Installation of reeled rigid pipelines connected to large and heavy subsea structures in ultra deepwater

SUBSEA7, Niterói, Rio de Janeiro, Brazil
V. Braga
PETROBRAS, Rio de Janeiro, Rio de Janeiro, Brazil

ABSTRACT

The PDEG-B installation scope comprised 165km of X-65 pipelines in water depths up to 1400m with 15 end and in-line structures, some of which were the largest ever launched from the reeled pipelay vessel Skandi Navica.

The larger structures (Pipeline End Manifold Y pieces) weighing more than 40t had dimensions exceeding the limits of the lay ramp structure handling frame normally used for standard structure handling onboard the vessel. A special frame was designed and attached to the aft end of the pipelay vessel’s ramp to secure the structure during pipelay initiation. This proved to be a suitable arrangement for the deployment of large and heavy pipeline end manifolds. Three large In-Line-Tees were also installed in water depths up to 1052m.

Specific facilities for installation of the mentioned subsea structures were developed, e.g. inclined base to suit the seabed profile, articulated yokes to allow the deployment and landing, attachment of buoyancy elements to reduce the level of stress on the pipeline, development of a contingency procedure to guarantee the structures' upright stability etc. Special attention was dedicated to the scenario of deepest section of the 12” pipelay (>1250m). The new Subsea7 Pipelay vessel, Seven Oceans, performed the deployment of 22km of pipeline that would exceed Skandi Navica capacities.

The purpose of this paper is to present all relevant aspects of the successful installation of the structures not only restricted to their design, but also focusing on the modifications to the pipelay Vessel and offshore operations during the PDEG-B project.

KEY WORDS: End and in-line subsea structures; rigid pipelay; deepwater.

INTRODUCTION

Oil and gas development in Brazil is characterized by fields located in deepwater. PDEG-B is an EPIC project, comprising the engineering, procurement, installation and commissioning of six pipelines in water depths varying from 100m up to 1400m, which connects FPSOs, Semi-Submersible Platforms and a fixed platform by means of 12,75” (323.85mm) and 10,75” (273.05mm) OD steel pipe.