Title: **Mitigating Excessive Pitch and Roll Motions on Semi-Submersibles**

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Abstract

The work is carried out as a consequence of observed large pitch and roll motions on some new 6th generation drilling rigs. The big pitch/roll motions are a combination of wave frequency motions and more lower frequency motions most likely caused by resonance between hull and mooring / DP system.

Natural pitch and roll periods of the vessels are significantly lower than the dominant wave period and also lower than what has earlier been observed with previous generation semis due to bigger mass without correspondingly increased hydrostatic restoring.

The goal of the study has been to derive a new control feature in the K-Pos DP system to mitigate the pitch and roll problems. For simplicity only pitch and surge motion is considered in this paper.

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