

XEBEC FAST-CYCLE PSA GOES OFF-SHORE TO SUCCESSFULLY RECOVER STRANDED GAS

Case Study: Off-Shore Platform Uses Fast-Cycle PSA to Recover Stranded Gas

Venoco Inc.

Situation: Restricted space and limited on-board gas processing solutions forced oil producer on off-shore platform to re-inject high-carbon dioxide laden associated gas

Solution: Installation of a Xebec PSA to dehydrate and separate CO₂ & heavy light hydrocarbons in the associated gas to meet California regulatory sales gas specification.

Benefits: Xebec PSA provides a cost effective solution within available platform space

Location: Santa Barbara Channel, California



Xebec's compact M-3100, fast cycle PSA was the perfect footprint for the off-shore Platform Gail in Santa Barbara

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Stranded off-shore gas opportunities are difficult to realize: Off-Shore Platform Gail, located in the Santa Barbara Channel, could not sell its produced associated gas due to the strict sales specifications on both carbon dioxide and ethane levels. As a result, operators on Platform Gail could only re-inject over 500 MMscfy of associated gas back into the wells. The loss of revenue to Venoco Inc. – the owner of Platform Gail – totaled tens of millions of dollars per year. Venoco researched various treatment methods to solve this processing dilemma. However, the resultant designs would have required increases to platform decking, superstructure and electrical demand making the entire project economically unfeasible.

XEBEC's Design

XEBEC engineers approached Venoco with a design incorporating the use of XEBEC's Fast-Cycle Pressure-Swing Adsorption (PSA) unit. On-shore, pressure-swing adsorption technology would have been an obvious solution to Platform Gail's gas treating needs. However, conventional PSA units are generally cumbersome, difficult-to-operate, and require a large footprint. XEBEC's Fast-Cycle PSA, however, incorporates the use of a rotary valve to replace the multitudes of valves found on conventional PSA technologies, and therefore, occupied a space no larger than 18 ft(L) X 8 ft(W) X 9 ft(H). In addition, as the entire treatment unit was contained in one small and easy-to-work-with skid, transportation effort from the dock to the platform, and crane lift time were all minimized.

The new gas treatment facility:

In the new facility, the PSA processes excess lift gas that is sweetened from the well casing(s). Approximately 1.2 MMscfd of sales-quality gas is produced by the PSA and is blended with sweet natural gas produced by the platform and sent to shore. Tailgas from the PSA is compressed and then blended with turbine fuel gas for power generation, where the high CO₂ content helps to reduce NO_x emissions in the turbine exhaust.

STREAM	GAS LIFT	TAIL GAS	PRODUCT TO SALES
Nitrogen (N ₂), vol%	1.0	0.3	1.5
Carbon Dioxide (CO ₂), vol%	14.0	29.8	2.0
Methane (CH ₄), vol%	69.0	36.7	93.6
Ethane (C ₂ H ₆), vol%	7.0	12.8	2.6
Propane (C ₃ H ₈), vol%	5.5	12.4	0.2
Butane+ (C ₄ H ₁₀), vol%	3.5	8.0	0.07
Flow Rate, MMscfd	2.0	1.2	0.8

Results

Start-up of the XEBEC Fast-Cycle PSA was very smooth, prompting executives at Venoco to claim it as the easiest commissioned system in company history. Since the start-up, the unit has successfully been in operation with virtually no operating and/or performance issues. Sales gas meets and/or exceeds current California regulatory gas specifications, as shown in the table above. Given the high reliability of the gas processing equipment, the operating personnel could now devote more time on maximizing their oil production.

About XEBEC Adsorption Inc.

Xebec Adsorption Inc. is a global provider of clean energy solutions to corporations and governments looking to reduce their carbon footprints, while improving energy conversion efficiencies. With more than 1300 customers worldwide, Xebec designs, engineers and manufactures innovative products that transform raw gases into marketable sources of clean energy. Xebec's strategy is focused on establishing leadership positions in markets where demand for biogas upgrading, natural gas treatment and hydrogen purification is growing. Headquartered in Montreal, Canada, Xebec is a global company with two state-of-the-art manufacturing facilities in Montreal and Shanghai, a technology center in Vancouver as well as a sales and distribution network in North America, Asia and Europe. Xebec trades on the TSX under the symbol XBC.

Contact Us

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