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## Solid Expandable Monobore Openhole Liner Extends 13-5/8 in. Casing Shoe without Hole Size Reduction

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### Abstract

Deepwater and other hard-to-drill objectives just got a little easier with the recent successful installation of a single-diameter 11-3/4 x 13-3/8 in. openhole liner. This expandable monobore liner confirms its value by enabling operators to install a casing string further up the hole with a higher collapse rating than any expandable openhole liner in this size range. The ability to extend the 13-3/8 x 13-5/8 in. casing shoe without losing any diameter in hole size facilitates the use of high-collapse conventional liners deeper in the well where they are typically required.

This paper will use a recent case history and examples of applications of the monobore liner in the Gulf of Mexico, Caspian Sea, and North Africa to validate the significance of using the larger-sized monobore liners. By installing the monobore openhole liner higher in the wellbore, operators are able to capitalize on more conducive wellbore environments and minimize installation risks. This paper will compare and contrast how these same circumstances have historically been addressed and how single-diameter technology provides a more efficient response.

The use of larger-sized monobore liners, utilizing thick-wall casing (with high collapse capacity) enables the operator to deepen wells without sacrificing hole size, thereby saving high-collapse conventional casing strings to be used across high-pressure, trouble zones deeper in the well.

Real applications of the new technology provide tangible results that can be leveraged to put hard-to-drill objectives within reach. Access to more reserves, the ability to reduce non-productive time, and the means to lower drilling costs are just a few of the significant implications to drilling and completion operations.

### Introduction

Conventional well designs in complex wells are now being seriously reviewed to include solid expandable casing drilling liners to allow a variety of well construction advantages. Using solid expandable liners as part of a well's basis of design (BoD) is still a small percentage of applications, with most included in the BoD typically as a planned contingency. Nevertheless, the use of expandable liners as planned contingencies allows for wells, whether one-off or multi-well projects, to be downsized while maintaining the same sized completions.<sup>1</sup> **Figure 1** illustrates how a contingency can be planned using a single conventional expandable liner to mitigate a possible drilling hazard and enable downsizing the well's upper casing plan. This feature allows for a reduction in well construction cost when the expandable liner is required. An entire field can realize larger cost savings using this type of well planning philosophy because the expandable contingency may only be required in a few wells, while all of the field's wells can be downsized. These benefits have been examined in detail<sup>2</sup> and are being realized today.

### Taking the Next Step

Since introducing solid expandable liners in 1999<sup>3</sup>, end users have looked to expandables to not only extend casing shoes with drilling liners, but to do so without sacrificing any hole size in the process. This ideal is being implemented in several arenas and in several available sizes<sup>4, 5, 6</sup>. Solid expandable liners that add a casing barrier without downsizing a well's hole size have been referred to as monobore or monodiameter expandable casing strings. **Figure 2** illustrates how combining these systems with conventional expandable liners can increase hole size when compared to well designs that strictly use conventional casing tubulars when addressing drilling hazards.