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2,000,000 lb. Slip-Based Landing String System Pushes the Limit of Deepwater Casing Running

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Abstract

With water depths increasing to over 10,000 feet, offshore well depths exceeding 34,000 feet and extended reach targets pushing out over 35,000 feet; operators are deepening the setting depths of larger diameter and heavier casing strings. These offshore designs require landing strings with hoisting capacity approaching 2-million pounds. These requirements have exceeded the limits of previous tubular manufacturing and handling capabilities. This paper documents the design, development, manufacture, and deployment of a 2-million pound slip-based landing string system to meet these requirements. The system incorporates three components: pipe, elevators and slips. The 6 5/8-inch, heavy wall, 150-ksi yield strength pipe incorporates an innovative thick-walled section in the slip contact area for resistance to slip crushing loads and a uniquely designed dual-diameter tool joint to increase elevator capacity. Slips were specially engineered to equalize radial and axial loads, increase the slip-to-pipe contact area, and optimize the contact angle to minimize the crushing loads on the pipe body. Combined with 1,000-ton elevators, the system utilizes conventional rig-up and operating procedures. The evolution of landing string systems is discussed, and the design criteria developed for landing string applications is presented. Two case studies are presented for landing operations, some with axial tension loads approaching 1.75-million pounds.

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