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## One-Trip Completion in Petrobras Campos Basin

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### Abstract

During part of the Campos Basin (CB) development, tubing installations in just one trip (deployment of the production string together with the tubing hanger without using DPs) were not considered very important. This fact was justified, mainly for the following reasons:

- Until the beginning of the last decade, the water depths in which the CB wells were completed ranged from 100 to 400m.
- The time spent with “spacing out” operations was not significant.
- The rigs’ daily rates were considerably lower than they are today.
- Many of the completion projects were not suitable to this technique.

Therefore, we can conclude that the scenario was not attractive for one-trip completion.

As we proceeded to deeper water depths, we realized the need to look for solutions to minimize the installation time, since in this case, the impact of the time spent with “spacing out” the tubing string, became significant.

Today, more than 90% of the developing wells in CB are located in water depths from 1000 to 1900m. Furthermore, we are facing a significant increase in the rigs’ daily rates impelled by soaring oil prices which we expect to remain high for the time being. Consequently, the rig time saving accomplished by using this technology becomes extremely attractive.

The objective of this paper is to describe the evolution of this technique, review different methods and key production string components, as well as the lessons learned from the first phase of this technology application.

### Introduction

The first one-trip installations took place in 2004. The main drive to use this technic was undoubtedly the rig time saving achieved by reducing the number of trips required for tubing deployment. The average time saving has been 24H.

Another aspect to be considered is the increasing use of “large bore” completion, including P&T gauges associated with electric cable and protection clamps. This situation is critical taking into account the very small tolerance between the casing ID and the clamps. In this case, the one-trip installation minimizes the tubing trip in the well and therefore the risks associated to loosened clamps.

Considering this background, we began a planning process in cooperation with some suppliers of the production string accessories. This process involves the development and adaptation of some components, culminating in a satisfactory case history of one-trip installation.

### Background

Considering the aspects already mentioned, one-trip production string deployment didn’t seem attractive to be used in Petrobras offshore wells until the mid nineties. Additionally, the first completion projects were not suitable to this technic: the “default” completion procedure used to be perforate the wells with wire-line guns in solid free completion fluid environment. Then, in order to minimize the exposure time of the already perforated well, it was recommended to run the lower completion as soon as possible using the workstring. Summarizing, the whole process was comprised of 3 trips:

- 1) Deployment of the lower completion (packer, shear-out sub, etc).
- 2) Assembly of the production string by joints (without DHSV and Tubing Hanger) using the landing workstring.
- 3) Pulling the landing string out until the position in which the DHSV is connected, space out and finally installing the tubing string along with the DHSV and the Tubing Hanger.

In the early completions, when botton hole P&T gauges were incorporated to the well projects, an additional issue had to be adressed. In order to minimize the P&T e-cable trip, the tubing was pulled out by stands just to connect the P&T gauge system. Then, the final assembly, including gas lift mandrils, DHSV and Tubing Hanger were deployed.