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MEMORANDUM

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To: Sector Northern New England (sp)
Sector Boston (sp)
Sector Southeastern New England (sp)
Sector Long Island Sound (sp)
Sector New York (sp)

Subj: USE OF DYNAMIC POSITIONING (DP) BY OFFSHORE SUPPLY VESSELS (OSVs) CONDUCTING OIL AND HAZMAT TRANSFERS IN SUPPORT OF ALTERNATIVE ENERGY ON THE OUTER CONTINENTAL SHELF

Ref: (a) IMO Maritime Safety Committee (MSC) MSC.1/Circ.1580 Guidelines for Vessels and Units with Dynamic Positioning (DP) Systems
(b) IMO Maritime Safety Committee (MSC) MSC/Circ.645 Guidelines for Vessels with Dynamic Positioning (DP) Systems

1. **PURPOSE:** This letter provides guidance[1] to Captains of Port (COTP) within the First Coast Guard District (D1) regarding minimum requirements for use of a DP system on an OSV for the purpose of "mooring" the vessel during oil and hazardous material (HAZMAT, as defined in 33 CFR § 154.105) transfers to and from facilities and vessels on the Outer Continental Shelf (OCS) within D1. Additionally, this policy clarifies the requirements for OSVs under 500 Gross Regulatory Tonnage (GRT) domestic or 6,000 International Tonnage Convention (GT ITC) to conduct oil and HAZMAT transfers to and from other vessels. There are also additional requirements for vessels over 500 GRT domestic or 6,000 GT ITC conducting oil and HAZMAT transfers that can be found in 46 CFR Subchapters D and O, and compliance shall be verified with the cognizant Officer In Charge, Marine Inspection (OCMI). Amplifying information regarding the guidelines put forth by this policy letter is provided in the enclosures. This policy letter is only intended to apply to OSVs supplying facilities or other vessels and does not apply to any other type of vessel, or cargo lightering operations.[2] Its application to such things as Floating Production, Storage, and Offload (FPSO) units and their supporting shuttle tankers is specifically excluded from this policy.

2. **DIRECTIVES AFFECTED**: None.

3. **BACKGROUND:**

a. OSVs have incorporated vessel propulsion and control systems that provide DP capability of

[1] This policy letter serves as guidance for alternatives as prescribed in 33 CFR § 156.107.
[2] Lightering of hazardous material other than oil is approved by COMDT CG-ENG under 33 CFR § 156.210 (b).

varying degrees. In 1994 and updated again in 2017, the International Maritime Organization (IMO) published MSC/Circ. 645 and following MSC. 1/Circ. 1580, which defines a DP vessel as follows: "Dynamically positioned vessel (DP-vessel) means a unit or a vessel which automatically maintains its position (fixed location or predetermined track) exclusively by means of thruster force." It also defines a DP system as "the complete installation necessary for dynamically positioning a vessel comprising the following subsystems: power system, thruster system, and DP-control system." An unknown number of OSVs currently use DP for most, if not all, their OCS facility support activities, including transfer of oils and HAZMAT.

b. 33 CFR § 156.120(a) requires that during oil and HAZMAT transfers "the vessel's moorings are strong enough to hold during all expected conditions of surge, current and weather." This regulation was written for a conventional mooring system or anchoring system and does not envision the use of DP. However, heightened energy exploitation and production activity in north Atlantic waters created a demand for OSVs with DP and a corresponding desire to use DP for "mooring" a vessel during deepwater cargo transfer operations. Questions have arisen about the use of DP as an acceptable mooring system for oil and HAZMAT transfers, accordingly this policy letter provides minimum requirements an OSV with DP should meet rather than complying with the mooring requirements of 33 CFR § 156.120(a).

c. The definition of an OSV can be found in 46 U.S.C. § 2101(25). Under current policy and regulations, vessels conducting DP oil and HAZMAT transfers must meet the definition of an OSV. For application of this policy, OSVs that have multiple certifications must be operating as an OSV at the time of the transfer operations and note this information appropriately in the ship's log. As per the General Definitions of 46 U.S.C. § 2101, an "Offshore Supply Vessel" is defined as a "motor vessel that regularly carries goods, supplies, individuals in addition to the crew, or equipment in support of exploration, exploitation, or production of offshore mineral or energy resources." "Energy resources" is broad enough to include alternative energy resources developed, exploited, or produced on the outer continental shelf (OCS), which includes offshore wind energy.

Therefore, self-propelled vessels that support offshore wind energy and do not meet the definition of a passenger-carrying vessel as defined in 46 CFR § 125.160, 46 U.S.C. § 2101(22) or 46 U.S.C. § 2101(35) meet the definition of an OSV per 46 U.S.C. § 2101(25), because they comply with the three statutory requirements:

(1) they are motor vessels;
(2) they carry goods, supplies, individuals in addition to the crew, and/or equipment; and
(3) they support the exploration, exploitation, or production of energy resources.

d. OSVs are also subject to the pollution prevention regulations in 33 CFR Subchapter O, and the transfer procedure requirements in 33 CFR § 155.720 stipulate that vessels subject to that regulation must meet the requirements of 33 CFR § 156.120.

4. DISCUSSION:

a. A conventional mooring system using moorings, as addressed by 33 CFR § 156.120(a), is

essentially a passive system such that there is little risk of a spontaneous failure unless the mooring system is overwhelmed by operator error or extraordinary external forces, such as a severe storm or a powerful wake from a passing ship.[3] A DP system is an active system with working machinery and moving parts controlled by "software," so a spontaneous failure is also possible unless the system is designed with redundant safety systems. Accordingly, a DP system must have redundancy if it is to provide an equivalency to a passive mooring system. Finally, this policy does not supersede restrictions set forth by company specific safety management system procedures nor requirements by the vessel's recognized organization.

References (a) and (b) address redundancy and establish three classes for DP systems:

(1) **Class 1**: loss of position may occur in the event of a single fault.
(2) **Class 2**: loss of position is not to occur in the event of a single fault in any active component or system.
(3) **Class 3**: loss of position is not to occur in the event of a single failure of any active or static component or system and does not occur if all components in one compartment are lost due to fire or flooding.

The IMO guidelines recommend that the vessel operator and their customer examine the risks associated with the operation and determine the appropriate class of DP system necessary.[4] The Coast Guard encourages vessel and facility operators to engage in such discussions but recognizes that this communication may not occur in every case. Therefore, this policy establishes minimum requirements for DP transfers of oil or HAZMAT. The IMO Guideline defines redundancy as follows:

> "Redundancy means ability of a component or system to maintain or restore its function, when a single failure has occurred. Redundancy can be achieved for instance by installation of multiple components, systems or alternative means of performing a function.[5]"

A summary of IMO's recommended criteria for each class of DP system is provided in enclosure (3).

b. *Alternative #1 (preferred) – IMO Class 2 or Class 3 DP System:* The likelihood of total failure of the DP system causing a pollution incident due to the vessel drifting off station is very remote for a vessel equipped with a Class 2 or Class 3 DP system. Even if the DP system were to fail the DP operator is likely to have ample warning so that transfer operations could be safely terminated before the vessel were to drift off station. Therefore, a vessel using a DP system that meets reference (a) or (b), as applicable or as Class 2 or Class 3 will be considered acceptable for meeting the mooring requirements of 33 CFR § 156.120(a) for the purpose of conducting oil and HAZMAT transfers.

[3] Similarly, a DP system can fail if overwhelmed by excessive external forces that exceed the performance limits of the system.
[4] IMO MSC. 1/Circ. 1580 (16 June 2017) Guidelines For Vessels and Units With Dynamic Positioning Systems
[5] IMO MSC/Circ. 645 (6 June 1994) Guidelines For Vessels With Dynamic Positioning Systems

c. *Alternative #2 – Recognized Organization "equivalency" to Class 2 or Class 3*: Any Class 2 or Class 3 DP system that has been certified by a recognized organization will be considered acceptable for meeting the mooring requirements of 33 CFR § 156.120(a) for the purpose of conducting oil and HAZMAT transfers. As shown in enclosure (3), some recognized organization DP criteria are not as stringent as that recommended by references (a) or (b); however, the DP criteria of these recognized organizations meets or exceeds the minimum requirements discussed below.

d. *Alternative #3 – DP System meeting Minimum Requirements specified in enclosure (1)*: There may be vessels operating in support of offshore wind energy which are not certified by a recognized organization as per paragraph 4.c. but are equipped with a DP system equivalent to that of IMO or classification society standards. Operators seeking this alternative shall engage the cognizant OCMI for evaluation with concurrence from the Marine Safety Center. Operators shall submit request with ample time for this complex review.

e. *Alternative #4 - Use of Breakaway Fitting with Quick-closing Valves (for OSVs with DP systems not meeting any of the above options)*: DP equipped OSVs may also utilize a "fail-safe" transfer system, so that even if the DP system were to fail and the OSV drifts off station the transfer system will prevent the release of any oil or HAZMAT into the environment. Therefore, for an OSV with a DP system not meeting any of the above options, the transfer system may be designed and configured using a breakaway fitting equipped with quick-closing valves. This must be engineered so that if the DP system were to fail and the vessel were to drift away from the receiving entity, the breakaway fitting will be the weak link in the transfer system and will part or break before any other component in the system fails. When the breakaway fitting parts, it must have a quick-closing valve in each half of the fitting (one half which remains connected to the OSV side of the transfer system and one half which remains connected to the facility or other vessel) that automatically closes to prevent the release of any oil or HAZMAT. Also, the transfer system must be designed so that if the breakaway fitting parts and the quick-closing valves immediately close, the transfer pump has a relief valve and re-circulation piping and/or an automatic shutdown device to prevent the system from being over-pressurized. If the transfer system is engineered and configured in this manner, then the OSV may conduct oil and HAZMAT transfers in DP mode. This system shall be reviewed and approved by the cognizant OCMI prior to operation.

f. *Operational Procedures:* Regardless of which Alternative is taken, operational procedures similar to Section 4, "Operational Requirements," of reference (a) or (b) should be developed to address the full range of operational safety issues while conducting oil and HAZMAT transfers with the vessel in DP mode and include the applicable surveys and tests found in references (a) and (b), specifically Sections 5.1. As an equivalency, it shall be the OSV owner's responsibility to ensure that all surveys and tests are properly conducted and documented. The Coast Guard does not intend to issue a Flag State Verification and Acceptance Document. An issued Dynamic Positioning Verification Acceptance Document (DPVAD) or equivalent as per the acceptance of the cognizant OCMI with concurrence from the First Coast Guard District, Chief

of Prevention (D1(dp)) is the standard a vessel should comply with. The operational procedures for conducting oil and HAZMAT transfers in DP mode may be incorporated into the transfer procedures required by 33 CFR § 155.720, and should include such things as maximum environmental conditions for the DP system, emergency shut-down and breakaway procedures, etc. Also, it is strongly recommended that the OSV be positioned so that if the DP system were to fail, the OSV would drift away from alternative energy associated facilities or other vessels and not collide. There should be procedures on how the DP operator assesses where to safely position the OSV with respect to the facility or other vessels.

g. *Safety Management Requirements (SMS):* Prior to conducting bunkering operations, vessels shall address this policy in their SMS, Bureau of Safety and Environmental Enforcement (BSEE) SMS, or, if no SMS is required, in company procedure to include weather limitations, crew fatigue, and notification procedures to the cognizant OCMI in accordance with 33 CFR § 156.118.

h. *Training and Qualifications for DP Operators:* In addition to having acceptable oil and HAZMAT transfer procedures that include procedures for transfers while in DP mode, as discussed above, the credentialed deck officer on watch during the DP operations must be suitably trained and qualified to operate the DP system in accordance with reference (b), Section 6, Training.

i. *Limitations of Policy Letter:* This policy letter applies only to operations in support of alternative energy resources developed, exploited, or produced on the OCS within the D1 area of responsibility (AOR). This policy is not applicable in State waters—Oil or HAZMAT transfer operations occurring on state waters will require the use of a conventional mooring in accordance with 33 CFR § 156.120. Under current regulations and the U.S. Code, if the transferring vessel is an OSV, < 500 GRT/6,000 GT ITC, then it may transfer fuel to other vessels and offshore drilling or production facilities that are in support of exploration, exploitation, or production of offshore minerals or alternative energy resources (including offshore wind energy). However, OSVs, > 500 GRT/6,000 GT ITC, are prohibited from transferring to other vessels and may only transfer fuel from fuel supply tanks to offshore drilling or production facilities in the oil industry if the vessel is not a tanker. OSVs not in the oil industry shall meet the “Carriage of Liquid Bulk Dangerous Cargo” rules of 46 U.S.C Chapter 37. Being that these OSVs over or equal to 500 GRT/6,000 GT ITC are in support of alternative energy / offshore wind energy and not the oil industry, they are not exempt from 46 U.S.C. Chapter 37 and shall comply with applicable sections of 46 CFR Subchapters D and O to transfer hazmat to offshore drilling or production facilities.

Permissible Vessel – Platform Transferring Matrix

	Vessel Transferring Oil/HAZMAT From:	
Vessel Receiving Oil/HAZMAT	OSV < 500 GRT or 6,000 GT ITC	OSV >/= 500 GRT or 6,000 GT ITC
OSV/ Service Operation Vessel	Permitted	Not Permitted
OSV with portable accommodations (PAMs)	Not Permitted*	Not Permitted
Lift Vessel in lifted position only	Permitted	Not unless vessel meets 46 CFR Subchapter D requirements and vessel is in lifted position
Cable Laying Vessel/ Feeder Support Vessel/ Field Development Vessel	Permitted	Not unless vessel meets 46 CFR Subchapter D requirements
Turbine or Fixed Substation	Permitted	Not unless vessel meets 46 CFR Subchapter D requirements
Installation Vessel	Permitted	Not unless vessel meets 46 CFR Subchapter D requirements

* This is permitted as long as the PAMs have been installed outside of hazardous areas onboard and fully comply with CG-ENG Policy 01-16.

5. **ACTION:** D1 OCMIs are encouraged to distribute this policy letter to OSV owners and operators within their area of responsibility so that OSV owners and operators ensure they comply with this guidance for oil or HAZMAT transfers by an OSV using DP on the OCS within the D1 AOR. It is not intended that the Coast Guard will conduct any additional inspection activities to enforce this policy.

6. **FEEDBACK:** Feedback or questions on this policy should be referred to the First Coast Guard District, Chief of Prevention (D1(dp)).

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Encl: (1) Alternative #3 – Coast Guard's Minimum DP Requirements for OSVs using DP for Oil & HAZMAT transfers
(2) Summary of References (a) and (b)
(3) Summary of Classification Society DP Designations & Criteria

Enclosure (1) – Alternative #3 – Coast Guard's Minimum DP Requirements for OSVs using DP for Oil and Hazmat Transfers

General comments:

1. 33 CFR § 156.120(a) requires that for oil or HAZMAT transfers "the vessel's moorings are strong enough to hold during all expected conditions of surge, current, and weather …"
2. The following guidance has been developed so OCMIs and OSV owners/operators can determine what minimum requirements a DP system must meet for an OSV to conduct oil and HAZMAT transfers on the outer continental shelf within the First Coast Guard District.
3. The burden is on industry to demonstrate compliance with this guidance whenever conducting oil or HAZMAT transfers; OCMIs will verify in coordination with the Marine Safety Center to ensure this guidance is being followed.
4. For questions about redundancy, please refer to the definition provided on page 3 of this policy letter.

Systems or Components		Minimum Req's	Comments	IMO Equiv.	Req'd by Sub I or L?	Req'd by Sub T?
Power Systems	Generators & Prime Movers	Redundant		Class 2	Yes	No
	Main Switchboard with Bus-Tie Breaker	1	This must be an automatic bus-tie breaker, which may not have been installed on some of the older OSVs.	Class 2	Maybe (not on some older OSVs)	No
	Distribution System	Redundant		Class 2	Yes	No
	Uninterruptible Power Supply (UPS)	1 for each computer	Where multiple computers are provided, one UPS is acceptable if it can provide power to each computer.	Class 2-	No	No
Thrusters	Arrangement of Thrusters	Redundant *	*A configuration with 2 stern thrusters & one bow thruster is acceptable as long as the vessel can still hold station long enough to safely disconnect after losing any one of these thrusters. NOTE: Thrusters may include fixed shafts with controllable or fixed pitch propellers, tunnel thrusters, Z-drives, etc.	Class 2-	No	No
	Hold Station with Single Thruster Failure	Yes*	*Long enough to safely disconnect	Class 2-	No	No
Sensors/ Controls	IMO General guidelines for DP Control systems	Recommended	References (a) and (b), section 3.4.1, contains general guidelines for DP Control systems, including DP info display, alarms & warnings, etc.	Class 1, 2, & 3	No	No
	Automatic Control – Number of Computers	1	2 are preferred, but 1 is acceptable since some redundancy is achieved by having Manual Control as back up.	Class 1	No	No
	Manual Control – Integrated Joystick with Auto heading	Yes	Where the Integrated Joystick is computer controlled, that computer shall be independent of the Automatic Control computer and shall have UPS provided.	Class 1, 2, & 3	No	No

table continued from previous page…

Sensors & Controls (continued)	Individual Control Levers for each Thruster	Yes		Class 1, 2, & 3	No	No
	Position reference system	2	The 2 position reference systems shall be based on different principles of operation, or if both are GPS-based then the differential corrections shall be from independent sources and shall be transmitted/received separately.	Class 1+	No	No
	External Wind Sensors	2		Class 1+	No	No
	VRS/MRU (Vert. Response Sensor/Motion Response Unit)	1*	*VRS/MRU is not required if the DP system has two years of satisfactory operational history without a VRS/MRU.	Class 1	No	No
	Gyrocompass	2*	*Required redundancy may be satisfied by other sensors that read or compute vessel heading information (e.g., corrected magnetic compass output or satellite compass), in which case only one gyrocompass is required.	Class 1+	No	No
	Consequence Analysis	Required*	*Equivalencies may be considered, including operational controls; and Consequence Analysis is not required if the DP system has two years of satisfactory operational history without a Consequence Analysis software program.	Class 2-	No	No

Enclosure (2) – Summary of references (a) and (b), "Guidelines for Vessels with Dynamic Positioning Systems"

Part 2, "Equipment Classes" [1.]	
Class 1	Loss of position may occur in the event of a single fault.
Class 2	Loss of position is not to occur in the event of a single fault in any active component or system. • Normally static components will not be considered to fail where adequate protection from damage is demonstrated and reliability is found satisfactory by the Administration. • Single failure criteria include (must be considered for): o Any active component or system (generators, thrusters, switchboards, remote controlled valves, etc.). o Any normally static component (cables, pipes, manual valves, etc.) that is not deemed properly protected or adequately reliable. Summary: Redundancy of all active components (i.e., those w/moving parts).
Class 3	Loss of position is not to occur in the event of a single failure of any active or static component or system, and does not occur if all components in one compartment are lost due to fire or flooding. Summary: Redundancy of all components (active & static) and physical separation of components.

Footnotes:

1. Some classification societies have a category for DPS-0, but IMO does not recognize this class of DP system.

Part 3, "Functional Requirements"					
Subsystem or Component			Minimum Requirements for Equipment Classes [1.]		
			Class 1	**Class 2**	**Class 3**
Power (3.2)	Generators & Prime Movers		Non-Redundant	Redundant	Redundant, in Separate Compartments
	Main Switchboard [2]		1	1 w/Bus Tie	2 normally open Bus Ties, in Separate Compartments
	Bus Tie Breaker		0	1	2
	Distribution System		Non-Redundant	Redundant	Redundant, in Separate Compartments
	Power Management System (3.2.6)		Optional	Optional	Optional
	UPS (3.4.2.7)		1	1 per computer	2, in Separate Compartments
Thrusters (3.3)	Arrangement of		Non-Redundant	Redundant	Redundant, in Separate Compartments
Control (3.4)	Auto Control – Number of Computer Systems (3.4.2)		1	2	3, with 1 in separate compartment from main control station & separated by A-60 boundary
	Manual Control – Joystick (3.4.1.7)		Yes	Yes	Yes
	Single Levers for each Thruster (3.4.1.7)		Yes	Yes	Yes
	Back-up Control Station (3.4.2.6)		No	No	Yes, in Separate Compartment
	Consequence Analysis or "DP Alert System" (3.4.2.4)		No	Yes	Yes
Sensors	Position Reference System (3.4.3)		1	3	3, with 1 connected to back-up control system & separated from other units by A-60 boundary
	External Sensors (3.4.4.)	Wind	1	3	3, with 1 connected to back-up control system & separated from other units by A-60 boundary
		VRS [2.]	1	3	3, with 1 connected to back-up control system & separated from other units by A-60 boundary
		Gyro	1	3	3, with 1 connected to back-up control system & separated from other units by A-60 boundary
		Other [3.]	1	3	3, with 1 connected to back-up control system & separated from other units by A-60 boundary

Footnotes:

1. Some classification societies have a category for DPS-0, but IMO does not recognize this class of DP system.
2. These items are not specifically addressed by the standard, but can be implied.
3. Other sensors might include ones to monitor sea state, water depth, magnetic compass interface, or other passive environmental sensors.

Enclosure (3) – Summary of Classification Society DP Designations & Criteria

The following table provides a summary comparison of the various DP standards. For specific requirements refer to the referenced guideline or standard. Classification Society Standards are derived from, but do not exactly match the IMO Guideline. A Class 0 designation is not addressed in the IMO Guideline. For approvals/designations by additional Recognized Organizations not listed below, please consult your cognizant OCMI.

Subsystem or Component		Minimum Requirements in Group Designation		
Authority	Reference (a) and (b)	Class 1	Class 2	Class 3
	ABS	DPS-1	DPS-2	DPS-3
	DNV	AUT	AUTR	AUTRO
	Lloyds	DP(AM)	DP(AA)	DP(AAA)
Power Systems	Generators & Prime Movers	Non-Redundant	Redundant	Redundant, Separate Compartments
	Main Switchboard	1	1 with Bus-Tie	2 normally open Bus Ties, Separate Compartments
	Bus-Tie Breaker	0	1	2
	Distribution System	Non-Redundant	Redundant	Redundant, Separate Compartments
	Power Management	IMO-Optional ABS-No DNV-No Lloyds-No	IMO-Optional ABS-Yes DNV-Yes Lloyds-Yes	IMO-Optional ABS-Yes DNV-Yes Lloyds-Yes
	Uninterruptible Power Supply (UPS)	1	1 per computer	2, Separate Compartments
Thruster	Arrangement of Thrusters	Non-Redundant	Redundant	Redundant, Separate Compartments
	Hold Station with Single Thruster Failure	IMO-No ABS-No DNV-No Lloyds - Yes	Yes	Yes
Control	Automatic Control – Number of Computers	1	2	3, 1 in separate compartment from main control station & separated by A-60 boundary
	Manual Control – Integrated Joystick with Auto heading	Yes	Yes	Yes
	Individual Control Levers for each Thruster	Yes	Yes	Yes
	Position reference system	IMO-1 ABS-2 DNV-2 Lloyds-2	3	3, 1 connected to back-up control system & separated from other units by A-60 boundary
	External Wind Sensors	IMO-1 ABS-2 DNV-1 Lloyds-2	IMO-3 ABS-2 DNV-2 Lloyds-2	3, 1 connected to back-up control system & separated from other units by A-60 boundary
	VRS/MRU	IMO-1 ABS-N/A DNV-1 Lloyds-2	IMO-3[1] ABS-2 DNV-2 Lloyds-2	IMO-3[1] 2, 1 connected to back-up control system & separated from other units by A-60 boundary
	Gyrocompass	IMO-1 ABS-2 DNV-1 Lloyds-2	IMO-3 ABS-2 DNV-2 Lloyds-2	3, 1 connected to back-up control system & separated from other units by A-60 boundary
Misc	Alternative Control System	No	No	Yes
	Consequence Analysis	No	Yes	Yes
	Performance Capability Rating (PCR)	Lloyds only – Factor that gauges the percentage of time a ship can remain on station when subjected to a set of standard environmental conditions with (1) all thrusters online and (2) with most effective thruster inoperative		
	Environmental Regularity Number (ERN)	DNV only – Factor used to indicate the position keeping ability of a vessel with (1) all thrusters operating; (2) minimal effect of single thruster failure; and (3) maximum effect of single thruster failure		

1. If DP-control system is fully dependent on correct signals from vessel sensors, then signals should be based on 3 systems serving the same purpose.