DP Systems – Fail to Test or Test to Fail

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Abstract

To fill out the title of this paper it should read – Are you failing to test properly if you do not test for failures? Comprehensive tests of DP Control Systems; in the factory, on the vessel, at acceptance trials, and during annual trials, are fundamental to the reliable, robust and continued operation of any DP vessel.

This paper demonstrates that it is to not important only to test a system for the functionality a DP control system was designed to meet; but to go far beyond that and to 'think failure' and test for the failure modes. Nautronix have learnt the hard way that thorough testing during design and at integration in the factory pay great dividends in reduced on site time and less post commissioning problems. A subjective estimate is that it might take four times longer to fix and retest a fault in the field than it does to fix it in the factory. The use of a simulator to exercise the system contributes greatly you this. Of course the reduction of faults found on the vessel during warranty saves the vessel owner, valuable time, aggravation and money.

Examples from both the author's experience will be given of the fundamental tests that need to be conducted. As well as identifying where the weak points in a design are likely to be. The main source for deciding the actual failure testing is the Failure Modes and Effects Analysis (FMEA), the technique of FMEA will also be discussed and further reading on this referenced.

The paper will assist any owner of any DP control system in ensuring that their DP system has been fully tested and is fault tolerant. It should also convince them of the importance of FMEA and subsequent failure testing.

The subject of systematic failures is also broached; these are software failures that can shut down all systems if they have common software. Examples of systematic failures from all DP control system suppliers will be given.