

**Title:** Defining Expanded Sectors for DP-Assisted Offloading Operations in Spread-Moored Platforms

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### **Abstract**

This paper presents a complete methodology applied by Petrobras for the definition of expanded operational sectors of DP shuttle tankers in offloading operations in Spread Moored Platforms, increasing the time availability and still guaranteeing the operations' safety.

The methodology consists at first in a Preliminary Risk Analysis to assess the potential hazards associated with the operation on the new expanded sector and, if necessary, some detailed analyses take place. Then, downtime analyses and a power demand analyses are made to evaluate the advantages of this proposition. The next step is performing real-time simulations commanded by experienced Captains in a full-mission simulator equipped with the actual DP System, in a hardware in the loop simulation architecture. The simulations are performed so that most critical conditions are recreated in the presence of the Captains so they can give their opinion on how safe the operation would be.

The new offloading sectors were then programmed in the DP software and a real operation was executed in order to test and validate the new proposition. Some minor improvements were included in the sectors, and an operational guideline with the new sector, combined with the updated DP console software, will be adopted for all Petrobras' DPST fleet.