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An Overview of the Roncador Field Development, a Case in Petrobras Deep Water Production

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Abstract

The giant field of Roncador was by far the largest discovery made in Brazil in the 90's. Holding more than 3.3 billion boe in reserves and located in ultradeep waters - 1,500 to 1,900 meters – its development has set up new technological and economical frontiers for Petrobras's offshore production.

Located in the northeastern portion of the Campos Basin, 125 km off the Brazilian coast (Figure 1), Roncador covers an area of approximately 110 square kilometers and is comprised of two main blocks, saturated with 18 to 31° API oil.

Due to the differences in oil characteristics and to the massive reserves involved, PETROBRAS decided to develop Roncador in modules. This paper describes the track record since the discovery and presents the situation of the field a few months after two new floating units started production: semi-submersible P-52 and FPSO P-54. Petrobras main plans for two other modules in the coming future are also outlined.

Roncador History

Roncador was discovered in 1996, when Petrobras drilled the wildcat well 1-RJS-436A, in 1,853 meters of water, and found an accumulation with light oil (28 to 31^{o} API) in the area which is known today as Module 1A (Figure 2) located in the eastern and deepest part of the field.

Based on the success of its portfolio of offshore projects in Brazil and the good results of PROCAP 2000, its technological capability program to produce oil and gas in ultradeep waters, Petrobras made the decision to develop Roncador with parallel activities, rather than in a more traditional sequential strategy. The company began, simultaneously, to:

- Drill appraisal wells;
- Design an Early Production System (EPS) – in order to anticipate revenues and gather reservoir data for the next phases;
- Design a long-term production system for the northeastern area of the field – flexible enough to accommodate the surprises that would certainly come up along the way;
- Develop equipment suitable for 2,000 meters of water.

Due to a period of scarcity of deepwater rigs, the appraisal wells were only drilled in 1998. They showed there were different conditions in other areas of the field, which contained crudes with densities varying from 18 to 22^{o} API, and presented a CO2 content of up to 4.5%. Through the years the different areas received several denominations, until a permanent nomenclature was established, as can be seen in Figure 2.

In 1999, Roncador Early Production System came on-stream, 27 months after the discovery of the field. Well 1-RJS-436A was tied-back to a Dynamically Positioned FPSO through a 6 5/8" multiplexed riser system especially designed for the project, known as Drill Pipe Riser (DPR). This EPS (Figure 3) produced a peak of 20,000 barrels of oil per day and, after remaining 24 months in Module 1A, was used for 15 months in Module 3 and later allocated to other projects of the