

## Jubarte Field—Development Strategy

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### Abstract

The Jubarte Field, off the Espírito Santo State coast, Brazil, is an offshore heavy oil deepwater field that poses several challenges. It was discovered in January, 2001, at about 1,300 m (4,400 ft) water depths, and its reserves mount to 700 million barrels of 17 API oil.

Before its commercial production, several questions remained to be answered, such as the well productivity, the best artificial lift method and the recommended production strategy. In order to fully understand and implement a solid definitive production system, PETROBRAS has decided to develop the field step-wise, starting from a two-month extended well test, then a Pilot Production phase, followed by two development phases, named Phase I and Phase II.

The Phase I system includes FPSO P-34, with a plant adapted to produce 60,000 bpd of heavy oil in deep waters and four horizontal production wells. In this phase, PETROBRAS is piloting several new technologies, regarding artificial lift, to be used in the final Phase II development and other PETROBRAS demands. High power downhole ESP installed through horizontal wet X-tree and seabed installed ESP systems are among the major innovations.

FPSO P-34 has a site where PETROBRAS Research Center – CENPES - will test new technologies of heavy oil and water separation.

Phase I started production in the 4th quarter of 2006, and it is expected to provide rich information regarding aquifer strength which will optimize the water injection system of Phase II.

For Phase II, in addition to the technologies tested in Phase I, other innovations are anticipated for the processing plant of the 180,000 bopd FPSO, specifically designed for heavy oil production. Phase II first oil is expected in 2011.

The process plant solution is presented considering free water knockout separator, oil stabilization on the oil dehydrator, the FPSO arrangement and main utilized facilities.

The technological solution to assure the oil quality is discussed.

This paper describes in details the technology gaps identified and the solutions on the works for making this heavy oil production system, in deep to ultra-deep water, a successful business.

### Introduction

The Jubarte Oil Field, discovered in January 2001, is located approximately 80 km off the Espírito Santo State coast, southeastern Brazil (Figure 1), under water depths between 1,000 and 1,500 m.

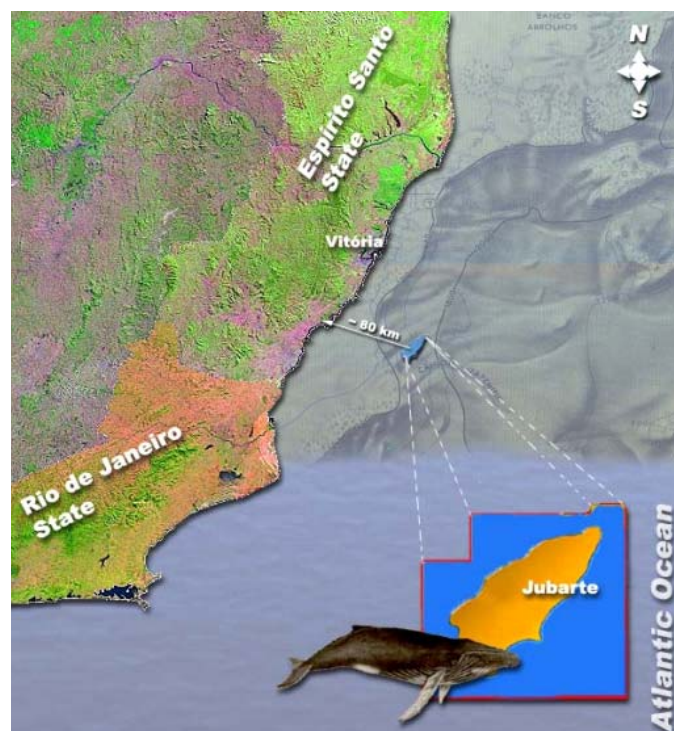


Figure 1 – Jubarte Oil Field location map.

The Jubarte field contains 17.1° API oil, with dead oil viscosity of 3,000 cP, at 20°C. It's the most viscous oil at surface conditions ever produced in Brazil through a wet completion system. Such fluid characteristics and the expressive discovered volumes in this area were considered as a big challenge and an opportunity to develop knowledge to exploit heavy offshore oil reservoirs in deep waters under economical basis. Thus, several questions should be addressed such as the well productivity, the best artificial lift method and