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## Experience With a Dynamically Positioned FPSO in a Hurricane Area

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### Abstract

This paper describes the successful application of Floating, Production Storage and Offloading vessel (FPSO) Munin fitted with Dynamic Positioning (DP) and high propulsion power in the South China Sea. The oil and gas industry offshore China is exposed to severe hurricanes and in order to minimize the exposure, most of the FPSOs in the area are disconnectable and able to sail away from the affected area. FPSO Munin however is also equipped with dynamic positioning and high propulsion power enabling her to minimize production downtime further in comparison with other installations.

This paper briefly describes the characteristics of these tropical cyclones and how a disconnectable FPSO reacts on their approach.



Figure 1 – DP FPSO Munin

FPSO Munin has been operating in the area for a decade now, on two different fields. The unit has experienced many hurricanes approaching the area. In 9 cases, the FPSO had to disconnect.

The paper describes two practical cases of a hurricane approaching the highly maneuverable FPSO and all steps to be taken to monitor the hurricane, shut-in production and if required, disconnect and seek shelter, followed by a re-connection once the weather returns to normal.

FPSO Munin has operated successfully in the South China Sea for 9 years and this demonstrates that the use of FPSOs equipped with DP and high propulsion power, either moored or on full DP for station-keeping, is a proven concept in hurricane areas. This type of FPSO minimizes production downtime and prevents costly damage to the infra-structure and associated production losses.

### Introduction

The destruction and damage of offshore installations in the recent history in Gulf of Mexico caused by hurricanes has again shown the vulnerability of the offshore industry in this region to these meteorological events. These events are not unique to the Gulf of Mexico. In various other areas in the world the offshore industry is faced with these storms. Australia and China are other areas where these storms influence the offshore industry; in China these storms have shown higher numbers in frequency and intensity than in the Gulf of Mexico.

The lesser scale of the offshore production industry in these regions may have contributed to the fact that this has not impacted the business in the manner as it has in the Gulf of Mexico. Another difference is the application of disconnectable FPSOs in these areas. The next paragraphs of the paper discuss the characteristics of these tropical storms and how a dis-connectable FPSO responds on their approach. It also presents two specific examples of such a disconnection experience to clear from an approaching hurricane.