

## Revalidation Course

The following is a list of the objectives which should be attained by the DPOs upon completion of the Revalidation Course:

### **DP Rules and Regulations**

- List of the various providers of documents containing statutory requirements and guidance relating to DP operations, including:
  - IMO (including IMO MSC/Circ. 645 of 1994 and 1580 of 2017 Guidelines for Vessels with Dynamic Positioning Systems)
  - Classification society DP rules
  - International Marine Contractors Association (IMCA)
  - Marine Technology Society (MTS)
  - IMCA and MTS guidelines for ASOG
- Explain the purpose of documentation associated with DP operations, such as DP operations manuals, Failure Modes and Effects Analysis (FMEA) and capability plots
- Describe the IMO (DP) equipment classes and their application, with reference to the IMO Guidelines for Vessels with DP Systems.
- Understand the importance of reporting DP incidents knows where to find DP incident reports and knows how to report DP incidents.

### **DP Sensors and PRS**

- Describe the following position reference systems commonly associated with DP installations:
  - Differential GNSS, hydro acoustic, INS, taut wire, Artemis, FMCW Radar and laser-based systems.
- Describe the failure modes of the following position reference systems: Differential GNSS, hydro acoustic, INS, taut wire, Artemis, FMCW Radar and laser-based systems.
- Describe the following sensors associated with DP installations: vertical reference sensor/unit, motion reference unit, gyro compass, wind sensor (anemometer) and draught input sensor. ASOG, TAM and CAM.
- Describe the failure modes of the following sensors: vertical reference sensor/unit, motion reference unit, gyro compass, wind sensor (anemometer) and draught input sensor.

### **DP Set Up**

- Ensure the vessel is on DP in accordance with the vessel's class and the vessel's operation manual. Class approved FMEA and ASOG (Complete DP Checklist)
- Determine and set alarm and warning limits
- Evaluate most appropriate PRS for specific DP-operations
- Select the number of position reference systems required in accordance with the DP class
- Using correct thruster allocation for a specific operation and weather conditions
- Testing vessel's maneuvering capability during prevailing weather conditions
- Determine a Safe Position and minimum distances to stabilize the vessel in DP
- Obtain information and clearance from e.g. installation, on issues important for the safe

operation of the vessel under DP.

### **DP Bridge Watchkeeping**

- Demonstrate a continuous awareness of the vessel's status, operation and impact of operating under DP
- Recognize the importance of maintaining lookout and awareness of the external situation including weather when controlling a vessel close to installations or other objects
- Recognize situations in which to call the Master to the bridge
- Log and report DP station keeping events
- Monitor position reference systems, sensors and signal quality in anticipation of the possibility of failure causing instant/violent reaction from main engines/thrusters
- Monitor power output and thrust
- Monitor thruster efficiency for station-keeping at different headings and drafts, which may affect DP Class
- Recognize DP-related changes in vessel systems and technical equipment which may affect DP Class
- Recognize technical and operational issues which may limit or stop DP operations
- Monitor that the DP operating parameters of continuous operating power are not exceeded.

### **Position Keeping**

- Recognize alarms related to the incorrect operation of the DP-system and maintaining position
- Acknowledge alarms within time constraints
- Discuss the alarms with relevant department
- Evaluate the possible consequences of each alarm and possibility to continue the operation
- Analyze the consequence analysis alarm
- Interpret visual indicators, indicating conditions which may result in malfunction of DP
- Monitor movement of the vessel and changes in the position and heading, in keeping with safe excursion limits depending upon the ongoing task/operations
- Monitor movement of the object / installation / target
- Monitor by various means, changes in distance/heading between object and own vessel (if applicable)
- Recognize limitations of vessel movement when having equipment or divers deployed.

### **Environmental Conditions**

- Recognize changes in environmental conditions
- Recognize when environmental conditions become critical with reference to station keeping
- Recognize increased importance of situational awareness when operating close to floating objects.

### **Alarms and Indicators**

- Identify the procedures to follow for DP and non-DP alarms
- Identify the procedures for when to change DP Alert status (e.g. from green to amber/yellow, blue/white or red).

### **Change of DP Watch**

- Prepare a hand-over checklist
- Transfer vessel's status and DP-details when handing over the watch (where not covered by the watch-keeping checklist)
- Providing an update on the ongoing operation and planned operational activities
- Review a hand-over checklist
- Verify vessel's position or movement and status
- Interpret all necessary information of vessel and operation
- Take-over / hand over DP-watch in a formal and clear manner
- Determine the DP-status and recent occurrences which may have an effect on the DP-operation during the watch.

### **Normal Completion of a DP Operation**

- Identify safe departure route and best vessel heading for departure
- Recognise external dangers prior to departure
- Identify an Emergency Escape route which may or may not be the same as the normal departure route
- Retrieve Position Reference System Equipment from e.g. the installation or seabed (if applicable and as part of a Departure checklist)
- Demonstrate moving to a safe position in appropriate steps
- Recover / retract deployed equipment (if applicable).

### **Operating in Joystick Mode (DP Joystick)**

- Stop the vessel at a pre-determined position
- Determine the need to stop the vessel completely before switching to DP control (system specific)
- Operate the DP Joystick to maintain position and/or heading in a controlled and safe manner
- Operate the DP Joystick to change position and/or heading in a controlled and safe manner
- Demonstrate DP Joystick station-keeping of the vessel under prevailing weather conditions.

### **Emergency Situation**

- Move the vessel to a safe position in a safe and controlled manner
- Demonstrate an awareness of the Emergency Escape Route.

### **Emergency Performance/Response (at least two)**

- Demonstrate actions in case of unstable Position Reference System(s)
- Demonstrate actions when losing Position Reference System(s)

- Demonstrate actions if Position Reference System(s) suddenly indicate significant changes in position/range/bearing data
- Demonstrate actions in case of error in wind input
- Demonstrate actions in case of a DP drive-off
- Demonstrate actions in case of a DP drift-off
- Demonstrate actions in case of a DP force-off
- Demonstrate actions in case of one thruster runoff
- Demonstrate actions in case of error in sensor input
- Demonstrate the proper sequence of actions if experiencing an onboard emergency which may influence DP-control during DP-operations
- Explain actions when losing all DP control functions
- Explain the proper sequence of actions if colliding or about to collide with an installation, nearby objects or vessels during DP-operations.