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Jackup Operations: New Operational Recommended Practices

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Abstract

The 2005 U.S. Gulf of Mexico hurricane season validated the industry's practice of "shut-in and evacuate". Successful application of this practice resulted in no fatalities or serious injuries as well as limited pollution events related to Jackup operations. However, infrastructure (hull) losses in regards to the Jackup fleet were unprecedented and demanded operational alterations by industry in advance of the 2006 hurricane season.

Prior to the 2006 Hurricane Season, Jackup owner/operators did not have a consensus on a recommended practice or specification document to utilize in order to adhere to minimum operational requirements to mitigate hurricane damage. The International Association of Drilling Contractors' (IADC) Jackup Rig Committee has been diligently engaged in producing the Gulf of Mexico Annex to the Society of Naval Architects and Marine Engineers' (SNAME) Technical and Research Bulletin 5-5A, Guidelines for Site Specific Assessment of Mobile Jack-up Units [1]. The committee was not at a stage where scientific studies had been completed and a consensus had not been achieved, consequently the document was not available for general use. Because of this, an interim operational-based solution was necessary.

Shortly after the conclusion of the 2005 hurricane season, industry met with its government partners, Minerals Management Service (MMS) and U.S. Coast Guard to preliminarily determine the primary causes of the losses, the impact on the fleet population and to assess opportunities for performance improvement in advance of the 2006 Gulf of Mexico hurricane season. This strategic partnership led to the development of API Recommended Practice (RP) 95J, Interim Guidance for Jackup Operations in the Gulf of Mexico During Hurricane Season [2].

Use of the RP essentially became mandatory as the MMS adopted the operational recommendations and promulgated its Notice to Lessees (NTL) No. 2006-G09 [3] in advance of the

2006 hurricane season. The results of the operational alterations have not been tested as the 2006 Gulf of Mexico hurricane season was unusually mild. MMS has advised industry that it intends on reissuing the NTL in same or similar form for the 2007 Gulf of Mexico hurricane season.

Introduction

As reflected in Figure 1, hurricanes Katrina and Rita severely impacted the Central Gulf of Mexico, which contained much of this nation's offshore energy infrastructure, including the majority of the domestic Jackup fleet.

Historically, Jackup operators have sustained minimal hull losses due to hurricanes. Between 1992 and 2005, three (3) units lost stationkeeping in Gulf of Mexico hurricanes. In recent years, deeper prospects, increased drilling rig demands, customer demands, and jackup water depth working capacity have placed units in deeper water depths throughout the Gulf of Mexico area. In retrospect, this trend, in certain instances, placed jackups at or near their maximum water depth capacity and outdated metocean criteria, contributed to the loss of stationkeeping of eight (8) such units during the 2005 hurricane season.

Preliminary analysis of the losses to the Jackup fleet and those units that survived indicates the likely causes to be wave inundation and/or foundation failure leading to hull wave inundation. Additionally, these studies on the surviving fleet reflect many units experienced forces in excess of their design criteria. These studies further validate that structural design and assessment methodologies of jackups are usually conservative.

The metocean data previously utilized to assess site suitability also has now been determined to be suspect. A review of metocean criteria by industry experts was conducted in order to determine appropriate air gap to avoid wave impingement on the hull.

Additionally, bottom survey data and geotechnical data (soil conditions) as well as the unit's pre-loading procedures were also addressed in the new RP to improve stationkeeping.

Other operational enhancements were reviewed and incorporated into the RP including storm preparation and post-storm recovery and inspection recommendations.

Part 1: Site, Geotechnical and Metocean Data

RP 95J and its companion document, the MMS NTL, mandate exchange of critical data between the Operator (Lessee) and the drilling contractor. Site data, geotechnical data and metocean data are now required in advance of the