Scrubber internals retrofit

contributes to 40% gas production increase.

The Bellevue and Ruby Jo processing facilities were bottlenecked by poor performance of the 1st and 2nd stage scrubbers. NOV performed computational fluid dynamic simulations to demonstrate that the routing of the inlet piping and the internals design caused uneven flow distribution within the scrubber. This combined with a high gas loading resulted in liquid carryover to compressors.

A solution was provided by retrofitting scrubbers with new high-performance internals including a vane inlet device, a liquid surface protection baffle, mesh pad agglomerator, and an axial flow cyclone deck.

The NOV Axial Flow Cyclone (AFC) is designed to provide a solution for high performance gas demisting, even for high pressure applications. As wet gas enters the cyclone, it is put into rotation as it passes a static swirl element. The liquid droplets accumulated at the cyclone wall are drained through slots downstream of the swirl element. The dry gas moves to the core of the cyclone and exits the cyclone. To improve efficiency, a fraction of the gas is extracted together with the liquid and reintroduced into the cyclone through low pressure regions inside the cyclone. The critical parts of the cyclones are produced using high precision manufacturing techniques to ensure consistency in performance.

Project details

Operating conditions

- From 200 to 280 MMSCFD gas
- 45 barg operation
- K-factor vessel: 0.17 m/s

Scope of work

- Computational fluid dynamics analyses (CFD) of original and new scrubber design
- Retrofit of 6 scrubbers with high efficiency internals

Key facts

- Location: Australia
- Client: QGC