

Dynamic Positioning Incidents Resulting From Inadequate Power System Analysis

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Abstract

Dynamically Positioned and other offshore drilling, pipe laying and mobile work platforms require dependable electrical power for operation, integrity of the well and safety – of both the installation and its personnel. Regulatory bodies review the design documents to ensure that the system is safe and predictable. Installations require larger and larger power systems but the limited availability of real estate demands that the space allocated for this equipment is kept to a minimum. Recent “improvements” in the design of circuit breaker devices used for system protection appear to simplify meeting the competing goals for safety ratings and space requirements. A closer look at the operational characteristics of these devices reveals a potential trap that could result in unexpected loss of essential services resulting from a circuit fault occurring in a power circuit serving a piece of non-essential equipment.

This paper looks at a typical large distribution system as might be found on a modern Dynamically Positioned vessel, with regard to the inter-relation between the different circuits in that system, and how improper use of these modern devices may cause these failures to propagate beyond the area that is anticipated. Evaluation of system distribution and approvals from regulatory bodies does not guarantee that the system will operate as intended. Some reasons for this are proposed. Experiences from newly constructed drillships are used to illustrate actual consequences from failures in analysis that allowed faults to spread beyond the device that should have protected the system from consequential results.

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