry



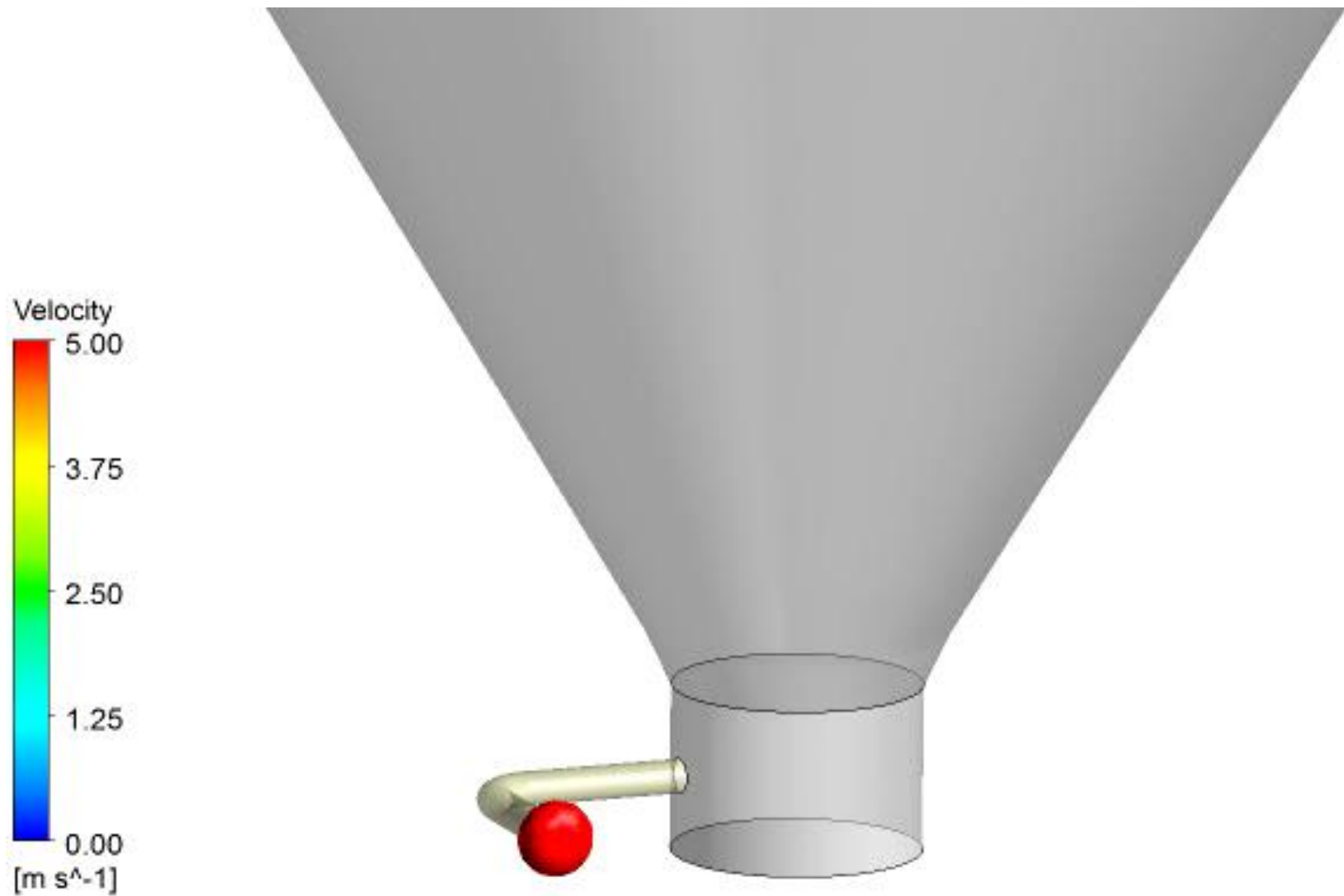
Side Feed Entry



Transition from Bottom Feed to Side Feed

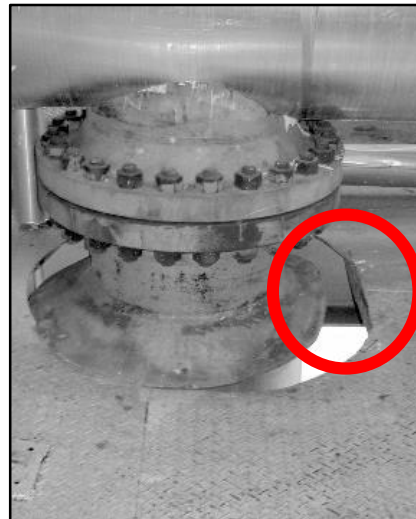


DeltaValve

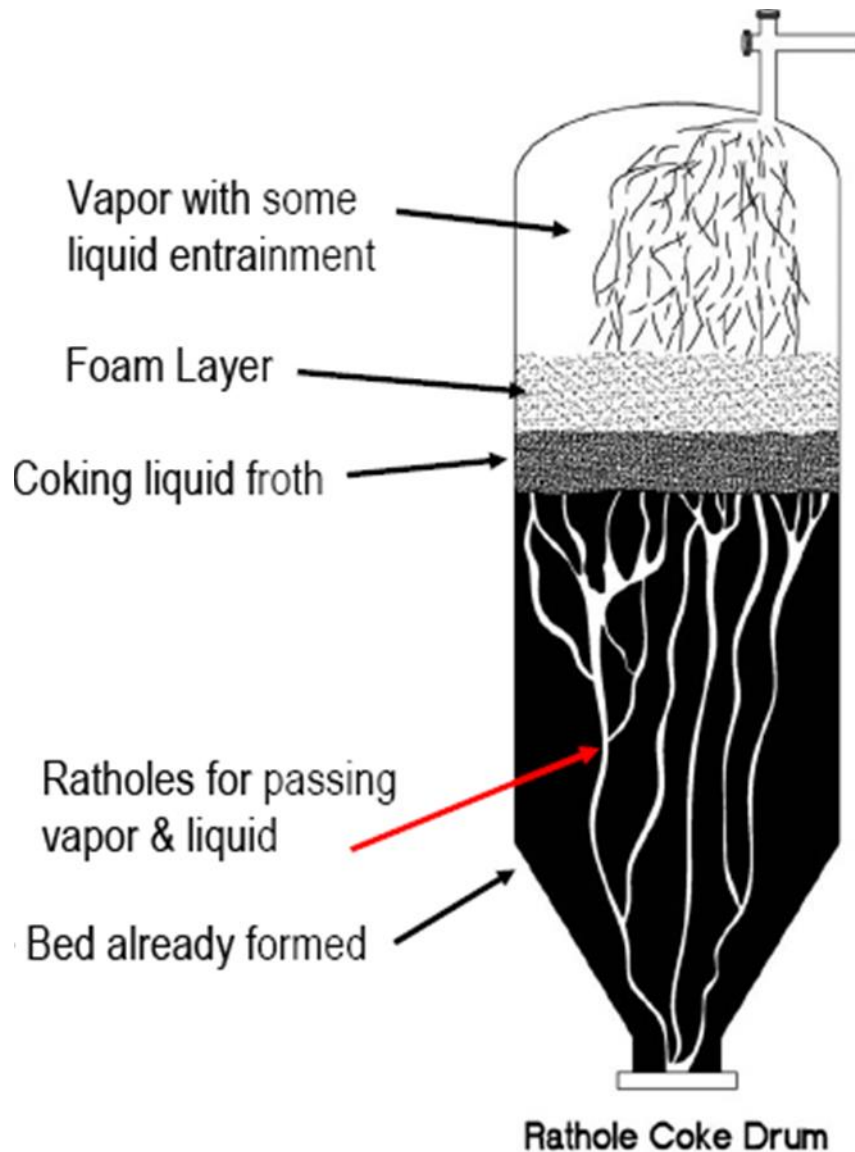


Side Feed Challenges

- Feed channeling against the drum wall causes the following:
 - Unsteady coke drum during feed
 - Drum tilt (banana effect)
 - Uneven quench
 - Localized hot spots
 - Top head steam geysers/blowouts
- Inconsistent rates of temperature change negatively impact drum fatigue life at the following locations:
 - Lower transition cone
 - Drum wall
 - Coke drum support skirt



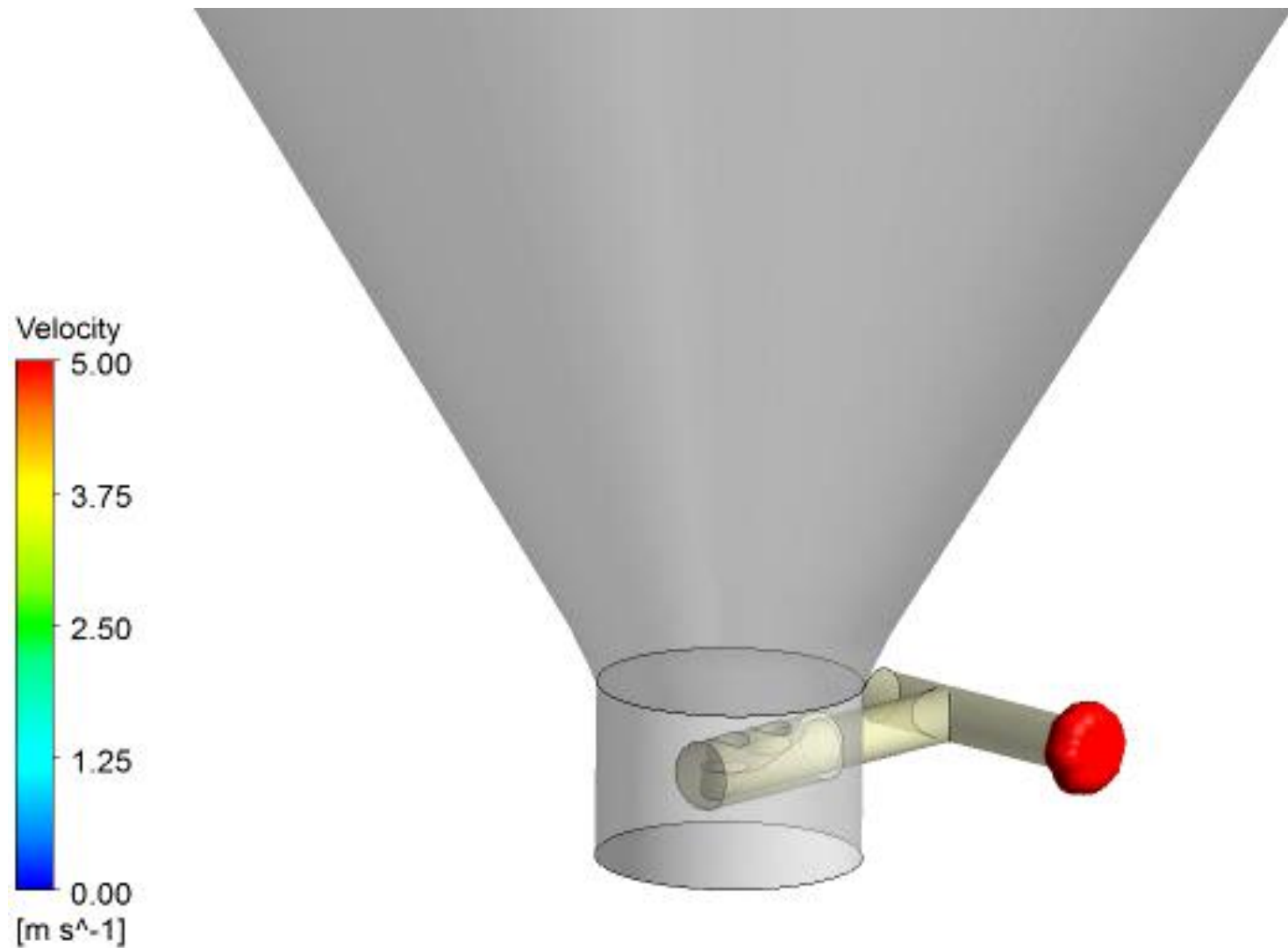
Coke Column Central Formation



**improved feed and quench
channeling**

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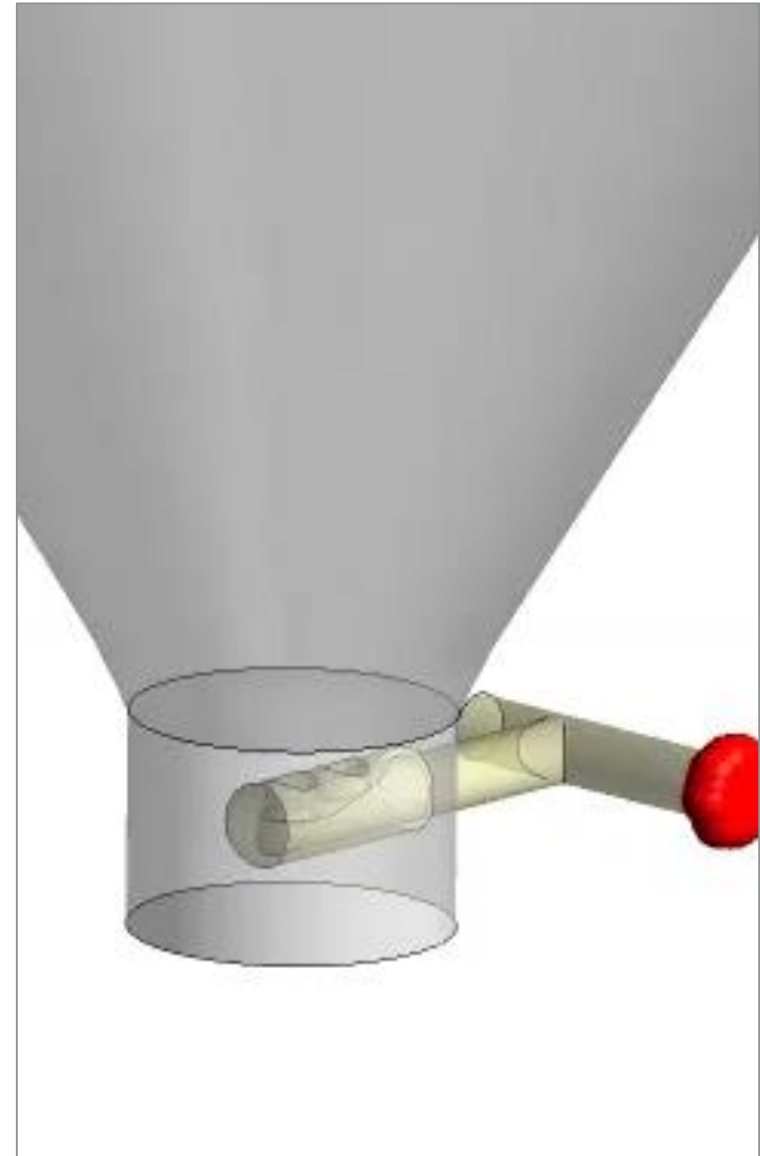
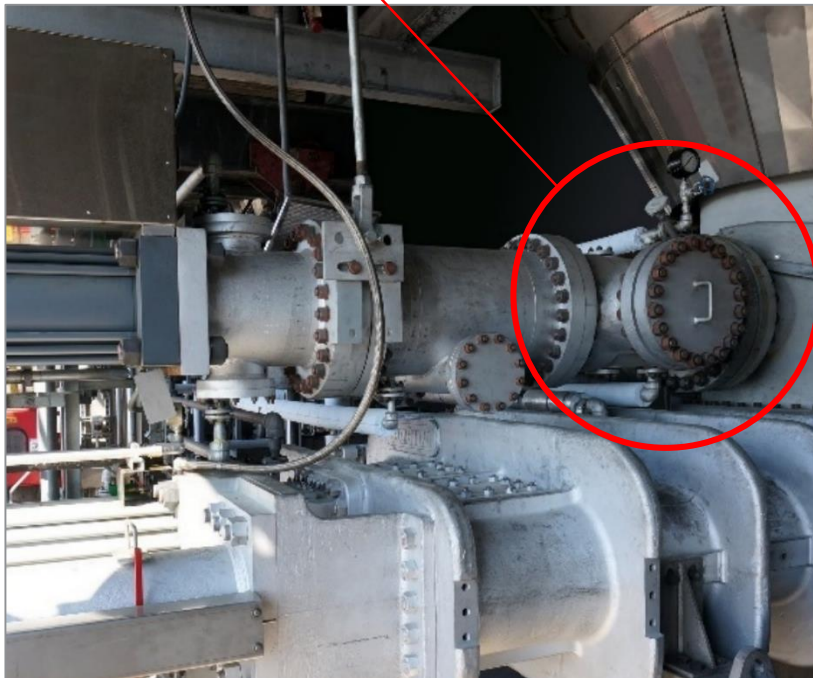
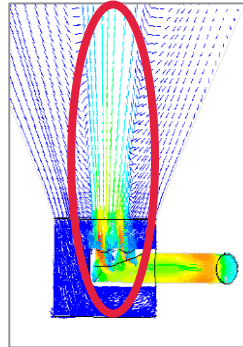
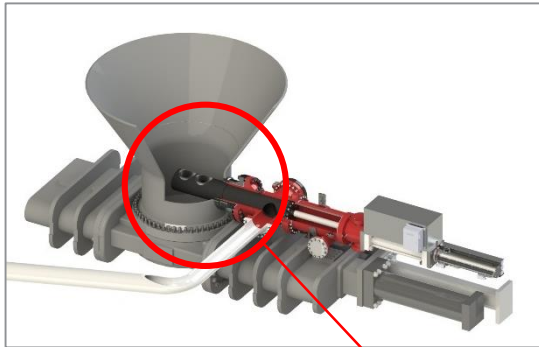
**coke drum life time
extension detected**

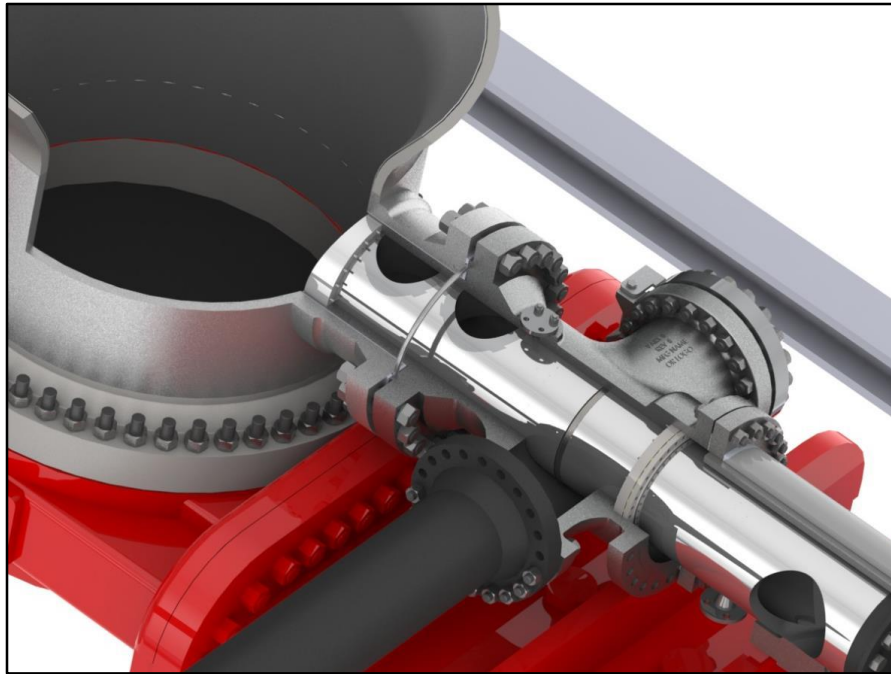


DeltaValve CenterFeed™ Injection Solution

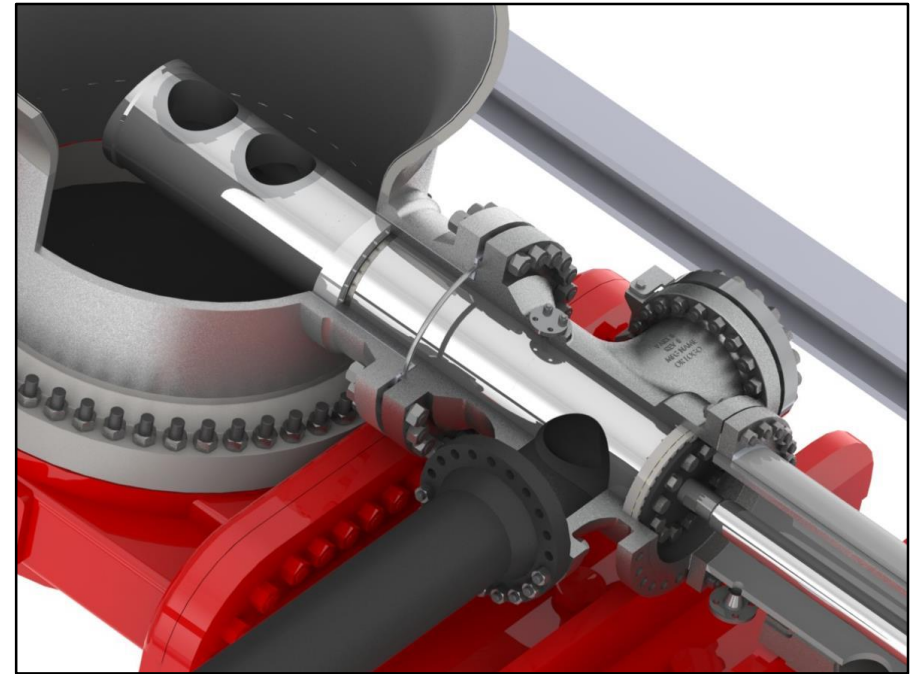


DeltaValve





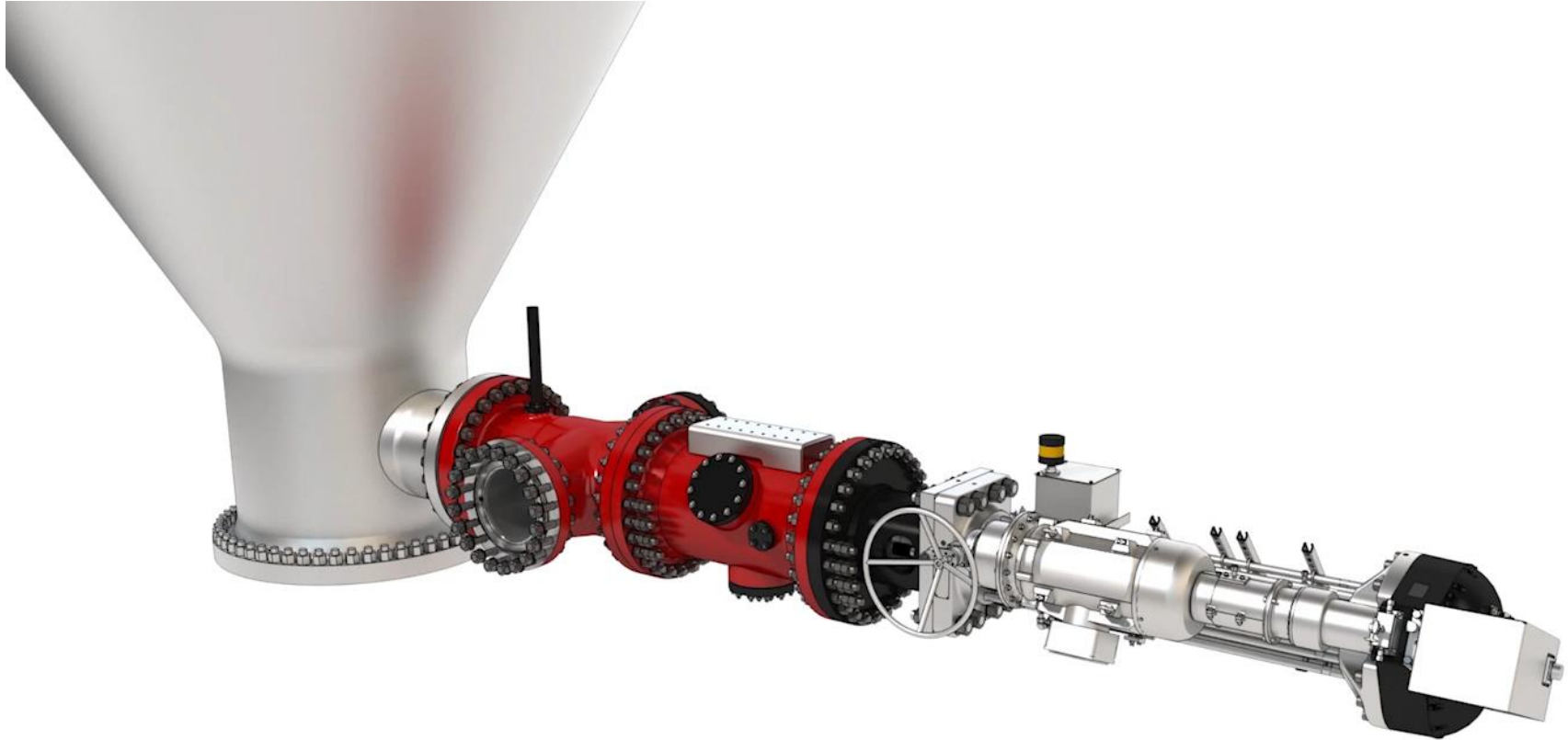
Retracted Position



Extended Position

- Technology proven since 2011
- 66 units sold / 50+ in negotiations
- Improved feed and quench channeling
- Reduced drum stresses
- Increased drum life

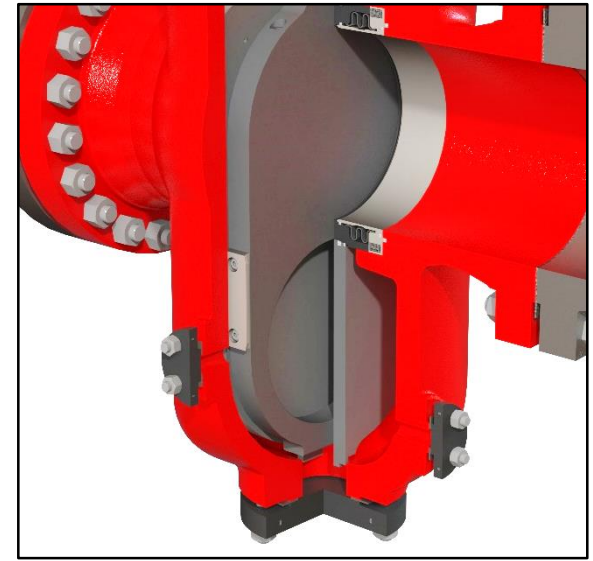
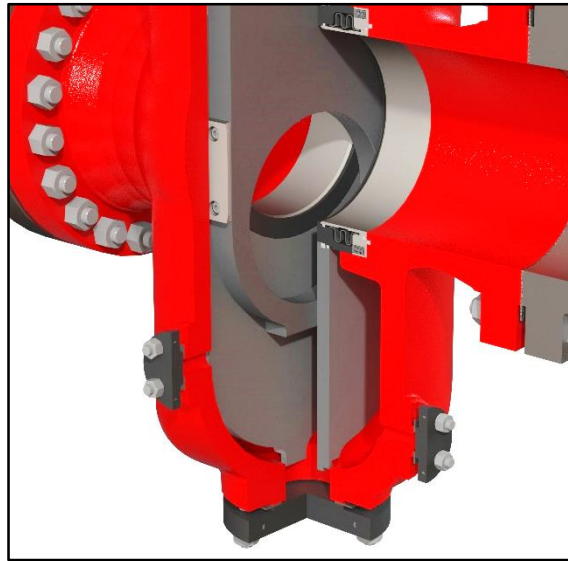
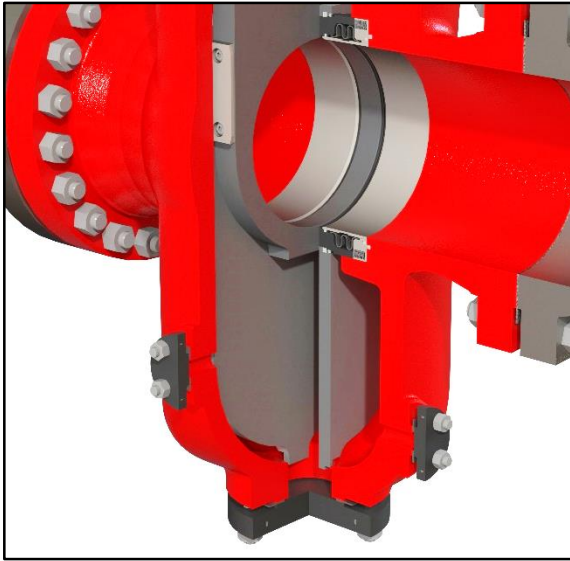
CenterFeed Operation



DeltaValve Delayed Coker Isolation Valves

- 125+ Units Sold
- Full Bi-Directional Isolation
- Dual Live-Loaded, Self Cleaning Metal Seats
- In-line Maintainable
- Ultra-low Steam Consumption
- Available in B16:10 Full Port Ball Valve, Gate Valve Short Pattern, and Full Port Wedge Plug Face to Face Configurations
- Customers and Licensors Approving 2 for 1 Configurations
- Electric and Hydraulic Actuation Options Available





Service

- Overhead Vapor to Blow Down
- Overhead Vapor to Fractionator
- Hydrocarbon Liquids/Vapor Bypass to Fractionator
- Feed Line
- Coke Condensate
- Drain to Coke Pad
- Wax Tailings/Steam

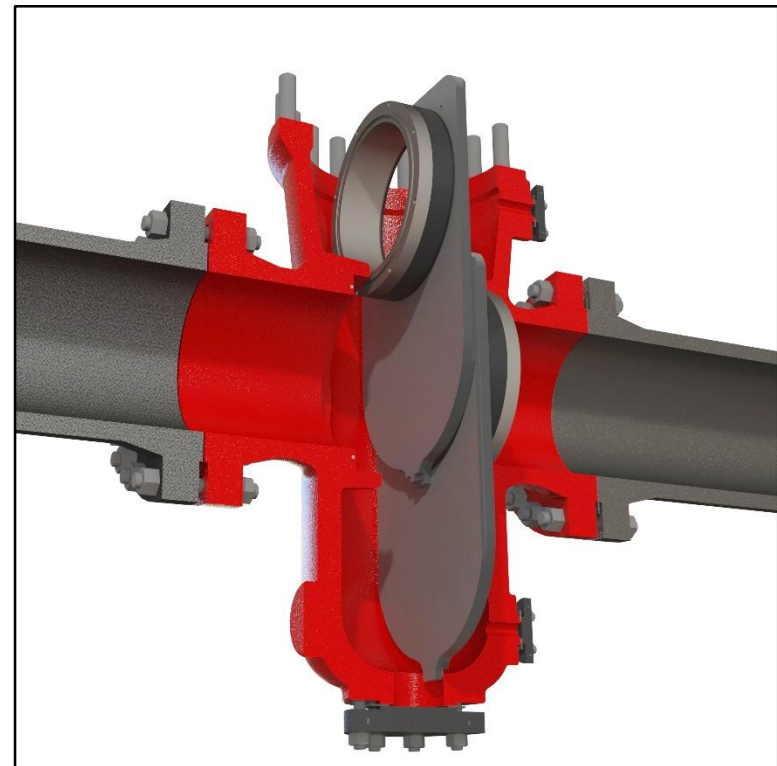
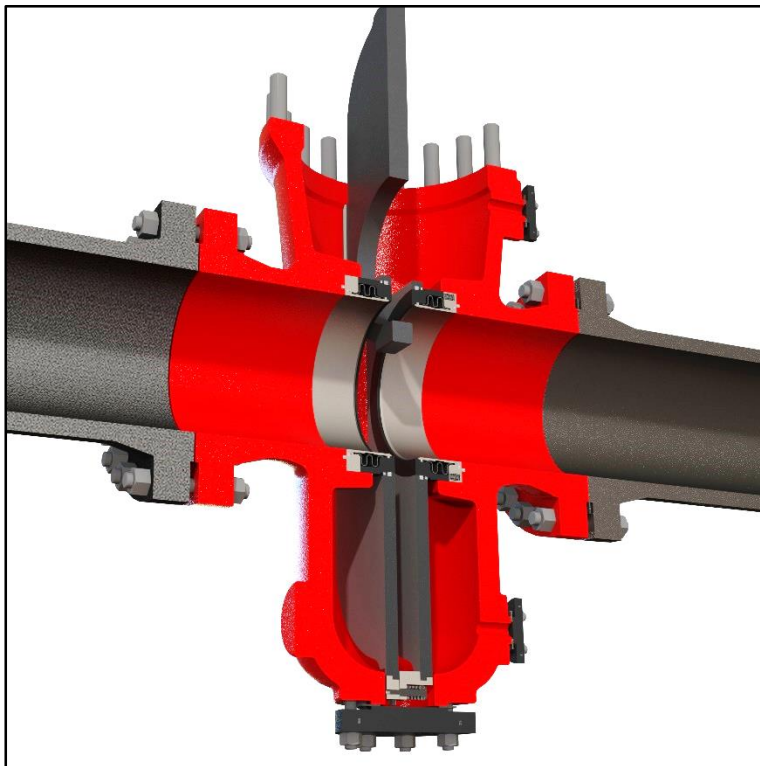
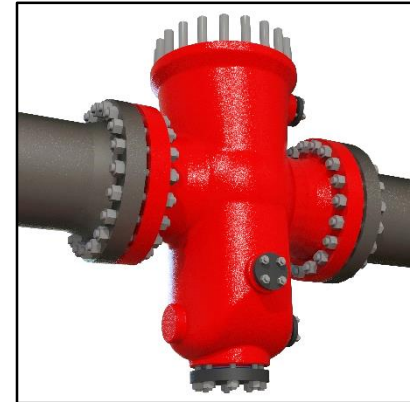
Environments

- Designed For Use In Challenging Environments
 - Hydrocarbon liquids near coking temperature
 - Solids laden hydrocarbon liquids
 - Dirty hydrocarbon vapor streams
 - On/off, **throttling service**

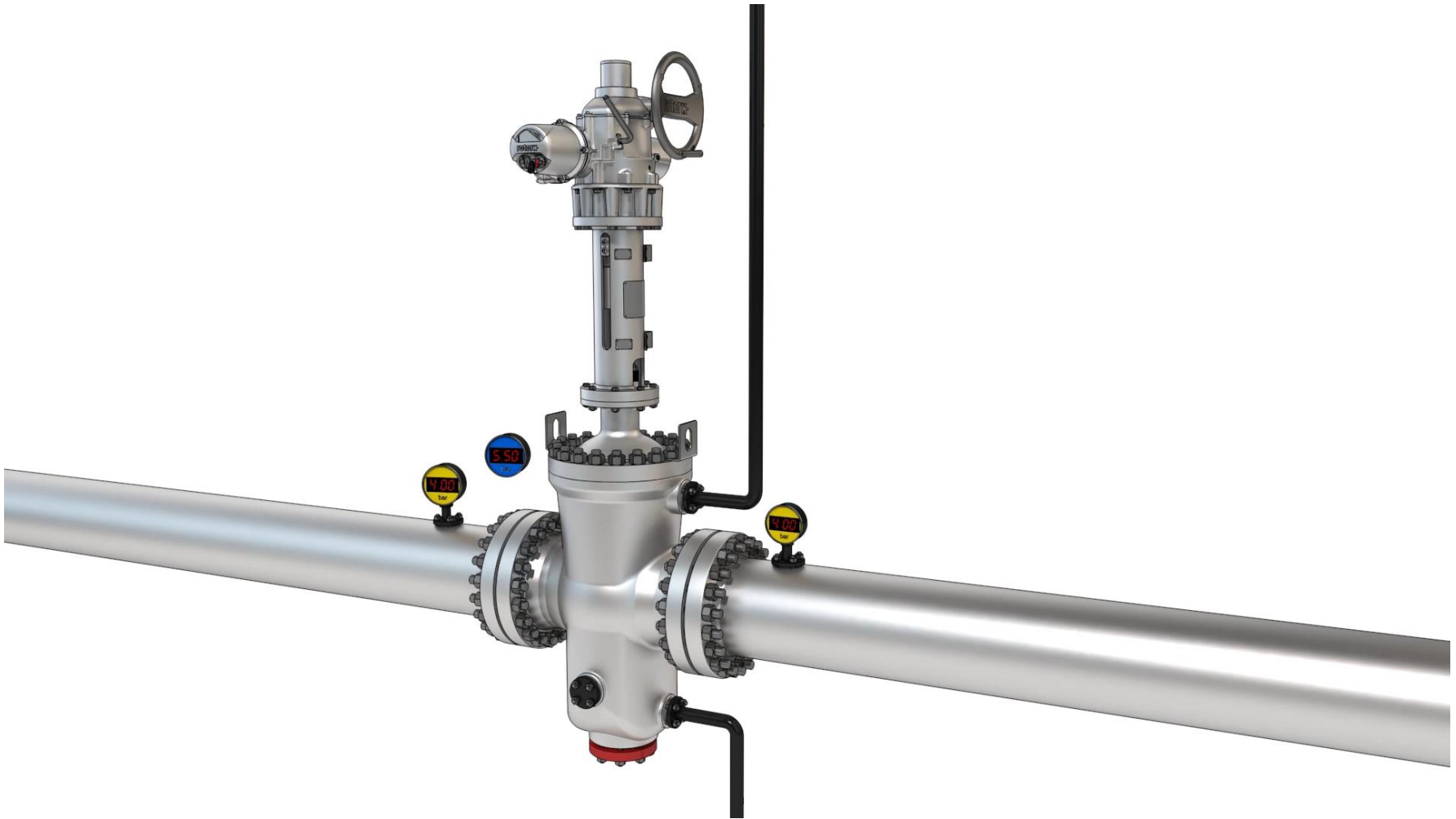
DeltaValve Isolation Valves

Top Entry / In Line Maintainable

- All Internal Components Accessible While Valve is Installed In Line
- Easy Disassembly and Re-assembly

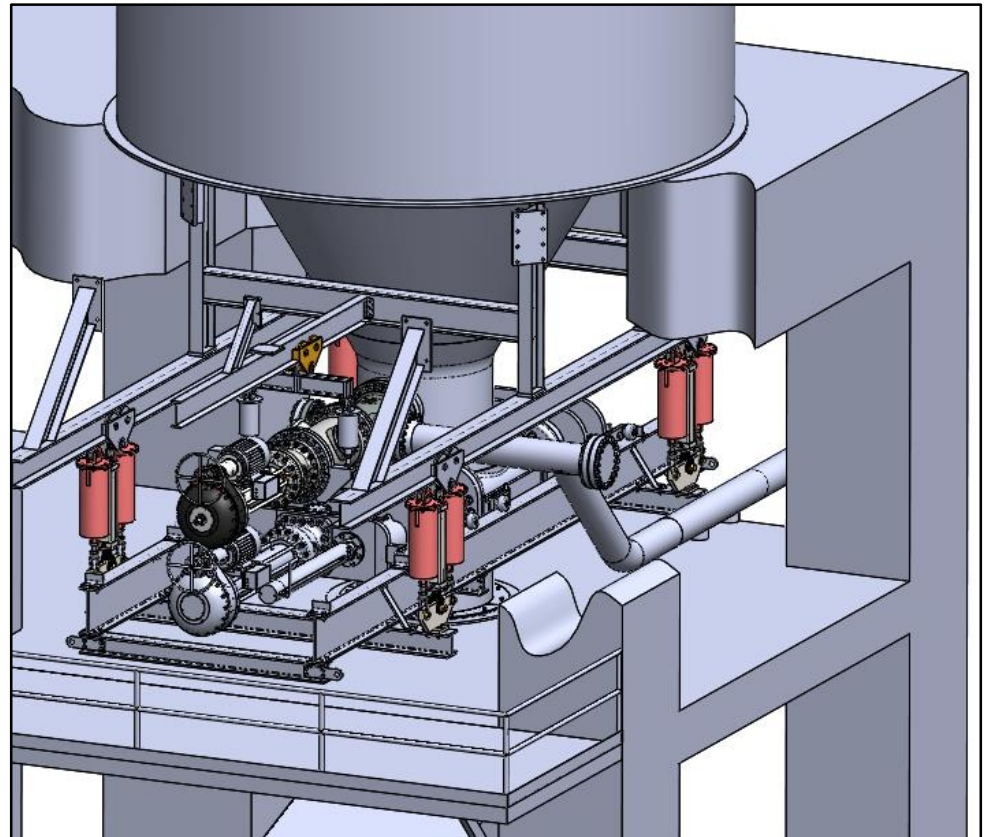
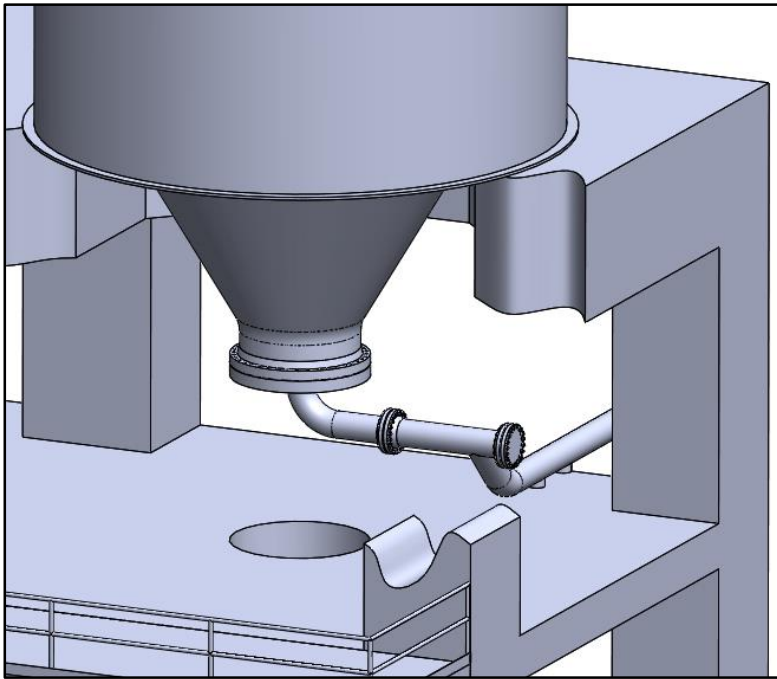


DeltaValve Delayed Coker Isolation Valve



Installation Services (Revamp Projects)

- Leveraging lessons learned from **100+** world-wide installations
- In-house engineering, design, procurement, and construction management
- Work with your EPC or direct hire
- **Goal: Streamlined low-cost revamp installation**

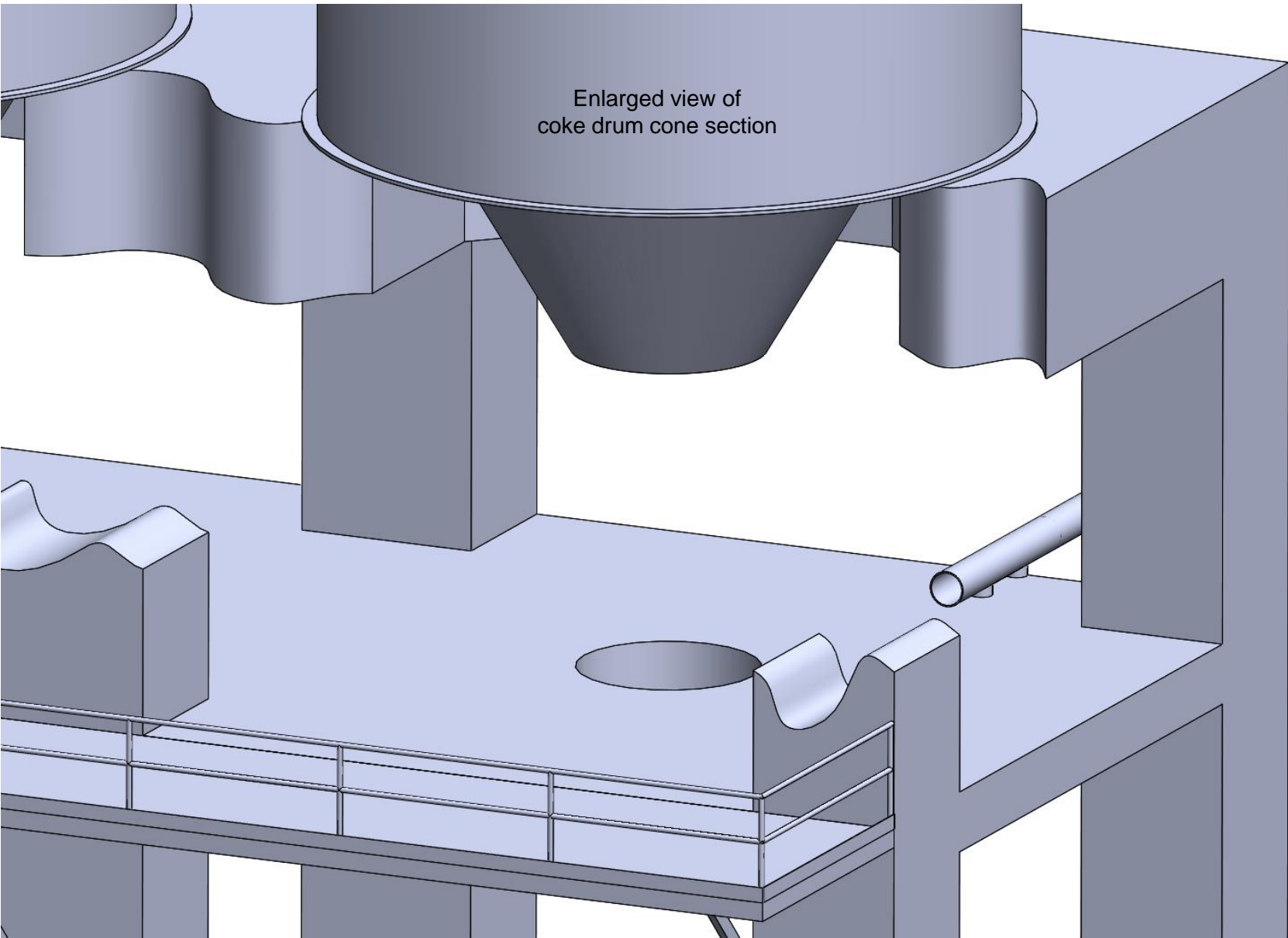


Installation Services (Revamp Projects)



DeltaValve

Enlarged view of
coke drum cone section

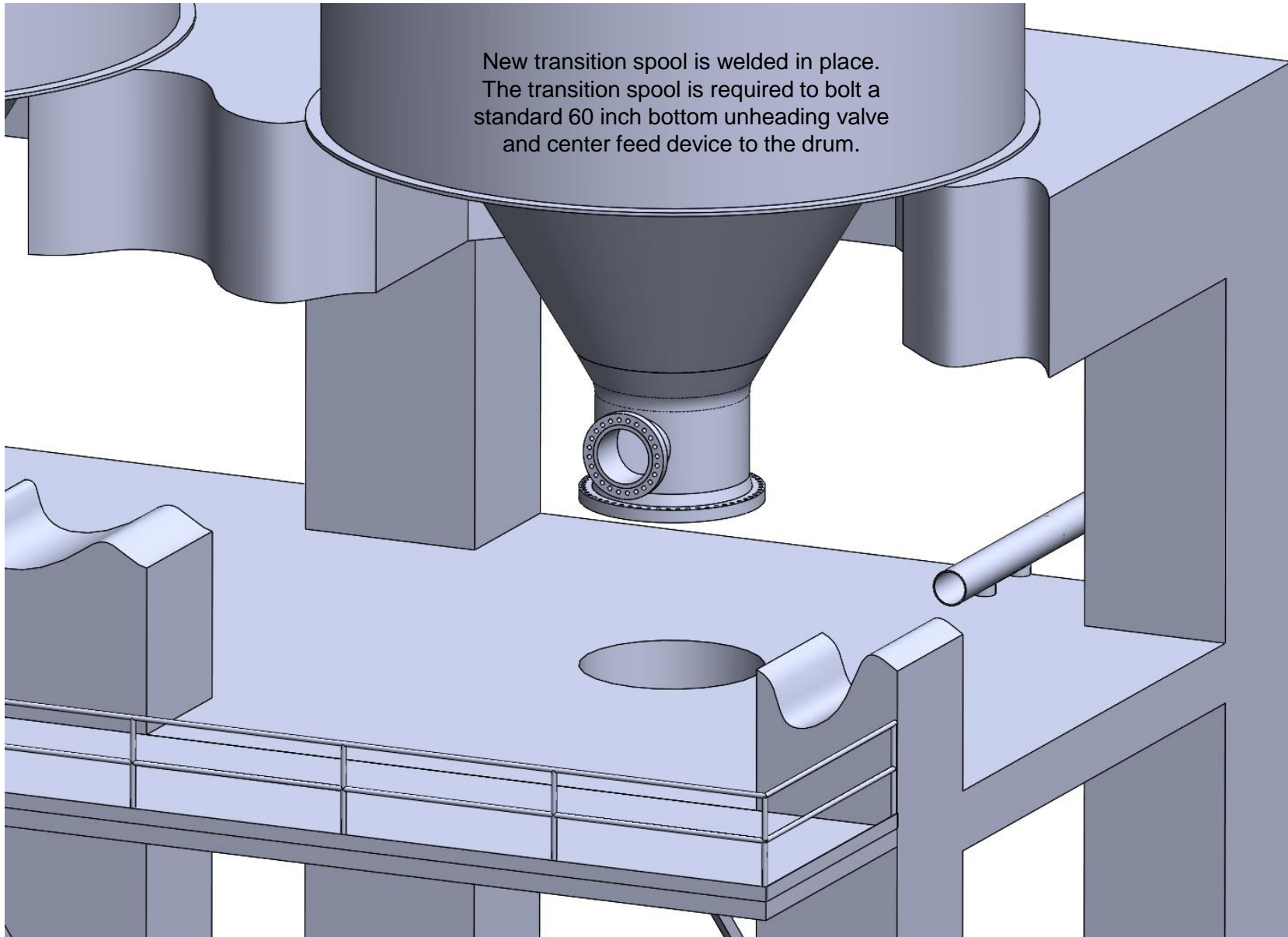


Installation Services (Revamp Projects)



DeltaValve

New transition spool is welded in place.
The transition spool is required to bolt a
standard 60 inch bottom unheading valve
and center feed device to the drum.

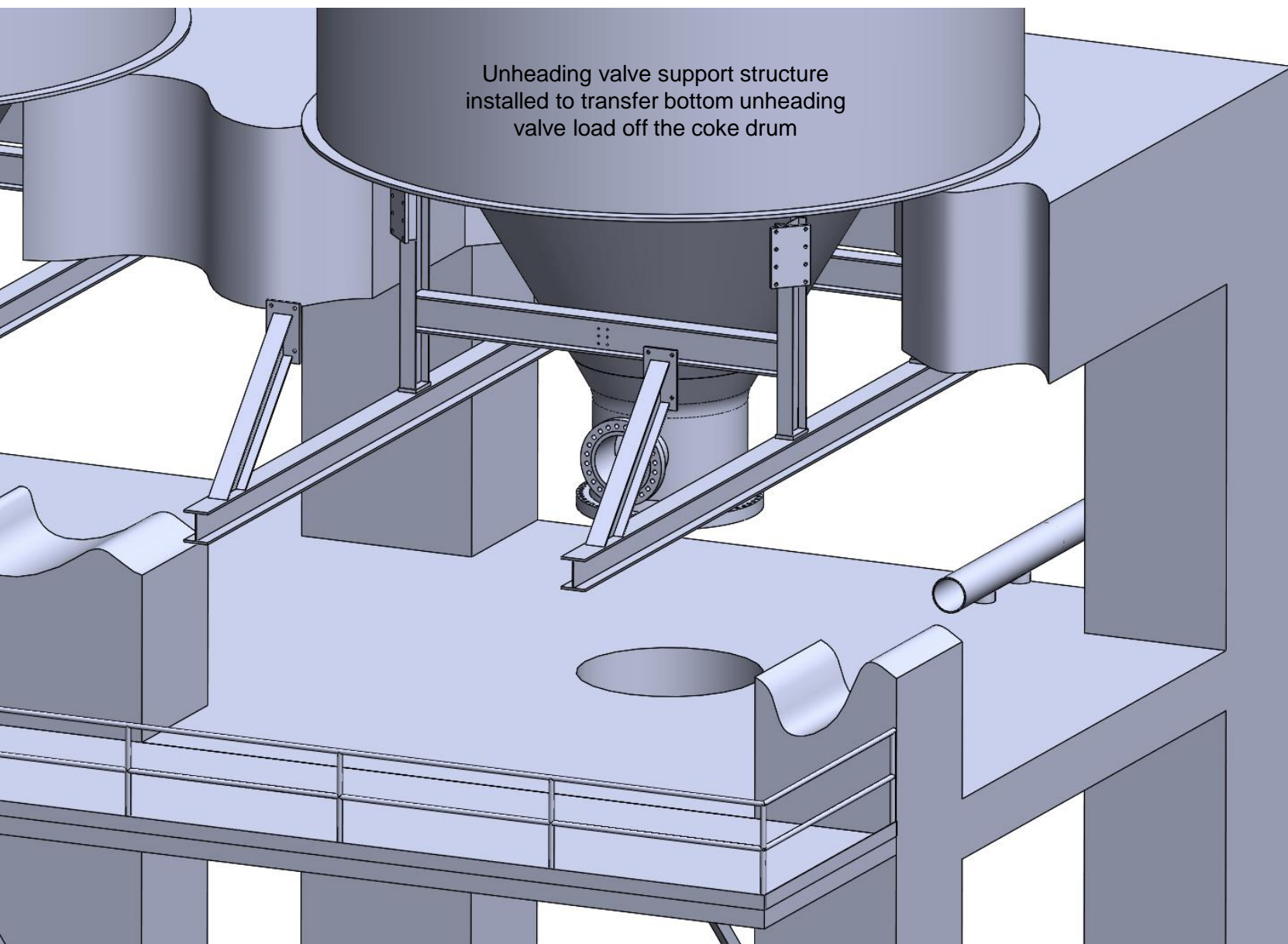


Installation Services (Revamp Projects)



DeltaValve

Unheading valve support structure
installed to transfer bottom unheading
valve load off the coke drum

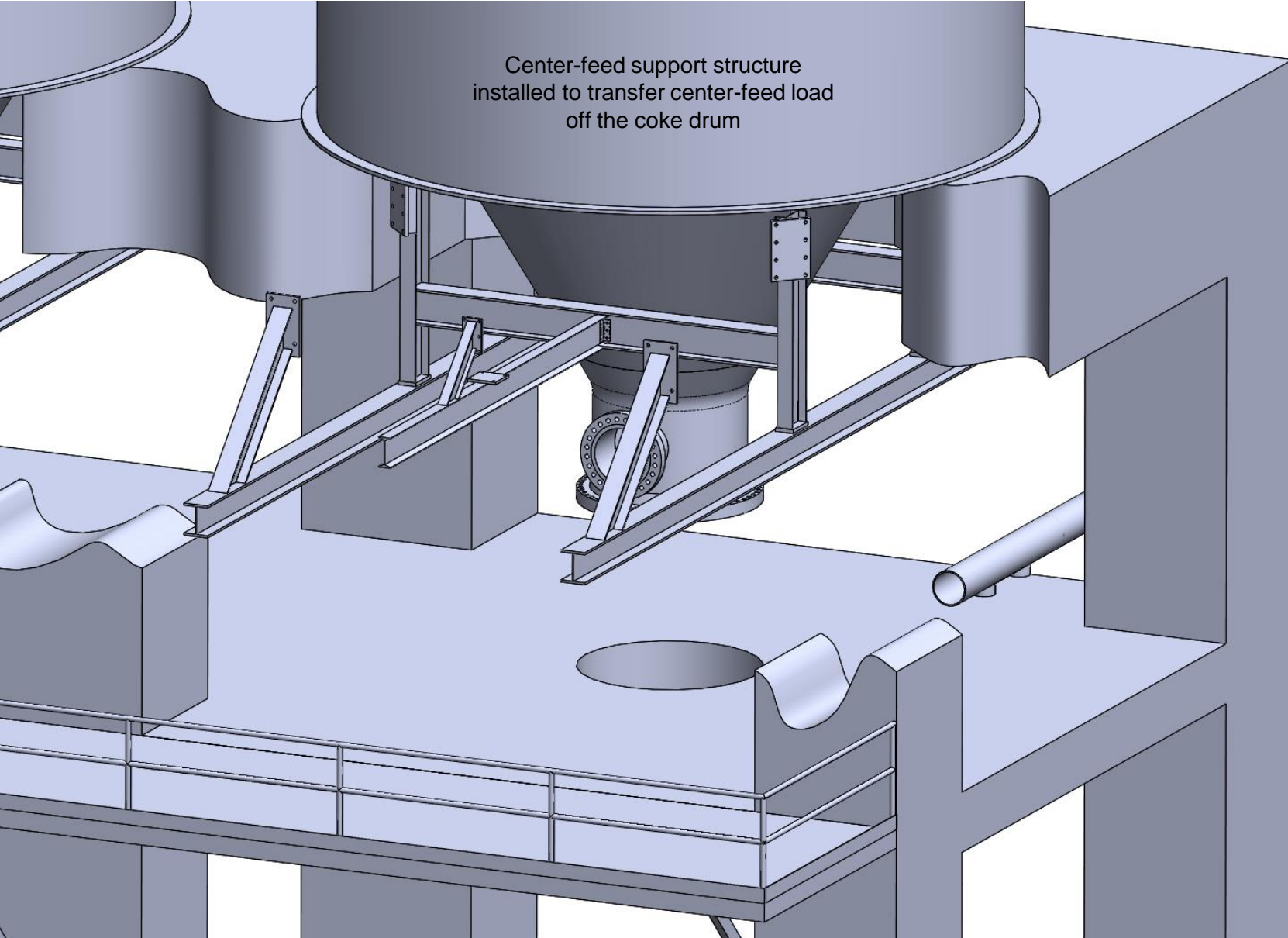


Installation Services (Revamp Projects)



DeltaValve

Center-feed support structure
installed to transfer center-feed load
off the coke drum

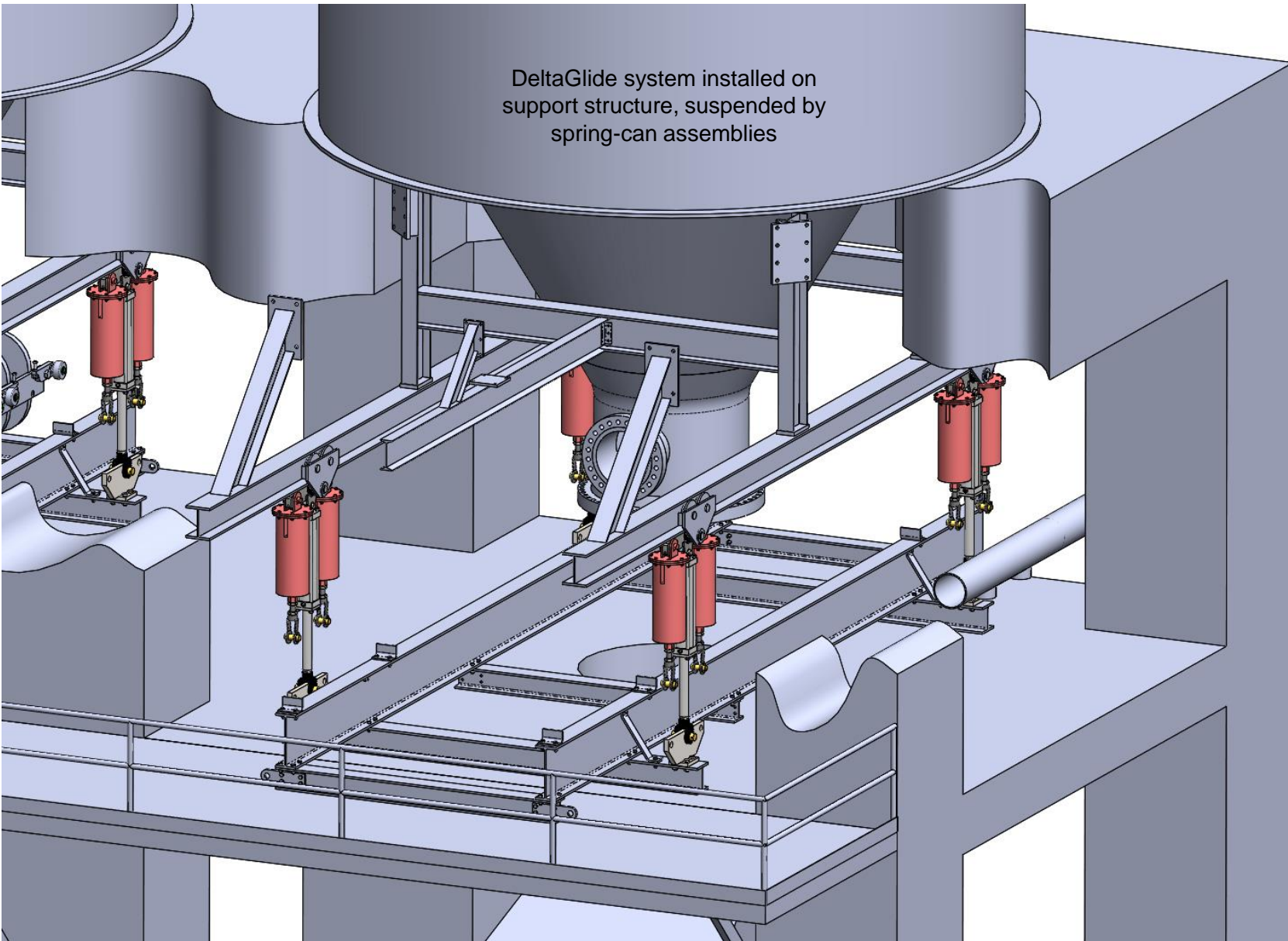


Installation Services (Revamp Projects)



DeltaValve

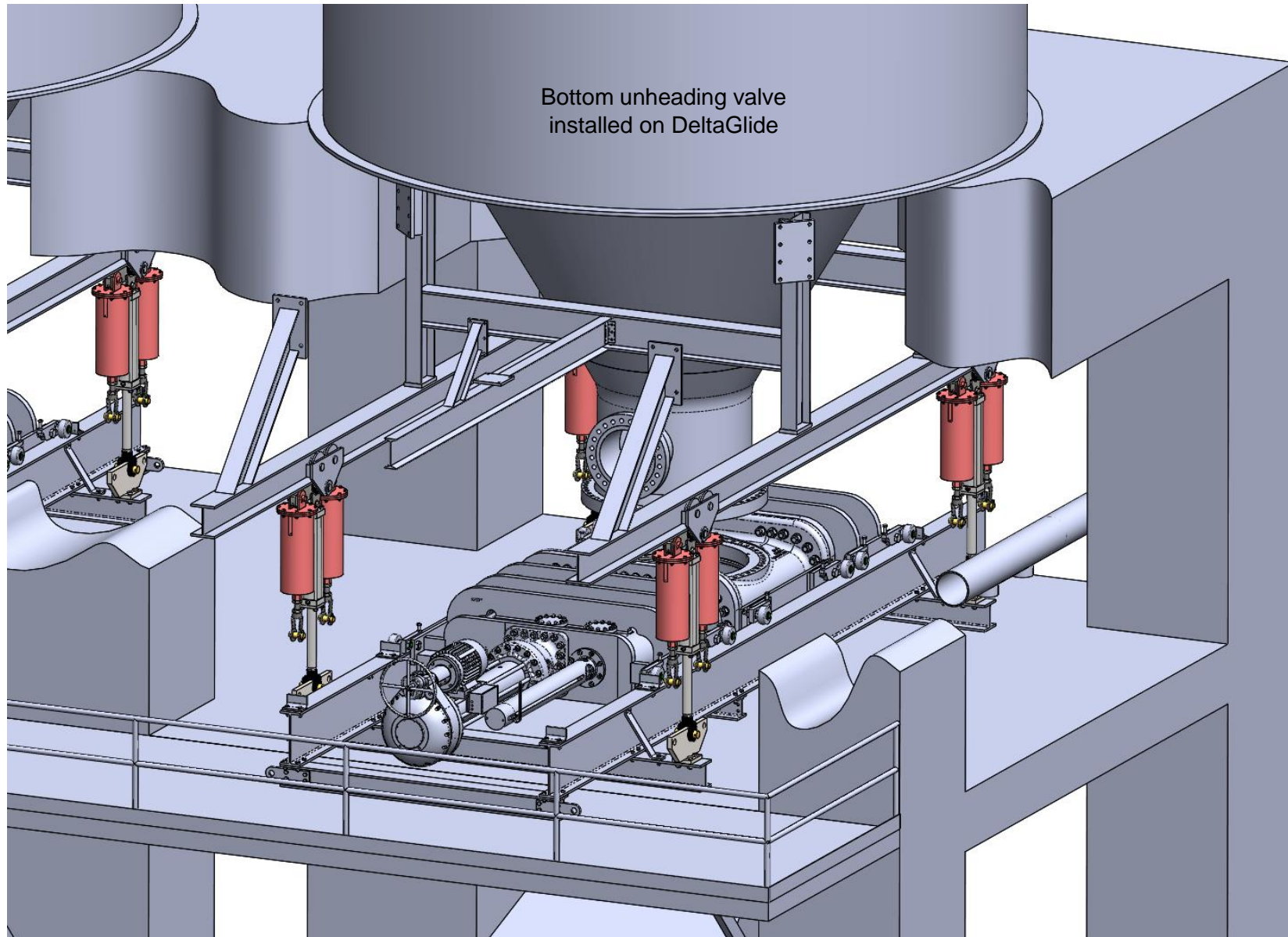
DeltaGlide system installed on support structure, suspended by spring-can assemblies



Installation Services (Revamp Projects)



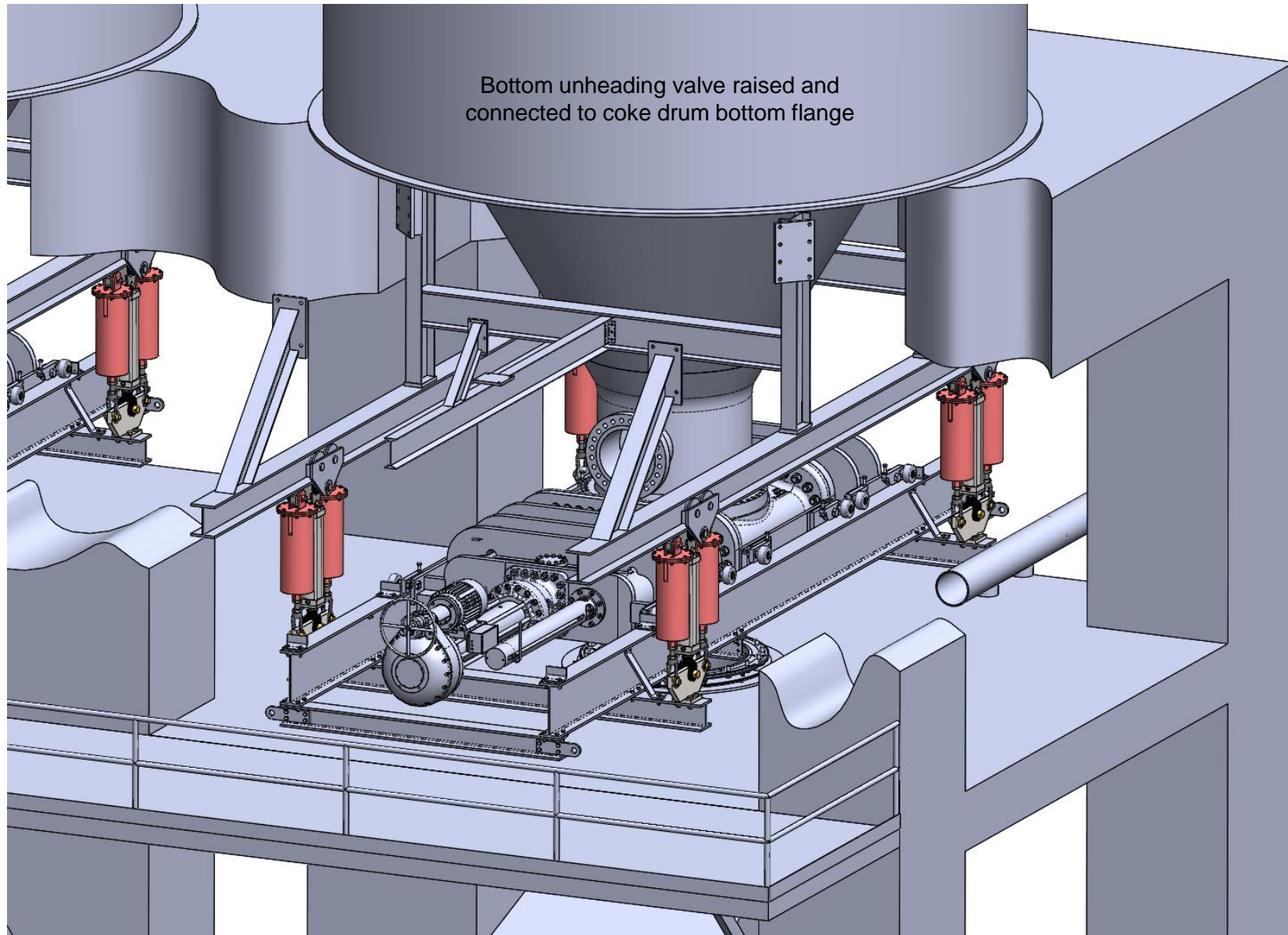
DeltaValve



Installation Services (Revamp Projects)



DeltaValve

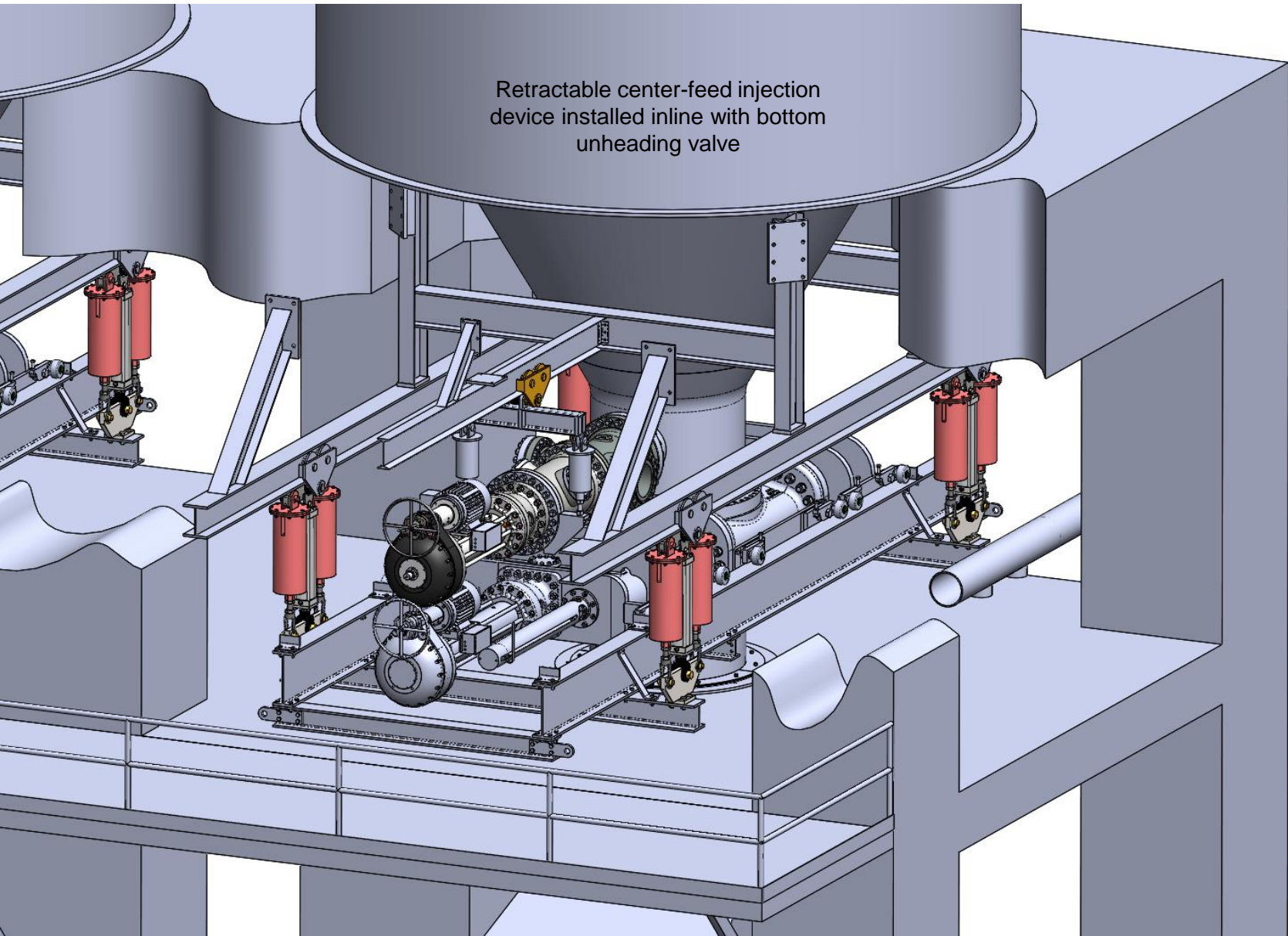


Installation Services (Revamp Projects)



DeltaValve

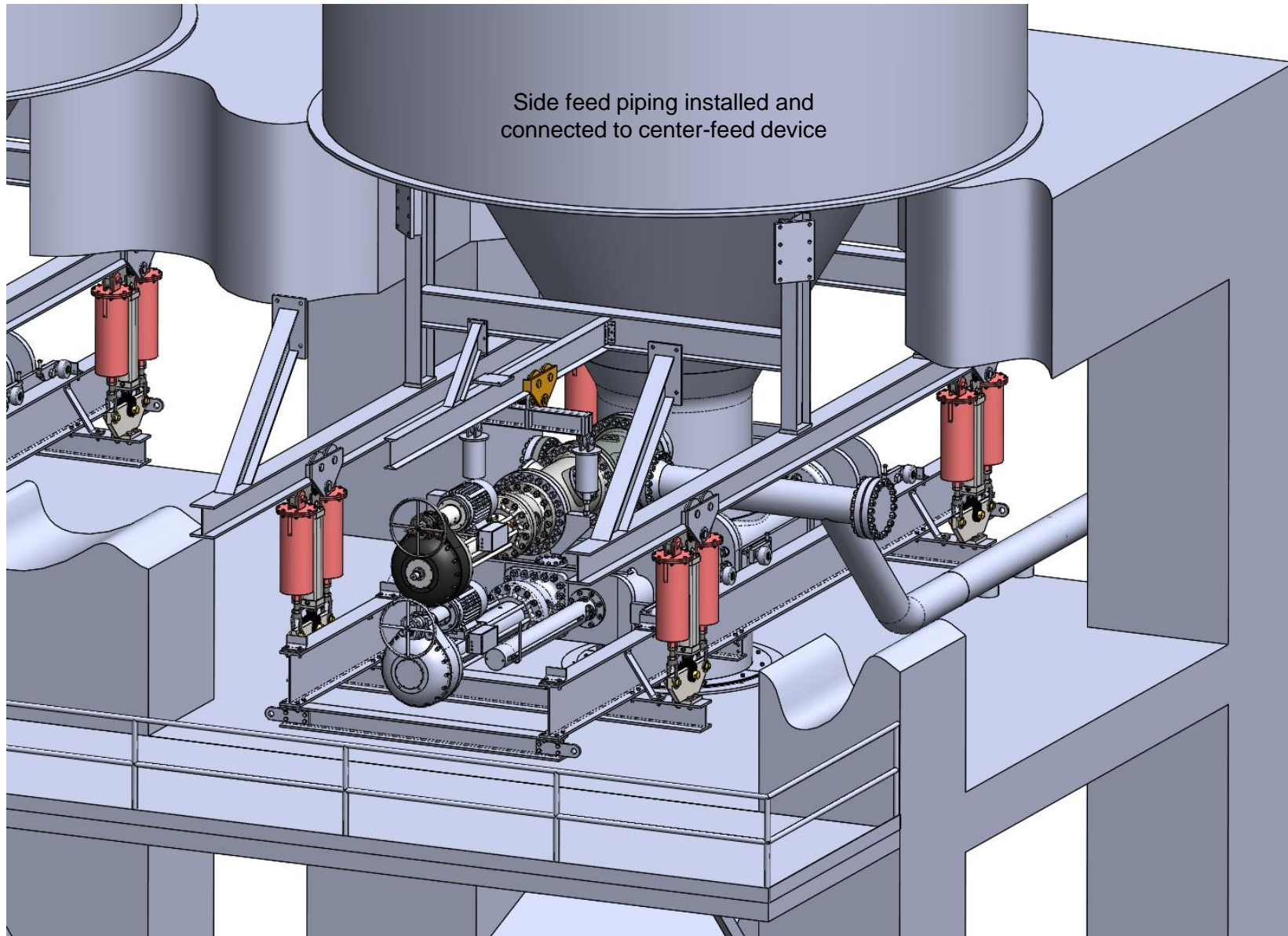
Retractable center-feed injection
device installed inline with bottom
unheading valve



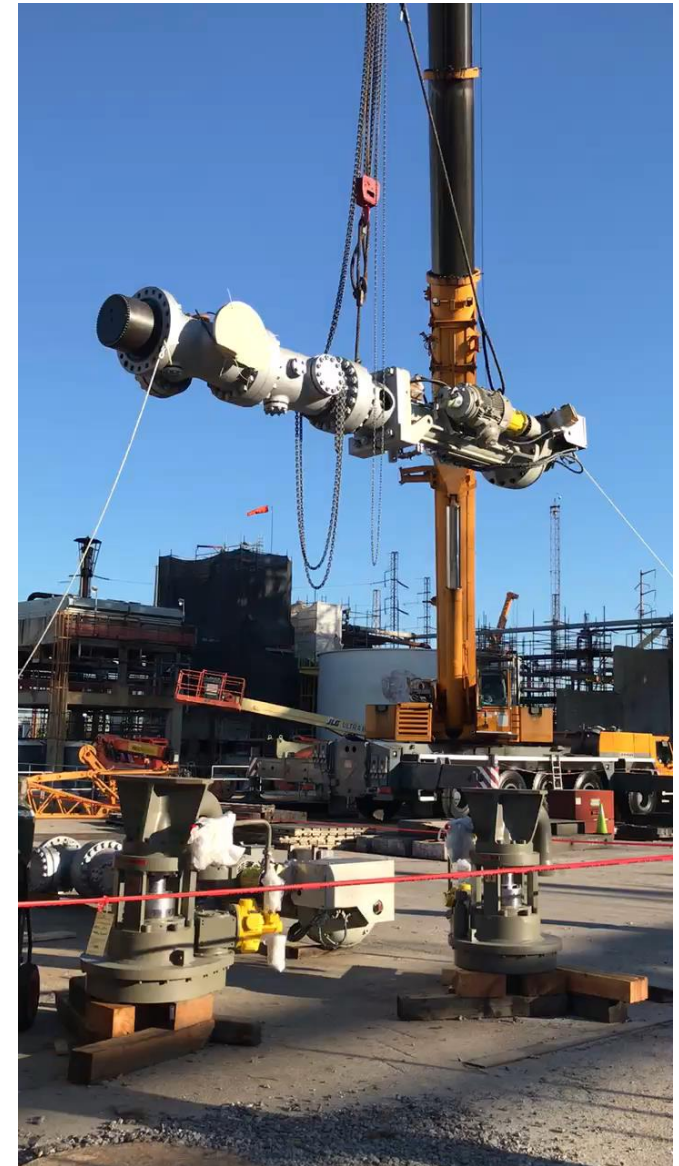
Installation Services (Revamp Projects)



DeltaValve



Recent Bottom Unheading Valve and CenterFeed installations



- Pre-installation and installation services
- Asset life-cycle management
- Parts and Service
- Service agreements and proposals



Due to the critical nature of delayed coking, DeltaValve has not authorized any 3rd party company to make parts or perform service on DeltaValve equipment or systems.



Global Aftermarket Service and Support



- **Technological Innovation (Industry Firsts)**
 - Fully automated Bottom Unheading Valve
 - Fully automated Top Unheading Valve
 - CenterFeed™ Injection Device
 - Ultra-low steam consumption Isolation Valve
- **Product Quality/Certifications**
 - ISO, ASME, U Stamp, R Stamp
 - PED, CRN, TR CU, KHK
- **World-wide sourcing and delivery capability**
- **Global aftermarket service/support**

Experience: Lessons learned from 100+ installations

- Every coker unit is unique (performance expectations are different)
- Single unit – 2 drum, to multi-unit, multi-drum combination
- Slow or fast cycle time
- Small or large drums
- Small or large diameter feed lines
- Shot coke or anode grade coke
- Various deck/structure constraints
- Preference for electric or hydraulic actuation systems
- Challenges of hot/humid or cold/dry climates
- Cutting into pits, sluice ways, rail cars, etc. (capability to throttle)
- Economical and safety driven projects
- Turnaround planning and site audit expertise

Innovation + Experience = DeltaValve (*Problem Solvers*)

What is the biggest problem at your refinery?

DeltaValve can help you solve it!

Come visit us at booth #7

Thank you!

QUESTIONS?