Shell Global Solutions has recently developed a new demister equipped with high-performance separation swirl tubes. This improved version of the standard separation swirl tube is shorter and could be installed without modifying the contactor. However, only a prototype was available and this had not been tested under the high operational pressures experienced on the Shearwater platform.

The challenge facing the Shell Global Solutions team was to test a high-performance separator unit and a standard unit for reference purposes under more realistic high-pressure conditions. The hardware for the two test units was designed using our process design methodology and tested using specially developed measurement procedures. The new contactor internals, based on the successfully tested high-performance separation swirl tube, were designed and manufactured by Sulzer Chemtech Nederland BV and installed six months after the project began.

Younger was delighted with the result: “The support received from Shell Global Solutions in the design and proving trials of the mini units was excellent. Their quick response in fast-tracking the checking and approval of Sulzer’s hardware design and manufacture, and their experience and willingness to help were important factors in this highly successful project, which was completed within budget, ahead of schedule and with a 100% safety record.”

Working to a strict budget and a demanding schedule, without compromising safety, teams from Shell Global Solutions have helped to restore full gas production to Shell UK Exploration and Production’s Shearwater platform in the North Sea by modifying gas-drying equipment.

On Shearwater, the production gas is dried using a conventional tri-ethylene glycol (TEG) process before entering the low-temperature gas conditioning plant. However, significant carry-over of condensate was experienced from the TEG contactor inlet separator section, which restricted the overall plant capacity to around 75% of the 410 million standard cubic feet per day design capacity.

The customer needed a solution that could be implemented within the normal four-week shutdown with minimum modification inside the contactor and no hot work.

Derek Younger, Shell UK project engineer, says, “We were faced with a large amount of shutdown work that was suddenly brought forward two months from the planned period in July. This placed great demands on the project team and our consultants and vendors.”

Analysis indicated that the contactor’s inlet scrubber separator needed to be upgraded to the more sophisticated SMS (schoepentoeter – mist mat – swirl tube) configuration. This required the existing vane-pack demister to be replaced by a mist mat and Shell Global Solutions’ proprietary separation swirl-tube demister. The standard equipment was readily available, but its configuration was too tall for direct installation in the contactor.
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