Loss of main DP system UPS

Drill Scenario

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Explore our drill scenario on the action required following the loss of power.

DP emergency drill scenarios are included to assist DP vessel management and DPOs / Engineers and ETOs to conduct DP drills onboard. The intent is that the template can be used on any DP vessel, so specific details regarding the technical outcome are not included.

The benefit of using this template is to monitor and learn from the human reactions of key DP personnel.

It is also important that the crew are familiar with various DP system set-ups including their failure modes.

Refer to Code of practice for the training and experience of key DP personnel – Appendix six (IMCA M117).

Exercise scenario: Loss of main DP system UPS

Objective:

To identify risks and impacts of this occurrence, possibilities to reduce that risk, and suitable actions to be taken if such an occurrence happened.

Method:

With the vessel in full auto DP control; power plant configured according to the vessel's DP operations Manual (and respective decision support tool); all other vessel equipment and systems set up in accordance with applicable DP checklists:

- Vessel in a safe location. Simulated location and activities agreed and communicated to all participants.
- Simulate the loss of a main DP system UPS by isolating all outputs simultaneously.
- Check the vessel ability to maintain position using remaining online equipment.
- Check the vessel DP crew ability to manage the situation in a controlled manner.
- Discuss the results and determine how the risk of losing the UPS could be mitigated.

Prior to executing, discuss the expected results:

- Is the methodology appropriate to gain the best outcome of the exercise?
- Who will be involved with the exercise and what roles will individuals have?
- What equipment will be impacted / lost?
- What are the risks of the exercise?
- Is the exercise scenario appropriately documented?

- What will be the communication channels during the exercise?
- Who will observe and accurately record exercise data including the DP system configuration pre-exercise?
- What is the anticipated loss of position?
- Are there any secondary failures expected, for example, mission equipment?

Observations during exercise:

- Is the DP emergency drill procedure being followed?
- Is the equipment performing / reacting as expected?
- Are those individuals directly involved in the exercise reacting appropriately given their assigned duties?
- Are those individuals indirectly involved reacting in an appropriate manner?
- Is the degree of participation and diligence as expected?
- What is the actual loss of position?
- What is the duration from commencement to concluding a safe outcome for the vessel?
- Was the communication effective during the drill?

Actual results witnessed:

EXAMPLE:
The vessel maintained accurate station keeping with remaining online equipment.
The DP system reacted well maintaining station keeping as did the crew's reaction and response to the failure...

Discussion points (post-exercise):

Human factors:

- What are the potential risks due to "multi-tasking" during DP operations that may directly lead to the scenario outlined during this drill? (Examples include managing / monitoring deck operations, radio traffic, etc.)
- What are the potential risks due to distractions in the workspace (i.e., Bridge, Engine Room) that may directly lead to the scenario outlined during this drill? (Examples include routine maintenance procedures, social media, personnel interactions, etc.)
- Discuss the alternative actions/reactions that may occur in response to a similar scenario. Are there multiple paths to a successful resolution or is there a preferred solution? Why?
- Following a review of the simulated exercise and the vessel and crew's reaction, what different operator (Bridge and/or ECR) reaction(s) might be warranted if faced with a similar situation during operation?

Review of DPO and other key DP personnel reaction:

- What potential gaps in the existing DP familiarisation program have been highlighted as a result of the exercise?
- What changes/revisions should be considered for the training and familiarisation procedures?

Review the applicable checklists (ASOG CAM/TAM/DP operations Manual/bridge and engine room checklists/ FMEA/DP Annual Trials programmes/etc.):

- What additional necessary actions and considerations should be addressed?
- What potential changes should be made to make the checklists more appropriate?

- What additional necessary operating conditions and parameters should be considered?
- What potential changes should be considered to make Decision Support Tools more applicable to the vessel and her equipment?
- How would these changes improve/affect the vessel's capabilities and limitations?

Conclusion:

Based on the results of the exercise and related discussions before and after, any suggestions for follow up including any corrective actions deemed appropriate should be accurately detailed and managed to close out.

Handling of UPS failures in the correct manner requires knowledge of the DP specific equipment being supplied by the particular UPS, how the DP system reacts to multiple failures and alarms and the human intervention required if necessary to ensure station keeping. Items to consider include:

- Awareness of the UPS DP supplies segregation (following the redundant groups).
- Appreciation that internal UPS failures can prevent bypass facilities operating in some designs.
- DP system reaction to multiple failures.
- What to look for on the operator stations.
- What event and alarms indicate UPS failures.
- Methods of fault finding and investigation.
- Appropriateness of communication.
- Training requirements.

Related IMCA Guidance

IMCA M117

The case studies and observations above have been compiled from information received by IMCA. All vessel, client, and operational data has been removed from the narrative to ensure anonymity. Case studies are not intended as guidance on the safe conduct of operations, but rather to assist vessel managers, DP operators, and technical crew.

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