

DEEPER, DEEP WATER DRILLING...

A **FASTR** Solution to Handling Heavy Loads

Workstrings, LLC, a subsidiary of Superior Energy Services, Inc., is proud to announce that their new landing string system for running long heavy casing strings in the magnitude of 1.5 to 2.0 million lbs has successfully been run in the Gulf of Mexico.

Background

The primary use of a landing string is to land heavy casing strings in subsea wellhead operations where the tensile capacity of the primary drill pipe is insufficient to support the increased load of the casing and the collapse forces exerted by conventional slips. A landing string is considered conventional sized drill pipe with a thicker wall. An optimum landing string is the same size as the primary drill string with the same tool joints and utilizes the same slips, elevators and accessories.

The Issues

With increasing water depths, well depths and extended target locations, heavier wall pipe has been in demand. Straight holes are not only being drilled to 30,000 ft. plus depths, but directional wells are now becoming more common pushing the larger OD casing (13-5/8") below 20,000 ft. plus and exceeding 1.50 MM Lbs. To drill to these 30,000 ft. plus depths, pipe that was traditionally classified as landing string is required to taper the drill string, providing the increased tensile capacity for the upper portion of the string during drilling and casing operations.

The Solution (**FASTR** Design)

The Workstrings, LLC **FASTR** landing string system (patent pending) consists of three components: the pipe, the elevators, and the slips. All three of these components were designed to work with conventional rig operations requiring no additional equipment. The most significant improvement is the introduction of a specially designed 6-5/8" FH landing string with a 6 ft. slip-proof section and a 45° taper at the box tool joint (see FIGURE 1).

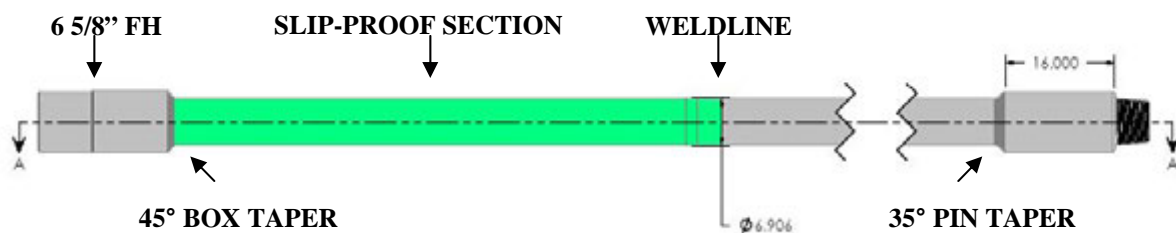


FIGURE 1- 6-5/8" FH Slip-Proof Landing String

A slip-proof section is an extended upset area of thicker wall pipe. The use of a 45° taper box tool joint fits a 45° tapered bushing inside the hydraulic operated elevator. The 45° taper is required to certify the hydraulic elevator to 1000 Ton.

Workstrings, LLC invested hundreds of engineering hours designing and testing the phenomena known as slip crushing. Slip crushing occurs when a tubular is collapsed by the radial force of the slips, due to the well known fact that tension reduces tubulars' collapse capacity. Slip designs were studied and re-engineered to spread the radial and axial force equally, by increasing the contact area and by varying slip contact angle. The newly designed 20" LDXL slips with a solid insert bushing and split master bushing system greatly improves the load distribution due to the optimum slip contact angle and minimizes the likelihood of pipe damage. The **FASTR** system is hydraulically operated by a Backsaver™, a lifting device which increases the efficiency of the running process (see FIGURES 2 & 3).

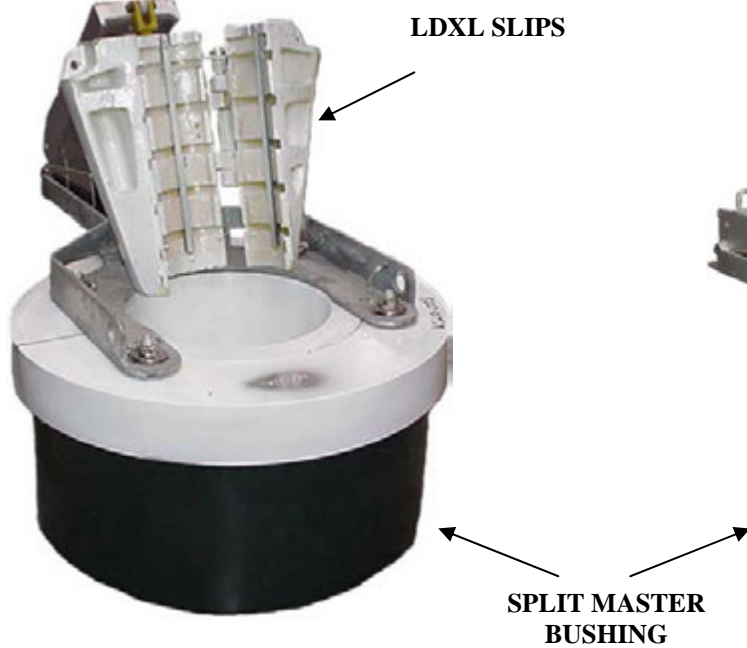


FIGURE 2- LDXL Handling System with the slips in up position, held by the Backsaver™

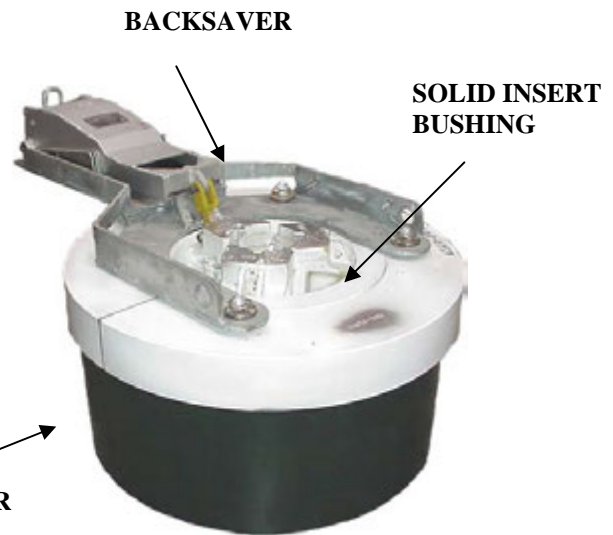


FIGURE 3- LDXL Handling System with the slips in down position, held by the Backsaver™

Case History

Workstrings', LLC 6-5/8" FH, 0.938" w.t. slip-proof landing string was used for the first time by a major oil company to land a 16" and 13-5/8" casing strings at 19,800 ft and 23,600 ft MD respectively, in 7,000 ft. of water. The maximum load recorded at the slips while landing the 16" casing was **1.314 MM Lbs.** While landing the 13-5/8" casing using the **FASTR** system, the maximum load recorded increased to **1.650 MM Lbs.** The string's inspection reports showed only minor slip marks and below average connection damages on three joints of pipe!

Conclusion

As the drilling envelope increases with the deeper directional deep water wells, so follows the demand for safe and capable equipment for handling heavy loads. The use of the **FASTR** system has enabled operators to handle loads in the range of 1.50 MM Lbs to 2.00 MM Lbs safely and efficiently.

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