IMCA Safety Flash 11/13

June 2013

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learnt from them. The information below has been provided in good faith by members and should be reviewed individually by recipients, who will determine its relevance to their own operations.

The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information on specific incidents you consider may be relevant. All information will be anonymised or sanitised, as appropriate.

A number of other organisations issue safety flashes and similar documents which may be of interest to IMCA members. Where these are particularly relevant, these may be summarised or highlighted here. Links to known relevant websites are provided at www.imca-int.com/links Additional links should be submitted to webmaster@imca-int.com

1 USCG Homeport Marine Safety Alert: Recent Failures of Dynamic Positioning (DP) Systems on MODUs

The United States Coast Guard has recently issued the attached Marine Safety Alert about recent failures of dynamic positioning systems on mobile offshore drilling units.

Clarification has been sought on the following recommendations from the safety alert:

"Where ride-through capability is an essential part of the DP redundancy concept, it should be proven by live short circuit and ground fault testing."

"Perform regular thermal imaging surveys of DP system electrical equipment (e.g. switchgear, drives, motor controllers, etc.) as part of a preventative maintenance program to provide early detection of faulty or loose connections."

The response, which should be noted, was:

- Guidance does state that analysis and proper planning is required to undertake short circuit testing;
- The intent is to do this not at FAT, but on the vessel, with appropriate planning and safety precautions;
- Additional guidance is provided in the Marine Technology Society Techop guidance;
- One of the objectives is to have the test validate the model, so that subsequent testing can be done with analytical and modelling techniques based on a validated model;
- Any short circuit testing is to be accompanied by the proper planning and with appropriate risk mitigating measures in place.

We would also like to draw attention to the guidance contained within IMCA M 217/IMCA SEL 031 *Offshore Vessel High Voltage Safety*.

The safety flash draws attention to the Marine Technology Society's operational guidance which is available from the MTS dynamic positioning website www.dynamic-positioning.com. It should be noted that this guidance refers extensively to IMCA guidance.

UNITED STATES COAST GUARD
U.S. Department of Homeland Security

MARINE SAFETY ALERT

Inspections and Compliance Directorate

June 17, 2013
Washington, DC

05-13

RECENT FAILURES OF DYNAMIC POSITIONING (DP) SYSTEMS ON MOBILE OFFSHORE DRILLING UNITS

This Safety Alert addresses dynamic positioning incidents resulting in a loss of position on drillships. A loss of position during a critical activity may result in a loss of well control and severe consequences including loss of life, pollution, and property damage. Critical activities are those activities where the consequences of equipment failure or loss of position are greater than under normal operating circumstances. Two examples would be a MODU conducting well operations with non-shearables through the blowout preventer (e.g., the blowout preventer's shear ram(s) cannot shear) or when the time to terminate operations is unacceptable (e.g., the MODU crew cannot reposition the non-shearable away from the BOP's shear ram in the time required to disconnect).

Recent incidents involving drillship loss of position and emergency disconnects have highlighted the importance of operating a dynamically positioned drillship within its design limits, ensuring dynamic positioning compentency levels and ensuring approprate precautions are taken during maintenance and testing of critical equipment. A loss of position on a dynamically positioned drillship can be mitigated by following dynamic positioning system guidance published in the "DP Operations Guidance Prepared through the Dynamic Positioning Committee of the Marine Technology Society to aid in the safe and effective management of DP Operations," March 2012 Part 2 Appendix 1 (dynamically positioned MODUs), available at:

http://www.dynamic-positioning.com/dp_operations_guidance.cfm .

See our notice in the Federal Register (77 FR 26562) available at:

http://www.uscg.mil/hq/cg5/cg521/docs/DP_FR_Notice_2012-10669.pdf .

In two recent incidents, dynamically positioned drillships lost functional thrusters due to an electrical disturbance when attempting to reconnect a faulty thruster after maintenance. When the thruster was reconnected it was not electrically isolated from other thrusters and the thrusters did not "ride through" the disturbance causing loss of thrust. During these incidents the drillship crews were unable to restore all functional thrusters and as a consequence these drillships lost position and had to initiate the emergency disconnect sequence (EDS).

In another incident a dynamically positioned drillship encountered severe weather with high, shifting winds that caused it to lose position and initiate the EDS. Despite receiving a weather alert for severe thunderstorms and high winds well before this incident, only half of the available diesel generators were on line when the storm hit and the DP Operator (DPO) ordered a significant heading change with a high rate of turn when the drillship began to lose position. The drillship was unable to achieve the ordered heading or bring all generators online before it lost position and had to initiate the EDS.

Based on these incidents, the **U.S. Coast Guard recommends** that owners and operators of dynamically positioned MODUs operating on the U.S. Outer Continental Shelf:

- Include appropriate material on preventing these incidents in *training programs* for DPOs and other key DP personnel. Training programs should maximize use of DP simulators to gain proficiency in maintaining heading (dynamically positioned drillships) and ensuring equipment is ready ahead of severe weather, ensuring communications with the drill floor (e.g. use of 'blue advisory'/risk assessment) and re-establishing thrust in emergency situations. (See Marine Technology Society (MTS) MODU Operations Guidance Section 4.13 and IMCA M 117 Rev.1 Appendix 4).
- Develop and implement a Critical Activity Mode of Operation (CAMO) and a Well Specific Operating Guideline per MTS, "DP Operations Guidance" to ensure that the most reliable DP system configuration is used during critical activities. Develop and utilize a CAMO for any activity you or your lessee identifies as critical. When developing a CAMO, consider requiring open bus operation during critical activities to prevent a worst case failure with a potential for zero thrust in excess of your drift off time to the Point of Disconnect (See MTS DP MODU Operations Guidance Section 4.8 and Appendix C "Example of a CAMO", "Power Distribution").
    - It may be possible to make a common power system fully fault tolerant in respect of single failure criteria for DP Class 2 and DP Class 3. However, in such designs fault tolerance depends on a very comprehensive range of protective functions and on many items of equipment being able to perform to capacity. Operating the power plant as two or more independent power systems reduces dependence on protective functions and vulnerability to hidden failures. It does not remove all common points between redundant systems. The potential to lose one part of the system is higher but the potential to lose the complete system is reduced (See MTS "DP Vessel Design Philosophy Guidelines" Section 10.8).
- Perform testing aboard MODUs to ensure functional thruster drives will ride-through a system disturbance. This testing should indicate how the system will react during a significant bus disturbance such as a short circuit on the main switchboard. Where ride-through capability is an essential part of the DP redundancy concept it should be proven by live short circuit and ground fault testing per Section 9.2.5 of the MTS "DP Vessel Design Philosophy Guidelines". This testing should be incorporated into the vessel DP Proving Trial (5-year).
- Perform regular thermal imaging surveys of DP system electrical equipment (e.g., switchgear, drives, motor controllers, etc.) as part of a preventative maintenance program to provide early detection of faulty or loose connections.

This Safety Alert is provided for informational purposes and does not relieve any foreign or domestic requirement. Developed by the Coast Guard Outer Continental Shelf National Center of Expertise. For additional information contact Commander James Rocco: james.v.rocco@uscg.mil .