

DELAYED COKER TRAIN ISOLATION

Location: Colombia

Plant type: Refinery

Industry: Downstream O&G

Application: Delayed Coker unit Fractionator Isolation

Product: ValvTechnologies' V1 metal seated Coker

ValvTechnologies' zero leakage high-performance isolation valves saved millions of dollars to Ecopetrol Delayed Coker Unit, allowing them to replace overhead bottoms valves without shutting down the whole unit.

Zero leakage was tested in the field with the following results:

- Customer was able to operate with one train while performing the replacement of the valve, saving millions of dollars.
- No Risk for maintenance staff and the environment because of ensured isolation.
- ValvTechnologies valves demonstrated to be zero leakage during the 30 hours required to replace the SP2 valve.
- Continuous steam purge system helped to isolate and increase durability of the valves.

ValvTechnologies supported Ecopetrol teams during the creation of the shutdown procedure in order to ensure it take advantage of all the



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Maximize Your Plant Operations Potential

Background: Among all the Delayed Coking Units with two or more trains there is a common challenge, which is to Isolate each train without the requirement of shutting down the whole unit. That was the case at Ecopetrol Cartagena Refinery, where they have a 4 drum (2 trains) Delayed Coker Unit, and they don't have any isolation valves installed between these two trains, meaning they have to shut down the whole unit to replace any of the overhead vapors valves. The coking process has challenges for isolation valves due to the coke formation inside the valves, requiring steam injection purges on the valves. Ecopetrol is using competitors' valves for the SP (steam purged) MOVs and they have to maintain those valves every 2-3 years. In addition to these challenges, the isolation of the train requires a valve that has zero leakage because any leakage on the 30" valve will represent a safety issue because people can be exposed to high temperatures and H2S presence.

Requirement: Ecopetrol generated an initiative to install two 30" 300# isolation valves. The main features required for the valves were:

- Valves must be designed to be installed in a coking unit. Meaning the valves must have metal seats, special materials, and a steam purging system.

- Valves must be zero leakage at 20 PSI and at 150 PSI with metal seats. API 598 or FCI 70.2 is not enough.
- The valves operate in the open position 95% of the time.

Solution: Final decision was to install ValvTechnologies valves because they fulfilled all the requirements of the application.

- Metal to Metal seat.
- Zero Leakage: To ensure no leakage, Ecopetrol specified High Pressure, Low Pressure, and 20 PSI hydrostatic tests. The acceptance criteria for all tests was ISO 5208 Rate A.
- Efficient Steam Purge configuration: ValvTechnologies continuous steam purge system ensures the valve will avoid coke built-up inside the valve even if the valve is in open position most of the time and will help to Isolate the media that is coming from the fractionator.
- Steam purge required just one point of connection reducing installation costs.
- Belleville Spring is not affected by coke fines and allows zero leakage on very low operating pressures, different from other valves designs that need high differential pressure for correct sealing.