

**Title:**           **Enabling Swifter Operator Response in the Event of a Fault Initiation Through Adaptive Automation**

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**Abstract**

The increasing size and operational complexity of Dynamic Positioning (DP) platforms and the continuous increase in number of DP incidents has driven the need to further improve the safety and reliability of DP operations. A large portion of so-called ‘operator error’ is explained by increasing automation of operator tasks, pushing bridge teams into a more and more passive supervisory role, a role for which humans are not very well suited. For instance, a supervisory role may undermine the team’s ability to develop and maintain sufficient situation awareness during DP operations. The ambition of The Netherlands Organization of Applied Scientific Research, or TNO in short, is to develop, together with the industry, a transparent (human-in-the-loop) adaptive automation platform, or *adaptive automation*, that substantially improves safety for maneuvering and control tasks. Ideally, this automation is based on a *computational model* that is able to assess the current and predicted state of the system, environment, and operator. For instance, when a drop in operator attention is detected, the computational model could decide to involve the bridge team to a greater extent in the DP process, reducing the chance for operator error and enabling a swifter response in the event of a fault initiation. Moreover, with adaptive automation, there may be less need for continuous human supervision of DP systems, leaving room for ship designers to reduce ship manning requirements. This paper describes the requirements of the computational model, how it could be made adaptive, and how measuring and modeling system, environment and operator state drives the actions of the adaptive automation platform.