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ACG Phase 3 Subsea Water Injection Scheme

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Abstract

The third phase of the Azeri, Chirag, Gunashli (ACG) Project for Azerbaijan in the Caspian Sea develops the Deep Water Gunashli (DWG) area of the ACG reservoir, approximately 130km East of Baku. The DWG reservoir is highly pressure depleted due to extensive production from existing facilities adjacent to the reservoir. The provision of six pre-drilled subsea water injection wells optimises oil recovery over the field life. The subsea water injection scheme supports the production of 20% of the ACG Phase 3 reserves, for 10% of the total capital outlay.

In this paper, details are given of the facilities design, fabrication and installation and how delivery challenges to Azerbaijan have been overcome, including key lessons learned.

ACG Phase 3 topsides and jackets delivery adopted the same production line approach that was used in earlier phases, cloning the previous topsides and jackets. Subsea facilities had never been successfully utilised in the Caspian. The solution was to establish a production line based on extensive experience of subsea projects in the North Sea and utilising existing Company contracts with subsea vendors as the foundation. The use of established Company North Sea contracts for Phase 3 subsea builds on existing subsea market sector and technical experience, and allows future leverage with contractor performance and life of field support. The strategy that emerged has been successful and resulted in design and fabrication in Europe with transportation to Azerbaijan for installation.

To date the ACG Phase 3 subsea facilities have been successfully designed, fabricated and transported to Azerbaijan. Two of the three manifolds have been installed and the third manifold is planned to be installed in the first half of 2008. This is an industry first in the Caspian Sea, overcoming significant delivery and infrastructure constraints.

Introduction

ACG Phase 3 sanctioned scope included a subsea water injection scheme, the first planned subsea development in the Caspian. This subsea water injection scheme supports the production of approximately 200 MMstb. Due to pre-production of the target reservoirs to both the NW and SE of the DWG area by the previous developments at Shallow Water Gunashli and Chirag, approximately 1000 psi depletion will have occurred prior to first oil in 2008. Therefore early pressure support and recovery by water injection is critically important to achieve economic production rates and reserves recovery, and to limit producing gas/oil ratio to acceptable levels. The provision of pre-drilled subsea water injection wells enabled pressure support to commence immediately from first oil and allow drilling to initially focus on oil production.