

Hybrid Offshore Drilling & Production Concepts for the East Coast of Canada and Heavy Sea Ice Environments

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ABSTRACT

The Rigid Artic Tension Leg Platform (RATLP) and the Stepped Steel Gravity Platform (SSGP) are recent results of efforts to develop solutions and concepts to meet the challenges of exploration and production in ice infested waters of the east coast of Canada. The RATLP concept offers drilling solutions in sea ice environments from water depths of 80 to 400 m by combining the tensioning principles of a conventional TLP with the properties of a buoy. The SSGP concept offers drilling and production solutions in water depths up to approximately 150 m and represents a departure from traditional cylindrical concrete gravity-based production platforms with respect to shape, material and method of construction.

KEY WORDS: Drilling Platform; Production Platform; Iceberg; Sea Ice; GBS; RATLP; SSGP.

INTRODUCTION

The Canadian East Coast Offshore oil and gas industry stands as a testament to the ability of innovative professionals to provide unique solutions and concepts to meet the challenges of exploration and production in iceberg infested waters. Future exploration and development of the east coast frontier is dependent on the provision of resourceful solutions to the ice, wave and water depth challenges of the area. Historically, the solutions to these challenges have evolved from the adaptation of existing technologies and the creation of new concepts.

The RATLP concept is based on existing buoy and TLP technologies and has been developed for use in first-year ice and iceberg environments. In this paper, the authors present a general overview and description of the RATLP, discuss the rig's installation and relocation procedures, and examine the platform's stability and response to ice and wave loading. An estimation of construction costs is also presented.

The SSGP concept represents a departure from traditional cylindrical concrete gravity-based production platform concepts for ice-infested waters with respect to shape and method of construction. Its unconventional profile reduces the effect of the global environmental loads. This paper presents a description of the structure, its associated design issues and an estimation of construction costs.

RIGID ARTIC TENSION LEG PLATFORM

The Rigid Artic Tension Leg Platform concept is unique in that it combines the tensioning principles of a conventional TLP with the buoyancy properties of a buoyed structure. The RATLP was developed to offer drilling solutions in sea ice environments with water depths ranging from 80 to 400 m.

The rig's stability and expected response to wave and ice loading are examined and an estimation of construction costs is provided. The rig's major components consist of a floating hull, three cable groups and three anchors, as shown in Figure 1 and Figure 2.

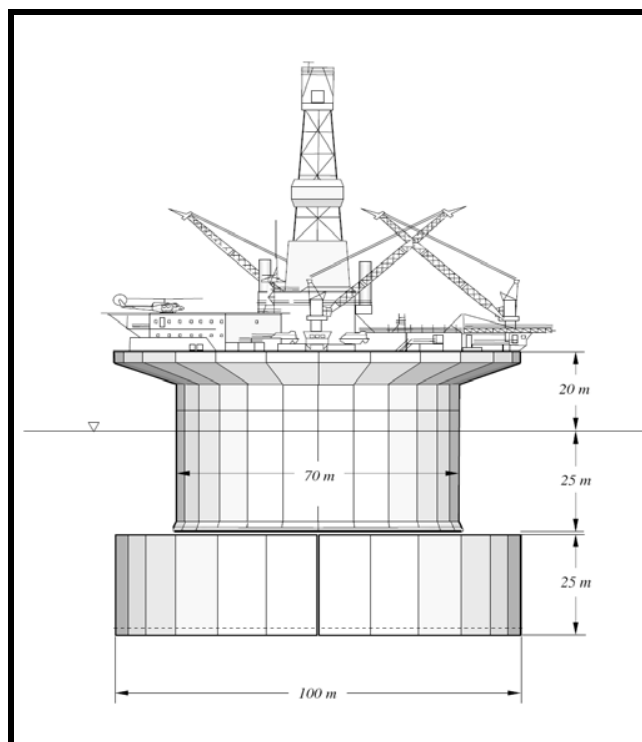


Figure 1. Rigid Artic Tension Leg Platform (RATLP)