
**DYNAMIC POSITIONING CONFERENCE**
**October 11-12, 2016**

**COMPETENCY/DESIGN**

# DPO Competency Review: A Statistical Analysis of the OSVDPA's Competency Assessments

**Aaron Smith**
**Ben Berson**
***Offshore Service Vessel Dynamic Positioning Authority***

# Summary.

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|---|---|
| Summary of our scheme | The basis of the OSVDPA DPO Certification Scheme and the requirements contained in this scheme. |
| Summary of Assessment System | The basis of the OSVDPA assessment system and how the assessments are structured and organized. |
| Assessment Scenario Content | A review of the assessment content presented in this analysis and how this content compares to existing findings. |
| Review of DPOs in Analysis | The certification and experience background of the mariners who took our assessment. |
| Results and Recommendations | What we found in the initial data gleaned from our assessments and what we feel this data means for the industry. |

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# Founding Principles.

**The OSVDPA believes the safety of the industry is increased when:**

- All who use DP are trained and certified in its safest use.
- DPO certification is based on a defined standard of competency.
- DPO competency is based on experience and assessments.
- DPO certification is practically achieved and relevant to position.

# DPO certification is based on a defined competency standard.

## Industry Guidance and Standards:

- The IMO's STCW B-V/f;
- IMCA M 117, M 182, C-002, etc.;
- MTS Ops. Guidance and MDAT;
- DNVGL-ST-0023 and RP-0007;
- The NI's certification scheme; and
- IMCA/USCG incident documents.

## International Standards:

- ISO 17024.

## OSVDPA's own emphasis:

- DP operation planning;
- Risk assessing;
- Communication;
- Use of decision support tools (e.g. ASOGs, CAM/TAM); and
- Manual control of vessels.

# OSVDPA Scheme Summary

**Phase 1: Induction Course**
Five Day or Blended Online/Classroom Course
Written Assessment

**Phase 2: Familiarization**
30 Days Sea Time and 90 Hours Practical Experience
Completion of the Taskbook

**Phase 3: Simulator Course**
Five Day Course
Simulator-Based Assessment

**Class C Permit (Optional)**

**Phase 4B: Watchkeeping**
60 Days Sea Time and 180 Hours Practical Experience on DP-1 or AUV
Completion of the Taskbook
Onboard or Simulator-Based Assessment

**Phase 4A: Watchkeeping**
60 Days Sea Time and 180 Hours Practical Experience on DP-2 or DP-3
Completion of the Taskbook
Onboard or Simulator-Based Assessment

**Class B DPO Certificate**

**Phase 5: Upgrade**
30 Days Sea-Time and 60 Hours Practical Experience on DP-2 or 3
Completion of the Taskbook
Onboard or Simulator-Based Assessment

**Class A DPO Certificate**

**"Grandfather" (transfer) in at any point by proving experience and passing assessments.**

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# Summary of OSVDPA Assessment System.

- Phase 1: 60 multiple choice questions at training center,
- Phase 2: On board assessment of 20 taskbook tasks,
- Phase 3: Simulator-based assessment,
- Phase 4: On board or simulator-based assessment,
- Phase 5: On board or simulator-based assessment, and
- Revalidation: On board or simulator-based assessment after 150 days of Sea Time and 450 hours of Practical Experience.

# Summary of OSVDPA Assessment System.

## Vessel operator enrollment required to conduct onboard assessments.

- Requests samples of on board documents and vessel particulars to cross-check DPO applications against,
- List of individuals that will submit sea service letters, and
- Must show understanding and following of OSVDPA assessment policy.

## Qualified on Board Assessors (QOBAs):

- Certified DPO,
- 150 days of Sea Time and 450 hours of Practical Experience in the last 5 years,
- Pass a Flag State approved on board assessing course.

# Summary of OSVDPA Assessment System.

- OSVDPA AS-1-CV, our practical assessment bank has more than 200 assessment items.
- Each Phase 3, 4, 5, and revalidation assessment is made up of 45 items.
- 15 of these items are Tier 1:
  - If done incorrectly can cause the vessel to lose position or heading,
  - All 15 must be completed correctly for assessment to be passed.
- 30 of these items are Tier 2:
  - Set up, monitoring, and system operation items,
  - 80 percent of the T2 items in an assessment (24) must be completed correctly.

# Summary of OSVDPA Assessment System.

| 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 the Chief Engineer's or Master's standing orders.<br>The item is passed if the assessee is able to perform the stop in a safe and controlled manner within the criteria. | 11.5<br>20.9 | 1 | All | All | List.<br>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.<br>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<br>Phase 5 | List.<br>Prompt. |

# Summary of OSVDPA Assessment System.

Scenarios:

- Pre-packaged assessment set up to mimic actual DP operation.
- Each scenario is written or approved by TAC.
- Multiple scenarios to match vessel type and industrial mission.
- Can be used on simulator or onboard (if the assessment is run straight through).

Standing Order:

- Provides choices for assessors/instructors to use to create own assessments.
- Can be done on a simulator or onboard over a period of up to 14 days.
- The standing order is changed periodically to prevent cheating.

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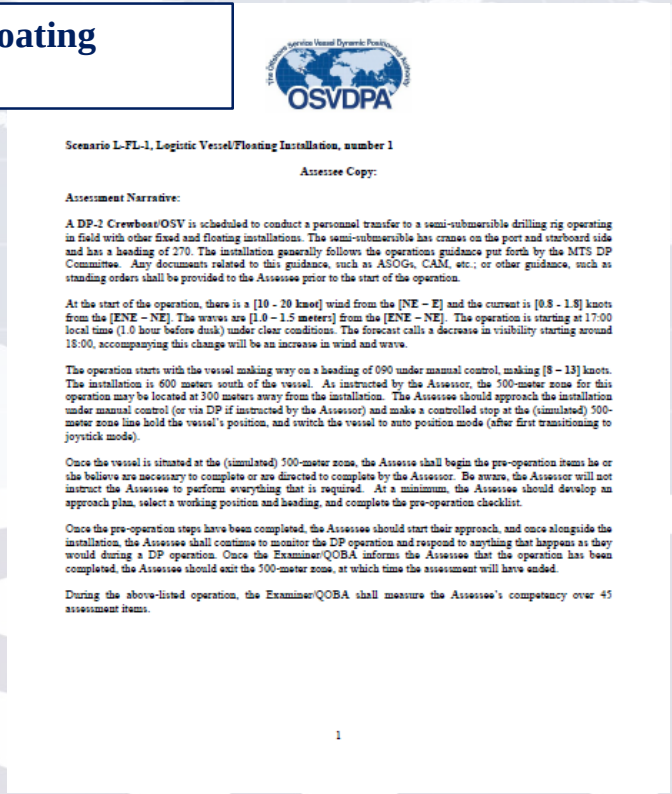
# Assessment Scenario Content.

**Scenario L-FL-1, Logistic Vessel/Floating Installation, Number 1**

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 installation generally follows the operations guidance put forth by the MTS DP Committee. . . . .
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]**.



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 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 Assessee 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.

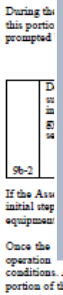
Once the pre-operation steps have been completed, the Assessee should start their approach, and once alongside the installation, the Assessee shall continue to monitor the DP operation and respond to anything that happens as they would during a DP operation. Once the Examiner/QOBA informs the Assessee 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.

1

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 . . . 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).

# Assessment Scenario Content.


During the
this portio
prompted
9b-2
If the Ass
initial step
equipment
Once the
operation
conditions. Also inform the Assessee you will be asking them questions about these factors. PLEASE NOTE: this
portion of the assessment scenario includes an assessment item or items that should not be listed and/or prompted

| | | | | |
|---|---|---|---|---|
| 8a-15 | Anticipate the result of an excursion during an operation. | During the operation, ask the Assessee what the result would be of an excursion at that time and what their reaction to the excursion would be.<br>The item is passed if the Assessee can correctly identify the plausible consequences and can relate a contingency plan that is within the vessel's capabilities and complies with the vessel's ASOG or other decision support tool. | Circle Score:<br><br>Pass<br><br>Fail |
| 9b-2 | Demonstrate the response to a sudden and significant change in data from a single gyrocompass or heading sensor. | During the operation (without announcement or notice) cause (if on a simulator) or simulate or mimic (if on a vessel) one of the enabled DP sensors providing the data problem mentioned by the item.<br><br>The item is passed if the Assessee realizes the situation, evaluates the situation against the vessel's ASOG or other decision support tool (and possibly class requirements) and takes the action required by evaluation.<br><br>**The OSVDPA does not recommend this item be attempted within 500 meters of a fixed or floating installation.** | Circle Score:<br><br>Pass<br><br>Fail |

# Assessment Scenario Content.

| Competency Section | Primary Weight in Scenario | Secondary Weight in Scenario |
|---|---|---|
| 1 – Alarms. | 4% | 22% |
| 6 – Communication. | 2% | 18% |
| 11 – Manual Control. | 4% | 0% |
| 15 – Responses to Failures and Emergency Procedures. | 18% | 11% |
| 19 – Operations Planning / Risk Assessing. | 22% | 38% |
| 20 – Operation (Set Up and Approach). | 16% | 20% |
| 22 – Operation (Degraded Status). | 16% | 9% |
| 25 – Reference Systems, Sensors, Related Equipment. | 11% | 16% |

# Assessment Scenario Content.

**Compared the content and results of Scenario L-FL-1 to 2011 and 2012 IMCA incident analysis (IMCA M 227 and IMCA M 228).**

| IMCA Report Incident Triggers | Percentage Category was Identified | Weight of Category L-FL-1 | Percentage of Failures within Category |
|---|---|---|---|
| Computer | 23% | 27% | 24% |
| Environment | 7% | 47% | 24% |
| Human Error | 15% | 20% | 100% |
| Reference | 14% | 36% | 29% |
| Sensor | 5% | 31% | 43% |
| Thruster | 29% | 22% | 29% |

# Assessment Scenario Content.

**Are the divergences from the IMCA data acceptable?**

**We reviewed the MDAT analysis of IMCA M 181 to find out.**

- 32 percent of the incidents were triggered by power and propulsion issues, the consequence could have been avoided with proper segregation and use of decision support tools.

- 38 percent of the incidents were triggered by sensors or PRS failures could have been prevented with “appropriate operator intervention.”

- 21 percent of the incidents were triggered by operator error, could have been mitigated through the understanding and use of decision support tools.

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# Review of DPOs in Analysis.

| Case Number | License | DPO Cert. | Type of Vessel Worked | Cold DP System | Result |
|---|---|---|---|---|---|
| 1 | STCW | No | DP-0/2 | Yes | Fail-5 |
| 2 | 100 T | No | DP-2 | No | Fail-6 |
| 3 | STCW | No | DP-1 | Yes | Fail-3 |
| 4 | STCW | No | DP-2 | Yes | Pass-2 |
| 5 | STCW | No | DP-2 | Yes | Pass-3 |
| 6 | STCW | No | DP-2 | No | Fail-1 |
| 7 | 100 T | No | DP-1/2 | No | Pass-0 |

| Case Number | License | DPO Cert. | Type of Vessel Worked | Cold DP System | Result |
|---|---|---|---|---|---|
| 8 | STCW | Yes | DP-2 | Yes | Fail-3 |
| 9 | STCW | No | DP-2 | No | Pass-0 |
| 10 | STCW | No | DP-2 | No | Pass-1 |
| 11 | STCW | Yes | DP-2 | No | Pass-0 |
| 12 | STCW | No | DP-2 | No | Pass-1 |
| 13 | STCW | Yes | DP-2 | Yes | Pass-0 |
| 14 | STCW | No | DP-1/2 | No | Fail-1 |

# Review of DPOs in Analysis.

- All of the DPOs in the assessment sample were trained under the Nautical Institute's certification scheme through at least Phase C.
- 57 percent of the assessees passed the assessment.
- 86 percent of the assessees held STCW licenses, 42 percent passed the assessment.
- 67 percent of the existing DPOs passed the assessment.
- 75 percent of the DPOs with less than DP-2 experience failed.
- 50 percent of the DPOs on a cold DP system failed, whereas 38 percent on a known system failed.

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# Results and Recommendations.

- Failures caused by the DPOs' lack of utilization of decision support tools, especially true for the more experienced DPOs.
  - Consultation of ASOG would have pushed passage to at least 85 percent.
- Don't develop false sense of security on competency with manual control.
  - Industry should determine if simulator's manual controls are sufficient.
- The buttonology of dynamic positioning is important but not a cause of a large number of failures.
- Utilize the existing vessel familiarization guidelines (Sec. 8 of IMCA M 117), especially for switching vessel class and DP system type.

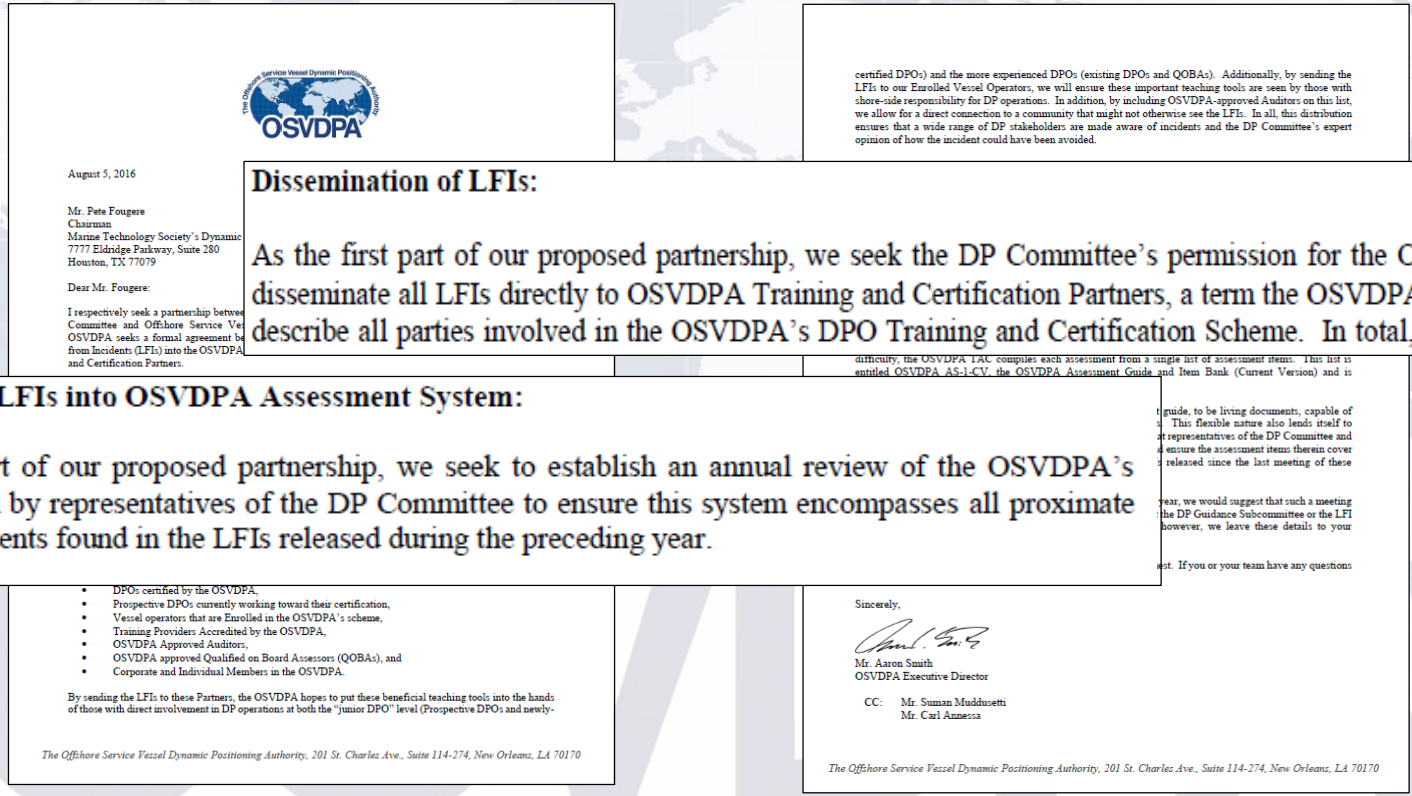
# Results and Recommendations.

- Significant change in data from 1 of 3 enabled gyros (5 failures):
  - 4 of 5 failed to consult ASOG, make required notification, or risk assess.
  - TPs urged to prioritize ASOGs and communication in curriculum.
  - VOs urged to ensure new hires understand decision support tools used.
- Thruster failing to full (3 failures):
  - This is the buttonology that should be taught.
  - Failures regarding both setpoint/feedback and E-Stop verses enabled.
  - Is this a simulator audio issue? With newer/bigger vessels does that matter?

# Results and Recommendations.

- Set up vessel in intended IMO equipment class (3 failures):
  - Forgetting to enable consequence analysis.
  - VOs urged to ensure visible part of checklist.
- Enabling laser-based PRS systems (2 failures):
  - DPOs not engaged in DP-2 or operations involving DP-2.
  - VOs urged to follow familiarization guidance on class switching.
- Consult decision support tools for gain settings (2 failures)
  - VOs urged to include gain setting direction as part of decision support tools.

# Future Changes to Content.



August 5, 2016

Mr. Pete Fougere
Chairman
Marine Technology Society's Dynamic
7777 Eldridge Parkway, Suite 280
Houston, TX 77079

Dear Mr. Fougere:

I respectively seek a partnership betwee
Committee and Offshore Service Ve
OSVDPA seeks a formal agreement be
from Incidents (LFIs) into the OSVDPA
and Certification Partners.

- DPOs certified by the OSVDPA,
- Prospective DPOs currently working toward their certification,
- Vessel operators that are Enrolled in the OSVDPA's scheme,
- Training Providers Accredited by the OSVDPA,
- OSVDPA Approved Auditors,
- OSVDPA approved Qualified on Board Assessors (QOBAs), and
- Corporate and Individual Members in the OSVDPA.

By sending the LFIs to these Partners, the OSVDPA hopes to put these beneficial teaching tools into the hands of those with direct involvement in DP operations at both the "junior DPO" level (Prospective DPOs and newly-

*The Offshore Service Vessel Dynamic Positioning Authority, 201 St. Charles Ave., Suite 114-274, New Orleans, LA 70170*

certified DPOs) and the more experienced DPOs (existing DPOs and QOBAs). Additionally, by sending the LFIs to our Enrolled Vessel Operators, we will ensure these important teaching tools are seen by those with shore-side responsibility for DP operations. In addition, by including OSVDPA-approved Auditors on this list, we allow for a direct connection to a community that might not otherwise see the LFIs. In all, this distribution ensures that a wide range of DP stakeholders are made aware of incidents and the DP Committee's expert opinion of how the incident could have been avoided.

difficulty, the OSVDPA TAC compiles each assessment from a single list of assessment items. This list is entitled OSVDPA AS-1-CV, the OSVDPA Assessment Guide and Item Bank (Current Version) and is

guide, to be living documents, capable of
This flexible nature also lends itself to
representatives of the DP Committee and
ensure the assessment items therein cover
released since the last meeting of these

year, we would suggest that such a meeting
the DP Guidance Subcommittee or the LFI
however, we leave these details to your

est. If you or your team have any questions

Sincerely,

Mr. Aaron Smith
OSVDPA Executive Director

CC: Mr. Suman Muddusetti
Mr. Carl Annessa

*The Offshore Service Vessel Dynamic Positioning Authority, 201 St. Charles Ave., Suite 114-274, New Orleans, LA 70170*

**Dissemination of LFIs:**

As the first part of our proposed partnership, we seek the DP Committee's permission for the OSVDPA to disseminate all LFIs directly to OSVDPA Training and Certification Partners, a term the OSVDPA utilizes to describe all parties involved in the OSVDPA's DPO Training and Certification Scheme. In total, this would

**Incorporation of LFIs into OSVDPA Assessment System:**

As the second part of our proposed partnership, we seek to establish an annual review of the OSVDPA's assessment system by representatives of the DP Committee to ensure this system encompasses all proximate causes of DP incidents found in the LFIs released during the preceding year.