



Environmental
Protection
Agency **Guyana**

DOF Subsea

Project Summary

Bunkering Marine Fuel Oil for Exxon Mobil Guyana Limited

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APPENDIX A – SKANDI CONSTRUCTOR GENERAL ARRANGEMENT

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1 REFERENCES

Table 1-1: References

Ref.	Document Title
1	<i>Environmental Impact Assessment, Liza Phase 1 Development Project, Esso Exploration and Production Guyana, Limited</i>
2	<i>Environmental Impact Assessment, Liza Phase 2 Development Project, Esso Exploration and Production Guyana Limited</i>
3	<i>EEPGI Environmental Impact Assessment, Payara Development Project</i>
4	<i>Environmental Impact Assessment, Uaru Development Project, Esso Exploration and Production Guyana Limited</i>
5	<i>Environmental Impact Assessment, Yellowtail Development Project, Esso Exploration and Production Guyana Limited</i>
6	<i>Environmental Impact Assessment, Whiptail Development Project, Exxon Mobil Guyana Limited</i>
7	<i>Project Summary for Liza Phase 1 Development, Stabroek License Area, Offshore Guyana, Esso Exploration and Production Guyana Ltd.</i>
8	<i>Bunkering at Sea from PSV – Skandi Constructor</i>
9	<i>Guidelines for Offshore Marine Operations</i>
10	<i>DOF Local Content Master Plan</i>

2 PROJECT DESCRIPTION

2.1 Physical Location

The *Skandi Constructor* operated by DOF and chartered by Exxon Mobil Guyana Limited (EMGL) is pursuing a permit to allow the *Skandi Constructor* to bunker fuel to other vessels chartered by EMGL operating in Guyanese waters. The proposed bunkering activities are to take place in the Stabroek Block, which covers approximately 26,800 km² and lies parallel to the Guyana coast[**Reference 1**]. Within the Stabroek Block, the main areas of operation would be in and between the Liza Phase 1 Field, the Liza Phase 2 Field, the Payara Field, the Yellowtail Field, the Whiptail Field, and the Uaru Field, as well as any future planned fields. All are operated by EMGL and located in the southeastern portion of the Stabroek Block see Figure 2.4-1 below. The fields are located northeast of Georgetown, the closest being the Liza Phase 2 Field located 183 km from Georgetown see Figure 2.4-2 below[**Reference 2**].

2.2 Alternatives

Currently, vessels chartered by EMGL are receiving fuel from offshore supply vessels (OSV) that have bunkered fuel in Guyana, or the vessels themselves are bunkering fuel in Trinidad if there are no OSVs available to bunker fuel because most installation vessels operating offshore Guyana such as the *Skandi Constructor* and *Havila Phoenix* do not have a shallow enough draft to bunker fuel in Guyana.

2.3 Baseline Information

The baseline information for the proposed operational areas have been well documented in multiple EMGL Environmental Impact Assessments [**Reference 1,2,3,4,5,6,7**], and will not be covered in this document due to the encompassing of all EMGL work areas and this proposed scope of work does not pose to alter the existing environment.

2.4 Maps

Figure 2.4-1 shows the location of the six (6) aforementioned fields located in the Stabroek Block [Reference 6].

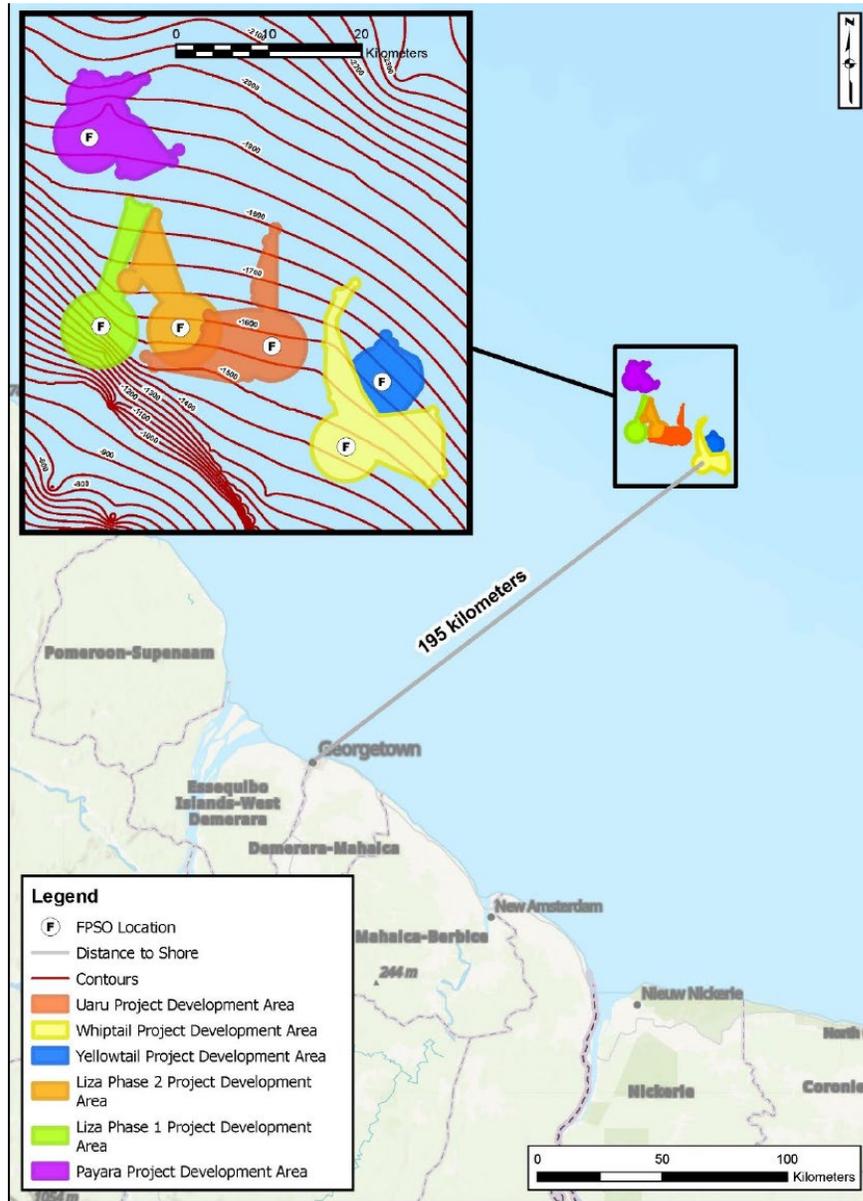


Figure 2.4-1: Field Locations

Figure 2.4-2 shows the 183 km distance between Liza Phase 2 and Georgetown [Reference 2].



Figure 2.4-2: Liza Phase 2 Location in Relation to Georgetown

3 PROJECT DESIGN

3.1 Vessel Information

The *Skandi Constructor* is an Ulstein SX121 style vessel built in 2009. The fuel tanks can hold a total of 2210m³ marine fuel oil. The *Skandi Constructor* general arrangement and fuel tank drawings are in **Appendix A** and **Appendix B** respectively.

3.2 Project Size

The *Skandi Constructor* typical personnel on board (POB) while operating in Guyana is approximately 65 people. This POB will be the same during the bunkering operations. The operation would include the *Skandi Constructor* and another vessel chartered by EMGL.

3.3 Project Activities

The following are the *Skandi Constuctor* guidelines for bunkering at sea [**Reference 8**].

1. Scope

This procedure shall apply to all transfer of fuel and fresh water at sea between Skandi Constructor and another DP vessel.

2. Purpose

The purpose of this procedure is to make sure that bunkering offshore is carried out in safe manner and also outline the responsibilities for the various parts of the operation.

3. Responsibilities

The Master is overall in charge of the operation and shall make sure this procedure is followed.

The Chief Officer is in charge of the preparations for sending the hoses to the supply vessel and for ensuring that the deck crew is fully aware of the procedure.

The Chief Engineer is responsible for the refuelling and shall make sure that the fuel transfer procedure and relevant checklists are being followed.

4. General

Bunkering at sea shall preferably only be carried out in daylight hours, at wind speed less than 20 knots and significant wave height less than 2.0 metres. The weather forecast must be evaluated in order to determine if the bunkering operation can be completed with the weather inside these limits.

Above limits are meant as a guidance. The captain's of the two vessels must use their professional judgement to decide if bunkering can take place in a safe manner.

The following must be observed.

- Both vessels shall have completed their DP checklists.
- Skandi Constructor will remain stationary throughout the operation. ANY moves or heading changes must be agreed with the supply vessel*.
- Before the supply vessel* start the approach, heading and footprint must be confirmed from Skandi Constructor
- Establish communication between all parties before the bunkering starts and maintain communication during the complete bunkering operation.
- Quantities to be transferred to be agreed before the supply vessel* approach.
- A toolbox meeting must be held with all involved personnel present.
- Ensure monitoring of the fuel connection at all times.

5. Transferring hoses

Skandi Constructor will have fuel hose** and fresh water hose connected to the manifolds on stb side just forward of main crane pedestal. The hoses must be secured to the railing. The hoses will be laid out on the wooden deck aft of the crane.

The supply vessels will move into position approximately 10 metres off Skandi Constructor's starboard side with the supply vessel's* aligned with the crane pedestal.

The hose will then be lifted over to the supply vessel*. A hookey with a 3m wire attached shall be fitted at the end of the hose. A round sling shall be secured to the hose approx 5 metres from the end of the hose. The supply vessel* will use this round sling to hang the hose off on top of the cargo rail.

Once the hose is secured on the supply vessel this will be confirmed to Skandi Constructor by VHF.

6. Bunkering***

Communication must be established between all involved parties.

Before start of operation it must be agreed if the bunkering should be stopped from the supply vessel* or from Skandi Constructor.

Chief Engineer is responsible for receiving fuel and fresh water when done at sea. He will report to the bridge when ready to receive. The bridge will inform the supply vessel*. The supply vessel* will start at slow rate and when confirmed by Skandi Constructor Chief Engineer that all is ok and no leaks observed, the supply vessel* the supply vessel will be requested to increase the rate.

Chief Engineer will request reduced rate for topping up as necessary.

Received and delivered quantities to be confirmed by both vessels.

7. Disconnecting the Hoses

Skandi Constructor will use the main crane to lift the hose back onto the wooden deck.

When lifting the hoses the manifold valve on Skandi Constructor must be kept open in order to allow drainage of the hose.

Position of manifold valves must be confirmed before disconnection and lifting of any hoses.

Once hoses are clear of the supply vessel*, the supply vessel* should report to Skandi Constructor bridge and when confirmed all clear, move away from Skandi Constructor.

Note*: Per 1. Scope: This procedure shall apply to all transfer of fuel and fresh water at sea between Skandi Constructor and another DP vessel.

Note**: The hose used for bunkering operations is 40m in length.

Note***: The bunkering steps are for the Skandi Constructor receiving fuel, but similar steps will be followed for the sending of fuel to another vessel, the Skandi Constructor would follow the supply vessel role.

3.4 Natural Resources

No raw materials are required for this project.

3.5 Utilities

The vessel is self contained and requires no supplemental utility services.

3.6 Waste Production

The crew on the *Skandi Constructor* produce food waste, domestic waste, and plastic waste. The means of disposal are incineration, discharging to the sea, and filling a trash skip to be taken to shore for proper disposal of waste. On a monthly basis, approximately 14.8m³ of domestic waste is produced, 76 kg of food waste is discharged to sea, and an 8.13m³ trash skip is filled.

3.7 Project Duration

DOF's contract began in late 2022 with EMGL and extends through November 2025 with the option of two(2) one (1) year extensions.

3.8 Decommissioning

There is no decommissioning plan associated with this bunkering project.

4 POTENTIAL IMPACTS AND THEIR SIGNIFICANCE

The proposed vessel bunkering is a low risk operation and is conducted in the field frequently by OSVs to Installation Vessels. The potential impact caused by this operation would be a release of fuel oil into the environment. There are mitigation measures in place to minimize this risk. They are covered in Section 5.1.

5 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

5.1 Environmental and Ecological Mitigation Measures

The hose used in the bunkering operations is the main focus for mitigating potential releases. The following are measures outlined in the Guidelines for Offshore Marine Operations, Appendix 10-C Bulk Hose Management, Handling & Connection Guidance [Reference 9].

4.7 Visual Inspection Pre and Post Use

A visual inspection must be carried out prior to and after vessel operations. The following checks should be carried out as a minimum:

- Correct colour coded hooky hooks, slings and shackles with proper split pins are attached to the hose. Hoses must show no signs of physical damage to fabric by chafing, splitting, perishing, blistering, deep lacerations or any other forms of deterioration.
- Check installation manifold couplings are tight and ready for operation.
- When using certain types of hose fittings, remove the end screw dust cap before lowering the hose to the vessel, and on return to the installation, replace the dust cap and check it is secured to an anchor point.
- Check gates on the bunkering station hang-off points (fingers) are maintained, lubricated and easy to open and close.

The preferred way to visually check a hose is from a safe location at the hose station while directing the crane operator to slowly raise the hose, allowing the hose to be inspected for wear.

Never allow the hose to be lifted close to the crane hoist rope safety cut-out. A similar method can be used to check the hose for damage when returning the hose to its hang-off point.

Note: Avoid lifting the hose immediately over the head of the person doing the inspection.

6. Pollution Safety

During fuelling operations, there is always the risk of pollution. This may be due to hose and/or instrument leaks, hose wear, mechanical breakdown or as a result of a hose becoming fouled in the vessel's propulsion. It is important that an individual is appointed to visually and operationally check the hose remains functional during bunkering operations.

If an oil sheen is detected on the surface of the water, bunkering operations must cease immediately. The incident must be reported to the installation control room and the cause investigated.

7. Bulk Transfer Operations at Installation

During bulk hose operations, the following should be observed:

- The vessel Master, crane operator and deck crews to confirm radio communication prior to operations
- The person appointed to supervise the bunkering process must ensure they can see the bulk hose(s) at all times, and that they are familiar with the alignment of valves and tank levels. They should not allow other distractions during the operation.
- The installation dry bulk vent line positions are identified
- The vessel bridge, or equivalent, and OIM/Barge Master, or equivalent, should confirm quantities discharged and received at regular intervals, to ensure that there are no leaks within the respective systems.
- The vessel deck crew and installation crane operator must be readily available and close at hand throughout any transfer operations.
- Sufficient warning/instructions shall be given by each party prior to changing over the tanks.
- If, at any stage, in the operation the vessel Master or provider is in any doubt as to the integrity of the operations, then that operations shall be suspended until integrity can be reinstated.
- When pumping is finished, both the receiver and provider shall set their line to allow the hose to be drained back to the vessel's tank. In suitable conditions, the crane may also be used to lift the hose to aid draining. In the case of dry bulk, purge air should be used to empty the hose and clear the line.
- Hoses used for potable water must not be used for transferring other bulk liquids. Potable water lines should be flushed through prior to transferring water to avoid any residues within the lines contaminating the installation's supplies.
- During periods of darkness, adequate lighting must be available over the hose and support vessel throughout the operation.
- To identify hoses, they may be fitted with hi-vis bands, tape or alternative means.

- Hoses are normally colour coded for manufacturers' identification and approval, frequently by way of spiral coloured bands within the hose structure. Ensure the management system is aware of the markings on the hoses.
- The manufacturers' colour coding of the hose should not be confused; any markings on receivers or structure should adopt the universal colour coding as described in Appendix 10-E to identify bulk hose products.
- All bulk hoses used offshore are to be of sufficient length and good condition; unapproved repairs shall not be carried out, and in the interests of safety, the hose should be disposed of immediately.
- In the event that the crane operator has to leave their cab, they shall inform the Master of the vessel. See 10.10 for further guidance.
- Any bulk hose should be disconnected from the vessel as soon as possible after the bunkering has been completed and retrieved to the platform, unless otherwise agreed by the Master of the vessel.

7.1 Bulk Hose Operations in marginal conditions

In marginal weather, great care is required by the vessel Master to avoid over-running the hose especially if deck cargo is also being transferred. Consideration should be given to the connecting of bulk hoses only at this time. During hose work, deck foreman must listen to all communications on selected radio channels, which can be transmitted to the control room and platform crane operator should a hose assembly leak or significant changes in weather conditions.

5.2 Social Impact

DOF has a 5 year Local Content Master Plan to coincide with the duration of the contract with EMGL in Guyana. This Local Content Strategy includes onshore management and support, offshore project resources, and offshore maritime resources[Reference 10].

Table 5.2-1: Projected Offshore Hires[Reference 10]

Name of Contractor Sub-Contractor or Licensee offshore positions:			DOF						
No.	Projected job position to be filled within the organization.	Minimum skills and competencies needed for the position.	Known related skillsets or competencies presumed to be lacking in the Guyanese workforce, for the position.	Projected Hires					Total
				Year					
				1	2	3	4	5	
1	ROV Pilot Technician Trainee	Hydraulic, electrical, mechanical, fiber optic experience or technical certification	MTSC ROV Certified levels: PT2	16	4	4	N/A	N/A	24
2	Rigger	MTSC, IMCA or DNV Certification	Basic Rigging Course Certification	0	6	6	N/A	N/A	12
3	Senior Pilot Technician	Achieve PT1 level + 100 hrs. piloting experience at PTII grade and achieve 180 days offshore as PTII and achieve 360 days offshore experience at PT1 grade.	MTSC ROV Certified levels: PT2, PT1, SPT	0	2	4	N/A	N/A	6

Note: Years 4 and 5 are optional years of the contract period and not firm. They are not included at this time.

Table 5.2-2: Projected Percentage of In Country Personnel Based on total ROV, Back Deck, and Offshore Management Personnel on Both DOF Managed Vessels [Reference 10]

Name of Contractor Sub-Contractor or Licensee:						
No.	Indicators	Targets				
		Year One	Year Two	Year Three	Year Four	Year Five
1	Percentage of total in-country employees that are Guyanese.	19%	33%	50%	N/A	N/A
2	Percentage of Guyanese employees receiving on-the- job training.	100%	100%	100%	N/A	N/A
3	Percentage increase in spending on the procurement of goods and services from Guyanese nationals and Guyanese companies.	0%	20%	30%	N/A	N/A
4	Number of local suppliers completing capacity- building training program	4	4	4	N/A	N/A
5	Percentage increase in expenditure on local industrial and technical education training institutions.	0%	0%	0%	N/A	N/A

Note: Years 4 and 5 are optional years of the contract period and not firm. They are not included at this time.

See [Reference 10] for more in depth explanation of DOF’s Local Content Plans.

6 PUBLIC CONSULTATION SUMMARY

No public consultations were held in regards to this project nor are any planned.

7 ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The main assumption of this project is that this operation will be conducted from the *Skandi Constructor*, an EMGL chartered vessel, to another EMGL chartered vessel. There are multiple vessels chartered by EMGL operating in Guyanese waters. The *Skandi Constructor* may be asked to transfer fuel to any of those vessels throughout the duration of the project. Where the fuel comes from or is going to is out of DOF's scope and will be managed by the EMGL team.

8 NONTECHNICAL PROJECT SUMMARY

The *Skandi Constructor* is a vessel operating in Guyanese water for EMGL offshore operations. The vessel is pursuing a permit to transfer fuel from the *Skandi Constructor* to other vessels involved in the project to support EMGL operations. This permit would allow the vessels utilized by EMGL to stay offshore for longer periods of time without using the time and fuel required to pursue other options for fuel transfers.



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for Exxon Mobil Guyana Limited**

Date
May 1, 2024

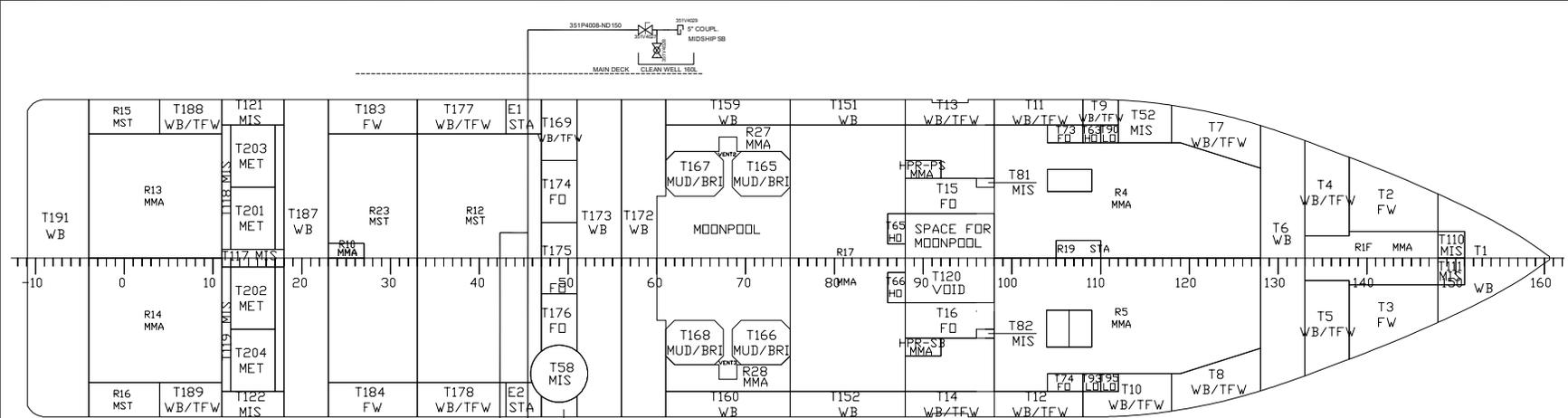
APPENDIX A – SKANDI CONSTRUCTOR GENERAL ARRANGEMENT



Project Summary:
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Date
May 1, 2024

APPENDIX B – SKANDI CONSTRUCTOR FO CARGO SYSTEM



PIPENO - DIMENSION	
351P4001 - ND200	
351P4001 - P4027	FO CARGO SYSTEM

FOC		PIPE DIMENSION	
MATERIAL: S31603		PIPE DIMENSION	
NO	Ø	WALL THICKNESS	CLASS
ND 40	Ø 48,3"	4,5	
ND 50	Ø 60,3"	4,5	
ND 65	Ø 76,1"	4,5	
ND 80	Ø 88,9"	4,5	
ND 100	Ø 114,3"	4,5	
ND 125	Ø 138,7"	4,5	
ND 150	Ø 168,3"	4,5	
ND 200	Ø 219,1"	6,3	
ND 250	Ø 273,0"	6,3	
ND 300	Ø 323,0"	6,3	

NOTE: FO CARGO SYSTEM

GENERAL: CLASS III PIPING SYSTEM

PROBLEME CODE: PIPE DIM. ND100 AND ABOVE WITH 10% X-RAY CLASS II PIPING SYSTEM

TESTING GENERAL: HYDROSTATIC TESTING AFTER INSTALLATION ON BOARD, MINIMUM 4 BAR

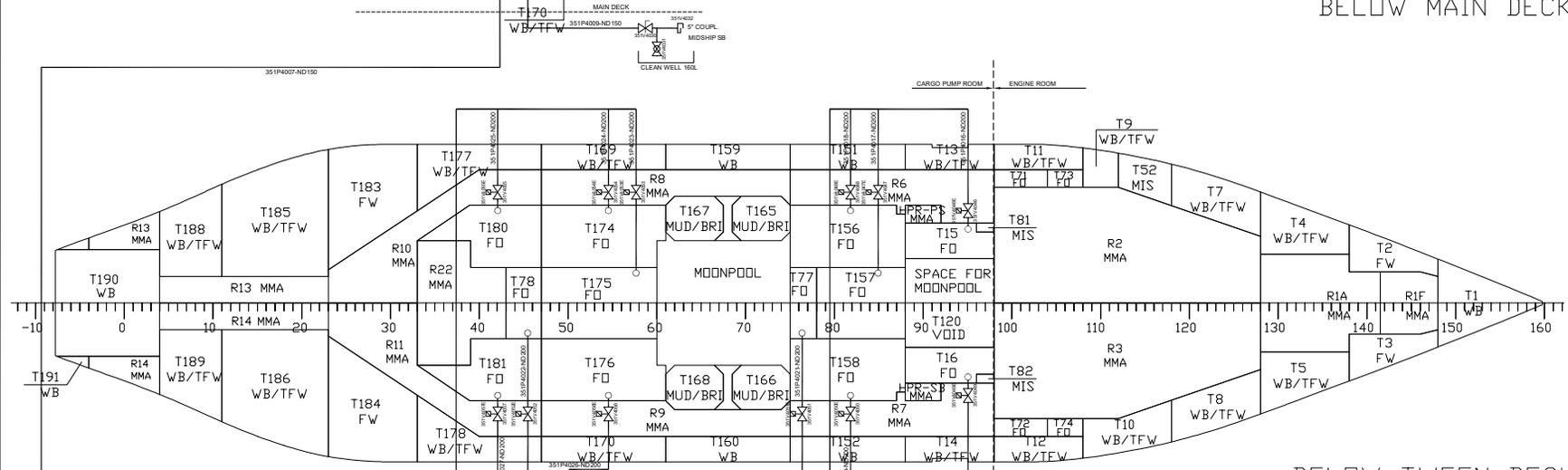
TESTING PROBLEME CODE: HYDROSTATIC TESTING AFTER INSTALLATION ON BOARD, 1.5 X MAX. WORKING PRESSURE

CARGO PUMPS AND REMOTE OPERATED VALVES TO BE MONITORED AND OPERATED FROM CARGO CONTROL STATION IN ENGINE CONTROL ROOM AND AFT BRIDGE.

EMERGENCY STOP TO BE ARRANGED FOR CARGO PUMPS @ 8 BAR MAX. WORKING PRESSURE @ 50°C MAX. TEMPERATURE.

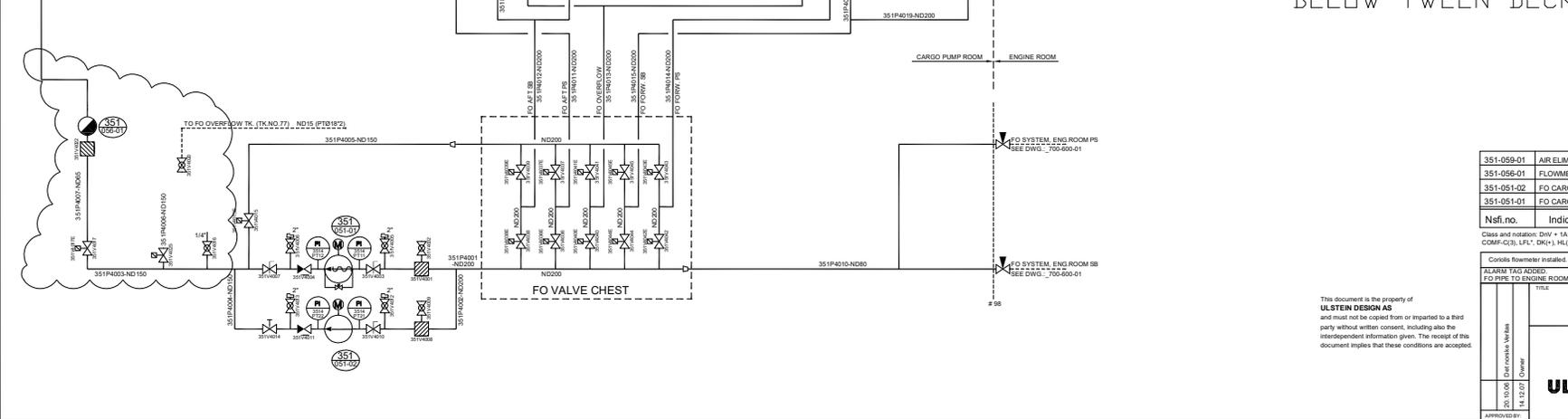
FOR FO STRIPPING / SAMPLING SYSTEM OF FO TANKS, SEE DWG. 714-000-01 WASTE/SLOUDGE OIL SYSTEM

BELOW MAIN DECK



⊘	QUICK CLOSING VALVE
⊙	DEARATOR
▨	STRAINER
— —	HOSE COUPLING, TODD OR EQUAL
⊗	BUTTERFLY VALVE REMOTE OPERATED
⊘	PIPE REDUCTION PIECE
→ →	PRESSURE INDICATOR
⊗	SAFETY VALVE
⊗	BALL VALVE
⊗	NR VALVE
⊗	BUTTERFLY VALVE
SYMBOLS.	

BELOW TWEEN DECK



351-059-01	AIR ELIMINATOR FO CARGO FLOWMETER	Flowrate: 15 - 250 m³/h	Ushain Verit AS
351-056-01	FLOWMETER FO CARGO	250 m³/h - 9 bar (Pres.com)	
351-051-02	FO CARGO PUMP NO.2	250 m³/h - 9 bar (Pres.com) Centrifugal pump	Shwabe AS Type NT 030-4000/420 U10
351-051-01	FO CARGO PUMP NO.1	250 m³/h - 9 bar (Pres.com) Twin screw pump	Shwabe AS Type 216.135/92.2.100.45.188

Nsf. no. Indication Capacity Type

Class and notation: DIV = 1A1, SF, 6D, DYN POS AUTO, NAUT-OSV (A) CLEAN DESIGN, OPR-F, CRANE, COMP-VIS), COMP-F-G3), LPL*, DR(+), HL(+), HELDR.

Corrosion flowmeter installed. By passes flowmeter removed due to Fueltax installation	01.06.23	RE	C
FO PIPE TO ENGINE ROOM PS	27.10.08	ESC	B

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ULSTEIN

PROJECT NO: **ULSTEIN SX121**
 U10265

REPLACEMENT: **283 351-604-01**
 U10265

SCALE: 1:1

DATE: 14.12.07

APPREVED BY: [Signature]