

A Surface Current Measurement System to Support DP Operations

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Abstract

Deepwater drilling units and construction vessels in the Gulf of Mexico are periodically impacted by strong surface currents as a result of the Loop Current and eddies that may be shed from it. Surface current velocities can exceed 4 knots and can impact dynamic positioning (DP) and disrupt offshore activities, with the potential to delay operations and cause fatigue damage to associated infrastructure. An accurate real-time knowledge of the magnitude of surface currents during these events is of great value as a data feed to DP systems, as support for operational planning and as subsequent support for engineering design. Over the last decade the use of Acoustic Doppler Current Profilers ADCP's to provide current information off structures has become widespread, however, the part of the water column of most interest to many – the surface waters – has been most difficult to monitor, due to the effects of the structure on the flow. Development of the Horizontal ADCP (H-ADCP) technology provides the first opportunity to overcome this problem. A H-ADCP measures the current velocity at a distance far enough away from the structure that the current field it is measuring is unaffected.

Fugro GEOS and RD Instruments have undertaken trial deployments of both a 600 and 300kHz H-ADCP off a drill ship in the Gulf of Mexico. The initial findings of this application of the H-ADCP are presented in this paper, including physical, environmental and operational factors that need to be considered when undertaking such an installation. Equipment performance and data quality of both the 600 and 300kHz ADCPs are also briefly discussed.

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