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A Statistical Review of Assessments: Using Data to Identify Opportunities for Industry Improvement

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Abstract

The Offshore Service Vessel Dynamic Positioning Authority (OSVDPA) intends to present a paper summarizing common amplitudes and deficiencies in the knowledge, competences, and abilities of dynamic positioning operators (DPOs) via a statistical review of the data gleaned from the OSVDPA's practical assessment system.

The OSVDPA's DPO Certification Scheme is predicated on the belief that certification is a product of classroom learning, experience gathering, and the passing of assessments. One of the OSVDPA's founding principles is the importance of practical assessments to certification and the revalidation of certifications. The OSVDPA's practical assessment system consists of a bank of assessment items, each item measuring a single or group of points of knowledge, competencies, or abilities. The assessment items have been grouped by subject matter, applicability, and difficulty. By utilizing different combinations of items—in similar ratios—the assessments can be customized to the DPO's industrial missions and vessels, while ensuring each assessment is of comparable content and difficulty.

Additionally, each assessment item contains a unique identifier and is linked to the OSVDPA Competency Standard. As such, the OSVDPA is able to track performance on an item-by-item and competency-by-competency basis.

The OSVDPA intends to present a report that identifies trends and areas for improvement within the industry. The aim is to provide actionable insights that can help the industry address skill gaps, refine training methods, and ensure that DPOs are fully prepared for real-world challenges. In turn, these informed actions will lead the industry toward our shared goal of incident free operations.

Abbreviations and Definitions

Within this paper the following terms and acronyms are utilized. To assist the reader, these terms are defined here.

- **Accreditation:** The OSVDPA approval of a Training Provider. A full definition is found in the OSVDPA MPP-1-CV, the OSVDPA Manual of Policies and Procedures (Current Version).
- **Activity Specific Operation Guidance (ASOGs)**
- **Assessment / Practical Assessment:** When these terms appear capitalized, they are being used as proper nouns and refer to the OSVDPA's Practical Assessments. The OSVDPA defines Assessments as "a structured and defined evaluation of an individual's fulfillment of the OSVDPA's requirements, which has been crafted by the OSVDPA and is administered in accordance with the policies and procedures set forth by the OSVDPA and administered by an individual approved by the OSVDPA to proctor assessments." More specifically, Practical Assessments are those Assessments that happen during or at the conclusion of Phase 3 (Simulator) Course, Phase 4 (Watchkeeping), Phase 5 (Upgrading), Revalidation, Grandfathering.
- **Assessment Item:** A defined point of knowledge, skill, or ability that has set prompting instructions and scoring criteria as defined by the OSVDPA and is directly tied to one or more OSVDPA Competency Items. All Assessment Items are listed in OSVDPA AS-1-CV, the OSVDPA Assessment Guide and Item Bank (Current Version).
- **Assessee:** A general term to describe the individual taking a practical assessment, usually a Prospective DPO or DPO.

- **Assessor:** A general term to describe the individual conducting a Practical Assessment, usually a Certified Instructor of Qualified onboard Assessor (QOBA).
- **Class A Simulator:** A full mission bridge simulator capable of simulating DP operations in a physical set up that mimic a fully equipped vessel's bridge. A full definition is found in the OSVDPA MPP-1-CV, the OSVDPA Manual of Policies and Procedures (Current Version). The simulator is capable of being used for the Phase 1 (Induction) Course, the Phase 3 (Simulator) Course; and the Phase 3, Phase 4, Phase 5, Grandfathering, and Revalidation Assessments.
- **Class B Simulator:** A Class B simulator is a multitask simulator capable of simulating DP operations in a physical set up that mimics a DP portion of a vessel's bridge environment. A full definition is found in the OSVDPA MPP-1-CV, the OSVDPA Manual of Policies and Procedures (Current Version). The simulator is capable of being used for the Phase 1 (Induction) Course, the Phase 3 (Simulator) Course; and the Phase 3, Phase 4, Phase 5, Grandfathering, and Revalidation Assessments.
- **Competency / Competency Item:** When capitalized, these terms mean an enumerated Competency as listed in the OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version). This is a list of particular points of knowledge, skill, or ability that are incumbent for DPOs as recommended by the OSVDPA.
- **Continuous Professional Development (CPD)**.
- **Critical Activity Mode (CAM).**
- **Decision Support Tool (DST)**: This term generally refers to a company or client created tool designed to inform and standardize a DPO's decision making. The OSVDPA does not dictate what DSTs should be utilized as this is a decision made by vessel operators and charterers, however, as used by the Authority the term generally means Activity Specific Operation Guidance (ASOGs), Critical Activity Mode (CAM), Task Appropriate Mode (TAM), company-based operations manuals, checklists, standing orders, and other such documents.
- **Dynamic Positioning Operator (DPO):** In this paper, this term means an individual certificated as a DPO by a recognized DPO Certification Body.
- **Grandfather:** The OSVDPA recognition of sea time, training courses, or certification provided by another DPO Certification Scheme. The OSVDPA requires all those grandfathering into the OSVDPA to pass the appropriate OSVDPA Assessment. For previously certificated DPOs this means the Phase 4 Assessment or the Revalidation Assessment. For those grandfathering in-scheme, this means the OSVDPA Assessment associated with the phase they are grandfathering within.
- **Instructor/Certified Instructor:** An individual certified by the OSVDPA to conduct Phase 1 (Induction) Courses, Phase 3 (Simulator) Courses and to conduct, proctor, and administer the Phase 1, Phase 3, Phase 4, Phase 5 Grandfather, and Revalidation Assessments.
- **Practical Experience:** An hour-based measurement of DP experience accrued when a DPO or Prospective DPO is at the DP controls for at least one (1) hour during a 24-hour period while the vessel is conducting auto positioning operations, auto heading operations (including DP or independent joystick-based autopilot), independent joystick operations, or other operations where the DP system is engaged.
- **Prospective DPO:** An individual who does not hold a DPO Certificate from a recognized DPO Certification Scheme and who has enrolled in the OSVDPA DPO Certification Scheme or an individual currently holding a valid DPO Certificate from another recognized certification scheme who is in the process of obtaining their OSVDPA DPO Certificate.
- **Qualified onboard Assessor (QOBA):** A DPO certified by the OSVDPA to conduct the Phase 4, Phase 5, Revalidation, and Grandfathering Assessments. In conducting these Assessments, the

QOBA utilizes criteria established by the OSVDPA to evaluate whether the DPO or Prospective DPO has passed the assessment.

- **Sea Time:** A day-based measurement of DP experience accrued when a DPO or Prospective DPO is on watch while the vessel is conducting auto positioning operations, auto heading operations (including DP or independent joystick-based autopilot), independent joystick operations, or other operations where the DP system is engaged for at least one (1) hour during a 24-hour period.
- **Task Appropriate Mode (TAM).**
- **Technical Advisory Council (TAC):** A group of DP industry professions elected by the OSVDPA Membership or appointed by the OSVDPA Board of Directors to advise the OSVDPA Board of Directors concerning the creation and updating of the OSVDPA's standards and certification requirements.
- **Training Provider:** An entity offering, or seeking to offer, training to the maritime community via classroom, simulator, or the production of computer-based learning programs.
- **Tier 1 Assessment Item:** Assessment Items are divided into two types: Tier 1 and Tier 2. Tier 1 Items are items that if, done incorrectly or not completed, cause the vessel to lose position or heading. Each Assessment must cover no less than 15 Tier 1 Items all of which must be completed correctly for the Assessment to be passed.
- **Tier 2 Assessment Item:** These are system monitoring, system set up, and other related aspects of DP operation. 80 percent of these items must be completed correctly for the assessment to be passed. Each of these Assessment Items is ordered how they would happen during a real DP operation.

Executive Summary

The OSVDPA has as a foundational belief that DPO certification is a product of training, experience gathering, and ensuring competency via assessments—specifically Practical Assessments. The OSVDPA's Practical Assessment system was formatted especially to collect data and is tied to the OSVDPA's Competency Standard. This formation allows for the OSVDPA to analyze the data collected from its Assessments. This analysis can be used to judge and provide feedback on the performance of groups or types of DPOs or Prospective DPOs, training providers, vessel operators or the greater industry, or any cohort thereof.

This paper analyzed the results from 349 assessments over a 10-year period. As a top-level, this analysis found that the OSVDPA's Practical Assessments had a pass rate of 96 percent. As discussed in the "Lack of Assessment Failures" Section, the OSVDPA is concerned about this passage rate and worries that the appropriate level of rigor is not being applied to assessments. However, this top-level number hides the recent year-by-year passage rate falls more into ranges the OSVDPA would expect to see. The OSVDPA attributes this change to the improvement of Instructors that are conducting OSVDPA Assessments. That said, looking at what passage rate for specific Assessment Items, the OSVDPA sees that it is possible some Instructors are not scoring those Assessment Items which can cause a vessel to lose position or heading correctly. This is concerning because when implemented correctly, the OSVDPA's Practical Assessment system lends itself to providing much more insight into the performance of individual DPOs and the collective industry.

Digging deeper into the data reveals specific skill areas with concerning failure rates that require attention. Specifically, this review found Assessment Items associated with some of the specific competencies within the "Operation Planning and Risk Assessing" section had the highest rates of failure and caused assessments

to be failed the most. The OSVDPA is concerned about this trend because the organization prioritizes operation planning as a point of emphasis.

The Assessment Item that was failed the most was generating a footprint plot. This is an Assessment Item that requests the proctor/assessor/simulator operator to prompt the Assessee to generate a plot and is considered passed if the Assessed is able to correctly produce the plot. This Assessment Item measures the Competency of generating a DP footprint plot using the DP system or paper charts.

Including the Assessment Items mentioned above, the top five most failed Assessment Items were:

- Anticipate situations that could arise based upon a change in the installation's position or heading; where the assessed must risk assess the installation's new heading and based upon the vessel's ASOG or other decision support tool, determine a new working position, and what additional changes in DP subsystems might be needed.
- Demonstrate verifying that the vessel is configured in accordance with the its redundancy concept; where the assessed must go through the checklist and describe how each applicable item supports the vessel's redundancy concept as determined by the FMEA.
- Demonstrate the creation of an exit plan for a DP operation; where the assessed must prepare a plan that provides for a safe and effective way to move from the installation to outside the 500 meter zone, is within the vessel's capabilities, factors in simultaneous operations by other vessels, does not endanger the crew, the vessel, the installation, or the environment, and complies with company policy, the charterer's instructions, and industry guidance.
- Demonstrate a verification that the exit plan is still viable; where the assessed must determine if the plan is still viable, taking into consideration the vessel's capabilities, the environmental conditions, the position of the installation, traffic, and any other factors such as charterer instructions.

Also of note, there are no significant performance differences between simulator- and vessel-based assessments, as indicated in Figure 7. Though there was a small sample size of assessments conducted onboard vessels, this finding is particularly valuable as it validates the OSVDPA's model of allowing assessments to be conducted on both vessels and simulators.

The OSVDPA notes a high historical assessor-to-assessor variability in Assessment passage rates, while also noting these rates have normalized with increases in Assessor competency. Early in the system, legacy instructors recorded very little failures. This trend suggests that in the initial stages of implementation, Instructors may have been more hesitant to assign failures, a possible carryover of more lenient practices from previous systems. Subsequent years show an increase in the willingness of instructors to document failures when competencies were not met. This shift indicates that as Instructors gained confidence and alignment with the OSVDPA's practical assessment-based system, they applied criteria more thoroughly. The result is not only better data integrity but also stronger assurance that Assessments reflect actual DPO skills. This progression demonstrates how Instructor adaptation has contributed to the maturity of the program and its ability to provide the industry with a more accurate and reliable picture of DPO competency.

OSVDPA's inferential analysis of the results indicates that several underlying trends have likely influenced overall performance outcomes. In the OSVDPA's interpretation, the data points towards the following factors:

- DPOs prefer systems that measure based on demonstration of their skills and are accessible without artificial time constraints, costs, or other obstacles.
- There is a commonality in the failure rates between Prospective DPOs, previously certified DPOs, and DPOs grandfathering into the OSVDPA. This trend is also noticed in the Assessment Items that are failed.
- Some of the OSVDPA's biggest areas of emphasis are the most failures are noted, including manual control, operation planning, and risk assessment.

Reviewing both the statistical data and inferential analysis, the OSVDPA makes the following recommendations to the industry:

- As demonstrated by the data, there is a need for the greater incorporation of Practical Assessments in the DP industry. These assessments should be done at repeated and regular intervals through Prospective DPOs training and DPOs career.
- Prioritize hands-on training in planning and risk assessment and continue to work towards the more widespread adoption of standardized decision support tools (DSTs) to address areas where deficiencies were most apparent, to ensure operators can apply knowledge in real operational conditions.
- Adopt standardized, practical assessor protocols across the industry to ensure that assessments consistently reflect actual operator competency and ensure that instructors do not feel pressures related to commercial or social promotion purposes.
- Harmonize training language with real-world terminology, reducing confusion caused by mismatches between classroom instruction and real-world operations as well as in between onboard systems.

Simulator-based training is effective, offering both scalability and realism. Continued training in simulation, coupled with training that reflects the conditions and terminology encountered in the field, will be essential for preparing operators to respond confidently to complex, real-world challenges. Equally important is addressing variability in assessment practices, which requires the industry to align expectations, review assessor performance, and ensure consistency in evaluating competencies across all environments.

Overview of OSVDPA

To understand the results presented, one must first understand the OSVDPA DPO Certification Scheme and its foundation and have a detailed understanding of the OSVDPA's Practical Assessment system. This section describes the OSVDPA DPO Certification Scheme and its foundation.

The OSVDPA DPO Certification Scheme was founded on four (4) principles. Each of these principles is described below.

All who use DP Should be Competent in the Safest Methods of DP Utilization.

The founders of the OSVDPA were repeatedly confronted with mariners that were operating DP systems but were prevented or constrained from receiving the training operating a DP-equipped vessel via the most up-to-date, and industry-accepted operational techniques. In the OSVDPA's opinion, this situation prevented the industry from realizing its goal of incident free DP operations.

As such, the OSVDPA does not believe it is the responsibility of the owner of the training scheme to decide who should be operating DP. Instead, this decision is made—regardless of the scheme owner's beliefs—by flag states, charterers, and vessel operators. Thus, the OSVDPA will follow the lead of these entities and has set its participation requirements at levels where all that are operating DP systems can receive training and certification from the Authority, if they meet the requirements and pass the assessments.

Training and Certification Requirements Should be based upon a Defined Competency Standard.

The OSVDPA believes that all training and certification activities—including the assessments included within the scheme—must be based on a defined list of competencies. Such a structure ensures that vessel operators, charterers, training centers, and prospective DPOs will know what can be expected during training and what the DPO is capable of upon certification. Further, once established, this basis ensures that all components of the certification scheme—e.g. classroom training, theoretical assessments, shipboard training, and assessments align and provide a more intentional certification pathway.

The OSVDPA's DPO Certification Scheme is built around OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version) (see Appendix 1) which was created by the Technical Advisory Council (TAC) by distilling the industry-based DP Competency standards.

In addition to these standards, the OSVDPA TAC layered in its own areas of emphasis. These areas represented the areas the TAC felt required increased emphasis in the training of DPOs due to the determination that these were the causes of, or had an increased likelihood of preventing, DP incidents or were areas where TAC members had observed a lacking of DPO competency. Specifically, these areas of emphasis were:

- **Operation planning:** Ensuring that unsafe situations are not created and developing contingency and exit plans for when the conditions change or when operations cannot be continued.
- **Risk assessing:** Ensuring the safety of an operation is preserved by conducting formal pre-operation risk assessments and constantly assessing the risk of the operation as it continues.
- **Communication:** Increasing the safety of operations by ensuring all parties understand the status of the operation and understand their role in this operation.
- **Use of Decision Support Tools**: The MTS DP Committee has created and popularized tools that improve the safety of operations by standardizing how vessels should be set up and when operations should or should not continue. The OSVDPA TAC found that the industry needed to do a better job of teaching DPOs and prospective DPOs how to utilize these tools.
- **Manual Control:** When use of DP is no longer possible due to faults or failures of the DP system or changes in the environment, the option of last resort is to switch to manual control. As such, the TAC believes that DP training must also ensure the operator is competent in manual control of the vessel.

The OSVDPA has provided a complete review of how it created OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version) and how this standard relates to other international guidance at the

2014 DP Conference. This report is titled "The Evolution and Divergence of DPO Competency: Commonalities and Differences in the Competencies Required of DPOs across Industry" and is available on the MTS DP Committee's website (Smith, 2014). Please see that report for more complete information about the OSVDPA's Competency Standard.

Certification is a Product of Experience and Assessments.

The OSVDPA believes that prior to certification, Prospective DPOs should have learned the basics and theory of DP in classrooms and simulators, honed these skills via participation in real world DP operations, and then prove they have become proficient with the required competencies via the passage of assessments.

When put into practice, the OSVDPA has a defined experience-gathering requirement; specifically, a dual-layer experience requirement with one measuring observing and exposure to DP operations and the other measuring time at the DP console. In the scheme, "Sea Time" is defined as spending at least one (1) hour during a 24-hour period in the wheelhouse while the vessel is on DP, and "Practical Experience" is defined as spending between one (1) and six (6) hours in a 24-hour period at the DP console while the vessel is on DP. Through the certification scheme, prospective DPOs are required to gain 90 days of Sea Time and 270 hours of Practical Experience.

When combined with the OSVDPA's Competency Standard, the OSVDPA's experience-gathering periods all have taskbooks that must be completed, proving that the Prospective DPO is gathering the experience the OSVDPA believes will make him or her a competent DPO. These tasks are designed to give the Prospective DPO experience with all of the competencies included in OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version).

After the Prospective DPO completes each phase of training, he or she is required to pass structured, theoretical or Practical Assessments. This culminates in the final assessment that must be passed before the Prospective DPO is provided a DPO certificate.

The OSVDPA is not alone in its support for assessment-based certification. Numerous other maritime guidance and regulation bodies have called for DPO certification schemes (as well as all training schemes) to be predicated upon or heavily upon assessments. Specifically, the following pieces of guidance and regulation call for assessments to be the deciding factors in certification or an integral part of certification.

- IMCA M 117, Rev. 3.2, "DPO certification is obtained by successfully completing all elements of an industry recognized DPO training scheme. This includes theoretical and practical assessment and examination at appropriate stages during the scheme." (The International Marine Contractors Association, 2024).
- Oil Companies International Marine Forum's (OCIMF) "Dynamic Positioning Assurance Framework: Risk-Based Guidance" states that assessments are required to maintain certification as a DPO (Oil Companies International Marine Forum, 2016).
- DNV's "The scheme should use summative assessments . . . to determine if a candidate can be considered competent to perform a specific task as input for the certification decision. Summative assessments or exams should determine if a person meets competence requirements as defined in the certification scheme." (DNV, 2021).
- The International Standards Organization (ISO) "one of the characteristic functions of the certification body for persons is to conduct an examination, which uses objective criteria to measure competence" (ISO 2012).

To ensure DPOs do not suffer from skill fade, the OSVDPA requires DPOs to revalidate their certificates every five (5) years. For the OSVDPA, revalidation also follows the principle of certification being the product of both experience and assessments. Specifically, to revalidate a certificate DPOs must show that they have accumulated 150 days of Sea Time and 450 hours of Practical Experience in the last five (5) years. Once this is proven, the DPO must again pass a Practical Assessment.

The OSVDPA also allows for DPOs or prospective DPOs to transfer or "grandfather" into the OSVDPA. The requirements to do so also follow the founding principle of certification being based upon experience and assessments. Specifically, to grandfather into the scheme, a DPO or Prospective DPO must prove they have met the experience-gathering requirements and pass the assessment of the phase the DPO or prospective DPO believes they have reached.

Certification Should be Practically Achievable and Relevant to the Industry Mission(s) conducted by the DPO.

The OSVDPA has attempted to remove the procedural challenges from securing a DPO certificate from its scheme, offering different ways for the scheme components to be completed. As described in further detail below, the best example of this factor is the different ways that OSVDPA Assessments can be conducted, e.g. on a simulator or on a vessel.

Summary of the OSVDPA Practical Assessment System

With an understanding of the OSVDPA's DPO Certification scheme, it is next fundamental to have an understanding of the OSVDPA's Practical Assessment system. This section provides an overview of this system. It should be noted, the below only provides a summary of the OSVDPA's Practical Assessments, that is the assessment that occur during the following phases or activities:

- Phase 3 (Simulator) Course,
- Phase 4 (Watchkeeping),
- Phase 5 (Upgrading) (for those holding a Class B DPO Certificate seeking to secure a Class A Certificate),
- Revalidation (every five (5) years after certification), and
- Grandfathering (anyone entering the OSVDPA DPO Certification Scheme after Phase 3 (Simulator Course).

As stated above, the OSVDPA believes that its scheme—and the accompanying assessments—must be practical to complete. For this reason, OSVDPA Assessments can be conducted either on a simulator, at an OSVDPA-accredited Training Provider, or on a DP-equipped vessel.

If the assessment is being conducted on a vessel, the assessments must be conducted by a mariner that has been approved by the OSVDPA as a Qualified on Board Assessor or (QOBA). To be approved as a QOBA, a mariner must meet the following requirements:

- Must have a valid and current DPO certificate from an industry-recognized DPO certification scheme,

- Must have recorded 150 days of Sea Time and 450 hours of Practical Experience in the last five (5) years, and
- Must have passed a flag-state-approved onboard assessing course or otherwise be approved by a flag state to conduct onboard assessments.

As stated above, the OSVDPA believes that training and certification, and therefore the assessments involved in training and certification, must be relevant to the industrial mission participated in by the DPO. As such, the OSVDPA Assessments are administered using OSVDPA-created "Scenarios." Each scenario is designed to mimic a DP operation—often created by actual DPOs—and contained within this operation are the Assessment Items, or points of measurement, that the Certified Instructor or QOBA should score.

By picking the scenario that most closely matches the operations conducted by the Assessee, the Certified Instructor or QOBA ensures that the scenario is relevant to what the Assessee does on a daily basis.

Each scenario is contained in a printable package. The first page of the scenario provides the Assessee with general information that they need to know about what they will be doing during the assessment. The rest of the package provides the points of assessment, instructions for how the assessment should be conducted, and a place to score the results. An example of the Assessee portion of an Assessment Scenario is found in Appendix 2.

Each of these Assessment Scenarios contains 45 points of assessment, or "Assessment Items." 15 of these Assessment Items are known as Tier 1 Items. These are items that, if done incorrectly, would cause the vessel to lose heading or position. To pass the assessment, every Tier 1 item must be completed correctly.

The other 30 Assessment Items in the scenario are Tier 2 Items. These are system monitoring, system set up, and other related aspects of DP operation. 80 percent of these items must be completed correctly for the assessment to be passed. Each of these Assessment Items is ordered how they would happen during a real DP operation, and the scenario provides the assessor (either the Certified Instructor or the QOBA) with instructions for how each Assessment item should flow together and what information should be provided to the DPO or prospective DPO taking the assessment.

While scenarios are customized, the Assessment Items are not. Each Assessment Item included in the scenarios is taken from OSVDPA AS-1-CV, the OSVDPA Assessment Guide and Item Bank (Current Version) (OSVDPA 2016). This standard has more than 200 Assessment Items, all of which are designed by the OSVDPA TAC to measure one or multiple competencies in ways that mimic real-life DP operations. Each Assessment Item has a unique identifier that is listed on each Assessment report completed by the Certified Instructor or QOBA.

Below are two examples of an Assessment Item as they appear in OSVDPA AS-1-CV. As seen in these examples, each Assessment Item is made up of the following components (reading from left to right):

- **Item Number:** A unique identifier that can be used to track the Assessment Item,
- **Assessment Item:** The title of what the Assessment Item is, or is attempting to measure,
- **Examiner/QOBA set up instructions and Pass/Fail criteria:** The instructions for how the Assessment Item is to be conveyed to the Assessee and the criteria that should be utilized by the assessor to determine if the item was passed or failed,

- **Competency Covered:** The reference number for each competency covered as contained in OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version),
- **Tier:** If the Assessment Item is a Tier 1 or Tier 2 Assessment Item,
- **DP Class:** What DP class of vessel the Assessment Item is suitable,
- **Phase:** What phase of the OSVDPA DPO Certification Scheme the Assessment Item is suitable for, and
- **How/Is the item conveyed:** If the action required by the Assessment Item should be prompted to the Assessee or if the Assessee should know to do the Assessment Item on their own.

Figure 1

Item Number	Assessment Item	Examiner/QOBA set up instructions and Pass/Fail criteria:	Competency Covered	Tier	DP Class	Phase	How/Is the item conveyed
7e-22	Demonstrate bringing the vessel to a full stop while in manual mode.	With the vessel moving at its normal transit speed and under manual mode, prompt the assessee to bring the vessel to a complete stop within 50 meters of a simulated 500-meter zone line without exceeding Chief Engineer's or Master's standing orders. The item is passed if the assessee is able to perform the stop in a safe and controlled manner within the criteria.	11.5 20.9	1	All	All	List Prompt
6g-10	Select a working position and heading that enables the vessel to operate within the requirements of the vessel's ASOG when considering the environmental conditions.	Prompt the assessee to select a working position and heading meeting the applicable requirements. The item is passed if the assessee selects a position and heading which enables the vessel to operate within the requirements of its ASOG.	19.11	2	All	Phase 4 Phase 5	List. Prompt

Thus, by combining these Assessment Items in different ways, the OSVDPA can formulate Assessment Scenarios that are relevant to numerous different vessels and industrial missions while still being of comparable difficulty.

The OSVDPA has created the following assessment scenarios:

Figure 2

OSVDPA Assessment Scenarios		
Number	**Name**	**Description**
C-SS-1	Construction Vessel / Subsea Operation	Scenario C-SS-1 details a DP-2 / DP-3 OSV / MPSV that is carrying team of ROV operators to take core samples 300 meters away from the vessel's current position.
L-FI-1	Logistic Vessel / Liftboat	Scenario L-FI-1A details a DP-1 Logistic vessel (crewboat/OSV) scheduled to offload deck cargo to a liftboat. As an assessment for DP-1 vessels, this assessment is inappropriate for a DPO seeking a Class A DPO Certificate via Phase 4A or Phase 5.
L-FL-1	Logistic Vessel / Floating Installation, Number 1	Scenario L-FL-1 details a DP-2 crewboat/OSV scheduled to conduct a personnel transfer to a semi-submersible drilling rig.
L-FL-2	Logistic Vessel / Floating Installation, Number 2	Scenario L-FL-2 details a DP-1 crewboat delivering a load of grocery boxes to a [semi-submersible drilling rig]. There are [three] other vessels working in the field conducting operations at various times. As an assessment for DP-1 vessels, this assessment is inappropriate for a DPO seeking a Class A DPO Certificate.
L-FL-3	Logistic Vessel / Floating Installation, Number 3	Scenario L-FL-3 details a DP-2 crewboat/OSV scheduled to deliver excess fuel to a drillship operating in the field with other fixed and floating installations.
L-FL-4	Logistic Vessel / Floating Installation, Number 4	Scenario L-FL-4 details a DP-2 OSV scheduled to work alongside a tension leg platform (TLP) in the preparation of a pipeline for commissioning, specifically transferring a hose from the vessel to the TLP.
L-FL-5	Logistic Vessel / Floating Installation, number 5	Scenario L-FL-5 details a DP-2 OSV conducting a cargo transfer to a tension leg platform (TLP) operating in the field with other fixed and floating installations.
L-FL-6	Logistic Vessel / Floating Installation, Number 6	Scenario L-FL-6 details a DP-2 OSV conducting a cargo transfer to a tension leg platform (TLP) operating in the field with other fixed and floating installations. While similar to OSVDPA Scenario L-FL-5, OSVDPA Scenario L-FL-6 includes significantly different assessment items and intends to measure an individual's competencies of, and abilities to handle, specific faults, failures, and situations introduced to the DP system that are not included in OSVDPA L-FL-5.
L-FL-7	Logistics Vessel / Drill Ship – Flowback Operations	Scenario L-FL-7 details a DP-2 OSV loaded with barrel tanks, for flow back operations.

Importance of Revalidation Assessments

Unlike other systems, the OSVDPA has, since its inception, required its DPO certificates to be revalidated every five (5). Also, since its inception, this revalidation required the DPO to successfully complete a practical assessment. This requirement has cost OSVDPA market share as some DPOs choose to go to DPO certification systems that did not include a similar requirement. However, when the Nautical Institute (NI) introduced their Continuous Professional Development (CPD) requirements in their system (April 2023 Press Release), it sparked notable growth in the number of DPOs seeking and taking OSVDPA

Assessments. As a result, 24 in-scheme and 57 post-scheme DPOs chose to Grandfather into the scheme since the NI's CPD requirement, alleviating the burden of purchasing courses or spending time in a refresher course.

The OSVDPA prioritized Revalidation Assessments to help protect against skill fade and reinforcing the essential functions of conducting DP operations via the industry-accepted best practices.

Further, numerous studies of the DP industry, maritime industry, and other highly critical industries have found that experience is one of the best ways to breed competency and prevent skill fade. According to "Factors Influencing Attenuating Skill Decay in High-Risk Industries: A Scoping Review" (Klostermann et al., 2022), test-based interventions, such as multiple-choice questions or online quizzes—primarily support temporal retention, or the ability to recall learned information over time. However, these methods fail to support adaptive transfer, meaning they don't prepare individuals to apply skills in new or changing situations. This is particularly problematic when DPOs are in the field where unpredictable conditions demand more than memory, but real-time judgment and hands-on proficiency, such as applying the metrics of an Activity Specific Operating Guidelines (ASOG) to an operation.

The review found that cognitive and behavioral-based training—such as practical and hands-on training—are effective in supporting both long-term retention and adaptability. These methods better equip DPOs to maintain operational competence under real-world conditions. The findings suggest that relying solely on test-based CPD frameworks may overlook the practical and flexible application of critical skills. For industries where real-time decision-making and physical performance are essential, more immersive and applied training approaches are likely to be more effective.

Another study for the General Medical Council found:

> There is substantial evidence that time out of practice does impact on skills retention. Skills have been shown to decline over periods ranging from 6 to 18 months, according to a curve, with a steeper decline at the outset and a more gradual decline as time passes. The amount of time between learning and losing a skill varies between skills and between individuals, with many mitigating factors. (General Medical Council, 2014)

Some studies have attempted to determine which skills fade faster. A U.S. Army study found that motor skills started to deteriorate after 10 months, while the ability to recall procedures decayed six (6) months after their last use (Wisher, 1999); confirming an earlier study, "after 365 days of non use or non practice, the average participant's performance was reduced by almost a full standard deviation" (Arthur, 1998).

The available research has also reached interesting conclusions regarding what can prevent, mitigate, or allow an individual to recover from skill fade. Specifically, in a paper for Military Medicine, a group of researchers found the following factors mitigated—but did not prevent skill fade:

- Length of time the skill was not used;
- Amount of "overlearning" (training beyond the mastery level);
- Complexity of the task, i.e. psychomotor verses cognitive, number of steps involved, etc.;
- Type of test used to prove original mastery;
- "Condition of retrieval" (e.g. is recall required or is simple recognition enough);
- Training and instructional methods used;

- Individual differences; and
- Motivation (Perez, 2013).

Conversely, a study performed for the Israeli military of experienced service member's proficiency in both knowledge-based requirements and practical abilities found that refresher courses helped delay the decay of procedural knowledge, but these courses did not impact the retention of practical abilities (Henik, 2002)

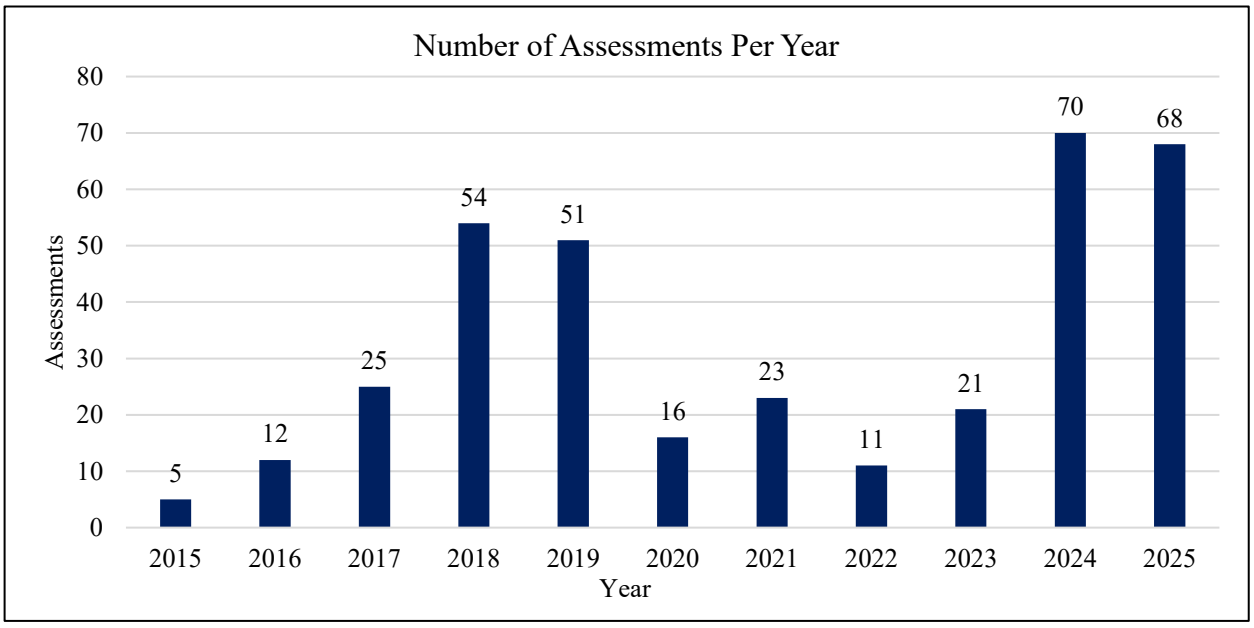
This review is interesting in that it confirms the maritime industry's support of experience-based training, the need to continue experience gathering throughout a career, and the more effective nature of continuing to maintain experience levels over classroom-based training.

Data Summary

The OSVDPA reviewed 361 assessments that were conducted over the last 10 years. After removing incomplete records, inaccuracies, and cases with privacy concerns, 349 assessments remained for analysis. While 12 assessments were excluded from the primary dataset, the incomplete data was retained for exploratory review of broader trends. Overall, the dataset showed a 96 percent pass rate, with 335 passes and 14 fails. It should also be noted that all personal and company identifiers have been removed from the analysis and replaced by numerical identifiers.

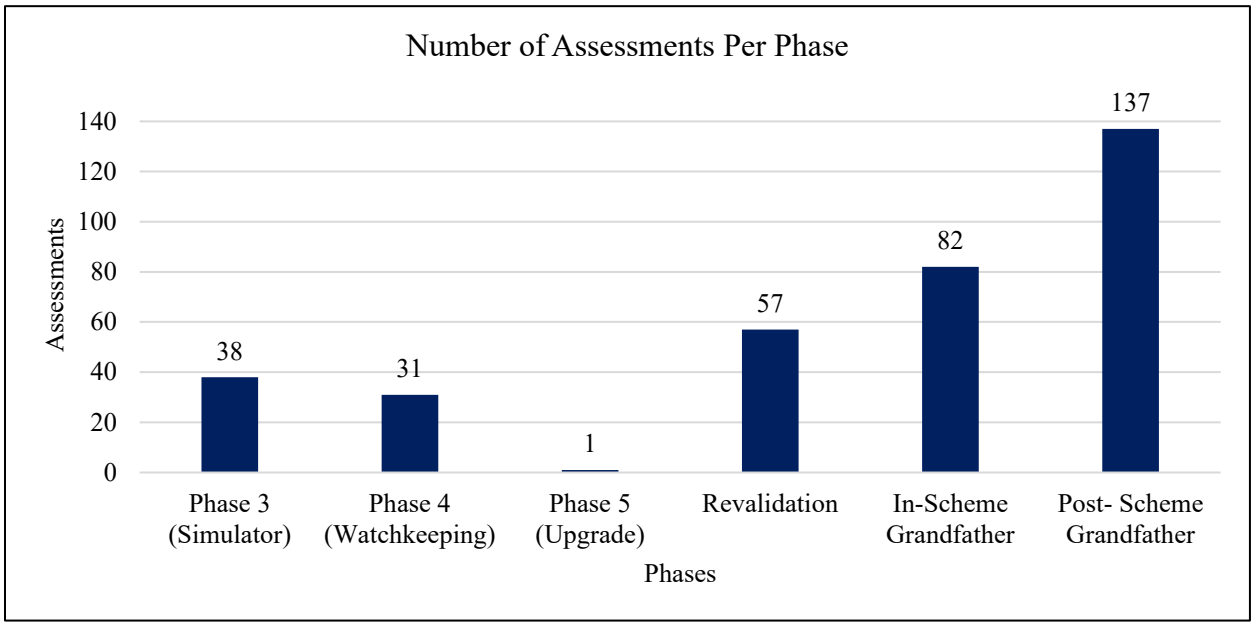
The volume of assessments varied over the ten-year period as displayed in Figure 3. The highest numbers were recorded in 2024, with 70 assessments, and 2025 with 68 Assessments recorded as of August 11, 2025. The OSVDPA had shown slow but steady growth from Accrediting its first Training Provider in late 2016 through 2019. However, the number of Assessments sharply declined between 2020 and 2022 due to the COVID-19 pandemic and an inability to conduct simulator-based assessments. The previously mentioned CPD announcement in 2023 subsequently caused a great deal of growth.

Figure 3



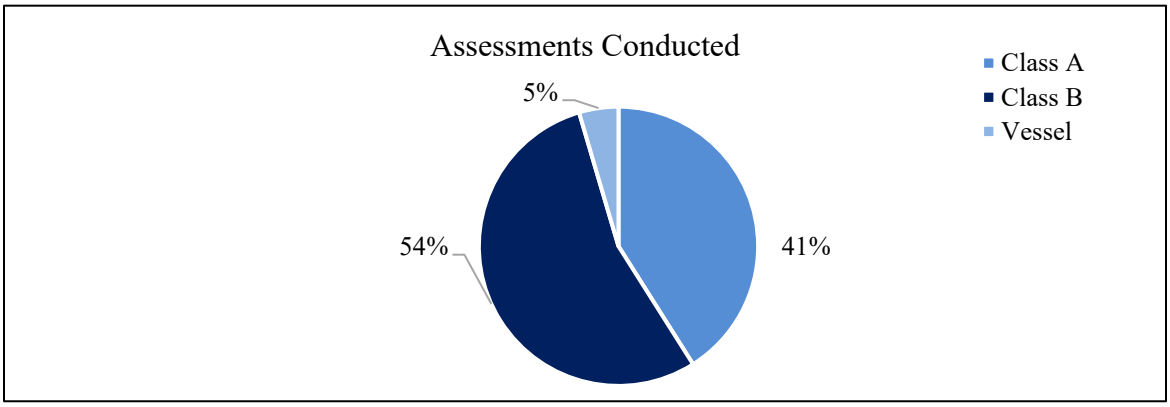
The data spans Prospective DPOs during Phase 3 (Simulator) and Phase 4 (Watchkeeping) of the OSVDPA's DPO Certification Scheme, Revalidation Assessments of OSVDPA DPOs, and Prospective DPOs and DPOs Grandfathering into the OSVDPA DPO Certification Scheme. Figure 4 includes a breakdown in Assessments per phase.

Figure 4



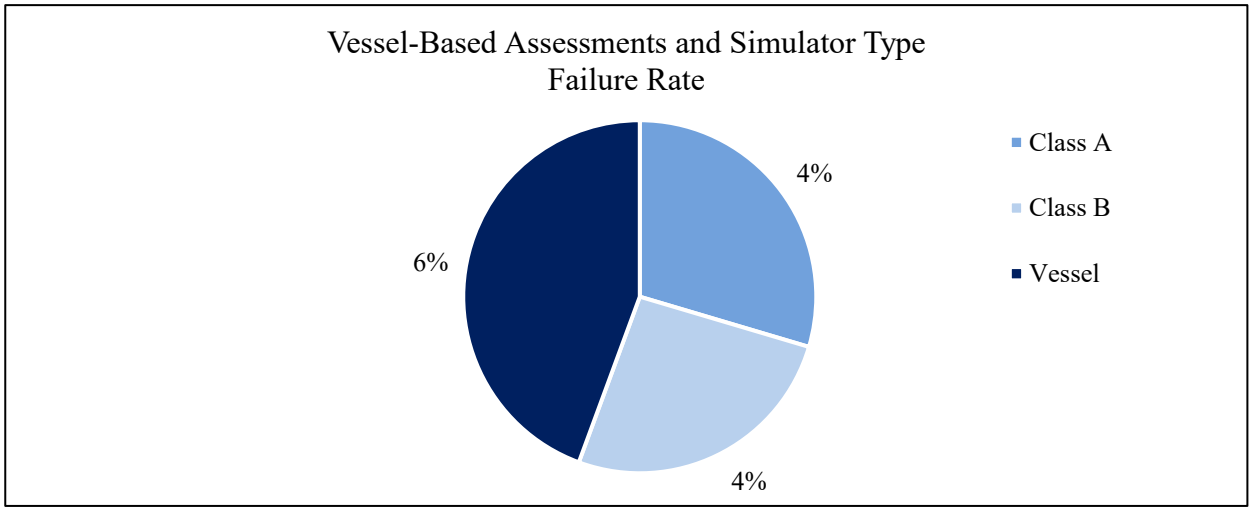
The assessments were conducted at seven (7) training providers that were or are currently Accredited by the OSVDPA to conduct practical assessments. Within these Training Providers, the Assessments were conducted by 17 Instructors and 13 QOBAs. Figure 9 below shows how many Assessments each Instructor conducted over the period. OSVDPA Assessments—as conducted at a Training Provider—can be conducted on a Class A or Class B Simulator. In the analysis, 144 (41 percent of total) Assessments were conducted on a Class A Simulator and 191 (54 percent of total) Assessments were conducted on a Class B Simulator (See Figure 5 below).

Figure 5



The OSVDPA also allows for Assessments to be conducted onboard vessels by a QOBA. Though most assessments are conducted on simulators, vessel-based assessments contribute five percent of the data. This distribution of predominantly simulator-based is interesting because when the OSVDPA policies and procedures were drafted, it was assumed that the default would be that OSVDPA Assessments would primarily be conducted onboard vessels—outside of Phase 3 Assessments which must be conducted at the end of the Phase 3 (Simulator) Course—with the alternative compliance mechanism being Assessments conducted on a simulator. As Figure 6 indicates, the failure rate difference is small between Assessments conducted on a simulator and onboard vessels. The Authority has noticed specifically manual handling Assessment Items were found to have performed better on a vessel which is further discussed in the Competency-Related Findings section of the paper.

Figure 6



Findings (Explanatory Note)

As indicated above, the OSVDPA gleaned a wealth of insights from this analysis. To make sense of this data, the below divides the findings into a section about the OSVDPA's assessment system (Assessment-Related Findings) and a section about the performance of DPOs (Competency-Related Findings).

Assessment-Related Findings

Lack of Assessment Failures:

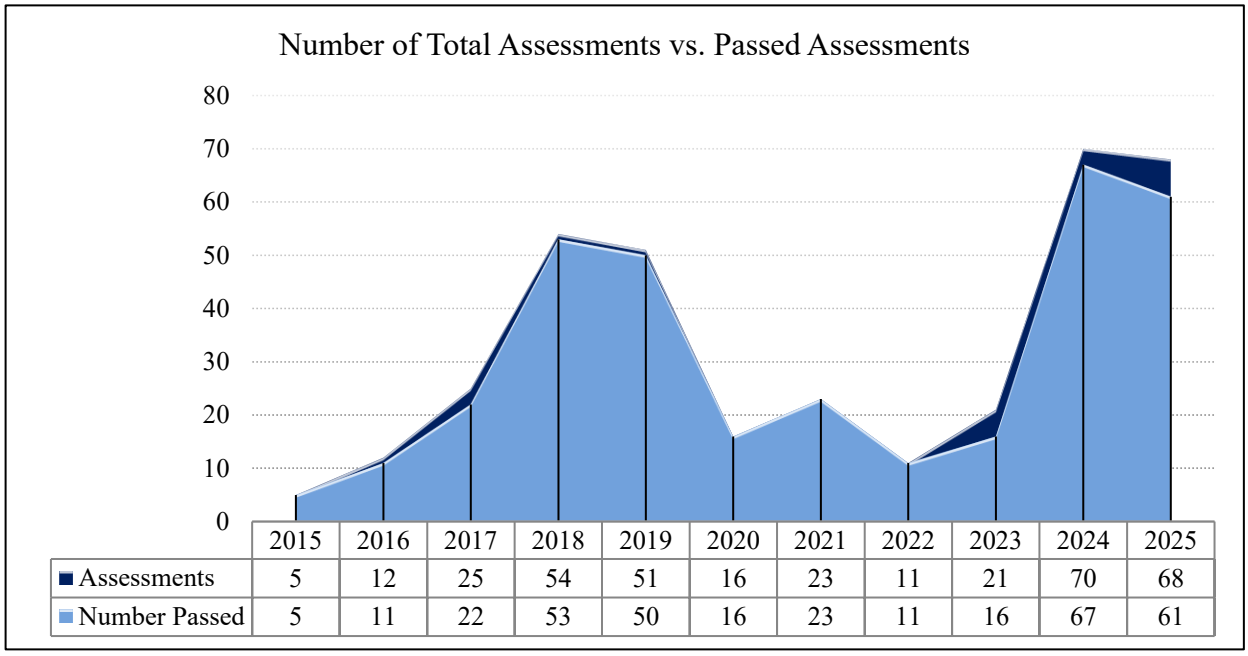
As reported above, the data shows that only four percent of Assessments have been failed. While the OSVDPA does not want to see Prospective DPOs and DPOs fail Assessments, the Authority does want to ensure that the scheme's Certificates are evidence of quality training and experience. Further, the Authority wants to ensure that shortcomings in competency are identified and remediated. Obviously, recording a Prospective DPO or DPO as having failed an Assessment is not the only way that discovery and remediation can occur, however, it is the most transparent way and it is the way that—considering the OSVDPA's data capturing system works—these failures help improve the competency of not only the Prospective DPO or DPO being assessed but also help the competency of the entire industry.

The OSVDPA has been aware of this problem for some time. However, the slow rate of growth of the OSVDPA made it difficult for the Authority to push harder on Assessors to record more failures when—as evidenced by the increase in utilization when the NI rolled out their CPD program—alternative routes to securing or revalidating a DPO certificate did not have a practical assessment.

Another reason for low numbers in failures are the OSVDPA-provided means for alternative compliance for manual control failures on simulators (see below). For Tier 1 items when a DPO displays competency throughout the Assessment but fails one Tier 1 due to unfamiliarity with the manual controls of the simulator, there are means for alternative compliance. As a founding principle, the Authority attempts to remove challenges in securing a DPO certificate and this applies to a simulator system being different than what a Prospective DPO or DPO experiences on board a vessel. These situations account for about five percent of passed Assessments.

The OSVDPA is pleased to report that this tread has started to abate. We are seeing Assessment passage rates more in line with what we expect to see. For example, as evidenced in Figure 7, year-to-date there has been a passage rate of 90 percent, over 68 Assessments. In comparison, in 2018 there were 54 Assessments and only one (1) failure.

Figure 7



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Assessments	5	12	25	54	51	16	23	11	21	70	68
Number Passed	5	11	22	53	50	16	23	11	16	67	61

A few factors and OSVDPA actions have contributed to this trend. First, the implementation of the NI's CPD program moved that certification scheme closer in revalidation requirement to the OSVDPA. This made it easier for the OSVDPA to enforce its standards and for the OSVDPA Training and Certification Partners to adhere to these standards without losing DPOs to the other certification schemes. Second, the OSVDPA has worked consistently with Training and Certification Partners to foster a greater understanding of the importance of correctly scoring assessments—for not only the Prospective DPO or DPO taking the Assessment, but for the larger DP community.

Additionally, when the OSVDPA started, it found it was hard to convince some legacy instructors about the importance of accurately grading DPOs. As such, in the early years of the OSVDPA DPO Certification Scheme there were not as many failures recorded as what the OSVDPA would hope to see. To correct this trend, the OSVDPA has worked consistently with Training and Certification Partners to foster a greater understanding of the importance of correctly scoring assessments—for not only the Prospective DPO or DPO taking the Assessment, but for the larger DP community. By 2023, some legacy instructors stopped conducting assessments and the data shifted as shown in Figure 8.

As seen in Figure 8, many of the Instructors that have been approved by the OSVDPA have a zero percent failure rate. However, Figure 9 shows that many of these Instructors conducted very few assessments. The OSVDPA is pleased to see that the Assessors that have conducted the most assessments have some of the highest failure rates. This is a product of building "buy-in" from the community and therefore getting better assessment results.

Figure 8

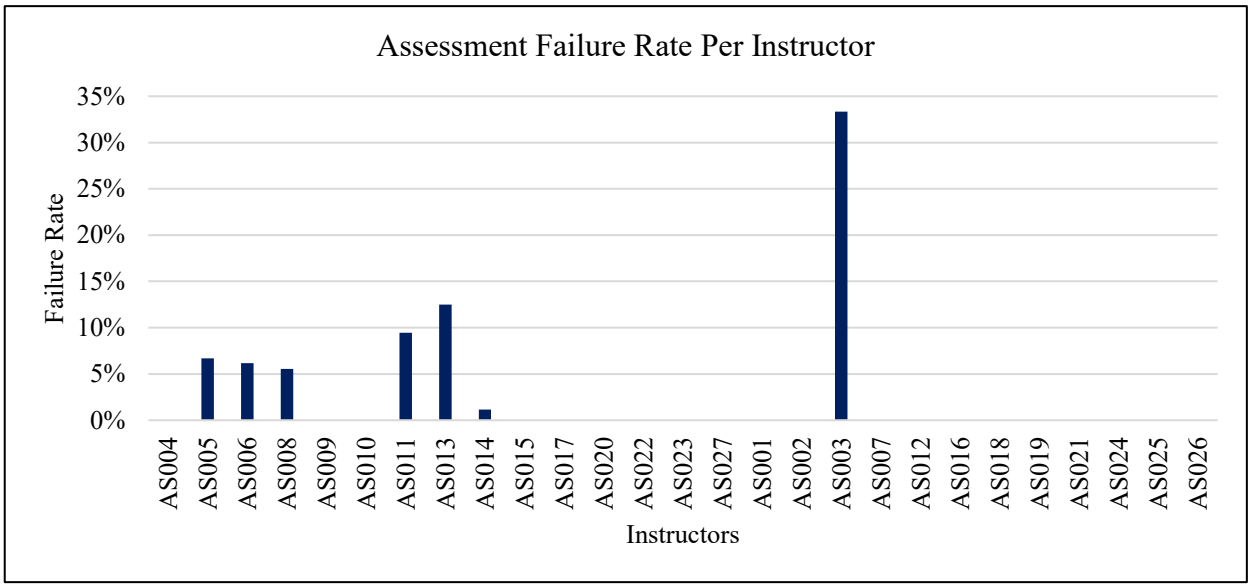
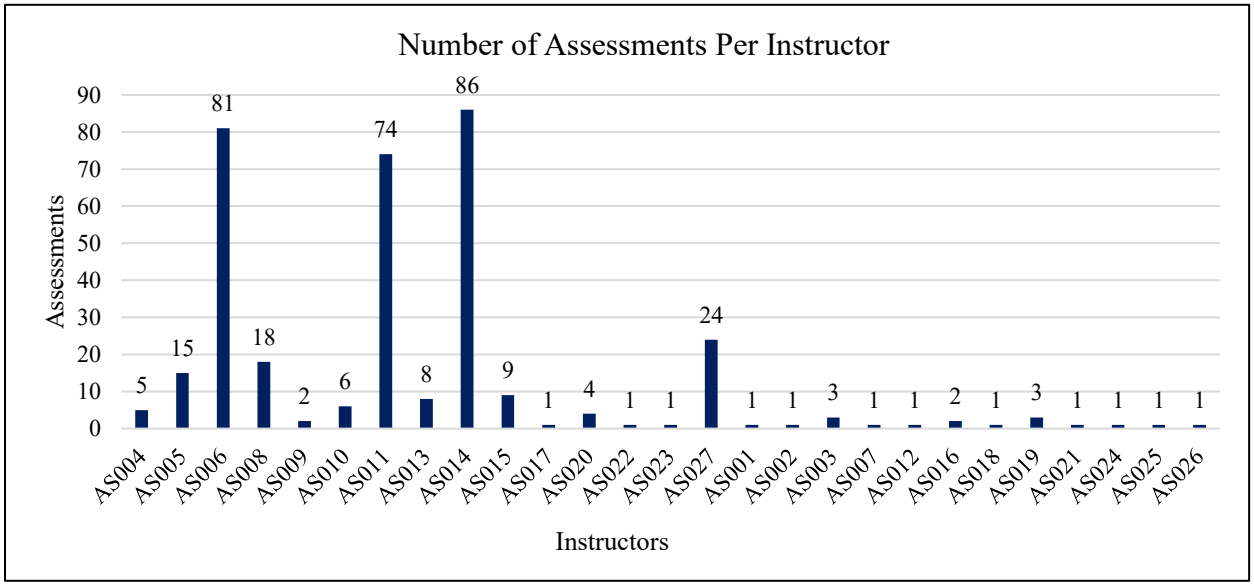


Figure 9

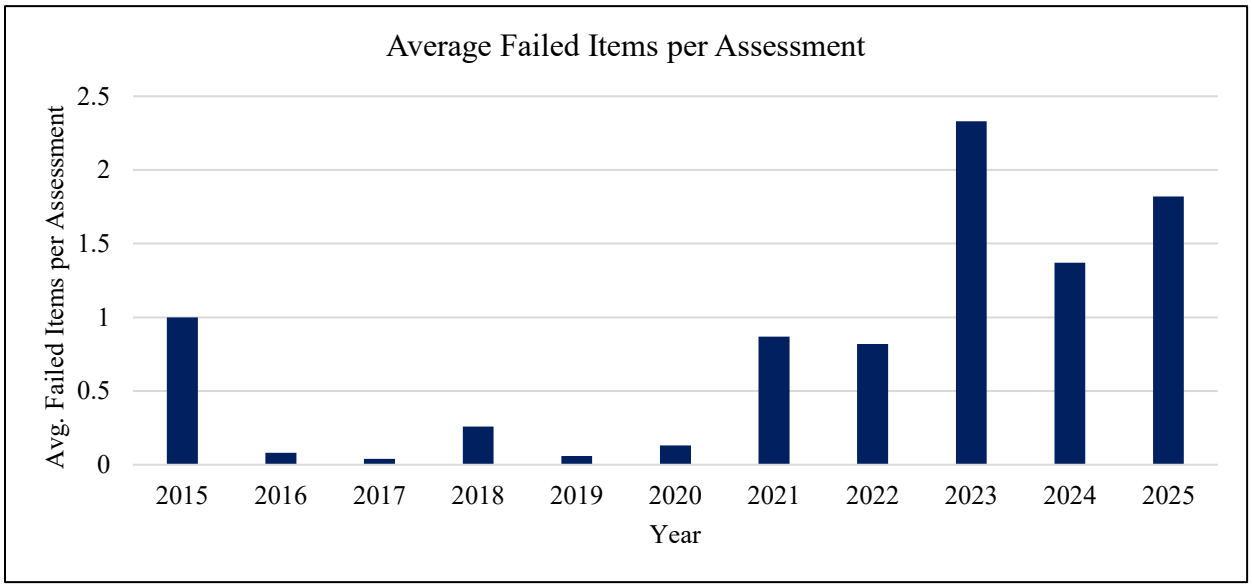


Number of Assessment Items Failed Per Assessment

As stated above, the OSVDPA understands the difficulty with an Assessor failing a Prospective DPO or DPO on an assessment. However, the OSVDPA would like to see improved—which can be done without any adverse consequences—is for Assessors to correctly apply the scoring criteria for Tier 2 Assessment Items. As stated above, every OSVDPA practical Assessment is composed of 30 Tier 2 Assessment Items, to pass the Assessment a Prospective DPO or DPO needs to complete 80 percent of these Items correctly. Thus, when—and only when—performance warrants, an Assessor can record a Prospective DPO or DPO as having failed up to six (6) Tier 2 Items and the Prospective DPO or DPO will still pass the Assessment. This scoring structure provides the Prospective DPO or DPO with input on areas he or she can work on and provides the industry with data about where we can improve.

Unfortunately, it does not seem like this scoring system was being utilized to its full potential in the early days of the OSVDPA. As noted in Figure 11, in 2016, 2017, and 2019 Prospective DPOs and DPOs averaged less than one failed Item per 10 Assessments (0.08, 0.04, and 0.06 (respectfully) Items failed per Assessment). Fortunately, this trend has changed in recent years—for reasons similar to the total Assessment Failures noted above—and the OSVDPA is now seeing the number of Assessment Items failed in each assessment at a rate that is closer to what the Authority expected to see.

Figure 11



Difference in Scores Between Post-Course Assessments and Off the Street Assessments

The OSVDPA is concerned about the disparity in failure Items found on Phase 3 Assessments verses any other type of Assessment. As seen in Appendix 4, the top 25 most failed Items were found 378 times during Phase 3 Assessments but there were only 14 failures recorded. In comparison, the top 25 most failed Items appeared on 575 Revalidation Assessments and were failed 55 times. The OSVDPA sees three possible—and not mutually exclusive—theories for this situation.

First, it could be that Prospective DPOs are performing better on the Phase 3 Assessment because this Assessment comes at the end of a four-day course where they have been practicing the skills that they are going to be assessed on and they have become familiar with the simulator and DSTs they will be using for the Assessment.

Second, this trend could be caused by a reluctance on the part of Instructors to fail a Prospective DPO they have just spent the better part of a week teaching. The OSVDPA notes that the DNV's Recommended Practice for DPO Certification Schemes does recommend that Prospective DPOs be assessed by a different instructor than the instructor that taught their course (DNV-RP-0007). The OSVDPA sees the wisdom in this recommendation in a perfect world but simply does not see it practical to implement. Simply Training Providers don't have the resources to keep Certified Instructors on payroll waiting to assess a class of DPOs that another Certified Instructor has taught.

Third, it is very possible that some or all of this discrepancy could have been caused by skill fade taking knowledge, skill, and abilities away from DPOs after they have been working and not in a class.

Competency-Related Findings

Top 25 Most Failed Items:

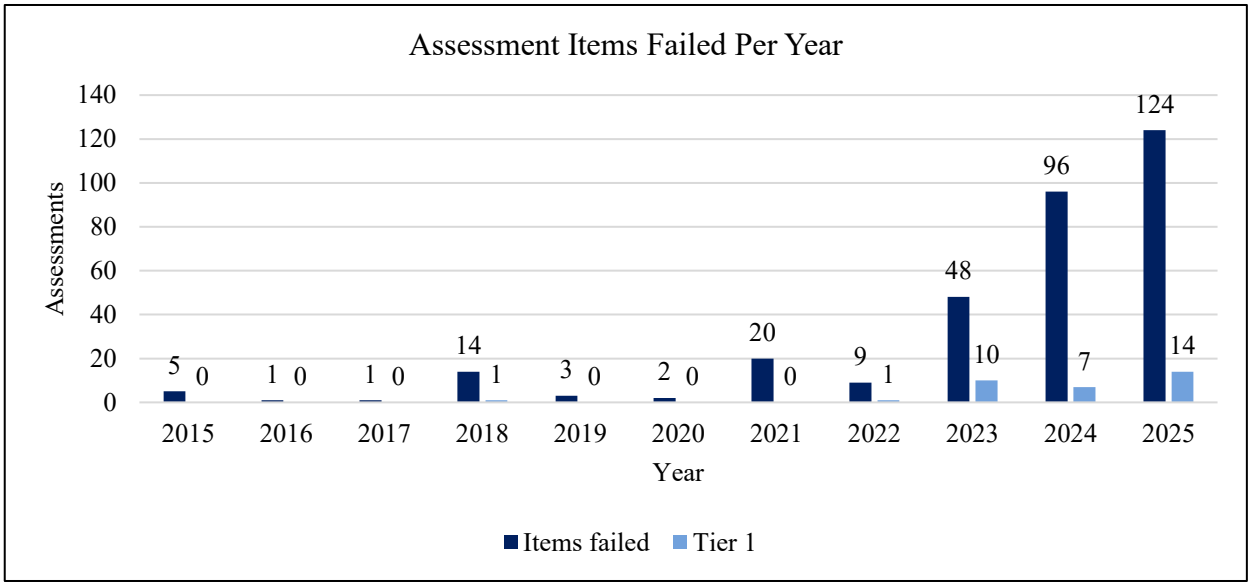
As stated above, there are more than 200 Assessment Items in the OSVDPA Item Bank, thus space and time prevent this paper from providing a full review of all 200 items. However, we have listed the Top 25 Assessment Items that have failed at the highest percentage. That data is contained in Appendix 3.

To ensure we are not overweighting Assessment Items that have been failed by only a small number of Assessees, we only include Assessment Items that have appeared on more than 30 (or roughly eight percent of the Assessments in the study) into the analysis. However, before discussing what Assessment Items are included in the Top 25 most failed Items, the OSVDPA finds it important to talk about Items that are not on this list.

Lack of Tier 1 Items:

As indicated above, the Assessment Items known as Tier 1 Items represent some of the most fundamental abilities, skills, and points of knowledge incumbent in DP operations. These are Items that, if done incorrectly, cause the vessel to lose position or heading. However, as indicated in Appendix 3 there was only one Tier 1 Item in the Top 25 most failed Items (see discussion of this Assessment Item below). In fact, the OSVDPA would note that of the 323 recorded Assessment Item failures in the analysis, only 33 or slightly more than 10 percent were Tier 1 Items.

Figure 12



As such, the OSVDPA is concerned that Assessors—understanding that recording a failure of a Tier 1 Item will cause the Prospective DPO or DPO to fail the entire assessment—are not recording the failures that should be recorded. As stated above, if the Assessors are noting these Items are being failed, relaying to the Prospective DPO or DPO why the Item was failed, performing remediation, and reassessing the Item to ensure that the standard has been reached not recording the failure is partially acceptable. However, the OSVDPA has no way of verifying or assuring that process is occurring. Further, such a system—if it is in fact occurring—does not help the broader industry understand and learn from trends in DPO's competency. All of that said, the OSVDPA understands why Assessors might be conducting this social promotional style grading. There are numerous factors that are complicated by a failed assessment and none of these factors

are the aim of the OSVDPA. As such, the OSVDPA is investigating other scoring methodologies, insight into these methods is found in the "Recommendations" Section below.

Manual Handling:

Outside of the above note on Class A and Class B Simulators, the OSVDPA has been monitoring the performance of Prospective DPOs and DPOs on manual vessel handling competency. As such, the OSVDPA Competency Standard, taskbooks, and Assessments all include items based on the nexus between DP operations and manual handling both in an intact state and post-worst case failure. Manual vessel handling is a significant point of emphasis for the OSVDPA and has been since its inception. To this point, the OSVDPA notes that there is only one manual vessel handling Assessment Item that is found in the top 25 most failed Items (see Appendix 3). The OSVDPA knows failures of this Assessment Item are under reported in the data because a means of alternative compliance that was worked out with the Training and Certification Partners and the OSVDPA.

Toward this end, the OSVDPA has long been concerned with the realism of manual controls on simulators. Simply, the lack of tactile and audio inputs, and mismatches between the controls and video inputs. do~~es~~ not provide the responsiveness or realism necessary to make for a suitable assessment tool for many mariners. It is important to note that these shortcomings exist across manufacturers and DP system types—more specifically the manual controls on most simulators are not made by DP manufacturer or even the simulator manufacturer but are often third-party add-ons. As would be expected, Class A Simulators and higher-end Class B Simulators provide more realism, however, the above-stated problems are still found on these simulators and thus making requirements for Class A Simulators does not solve this problem.

Not every Prospective DPO or DPO has encountered problems with the manual controls on simulators. To figure out if there were mitigating factors that could be investigated, the OSVPA has asked Instructors to talk to Assesses who performed either very well or poorly on ~~the~~ manual controls to see what common or mitigating factors might be at play. As could be expected, those Prospective DPOs or DPOs that had a history of playing video games or had otherwise developed a familiarity with video-based graphics reported having less problems with the manual controls.

While confirming and interesting information, that data does not help the OSVDPA ensure that the DPOs that complete the OSVDPA Training and Certification Activities are competent manual vessel handlers. Further, the OSVDPA noticed early on that it was often more experienced mariners that reported the problems with the simulator's manual controls. This lead the OSVDPA and the Instructors to be fairly confident that these individuals did not lack competency in operating a vessel in manual mode, they lacked competency in operating the manual controls of the simulator.

As a result, the OSVDPA provides alternative compliance for manual control Assessment Items that are failed on a simulator when the Instructor believes the failure is due to unfamiliarity with the simulator's controls or inputs rather than a lack of actual vessel-handling Competency. When this happens, the Instructor informs the Assessee that the item was not correctly completed and discusses their vessel-handling experience. If this conversation confirms that the Assessee has a history of manual control competency, the Assessor leaves the Assessment incomplete and notifies the OSVDPA. Subsequently, the OSVDPA contacts the Assessee to explain the Assessment Items and provides an opportunity to the Assessee to complete the failed Assessment Item under the watch of the Master of the Vessel or company representative. The correspondence specifies the entire Assessment Item, scoring criteria, and other relevant considerations. Once the Master or other cognizant representative observes the Assessee complete

the item meeting the criteria, they sign a letter attesting to this fact, include the vessel's stamp, and send to the OSVDPA. Upon receipt, the OSVDPA informs the Training Provider, the Instructor amends the Assessment Item as passed, then provide the assessment report to the OSVDPA. The OSVDPA then accepts the assessment as passed.

Well-Performed Assessment Items:

Notwithstanding the above points regarding a lack of Items being recorded as failed. The OSVDPA was pleased to see the data indicate that Prospective DPOs and DPOs showed proficiency in numerous competencies. Specifically, 29 Assessment Items were never recorded as having failed. These covered such areas as environmental sensor awareness, communication, and alarm response. When these results are read in conjunction with the below results, it indicates to the OSVDPA that many Prospective DPOs and DPOs are proficient with the "buttonology" of DP but not safest practices for DP operations.

In the Moment and in the Console:

In largest part, the failures that have been recorded show the area Prospective DPOs and DPOs who took the OSVDPA Assessments are in the moment and in the DP console, which is positive, however, the data indicates that the Assessee may have difficulty planning or thinking ahead and monitoring what is going on outside of their vessel and thinking about how these factors may influence their vessel. Specifically, the most failed Assessment Items are associated with Competencies in the following sections of OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version):

- **Operation (Normal Execution):** second, seventh, 10th, 17th (multiple competencies), 23rd, and 25th most failed Items
- **Operation Planning and Risk Assessing:** fourth, eighth, eleventh, 14th (multiple competencies) 17th (multiple competencies), and 20th most failed Items.
- **Operation (Set up and Approach):** sixth, 14th (multiple competencies), 15th, 16th (multiple competencies), and 18th most failed Items.

Granted, these sections account for a large portion of the OSVDPA CT-1-CV, the OSVDPA Competency Standard (Current Version) and therefore account for a sizeable portion of the Assessment Items in OSVDPA AS-1-CV the OSVDPA Assessment Guide and Item Bank (Current Version). However, OSVDPA guidance states that each Assessment Scenario should only include between nine and 14 of these Assessment Items. In comparison, OSVDPA AS-1-CV, OSVDPA guidance also states that each Assessment Scenario should be composed of four and eight Assessment Items representing faults, failures, degradation, and emergencies, yet none of these Assessment Items appeared in the top 25 most missed Assessments Items.

In large part, this composition of failed Assessment Items shows the OSVDPA's emphasis on operation planning, risk assessing, and use of DSTs. However, if these are points of emphasis, then the OSVDPA believes that Prospective DPOs and DPOs should be receiving the training and experience they require to correctly complete these Assessment Items during the Assessments. More information on this topic is in the Implications Section below.

Most Failed Item, Footprint Plots:

The OSVDPA was also somewhat concerned to see that the most missed Assessment Item seemed like a very rudimentary skill that is included in every DPO training course. Specifically, the most missed Assessment Item was Item 6i-1 "Generate a footprint plot for the operation utilizing footprint plotting sheet." The OSVDPA has a high degree of confidence that the industry should examine the competency of DPOs completing footprint plots because this Item was included on 150 Assessments in the analysis (42 percent) and failed 20 times (13 percent of the time it appeared).

Not only is completing a footprint plot a rudimentary skill, but there is also amble guidance on how this skill should be completed. Specifically, the OSVDPA notes that the MTS DP Operational Guidance, contains guidance and templates on how these plots should be completed. Similar guidance is found in Guidelines for the Design and Operation of Dynamically Positioned Vessels (IMCA M103) and International Guidelines for the Safe Operation of Dynamically Positioned Offshore Supply Vessels (IMCA M182), amongst other industry resources.

The OSVDPA looked further into the data to see if a reason for this high failure rate could be identified. In doing so, it was noted that the Assessors had notes 11 times that this Assessment Item was failed, these notes were (all are direct quotes, please excuse syntax and grammatical errors, Assessors are having to write fast during Assessments):

- Used to screen print
- Filled wrong, had to teach
- Used to screen print
- Filled out wrong
- Never filled one out
- Drew drift test/ Didn't know
- Didn't fill out correctly
- Never filled out paper plot
- Filled out wrong
- Never filled out one before
- Not filled out correctly

From these notes it appears that footprint plots are not being widely used in the field or working Prospective DPOs and DPOs have developed a reliance on the footprint plots generated by the DP system. The OSVDPA believes that DPOs should have the ability to complete a paper footprint plot in case the DP system is not capable of completing—or more likely printing—a footprint plot.

The good news is that it appears the DPO training courses are correctly covering how a footprint plot should be created. As seen in Appendix 4, this Assessment Item was not failed during the Phase 3 (Simulator) Assessments but was failed in 15 percent of the Phase 4 Assessments and 35 percent of the Revalidation Assessments where it appeared. Considering the divergency between this Phase 3 Assessment performance and the performance of Prospective DPOs/DPOs that had not just been in a classroom, it appears that skill fade is taking away the knowledge of how these plots should be completed.

Second and Seventh Most Failed Item: Operation Monitoring.

The second most failed item in the analysis was Assessment Item 8a-14, "Anticipate situations that could arise based upon a change in the installation's position or heading." This Assessment Item was included

on 45 assessments and was failed six (6) times. As such, the OSVDPA does note that the number of failures of this Assessment Item is significantly lower than the above or below-mentioned Items, thereby providing some degree of doubt into the ranking of this particular finding. That stated, it should be noted that as seen in Appendix 4, the failures of this Item were exclusively found in the Grandfathering Assessments and were not found in Phase 3, Phase 4, or Revalidation Assessments.

Assessment Item 8a-14 is associated with OSVDPA Competency 21.1 "Describe the items a DPO should be monitoring during a DP Operation." This Competency is also associated with Assessment Item 8a-13 which was the seventh most failed Assessment Item having been included on 47 Assessments and failed three (3) times. Combined, the items appeared in 92 Assessments and were failed nine (9) times.

It should be noted that the prompts for Assessment Items 8a-14 and 8a-13 are different, 8a-14 provides the following prompt and scoring criteria for the Assessor:

> During the operation, ask the assessee the result of and his or her response to a 10 degree heading change in the installation.
>
> The item is passed if the assessee relates that they would risk assess the installation's new heading and based upon the vessel's ASOG or other decision support tool, determine a new working position, and what additional changes in DP subsystems might be needed.

Conversely, Assessment Item 8a-13 is more reactive specifying the following prompt and scoring criteria, this could have led to the higher passage rate:

> During the operation, cause (on a simulator) or simulate or mimic (on a vessel) a change in the installation's heading and prompt the assessee to react accordingly.
>
> The item is passed if the assessee risk assesses the installation's new position, determines if continued operations are possible within the vessel's ASOG or other decision support tool, communicates this determination to the installation (if necessary), determines if a change in the vessel's position and heading are necessary, and determines if additional/different PRS or thrusters are necessary.

The OSVDPA prioritizes training DPOs to conduct quality operation planning and risk assessing. As such, planning for and reacting to a heading change from the installation are some of the competencies that the OSVDPA wants to see DPOs performing well.

Third Most Failed Item: Redundancy Concept:

Appearing in almost double the number of Assessments, the third most failed Item, 6g-5, "Demonstrate verifying that the vessels is configured in accordance with its redundancy concept." This Assessment Item appeared in 80 Assessments and was failed eight (8) times. It should be noted that there was no discernable pattern as to when in the scheme this Assessment Item was most failed as it was failed 17 percent of the time in Phase 3 and 15 percent of the time during Revalidation.

This Assessment Item was failed for two primary reasons: first, it was failed when Prospective DPOs/DPOs failed to set up their vessel in a way which would account for its operational capacity post worst-case failure. The Assessment Item was also failed because Prospective DPOs or DPOs did not enable the correct mix of position reference sensors and therefore were not technically operating as DP-2 vessels.

It should be noted that Assessment Item 6g-5 is associated with Competency Item 17.3 from the OSVDPA Competency Standard, which is, "Demonstrate verification that the vessel is configured in accordance with its redundancy concept as proven in the vessel's FMEA, class standards or other applicable requirements." This Competency Item is alternative measured—in other OSVDPA Assessment Scenarios—by Assessment Item 6j-3, "Demonstrate knowledge that the consequence analysis function must be enabled for the vessel to operate as a DP-2 or higher vessel." That Assessment Item also appeared in the top 25 most failed Assessment Items as it was included in 79 Assessments and failed three (3) times.

Interestingly, and as seen in Appendix 4, this was the only Assessment Item in the top 25 most failed Items that was failed at a significant rate in the Phase 3 Assessment, specifically, Assessment Item 6g-5 appeared in 23 Phase 3 Assessments and was failed four (4) times,

Fourth and Fifth Most Failed Items: Exit Plans:

In the analysis, the fourth and fifth most failed Items were closely related. Specifically, the fourth Item was 6g-8, "Demonstrate the creation of an exit plan for a DP operation and the fifth item was 8d-3 "Demonstrate a verification that the exit plan is still viable." Item 6g-8 appeared in 98 Assessments and was failed nine (9) times (nine (9) percent), while 8d-3 appeared in 291 Assessments and was failed 21 times (eight (8) percent).

The analysis also found that these Items were failed most during Revalidation Assessments (failure rate of 17 percent and 14 percent respectively) and during In-Scheme Grandfathering Assessments (failure rates of 27 percent and nine percent respectively). Considering that Revalidation and In-Scheme Grandfathering are the most different pathways of DPO certification (i.e. someone who starts within the OSVDPA scheme from day one, earns an OSVDPA DPO Certificate, and then revalidates said DPO Certificate verses someone that starts in the NI Scheme and then crosses into the OSVDPA system midway) there seems to be widespread failure of these competencies.

Other Notable Failure Rates:

The OSVDPA also noted the following failure rates within the data:

- **PRS Blending:** Despite an increased industry emphasis in understanding the correct blending of PRS systems, Assessment Item 6b-2 "Describe which position reference systems should be enabled for the operation and explain to the Examiner/QOBA how these choices minimize the risk posed by the loss of a PRS." This Assessment Item was the eight most failed Item after being included—intentionally—on many Assessments (143 Assessments). While the Assessment Item does not specifically mention the blending of relative and absolute PRSs, the OSVDPA notes that the notes from the Assessors recording these failures repeatedly reference that this Item was failed because of incorrect blending or weighting. Finally, it should be noted that the majority of these failures were recorded by previously certificated DPOs.
- **Approach Techniques:** There was a 10 percent failure rate for Post-Scheme Grandfather Assessments for Assessment Item 7e-30 "Approach the installation using speed and steps

appropriate for the operation, conditions, company policy, and charterer requirements." This Item was included on 135 of the above-mentioned Assessments and was failed 13 of those times.

- **Approach Plan:** During Revalidation Assessments Assessment Item 6g-7 "Demonstrate Creation of an Approach Plan" was failed 16 percent of the time. This was interesting because this Assessment Item was included on a high number of Revalidation Assessments, thereby giving a good degree of confidence that this type of DPOs are lacking this Competency. However, this Assessment Item was also included on 219 Grandfathering Assessments and was only failed five percent of the time.

Implications of the Data and Recommendations

As this paper indicates, the OSVDPA's Assessment data can be utilized as a look directly into how the DP industry is doing in breeding competency in its front-line stakeholders. Having reviewed this data as well as the OSVDPA's analysis of this data, this paper now provides suggestions to the industry for how these findings can be used to improve the safety of our shared industry.

Importance of Regular Practical Assessments:

The findings reinforce the value of competency-based practical assessment systems both as part of the certification process and subsequently as part of revalidation. The data shows that the OSVDPA's practical evaluations are validating operator skills and pinpointing areas requiring improvement. This validates OSVDPA's founding principle that certification should be based on real-world, observable operator performance rather than theoretical or multiple-choice examinations. Specifically, the OSVDPA notes the following:

- **Perfect and Good are not Enemies:** As demonstrated above, the data shows that Prospective DPOs and DPOs performed relatively equally on Class A Simulators, Class B Simulators, and onboard vessels (however the data was limited on vessels). Further, the findings regarding manual control show that simulators do have some drawbacks. As such, it appears that the most important part is to ensure assessments are completed regardless of means. There is an understandable urge to push for the utilization of high-profile simulators, however, equal results can be gleaned from onboard assessments or more accessible simulators.
- **Practical Provides for Theoretical:** Theoretical knowledge points can and should be part of practical assessments. As demonstrated above, some of the failures observed by the OSVDPA are theoretical points of knowledge--e.g. "knowing X has to be done before Y can happen." These knowledge points can be integrated into practical assessments, however physical skills—which were also found by the data to be lacking in some cases—cannot be incorporated into theoretical assessments.
- **Manual Control:** As evidenced by the discussion above, for some Prospective DPOs and DPOs, the manual controls on simulators do not provide the level of realism necessary to adequately assess their abilities. As such, vessel operators should take measures to ensure that their internal quality assurance measures are measuring how Prospective DPOs and DPOs are handling the interface between DP and manual control and their competency at handling a vessel post worst-case failure.
- **Repeated Assessments:** Many experienced DPOs were originally trained and evaluated under schemes that relied heavily on sign offs. Further, some of these DPOs work for operators or charterers that do not have as stringent requirements for use of DSTs. As a result, these operators often struggle with structured procedures. Industry certification systems and vessel operators must

bridge this gap by placing greater emphasis on practical assessments, ensuring that operators who excelled in theory are equally capable in practice.

- **Importance of Familiarity:** As discussed in the section about the different in scores between Phase 3 Assessments and Revalidation Assessments, it is very possible that the differences between a "cold" simulator or DP system is affecting performance. DPOs should take note of this possibility and ensure that they consider scheduling revalidation assessments at Training Centers that have equipment they are familiar with or ensure they have ample time to familiarize themselves on the equipment and/or take advantage of the OSVDPA familiarization tools. More importantly, if this trend is being seen on simulators it means it is also present on DP systems. As such, vessel operators should ensure DPO are familiar with and have experienced on the DP systems the are utilizing.
- **Importance of Impartiality:** As stated, the OSVDPA notices that there may be some problems with the impartiality of assessments. As such the OSVDPA urges vessel operators and training providers to find practical ways to overcome these challenges. In doing so, the industry should ensure that we do not create barriers to assessing Prospective DPOs or DPOs.

Don't Forget the Day-to-Day Skills in the Rush to Introduce New and Higher Concepts:

Further, some of deficiencies pinpointed in the data are practical abilities that might be overlooked as rudimentary or perfunctory. In this case, the OSVDPA notes that skill fade does not remove the ability to complete these tasks should not be lost as the industry looks to ensure DPOs understand the newest industry trends and developments.

Footprint plots are taught in every introductory and advanced training course in both the OSVDPA and NI training scheme. Additionally, there is ample guidance provided for how footprint plots should be completed in every major source of DP industry guidance. Despite this ubiquity, the data shows the completion of a paper footprint plot was the most failed Assessment Item. Further, the Item was failed most by DPOs revalidating, not by Prospective DPOs as some may intuitively believe.

Moving forward, the industry must treat training and assessment as living systems—capable of adapting to new technologies, regulatory expectations, and operational risks. Building on the strengths already demonstrated, stakeholders should use these insights to target areas where they are most needed, while leveraging proven successes as models for improvement. By focusing on practical learning, standardized practices, and continuous monitoring, the industry can elevate competency standards and reinforce its commitment to safe, reliable operations across all phases of DP certification.

Put Increased Emphasis on Planning, Risk Assessing, and Monitoring Tools:

As detailed above, operation planning and risk assessing continue to be areas where newly minted and experienced DPOs have problems. As specific examples, the OSVDPA notes approach, exit, and contingency planning. Vessel operators should review their operational procedures and internal competency managements systems to ensure these concepts are correctly taught and evaluated.

Use of Decision Support Tools:

Relatedly, Training Providers and vessel operators are urged to prioritize proper understanding and utilization of DSTs with a specific emphasis on ASOGs to ensure DPOs understand how to utilize this

document. Additionally, Training Providers are urged to review their curriculum to ensure that proper instruction is provided on how to utilize DSTs. In this effort, the OSVDPA notes that the most effective training is provided when the DST aligns with the vessel being simulated. The OSVDPA understands that it can be challenging for training providers to find ASOGs, checklists, etc. that align with each of the simulated vessels. Considering this challenge, the OSVDPA urges vessel operators to attempt to partner with training providers to provide aligned ASOGs, checklists, and other DSTs.

Instructor Empowerment:

The industry must also address assessor-related variability and work to empower them with the tools, training, and support needed to apply standards confidently and consistently. Broader adoption of practical assessment standards, more consistent assessor training, and ongoing revision across certification schemes will help ensure fairness and comparability. By elevating assessors as trusted agents of competency, the industry can create an environment where certification is not only consistent but also a source of professional pride for both candidates and evaluators. Addressing this approach at the industry level ensures that assessors are equipped and empowered to uphold standards across all certification environments, strengthening confidence in the process and its results.

Conclusion

The data presented in this paper provides a detailed picture of where Prospective DPOs and DPOs demonstrate strong competency and where meaningful improvements can be made. While many DPOs perform well in areas such as communication, environmental awareness, and alarm response, failures were concentrated in competencies that demand forward thinking, structured planning, and procedural compliance. Operation planning, risk assessment, and checklist execution emerged as points of difficulty for Prospective DPOs and DPOs. Likewise, the high failure rate of seemingly rudimentary tasks—such as generating a footprint plot—illustrates how skill fade and overreliance on automated system outputs can erode core competencies over time.

The findings also show systemic challenges. Variability in assessor recording practices, as well as challenges linked to simulator-based manual controls, reveal opportunities to strengthen reliability across training and certification. Addressing these gaps will allow the industry to capture an even clearer, more accurate picture of DPO competency while ensuring assessments remain both practical, accessible, and fair.

By prioritizing practical assessments, reinforcing the use of decision support tools, and addressing vulnerabilities, the industry can improve training practices that strengthen DPOs' DP competency at every stage of their careers. Equally important is the stimulation of assessors, whose consistent application of standards strengthens the fairness, credibility, and transparency of the certification process. The OSVDPA's Practical Assessment system offers not just a certification pathway, but a framework for elevating safety, competence, and professionalism across the dynamic positioning community.

References

Det Norske Veritas AS. 2013. *Competence of Dynamic Positioning Operators (DPO).* Oslo : Det Norske Veritas, 2013. 3.322.

—. 2013. *Competence of Dynamic Positioning Operators*. London : The International Marine Contractors Association, 2022. DNV-ST-0023.

DNV. 2021. *Certification Scheme for Dynamic Positioning Operators*. Oslo : DNV, 2019. DNV-RP-0007.

International Maritime Organization. 1994. *Guidelines for Vessels with Dynamic Positioning Systems*. London : International Maritime Organization, 1994. MSC/Circ. 645.

—. 2010. *The International Conventions on Standards of Training, Certification, and Watchkeeping for Seafarers*. London : The International Maritime Organization, 2010. 2010.

The International Marine Contractors Association. 2024. *Code of practice for the training and experience of key DP personnel*. London : The International Marine Contractors Association , 2024. IMCA 117 Rev. 3.2.

—. 2015. *Dynamic Positioning Station Keeping Incidents: Incident Reported for 2011 (DPSI 22)*. London : The International Marine Contractors Association , 2015. IMCA M 227.

—. 2012. *Guidance on Competence Assurance and Assessment*. London : The International Marine Contractors Association, 2012. IMCA C 002 Rev. 2.

—. 2009. *International Guidelines for the Safe Operation of Dynamically Positioned Offshore Supply Vessels*. London : The International Marine Contractors Association, 2009. IMCA M 182.

—. 1996. *The Training and Experience of Key DP Personnel*. London : The International Marine Contractors Association , 1996. IMCA M 117, Rev. 1.

—. 2022. *Guidelines for the design and operation of dynamically positioned vessels*. London : The International Marine Contractors Association , 2022. IMCA M 103, Rev. 5.2.

The Marine Technology Society's Dynamic Positioning Committee. 2012. *DP Operation Guidance* . Houston : The Marine Technology Society's Dynamic Positioning Committee , 2012.

—. 2012. *Guidance for Professional Development of Personnel Engaged in DP Operations using the Mapping Delivery Tool (MDAT)*. Houston : The Marine Technology Society , 2012.

. The Offshore Service Vessel Dynamic Positioning Authority**.** *The Evolution and Divergence of DPO Competency: Commonalities and Differences in the Competencies Required of DPOs across Industry.* Houston : Marine Technology Society, Dynamic Positioning Committee, 2014.

— . 2016. *2016 DP Conference - Competency and Design*. New Orleans: The Offshore Service Vessel Dynamic Positioning Authority.

—. 2016. *The OSVDPA Assessment Guide and Item Bank*. New Orleans: The Offshore Service Vessel Dynamic Positioning Authority.

—. 2018. *The OSVDPA Manual of Policies and Procedures* (005 ed.). New Orleans: The Offshore Service Vessel Dynamic Positioning Authority.

--. 2018. *DP Sea Time Validation: An in-depth review of the commonly utilized DP validation practices and suggestions for how the industry can improve*. New Orleans: The Offshore Service Vessel Dynamic Positioning Authority.

The Nautical Institute. (2023, April 11). *Press release: Important news for all DP Operators and DPVMs*. https://www.nautinst.org/resources-page/press-release-important-news-for-all-dp-operators-and-dpvms.html

Klostermann, M., Conein, S., Felkl, T., & Kluge, A. (2022). Factors Influencing Attenuating Skill Decay in High-Risk Industries: A Scoping Review. *Safety*, *8*(2), 22. https://doi.org/10.3390/safety8020022

General Medical Council. (2014). *Skills Fade: A Review of the evidence tha clinical and professional skills fade during time out of practice, and how skills fade may be measured or remediated.* London: General Medical Council.

Henik, A. e. (2002). *The Preservation and Decay of Military Skills. Final Report of the Project.* Tel Aviv .

King, A. D. (1998). Inertial Navigation - Fourty Years of Evolution. *GEC Review, Vol 13, No. 3*, pp. 140 - 148.

Appendices

Appendix 1, OSVDPA CT-1-CV, the OSVDPA Competency Standard (Version 1).

Sec. 1	Alarms (DP Control Systems)	Phase
1.1	Describe the criteria for setting position, heading, and other critical alarms (e.g. those resulting in loss of position). (Theoretical)	1
1.2	Describe the problems that may arise due to a lack of spatial awareness caused by an over reliance on alarms. (Theoretical)	1
1.3	Describe the how a change in the set point will affect position and heading alarms	1
1.4	Describe each of the below-listed alarms, how each is set, what factors each is measuring, and when each is critical. (Practical)	2
1.4.1	Position and Heading.	2
1.4.2	Power plant.	2
1.4.3	DP system alarms.	2
1.5	Recognize and acknowledge alarms and convey information about the alarms to relevant crew members and other parties. (Practical)	2
1.6	Demonstrate the setting of alarms relevant to the DP system. (Practical)	2
1.7	Describe the procedures for setting warnings and alarms, including selecting acceptable limits and recognizing factors that decrease acceptable alarm limits. (Theoretical)	3

Sec. 2	Bridge Team	Phase
2.1	Describe a formal hand-over and the importance of clearly relating and understanding all relevant factors. (Theoretical)	1
2.1.1	Describe when a handover should not be conducted and when it should not. (Practical)	1
2.2	Describe the organization of the bridge team on your vessel when the vessel is under DP, including the authority, tasks, and responsibilities of each member of the bridge team.	2
2.3	Demonstrate a clear and formal handover of the DP watch (Practical):	2
2.3.1	The preparation of a handover/watch-change checklist.	2
2.3.2	Clearly communicating the status of the vessel, DP system, equipment, ongoing/planned operations, conditions, and other recent occurrences that affect	2
2.3.3	Utilizing the vessel's ASOG (where available) to facilitate a hand-over/watch-change.	2
2.4	Demonstrate a review and verification of handover/watch change checklist (Practical):	2
2.4.1	The vessel's position, movement and status; recent occurrences; weather changes (including the vessel's drift on/off status) and DP log.	2
2.4.2	Validate the vessel's status against the vessel's ASOG (where available).	2
2.5	Demonstrate execution of a DP watch as part of a bridge team (if utilized) in accordance with applicable industry standards. (Practical)	2
2.6	Demonstrate response to a DP incident or emergency as part of a bridge team (if utilized) in accordance with applicable industry practices. (Practical)	2

Sec. 3	Capability and Footprint Plots	Phase

3.1	Describe how a capability plot is interpreted, its usefulness to DP operations, its relation to a vessel's Worst Case Failure (WCF), and its limitations. (Theoretical)	1
3.2	Explain the function of a DP footprint plot, how it is produced and the environmental or operational characteristics affecting its shape. (Theoretical)	1
3.3	Assess the vessel's station keeping capabilities against the vessel's capability plot and interpret this information. (Practical)	2
3.4	Utilize the vessel's capability plot in the planning of an operation. (Practical)	3
3.5	Demonstrate the generation of a DP footprint plot using the DP system or paper charts. (Practical)	3
3.6	Describe the difference between capability plots and footprint plots and the correlation between the two. (Theoretical)	4

Sec. 4	Checklists	Phase
4.1	Describe the checklists that should be completed under applicable regulatory standards or industry guidance (e.g. IMCA, MTS, etc.) and their importance. (Theoretical)	1
4.2	Demonstrate completion of the location (field arrival), pre-operation (500-meter), and any other required checklist. (Practical)	4

Sec. 5	Commands and Use of the DP Console	Phase
5.1	Describe, generally, the information provided by the DP console and the variety of methods the DPO can use to enter commands into the DP system. (Theoretical)	1
5.1.1	Position Commands.	1
5.1.2	Heading Commands.	1
5.2	Describe the risks associated with different input methods and which methods should be avoided. (Theoretical)	1
5.3	Describe why the DPO should change control stations including instances when control should be changed and when it should not be changed. (Theoretical)	1
5.4	Describe how to use the gain settings, when different gain settings should be utilized, when settings should be adjusted, and the risks associated with adjusting gain settings	1
5.5	Describe why the center of rotation or set point should be changed and the effect this will have on the DP system and vessel. (Theoretical)	1
5.6	Demonstrate a knowledge of the layout of the DP console, noting: (Practical)	2
5.6.1	Location of control and status information.	2
5.6.2	The relation between DP controls and other maneuvering controls.	2
5.6.3	Any vulnerabilities in the layout of the DP console (e.g. hard to reach controls).	2
5.7	Demonstrate the ability to set up and verify the various operator controls of the DP system. (Practical)	2
5.8	Demonstrate use of the gain settings: (Practical)	2
5.8.1	Selection of a gain setting appropriate for the current operation and condition.	2
5.8.2	Setting and adjusting of gain settings.	2
5.9	Demonstrate a transfer of control from one DP station to another (if fitted).	2
5.10	Demonstrate a change in the setpoint and center of rotation. (Practical)	2
5.11	Demonstrate a procedure to verify DP system is correctly responding/ following commands and the procedures to follow when system fails to respond to commands. (Practical)	3

	Communication	Phase
6.1	Describe the importance and methods of keeping crew, engine room personnel, equipment operators, the installation, and other relevant entities informed of operational details. (Theoretical)	2
6.2	Describe what changes in the vessel, DP system, or equipment the ASOG (if available) requires to be communicated and to whom the ASOG requires these changes be communicated to. (Theoretical)	2
6.3	Describe which crew members should be kept apprised of relevant operational information. (Theoretical)	2
6.4	Demonstrate clear communication (via all relevant methods) of relevant operational details (including changes in status) with relevant crew, onboard and project personnel, the installation, and third parties (including SIMOPS vessels). (Practical)	2

Sec. 7	Conditions, Environment, and Weather	Phase
7.1	Describe the effects of environmental conditions on vessel performance, including the effect on subsystems such as position reference systems. (Theoretical).	1
7.2	Describe the importance of environmental condition monitoring and instances and operations where condition monitoring is of critical importance (Theoretical)	1
7.3	Interpret actual and forecasted weather against operation planning tools, such as the vessel's ASOG (where available) and determine if conditions are projected to be inside of the vessel's DP operation envelope, including post Worst Case Failure (WCF) capabilities. (Practical)	2
7.4	Evaluate changes in weather and environmental conditions against operation planning tools (such as the vessel's ASOG) and time to terminate the industrial mission to determine if operations can be continued. (Practical)	2

Sec. 8	Consequence Analysis	Phase
8.1	Describe the importance of the consequence analysis function and how it is used.	1
8.2	Describe what conditions the consequence analysis function on your vessel is monitoring (if fitted). (Practical)	2
8.3	Demonstrate how to enable the consequence analysis function (if fitted) and a response appropriate to a consequence analysis alarm, the conditions, and operations of your vessel. (Practical)	4
8.4	Demonstrate the ability to utilize the consequence analysis function in conjunction with the vessel's capability plot (if applicable).	4

Sec. 9	Control Systems (General) and Computer	Phase
9.1	Describe the widely accepted procedures for powering up and shutting down the DP system and DP controller. (Theoretical)	1
9.2	Describe the procedures to be used when the controller resets itself. (Theoretical)	1
9.3	Demonstrate the procedures for powering up and shutting down the DP system and DP controller as mandated by the vessel's operation manual or DP system manufacturer’s instructions. (Practical.	2
9.4	Describe the effect of resetting the DP computer and the DP controller, why the effect of resetting the computer and controller are different, how to realign out of sync controllers, and when not to reset the DP computer and DP controller. (Theoretical)	2
9.5	Demonstrate resetting of all DP computers (DP console, controllers, and backups) while remaining in control of vessel. (Practical)	4

9.6	Demonstrate the different ways of resetting the DP computer and controller and a transfer of control of all available systems, without losing control of the vessel, and describe the advantages and disadvantages of each way. (Practical)	4

Sec. 10	DP Control Modes and Features	Phase
10.1	Describe the common control modes (or the equivalent mode depending upon equipment used), when each mode would be used, and the benefits and drawbacks of each mode. (Theoretical)	1
10.1.1	Auto Position.	1
10.1.2	Auto Heading.	1
10.1.3	Auto Pilot.	1
10.1.4	Follow Target.	1
10.1.5	Joystick.	1
10.1.6	Independent Joystick.	1
10.1.7	Track Follow.	1
10.1.8	Weathervane.	1
10.1.9	Mixed Mode.	1
10.1.10	Heavy Lift Mode.	1
10.1.11	Other modes.	1
10.2	Understand and describe the set-up of the DP control elements (i.e. controlling the degrees of freedom), modes of operation, and the limitations associated with each mode. (Theoretical)	1
10.3	Describe the difference between a DP joystick and an independent joystick and the benefits and limitations of each joystick. (Theoretical)	1
10.4	Describe when the quick model/fast learn function should and should not be used. (Theoretical)	1
10.5	Demonstrate the ability to use each control mode fitted on your vessel (e.g. Autopos, Autopilot, Joystick, mixed mode). (Practical)	2
10.6	Demonstrate the ability to select, enter necessary parameters, and switch between the various operating modes of the DP system. (Practical)	2
10.7	Demonstrate use of the independent joystick to maintain/change position/heading. (Practical)	2
10.8	Demonstrate use of the quick model/fast learn function. (Practical)	2

Sec. 11	Manual Control	Phase
11.1	Describe advantages/disadvantages of operating in manual mode including references to the various types of propulsion systems. (Theoretical)	1
11.2	Describe the importance of bringing the vessel to a full stop prior to switching to the DP system. (Theoretical)	1
11.3	Describe the hierarchical steps and procedures for switching from manual mode to DP. (Theoretical)	2
11.4	Describe under what conditions manual control should be selected after a system degradation, a blackout, or Worst Case Failure based on the specifics of your vessel. (Theoretical)	2

11.5	Demonstrate bringing the vessel to a full stop at a safe distance from all objects in manual mode. (Practical)	2
11.6	Demonstrate holding position and maneuvering in manual mode under various weather conditions. (Practical)	2
11.7	Describe the vessel specific procedure for switching to manual mode to deal with a fault, failure, or change in conditions which prevents further DP operations. (Theoretical)	3
11.8	Demonstrate competency in ship handling abilities, including stopping, station keeping, and maneuvering the vessel in close quarter situations under various environmental conditions. (Practical)	2
11.8.1	Demonstrate handling of the vessel after the WCF for your vessel. (Practical)	2
11.9	Demonstrate the ability to change from DP to manual control. (Practical)	4
11.9.1	Under a normal operating condition.	4
11.9.2	Under an emergency condition.	4

Sec. 12	DP System General	Phase
12.1	Describe the various components that comprise a DP system, including position and environmental references, computer controller and display, propulsion and steering systems, power plant and power distribution. (Theoretical)	1
12.1.1	Draw a one-line diagram of a generic DP system for each DP class.	1
12.1.2	Draw a one-line diagram of your vessel's DP system.	2
12.2	Describe industry-recognized criteria for evaluating DP systems (e.g. the seven pillars of a robust DP system as expressed by the MTS guidance). (Theoretical)	1
12.3	Describe the purpose of the model and how it is utilized. In doing so, explain the function and when it should be used and how long model building takes in both modes and the system's limitations during this time. (Theoretical)	1
12.4	Describe "estimated residual force" and its function within and importance to DP operations. (Theoretical)	1
12.5	Describe the importance of maintaining the segregation of a vessel's redundancy concept. (Theoretical)	1
12.6	Use onboard documents to locate and describe the various vessel specific components that comprise the DP system, and their function and interaction (including how they relate to the vessel's redundancy concept). (Practical)	2
12.7	Describe what equipment is critical, the failure of which will affect vessel position and/or heading. (Theoretical)	2
12.8	Describe identified Worst Case Failure and describe the vessel's design intended capabilities after WCF and where onboard the vessel this information can be found. (Theoretical)	4

Sec. 13	Drift/Drive On, Drift/Drive Off, and Force Off	Phase
13.1	Describe drift/drive on and drift/drive off, the differences, risks, and factors leading to each. (Theoretical)	1
13.2	Describe actions to be taken in drift/drive on and drift/drive off scenarios, including how to turn a drift/drive on into a drift/drive off. (Theoretical)	1
13.3	Describe a force off scenario, the factors that lead to this scenario, its risks, and how it can be avoided. (Theoretical)	1
13.4	Demonstrate actions to be taken in a force off scenario. (Theoretical)	2

13.5	Demonstrate actions to be taken in drift/drive on and drift/drive off scenarios. (Practical)	3
13.6	Demonstrate how to turn a drift/drive on into a drift/drive off. (Practical)	3

Sec. 14	Drills and Training	Phase
14.1	Describe the importance of DP-based drills and the specific vessel's drill schedule.	2
14.2	Demonstrate use of the onboard training/simulation function (if fitted). (Practical)	2
14.3	Demonstrate participation in a documented DP drill. (Practical)	2

Sec. 15	Responses to Failures and Emergency Procedures	Phase
15.1	Describe the situations (e.g. DP system degradation or change in conditions) that are mostly likely to indicate an impending emergency and what measures can be taken to correct the situation. (Theoretical)	1
15.2	Describe how the time to terminate impacts the DPO's actions when responding to a failure. (Theoretical)	1
15.3	Describe the proper sequence of actions to respond to a DP system emergency. (Theoretical)	1
15.4	Describe the use of an ASOG, CAM, or TAM in an emergency situation and how these documents guide the operator. (Theoretical)	1
15.5	Describe when dead reckoning mode can be utilized after a failure or degradation in position reference system data. (Theoretical)	1
15.6	Describe when dead reckoning is used and its importance. (Theoretical)	1
15.7	Demonstrate the ability to recognize an emergency, and the possible necessity of taking manual control of the vessel. (Practical)	2
15.8	Demonstrate the evaluation steps and potential actions (up to and including DPO intervention) to the following situations (Practical):	3
15.8.1	A sudden and significant change or loss in reference system data, unstable PRS, or sensor input error.	3
15.8.2	A drift off, drive off, and force off.	3
15.8.3	A thruster failure (e.g. thruster fail to full, RPM runoff, frozen pitch).	3
15.8.4	The loss of the DP system.	3
15.8.5	The loss of the DP Controller	3
15.8.6	Instability, or loss of generator/power system, computer system, commands, feedbacks, inputs, or other components impacting the DP system.	3
15.8.7	The vessel exceeding a pre-defined alarm limit.	3
15.9	Demonstrate what actions a DPO should initiate in the event the DP system loses position reference system data or experiences an instability in PRS data and enters dead reckoning mode control. (Practical)	4

Sec. 16	Failure Mode Effect Analysis (FMEA) and Annual Trials	Phase
16.1	Based on IMCA M 166, IMCA M 190, MTS' DP Vessel Design Philosophy Guidelines, and other relevant current guidance, describe a Failure Mode Effect Analysis (FMEA) (Theoretical):	1
16.1.1	The FMEA's purpose and value to operations.	1
16.1.2	How an FMEA is proven.	1
16.1.3	The process and schedule of FMEA revalidation.	1

16.1.4	The procedures carried out during annual trials and what information the DPO can glean from the trials.	1
16.2	Describe how the vessel's FMEA correlates to the vessel's redundancy concept, operational procedures or planning tools such as ASOG, CAM, and TAM. (Theoretical)	2
16.3	Demonstrate an ability to understand an annual trial and describe what findings should be addressed. (Practical)	2
16.4	Demonstrate an application of the vessel's FMEA to the planning and execution of an operation, including contingency planning, emergency response, and creation of CAM within the capabilities of the vessel after worst case failure. (Practical)	3

Sec. 17	**Class, Standards, Guidance, Manuals, and Logs**	**Phase**
17.1	Describe the general concepts and specific requirements of each equipment class, as defined by IMO MSC 645. (Theoretical)	1
17.2	Describe the importance of keeping a vessel DP logbook and what information should be recorded in the logbook. (Theoretical)	1
17.3	Demonstrate verification that the vessel is configured in accordance with its redundancy concept as proven in the vessel's FMEA, class standards or other applicable requirements.	2
17.4	Demonstrate locating the DP related documentation onboard and explain their relevance to specific vessel operations. (Theoretical)	2
17.5	Describe the publications or sources of the current rules, standards, guidelines, and recommendations affecting DP operations; each document's relevance, and which of these documents are normally kept on the vessel. (Theoretical)	2
17.6	Demonstrate knowledge and understanding of operational instructions (e.g. operations manuals, industry guidance/standards, client procedures, bridging documents, etc.). (Practical)	2
17.7	Determine if the vessel continues to operate within its post worst case failure capability after the loss of a system or component. (Practical)	4

Sec. 18	**Incident Reporting and Investigation**	**Phase**
18.1	Describe the importance of reporting DP events, which events should be reported, the company procedure for reporting DP events via a voluntary or mandatory reporting system.	1
18.2	Demonstrate an ability to understand a DP incident report, identify actions (if any) the DPO could have done to avert incident, and apply lessons-learned. (Practical)	2

Sec. 19	**Operation Planning and Risk Assessing**	**Phase**
19.1	Describe the importance of planning a DP operation and the elements that should be considered when planning an operation. (Theoretical)	1
19.1.1	Describe the commonly used planning tools, such as an ASOG, the process used to create these tools, how they are used, and the defined scope of these tools.	1
19.1.2	Describe CAM and TAM, the differences between each mode, why each mode would be selected, and how (and how not) a vessel enters TAM.	1
19.1.3	Describe operational external factors that will influence, complicate, or require abandoning of a DP operation (e.g. SIMOPS, thruster force from a drillship, etc.).	1
19.1.4	Describe additional precautions that should be taken when the vessel is positioned on the drift on side of the installation.	1
19.1.5	Describe the process used to determine a safe working position and heading and safe standby position, taking into consideration all of the factors necessary to make these	1

19.1.6	Describe the process used to create a DP approach plan, work plan, escape plan, and plan to exit the field.	1
19.1.7	Describe what factors should be considered when selecting which reference systems should be used for an operation and the limitations carried by each system.	1
19.1.8	Describe the impacts of changes (temporary or permanent) on the vessel's station keeping performance (e.g. installation of Industrial Mission Equipment impacting wind coefficient of the vessel).	1
19.2	Describe the risk assessment processes and procedures and their importance. (Theoretical)	1
19.2.1	A formal risk assessment.	1
19.2.2	A safe job analysis.	1
19.2.3	Tool box talk.	1
19.2.4	A contingency plan and ensuring the plan remains valid throughout the operation.	1
19.2.5	Continuous risk assessment throughout an operation.	1
19.3	Describe the impact of a loss of position on the vessel's industrial mission.	2
19.4	Determine a safe location outside the 500-meter zone to complete arrival checklists, considering conditions and movement of other vessels and obstructions. (Practical)	2
19.5	Demonstrate the ability to conduct a formal risk assessment, safe job analysis, and tool box talk or interpret the results of a risk assessment, safe job analysis, or tool box talk prior to the start of an operation. (Theoretical)	2
19.6	Demonstrate use of the vessel's ASOG or other planning tools and capability plot to determine if DP operations are possible. (Practical)	2
19.7	Demonstrate selection of reference systems appropriate for an operation, the ability to evaluate the consequences of losing a particular reference system, and external influences that may interfere with references systems. (Practical)	2
19.8	Demonstrate setting excursion limits based upon company/client procedures, job requirements, or the vessel's ASOG. (Practical)	2
19.9	Demonstrate the creation of a DP approach plan, work plan, and plan to exit the field.	3
19.10	Utilizing the vessel's operational guidance (e.g. ASOG), operating mode (i.e. CAM or TAM), and class requirements (as applicable), demonstrate set up of the power plant for a particular operation. (Practical)	4
19.11	Demonstrate the ability to determine a safe working position and heading based on conditions, charterer requirements, and international or regional regulations or guidelines.	4
19.12	Demonstrate the development of a contingency plan and the ability to plan a new escape path during the operation based upon changes in conditions, other vessels, or changes in the operation. (Practical)	4
19.13	Demonstrate the ability to conduct a continuous risk assessment of an operation, react appropriately to any alarms, and make necessary changes to the operation. (Practical)	4

Sec. 20	Operation (Set Up and Approach)	Phase
20.1	Describe the procedures for approaching an installation, including (Theoretical):	1
20.1.1	Transferring from manual to DP.	1
20.1.2	Selecting and setting of steps (increments for movements and changes in heading) that are appropriate to the operation, conditions, and client requirements.	1
20.1.3	Speed selection.	1
20.1.4	Stopping the vessel in a safe manner at the proper position and with the proper heading.	1

20.2	Describe the process of setting up the vessel on DP and ensuring all DP systems and subsystems are operational. (Theoretical)	1
20.3	Describe what factors the DPO should monitor during an approach to an installation, (e.g. changes in conditions, other vessels, changes in installations) and how these factors can affect the approach and contingency plan. (Theoretical)	1
20.4	Describe the purpose of, how to conduct, and the limitations of a drift test. (Theoretical)	1
20.5	Demonstrate set up and verification of the thrusters for an operation, taking into consideration the environmental conditions, exclusion zones, and efficiency of the power plant. (Practical)	2
20.6	Assess the vessel against the capability plot (if available) and interpret the results. (Practical)	2
20.7	Demonstrate setting up the correct reference systems and sensors for the operation and verifying they are operating correctly. (Practical)	2
20.8	Demonstrate how to set up and conduct a drift test or environmental force evaluation. (Practical)	2
20.9	Utilizing company/client requirements and/or the vessel's operational guidance (e.g. ASOG), demonstrate stopping and stabilizing the vessel in a controlled manner and safe position; switching from manual control, to joystick, to full DP; then beginning the approach to the worksite. (Practical)	2
20.10	Utilizing company procedures, client requirements, and/or the vessel's operational guidance (e.g. ASOG), demonstrate proper selection of speed and steps to approach an installation. (Practical)	2
20.11	Demonstrate anticipation and reactions appropriate and proportional to changes in operational or environmental conditions during the approach. (Practical)	2

Sec. 21	**Operation (Normal**	**Phase**
21.1	Describe the items a DPO should be monitoring during a DP operation. (Theoretical)	1
21.2	Describe center of rotation, how the DPO selects the center of rotation and set point, its effect on the DP system and controls and why selecting a center of rotation appropriate to the conditions and operation is important. (Theoretical)	1
21.3	Describe factors, (e.g. deployed equipment), that may limit a vessel's performance or ability. (Theoretical)	1
21.4	Describe how changes in the installation’s heading and position can affect an DP operation. (Theoretical)	1
21.5	Describe the need to anticipate changes in the operation and make changes when necessary. (Theoretical)	1
21.6	Describe the process of selecting an additional PRS. (Theoretical)	1
21.7	Describe how to use an ASOG to determine if continued operations are possible. (Theoretical)	1
21.8	Describe the potential causal factors for an inexplicable ramp up of thrusters and the means employed by the DPO to discriminate faulty inputs. (Practical)	1
21.9	Demonstrate continued situational awareness of the vessel's heading, position, and status during a DP watch. (Practical)	2
21.10	Demonstrate continued awareness of the installation's heading and position and anticipate and reacting to situations that may arise from a change in the installation's heading or position. (Practical)	2

21.11	Demonstrate monitoring the DP system, anticipating problems and making corrections as needed. (Practical)	2
21.12	Demonstrate an ability to analyze the consequences of a loss of position and react accordingly. (Practical)	2
21.13	Demonstrate monitoring of environmental conditions. (Practical)	2
21.14	Demonstrate monitoring of PRS and vessel sensors, including monitoring signal quality, accuracy, and anticipating and reacting to problems. (Practical)	2
21.15	Demonstrate monitoring the functionality of the DP system and sub-systems against the vessel's operational guidance (e.g. ASOG) to determine if continued operations are possible. (Practical)	2
21.16	Demonstrate planning of a new escape route during the course of an operation. (Practical)	2
21.17	Demonstrate changing of position by inputting speed and steps appropriate for the conditions, vessel capabilities, and in compliance with applicable requirements, (Practical)	2
21.18	Demonstrate an awareness of vessel position, monitor vessel excursions, and determine if excursions exceed safe working conditions, based on company/client procedures and/or vessel's ASOG. (Practical)	2
21.20	Demonstrate an evaluation of environmental conditions and vessel status against the vessel's ASOG to determine if continued operations are possible. (Practical)	2
21.21	Demonstrate monitoring of the percentage of available power in use and in reserve and determine if continued operations are possible. (Practical)	2
21.22	Demonstrate monitoring of the vessel's thrusters and making changes to adapt to changing environmental conditions or to maximize efficiency of the power plant. (Practical)	2
21.23	Demonstrate the ability to discern a faulty reference system input, evaluate the situation, and react according to the correct procedures for the equipment (e.g. manually removing the sensor or monitoring the automatic processes). (Practical)	2
21.24	Demonstrate a continued awareness of class redundancy requirements (or other redundancy concept requirements) as they relate to the current set up and operation of your vessel.	2
Sec. 22	**Operation (Degraded**	**Phase**
22.1	Describe actions to take in case of a degraded status. (Theoretical).	1
22.2	Describe degraded status, vessel capabilities, additional risks. (Theoretical)	1
22.3	Describe the difference between a degraded status and TAM and how each mode is entered. (Theoretical)	1
22.4	Describe when reassessing the vessel's station-keeping capabilities post worst case failure would be appropriate. (Theoretical)	1
22.5	Demonstrate the ability to take corrective action in case of a degraded status. (Practical)	3
22.5	Demonstrate the ability to safely maneuver and stabilize the vessel with degraded thruster/power capacity (after identified WCF). (Practical)	3
22.6	Demonstrate the reaction to an unstable PRS, the loss of a PRS, or when a PRS suddenly indicates a significant change in position. (Practical)	4
22.7	Demonstrate the response to a malfunctioning or inaccurate vessel sensor. (Practical)	4
22.8	Demonstrate the ability to use an ASOG (or other operational guideline) to determine the vessel's status and if an operation needs to be discontinued or if continued operation needs to be risk assessed. (Practical).	4

Sec. 23	**Operation (Abandoning or Aborting of Operations)**	**Phase**

23.1	Describe possible reasons a DP operation would need to be abandoned quickly. (Theoretical)	1
23.2	Describe the vessel specific procedures for the abandoning of DP operations under short and long time to terminate. (Theoretical)	2
23.3	Demonstrate the procedures for abandoning of the operation under short and long time. (Practical)	3
23.4	Demonstrate utilizing the vessel's planning tools (e.g. ASOG, CAM capability plot, or other operation guideline) to determine if DP operations must be abandoned. (Practical)	4
23.5	Demonstrate safely navigating away from the installation after an emergency or incident/change in conditions, vessel capabilities, or other factors which require the operation to be abandoned or aborted. (Practical)	4

Sec. 24	Operation (Normal Completion)	Phase
24.1	Describe the need to move the vessel to a minimum safe location prior to changing control modes. (Theoretical)	1
24.2	Describe where to find the minimum safe distance (e.g. client requirements, company procedures, etc.). (Theoretical)	1
24.3	Describe the field departure procedures and what hazards can be encountered during these procedures. (Theoretical)	1
24.4	Describe the importance of revalidating the departure plan, industrial mission termination plan, cargo transfer termination plan, or other applicable end-of-operation plans, and step size and speed at the end of the operation. (Theoretical)	1
24.5	Describe the interaction and impact the vessel can have on the installation during departure and steps the vessel can take to minimize this impact. (Theoretical)	1
24.6	Demonstrate moving the vessel to an identified safe location via step size and speed appropriate for the conditions, vessel capabilities, and in compliance with applicable requirements on DP prior to switching to manual control. (Practical)	2
24.7	Demonstrate the process of recovering equipment and personnel, (e.g. disconnecting hoses, recovering deployed equipment of the vessel, or sensors). (Practical)	2

Sec. 25	Reference Systems, Sensors, and Related Equipment	Phase
25.1	Describe the working principle behind and role within the DP system of each of the following: (Theoretical)	1
25.1.1	Environmental reference system.	1
25.1.3	Heading sensor.	1
25.1.4	Motion/Vertical Reference Unit.	1
25.2	Describe the working principle behind, benefits, limitations, external influences, and common faults of the following: (Theoretical)	1
25.2.1	Laser-based systems.	1
25.2.2	Microwave- and radio-based systems.	1
25.2.3	Satellite-based reference systems.	1
25.2.4	Acoustic systems.	1
25.2.5	Taut Wire.	1
25.2.6	External Force Sensors (e.g. pipe tension sensors).	1
25.2.7	Other PRS (e.g. INS units, gangway reference systems, etc.).	1

25.3	Describe how PRS are utilized by the model (or not utilized by the model), including the weighting of reference systems in the model and differences between the model and current conditions. (Theoretical)	1
25.4	Describe the importance of and how to conduct PRS selection, validating, and prioritization. (Theoretical)	1
25.5	Describe the effect of shadow, which reference systems shadowing can affect, and how to minimize the effect of shadowing. (Theoretical)	1

25.6	Describe the differences between absolute and relative PRS and how these systems could be utilized in together. (Theoretical)	1
25.7	Describe the process, reasoning, and criteria for the rejection of a PRS. (Theoretical)	1
25.8	Describe the importance of sensor independence and segregation. (Theoretical)	1
25.9	Describe the possible results of the loss of a PRS. (Theoretical)	1
25.10	Describe the possible sources of disruption to wind sensors (e.g. helicopter operations). (Theoretical)	1
25.11	Describe what factors shall be considered when selected the correct wind sensor. (Theoretical)	1
25.12	Describe Universal Transverse Mercator (UTM) coordinate system, what position reference systems use UTM coordinates, and how these systems are utilized by these systems.	1
25.13	Demonstrate use of the following (if fitted). (Practical)	2
25.13.1	Environmental reference system.	2
25.13.2	Heading sensor.	2
25.13.3	Motion/Vertical Reference Unit.	2
25.14	Demonstrate use, calibration, and testing of the following (if fitted): (Practical)	2
25.14.1	Laser-based systems.	2
25.14.2	Microwave- and radio-based systems.	2
25.14.3	Satellite-based reference systems.	2
25.14.4	Acoustic systems.	2
25.14.5	Taut Wire.	2
25.14.6	Other PRS as fitted on your vessel (e.g. INS units, gangway reference systems, etc.).	2
25.15	Demonstrate PRS selection, validation, and prioritization. (Practical)	2
25.16	Demonstrate maintaining sensor segregation.	2
25.17	Demonstrate set up (and clean-up after the operation, if applicable) of the PRS, VRU, environment, MRU, and heading sensors equipped on the vessel. (Practical)	2
25.18	Demonstrate where information about a predicted degradation of an external reference system (e.g. GNSS) can be found (if fitted). (Practical)	2
25.19	Demonstrate selection of the correct (or optimum) wind sensor based on operation, location, external influences. (Practical)	2

Sec. 26	**Power Generation and Marine Auxiliaries**	**Phase**
26.1	Describe the main power generation elements in a diesel electric DP vessel, including main engines, governors and alternators as they relate to DP operations and how redundancy is achieved on DP Class 2 and 3 vessels. (Theoretical)	1
26.2	Describe the main power generation elements in a direct drive diesel engine DP vessel, including gearing and clutch mechanisms and how redundancy is achieved on DP Class 2 and 3 vessels. (Theoretical)	1

26.3	Describe the marine auxiliary systems that support power generating plant, including fuel oil, lube oil, cooling water systems and compressed air and how redundancy is achieved on DP Class 2 and 3 vessels. (Theoretical)	1
26.4	Describe the role of the emergency generator and its relevance to the DP system.	1
26.5	Describe how problems in engine room or problems with external influences on the power supplies (e.g. fuel sources and types, and fire and gas shutdowns) can affect DP operations. (Theoretical)	1

Sec. 27	Power Distribution	Phase
27.1	Describe the essential elements of power distribution in a diesel electric DP vessel, including switchboards, governors, bus-ties, high, medium and low voltage systems and transformers. (Theoretical)	1
27.2	Describe the importance of maintaining segregation between redundant systems and the impacts of cross connections spanning across redundant groups including open and closed bus ties. Describe principles behind CAM and TAM configurations. (Theoretical)	1
27.3	Describe battery back-up systems and UPS and their importance to the DP system. (Theoretical)	1
27.4	Describe the procedures, the role of the DPO, and sequence of procedures undertaken after a full or partial blackout. (Theoretical)	1
27.5	Describe the purpose behind and reason for the inclusion of a power management system. (Theoretical)	1
27.6	Describe the vessel's switchboard and bus-tie configurations and which configurations are available under CAM/TAM, FMEA, and/or class requirements. (Theoretical)	2
27.7	Demonstrate how to set up the power distribution system to achieve compliance with CAM and TAM (if applicable). (Practical)	2
27.8	Describe how your vessel's redundancy concept is achieved by your vessel's power distribution arrangement. (Theoretical)	2
27.9	Demonstrate the sequence of procedures undertaken by a DPO after a full or partial blackout. (Practical)	3

Sec. 28	Power Usage and Power Management	Phase
28.1	Describe available power and spinning reserve and how to monitor both. (Theoretical)	1
28.2	Describe the power available post Worst Case Failure. (Theoretical)	1
28.3	Describe the potential impact of non DP related consumers on power available to the DP system and the means of limiting the power consumed by them. (Theoretical)	1
28.4	Describe the impact of heading and position on thruster usage and how to determine a working position to maximize thruster efficiency. (Theoretical)	1
28.5	Describe the need or periodic testing of the vessel's power plant and thrusters to ensure these systems have maintained their DP rating. (Theoretical)	1
28.6	Describe the relationship between power usage and the vessel’s ASOG. (Theoretical)	1
28.7	Demonstrate monitoring of power output and percentage of power in use. (Practical)	2
28.8	Demonstrate an awareness of the percentage of power required to maintain position. (Practical)	2
28.9	Demonstrate the selection of a working position which maximizes thruster efficiency. (Practical)	2

28.10	Demonstrate competency in monitoring DP operating parameters in accordance with operating mode or planning tools (e.g. CAM, TAM, and/or ASOG) requirements to ensure continuous available power is not exceeded. Identify and implement appropriate actions based on observations. (Practical)	2

Sec. 29	Principles of DP	Phase
29.1	Define the term "dynamic positioning". (Theoretical)	1
29.2	Describe the six degrees of freedom, the vessel motions associated with the six degrees, the external forces that impact these motions, and the vessel components that measure and/or counter these motions. (Theoretical)	1

Sec. 30	Thrusters and Main Propulsion	Phase
30.1	Describe the different types of thrusters used in the DP system and the role of thrusters in the DP system. (Theoretical)	1
30.2	Describe the thruster related items that a DPO should monitor and why they are important. (Theoretical)	1
30.3	Describe the various failure modes of the different types of thrusters. (Theoretical)	1
30.4	Describe bias mode, its importance, and its effect on DP operations. (Theoretical)	1
30.5	Describe the purpose behind thruster exclusion zones. (Theoretical)	1
30.6	Describe the configuration of the thrusters on your vessel. (Theoretical)	2
30.7	Demonstrate identification of the various failure modes for all of the thrusters on your vessel. (Practical)	2
30.8	Demonstrate an understanding of the industrial mission operational requirements which may require deselection of thrusters, the impacts on station-keeping and the processes employed to manage the resulting vulnerability to a station-keeping incident. (Practical)	2
30.9	Demonstrate selection of a working position that optimizes efficient thruster usage.	2
30.10	Demonstrate the monitoring of thrusters, the ability to modify thruster set up to adapt to changes in environment and/or conditions or new operational requirements. (Practical)	2
30.11	Demonstrate an appropriate response to a thruster’s malfunction (e.g. loss of a thruster or thruster- fail-to-full). (Practical)	3

Appendix 2, Examples from Assessment Scenario L-FL-1 (Logistics Vessel to Floating Installation, Number 1.

Scenario L-FL-1, Logistic Vessel/Floating Installation, number 1

Assessee Copy:

Assessment Narrative:

A **DP-2 Crewboat/OSV** is scheduled to conduct a personnel transfer to a semi-submersible drilling rig operating in field with other fixed and floating installations. The semi-submersible has cranes on the port and starboard side and has a heading of 270. The installation generally follows the operations guidance put forth by the MTS DP Committee. Any documents related to this guidance, such as ASOGs, CAM, etc.; or other guidance, such as standing orders shall be provided to the Assessee prior to the start of the operation.

At the start of the operation, there is a **[10 - 20 knot]** wind from the **[NE – E]** and the current is **[0.8 - 1.8]** knots from the **[ENE – NE]**. The waves are **[1.0 – 1.5 meters]** from the **[ENE – NE]**. The operation is starting at 17:00 local time (1.0 hour before dusk) under clear conditions. The forecast calls for a decrease in visibility starting around 18:00, accompanying this change will be an increase in wind and wave.

The operation starts with the vessel making way on a heading of 090 under manual control, making **[8 – 13]** knots. The installation is 600 meters south of the vessel. As instructed by the Assessor, the 500-meter zone for this operation may be located at 300 meters away from the installation. The Assessee should approach the installation under manual control (or via DP if instructed by the Assessor) and make a controlled stop at the (simulated) 500-meter zone line, hold the vessel's position, and switch the vessel to auto position mode (after first transitioning to joystick mode).

Once the vessel is situated at the (simulated) 500-meter zone, the Assesse shall begin the pre-operation items he or she believe are necessary to complete or are directed to complete by the Assessor. Be aware, the Assessor will not instruct the Assessee to perform everything that is required. At a minimum, the Assessee should develop an approach plan, select a working position and heading, and complete the pre-operation checklist.

Once the pre-operation steps have been completed, the Assessee should start their approach, and once alongside the installation, the Assessee shall continue to monitor the DP operation and respond to anything that happens as they would during a DP operation. Once the Examiner/QOBA informs the Assessee that the operation has been completed, the Assessee should exit the 500-meter zone, at which time the assessment will have ended.

During the above-listed operation, the Examiner/QOBA shall measure the Assessee's competency over 45 assessment items.

During the approach, cause (if on a simulator) or simulate or mimic (if on a vessel) the below. PLEASE NOTE: this portion of the assessment scenario includes an assessment item or items that should not be listed and/or prompted by the Examiner/QOBA, see below for more information.

Appendix 3, Top 25 Failed items Competencies.

Rank	Item Number	Tier	Assessment Item	Attempts	Failures	Percent Failed	Competency Covered
1	6i-1	2	Generate a footprint plot for the operation utilizing footprint plotting sheet.	150	20	13%	3.5
2	8a-14	2	Anticipate situations that could arise based upon a change in the installation's position or heading.	45	6	13%	21.1
3	6g-5	2	Demonstrate verifying that the vessel is configured in accordance with its redundancy concept.	80	8	10%	17.3
4	6g-8	2	Demonstrate the creation of an exit plan for a DP operation.	98	9	9%	19.9
5	8d-3	2	Demonstrate a verification that the exit plan is still viable.	291	21	7%	24.6
6	7d-5	2	Monitor the area for any changes that could cause the approach to be halted. Address any changes that arise.	105	7	7%	20.11
7	8a-13	2	Demonstrate a response to a change in the installation's heading during the operation.	47	3	6%	21.1
8	6b-2	2	Describe which position reference systems should be enabled for the operation and explain to the Examiner/QOBA how these choices minimize the risk posed by the loss of a PRS.	143	9	6%	19.7
9	6h-1	2	Complete a pre-operation (500 m) checklist.	244	15	6%	4.2
10	8a-12	2	Ask DPO if there are items in alarm status (items he or she acknowledged without clearing).	33	2	6%	21.9
11	6g-7	2	Demonstrate the creation of an approach plan for a DP operation	351	21	6%	19.9
12	8d-5	2	Demonstrate retrieving any equipment or disconnecting any hoses prior to the end of the operation.	34	2	6%	24.7
13	6f-1	2	Demonstrate the ability to conduct a formal pre-operation risk assessment.	143	8	6%	19.5
14	6i-2	2	Review the vessel's capability plot and assess if the operation is possible.	144	8	6%	3.3 20.6 19.6
15	7e-30	2	Approach the installation using speed and steps appropriate for the operation, conditions, company policy, and charter requirements.	343	18	5%	20.1

16	7e-23	1	Using manual mode, hold the vessel's position and heading.	346	18	5%	11.6 20.9
17	8a-10	2	Demonstrate updating an escape route during an operation due to a change in conditions.	102	5	5%	19.12 21.16
18	7b-3	2	Demonstrate setting up the vessel and its thrusters to maximize power plant efficiency without compromising station keeping capabilities or the vessel's indented operational status (e.g. CAM or IMO equipment class requirements).	177	8	5%	20.5
19	6h-3	2	Complete a field arrival checklist.	147	6	4%	4.2
20	6f-3	2	Demonstrate an understanding that DP operations must be risk assessed.	123	5	4%	19.5
21	8c-2	2	Utilize the DP console to determine DP sensors in use.	152	6	4%	5.6 5.6.1 25.12
22	7a-13	2	Demonstrate understanding of when to enable relative position reference systems.	78	3	4%	25.14
23	8a-11	2	Demonstrate an awareness of the vessel's heading and position during an operation and if station keeping is improving or degrading.	157	6	4%	21.9
24	6j-3	2	Demonstrate knowledge that the consequence analysis function must be enabled for the vessel to operate as a DP-2 or higher vessel.	79	3	4%	8.3 17.3
25	8a-19	2	Demonstrate monitoring of the DP sensors to ensure all are providing accurate data.	107	4	4%	21.14

Appendix 4, Top 25 Failed items by Phase.

Phase	Phase 3 (Simulator) Course			Phase 4 (Watchkeeping)			Phase 5 (Upgrade)			Revalidation		
Item	Attempts	Failures	% Failed	Attempts	Failures	% Failed	Attempts	Failures	% Failed	Attempts	Failures	% Failed
6i-1	12	0	0 %	26	4	15 %	–	–	–	20	7	35 %
8a-14	1	0	0 %	1	0	0 %	–	–	–	10	0	0 %
6g-5	23	4	17 %	2	0	0 %	–	–	–	13	2	15 %
6g-8	23	0	0 %	3	0	0 %	–	–	–	18	3	17 %
8d-3	15	0	0 %	30	3	10 %	1	0	0 %	49	7	14 %
7d-5	5	0	0 %	2	0	0 %	1	0	0 %	19	2	11 %
8a-13	22	1	5 %	1	0	0 %	–	–	–	6	1	17 %
6b-2	10	0	0 %	26	3	12 %	–	–	–	19	3	16 %
6h-1	14	0	0 %	28	1	4 %	1	0	0 %	39	3	8 %
8a-12	23	2	9 %	4	0	0 %	–	–	–	3	0	0 %
6g-7	38	1	3 %	31	0	0 %	1	0	0 %	58	9	16 %
8d-5	23	1	4 %	30	1	3 %	–	–	–	3	0	0 %
6f-1	11	0	0 %	26	2	8 %	–	–	–	21	2	10 %
6i-2	10	0	0 %	26	2	8 %	–	–	–	20	2	10 %
7e-30	38	0	0 %	31	1	3 %	1	0	0 %	56	2	4 %
7e-23	38	1	3 %	30	0	0 %	1	0	0 %	56	8	14 %
8a-10	5	0	0 %	3	0	0 %	1	1	100 %	19	1	5 %
7b-3	27	0	0 %	4	0	0 %	1	0	0 %	31	2	6 %
6h-3	10	0	0 %	26	0	0 %	–	–	–	21	2	10 %
6f-3	5	0	0 %	2	0	0 %	1	0	0 %	21	4	19 %
6j-3	23	3	13 %	28	0	0 %	–	–	–	13	0	0 %
8c-2	25	2	8 %	4	1	25 %	1	0	0 %	30	1	3 %
7a-13	24	3	13 %	2	0	0 %	–	–	–	41	3	7 %
8a-11	6	0	0 %	4	0	0 %	1	0	0 %	31	2	6 %
8a-19	6	0	0 %	2	0	0 %	1	1	100 %	19	1	5 %
Totals	**378**	**14**	**4 %**	**340**	**14**	**4 %**	**11**	**2**	**18 %**	**575**	**55**	**10 %**

Phase	All Grandfather			In-Scheme Grandfather			Post-Scheme Grandfather		
Item	Attempts	Failures	% Failed	Attempts	Failures	% Failed	Attempts	Failures	% Failed
6i-1	90	9	10 %	36	5	14 %	54	4	7 %
8a-14	33	6	18 %	10	4	40 %	23	2	9 %
6g-5	40	2	5 %	15	0	0 %	25	2	8 %
6g-8	52	6	12 %	15	4	27 %	37	2	5 %
8d-3	194	11	6 %	74	7	9 %	120	4	3 %
7d-5	77	5	6 %	32	2	6 %	45	3	7 %
8a-13	16	1	6 %	3	0	0 %	13	1	8 %
6b-2	87	3	3 %	34	1	3 %	53	2	4 %
6h-1	160	11	7 %	64	5	8 %	96	6	6 %
8a-12	4	0	0 %	3	0	0 %	1	0	0 %
6g-7	219	11	5 %	82	4	5 %	137	7	5 %
8d-5	5	1	20 %	3	1	33 %	2	0	0 %
6f-1	84	4	5 %	33	2	6 %	51	2	4 %
6i-2	87	4	5 %	34	1	3 %	53	3	6 %
7e-30	214	15	7 %	79	2	3 %	135	13	10 %
7e-23	218	9	4 %	83	4	5 %	135	5	4 %
8a-10	75	4	5 %	31	2	6 %	44	2	5 %
7b-3	111	6	5 %	43	1	2 %	68	5	7 %
6h-3	89	4	4 %	35	3	9 %	54	1	2 %
6f-3	93	1	1 %	34	1	3 %	59	0	0 %
6j-3	39	1	3 %	14	0	0 %	25	1	4 %
8c-2	90	2	2 %	33	0	0 %	57	2	4 %
7a-13	37	0	0 %	12	0	0 %	25	0	0 %
8a-11	114	4	4 %	44	2	5 %	70	2	3 %
8a-19	78	2	3 %	34	2	6 %	44	0	0 %
Totals	**2,091**	**99**	**5 %**	**804**	**40**	**5 %**	**1,287**	**59**	**5 %**