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# SPECIFICATION - ADDITION OF LIMBER HOLES IN MAIN ENGINE ROOM

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## CCGS G PEDDLE

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### CANADIAN COAST GUARD

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## TABLE OF CONTENTS

1	Specification.....	1
	1.1    Scope of Work.....	1
	1.2    Background .....	1
2	Reference Documents.....	1
	2.1    Drawings and Documents.....	1
3	Technical Description .....	1
	3.1    Functional and Design Requirements .....	1
	3.2    Acceptance Criteria .....	2
	3.3    Equipment Components and Materials.....	2
4	Inspections, Tests & Trials .....	4
	4.1    General .....	4
	Appendix A References .....	5
	Appendix B Photos .....	6

# 1 SPECIFICATION

## 1.1 SCOPE OF WORK

### 1.1.1 *MAIN ENGINE ROOM*

The Contractor is to perform all strip-out, fabrication and installation work required to meet the modifications to the Main Engine Room in accordance with the references listed in Section 2.0 and the Technical Description as detailed in Section 3.

## 1.2 BACKGROUND

A survey of the workboat engine rooms has shown an issue with respect to bilge drainage.

### 1.2.1 *MAIN ENGINE ROOM*

In the Main Engine Room, the bilge water was observed to collect in the longitudinal direction along the outboard side of the main engine girders (port and starboard) from approximately frame 11 to 17. On closer examination these outboard girders do not have any limber holes (rat holes) in the athwartship direction. This means that any water collecting outboard of these girders will not be able to drain to the bilge suctions underneath each main engine. There is a requirement to make a number of limber holes along the outboard side of the main engine girder webs between frames 13 to 15. It should be noted that access to the space where the limber holes are to be installed is very restricted and narrow.

# 2 REFERENCE DOCUMENTS

## 2.1 DRAWINGS AND DOCUMENTS

- A. Irving Shipyard Inc. Drawing No. AF6099-52000-01 Rev AF – CCGS Corporal McLaren M.M.V. – Bilge Drainage and Dewatering System.
- B. Irving Shipyard Inc. Drawing No. AF6099-20000-01 Rev AF – CCGS Corporal McLaren M.M.V. – Engine Room Arrangement.
- C. Allswater Structural Drawing No. 15069-800-S-001 – Main Engine Room Limber Hole Additions.  
(See Appendix A)

# 3 TECHNICAL DESCRIPTION

## 3.1 FUNCTIONAL AND DESIGN REQUIREMENTS

The Contractor will fabricate and/or supply the installation components in accordance with the drawings and guidance notes referenced in Section 2.0.

## 3.2 ACCEPTANCE CRITERIA

The Contractor shall ensure that all steel work and removals are within accepted tolerances. The Contractor shall ensure that, after the verification of the installation, all stripped out piping, supporting structure, walkways and walkway frames will be returned to the as found condition.

## 3.3 EQUIPMENT COMPONENTS AND MATERIALS

### 3.3.1 *GENERAL*

In addition to the acceptance criteria of section 3.2, the Contractor shall ensure that all bilges and spaces within the Main Engine room are to be dry, clean and certificates provided for gas freed spaces prior to any hot work and appropriate fire watches are placed. The pipe sections to be removed are to be isolated, drained and tagged within the appropriate system before removal.

As noted in section 3.2, the Contractor shall ensure that, after verification of the modification, any disturbed steelwork, piping, wire conduit, electrical wiring and/or wire fastenings, paint coatings will be returned to the as found condition. All new steelwork, piping, and wire conduit are to be primed and painted with marine paint (two coats).

All items removed and identified as items to be re-installed are to be tagged and safely stored for re-installation. The Contractor is to ensure that all new pipes are to be appropriately identified, recorded and "tagged".

Equipment components and material to be removed and installed are listed in the following sections.

### 3.3.2 *REMOVAL*

#### 3.3.2.1 MAIN ENGINE ROOM STRIP-OUT – STARBOARD

The Contractor shall remove, as a minimum, the following material [Photo 1, 2 & 3] from the outboard side of the starboard engine support girder:

- Steel floor plate and floor support structure b/w frame 13 to 16. To be retained for reinstallation.
- All piping (2" Nom. Dia.) and supports associated with the Sea Water Cooling Line pipe b/w frame 13 to 14. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #1 - Line #3)

- All piping (1" Nom. Dia.) and supports associated with the Main Engine Pre-Heat Line pipe b/w frame 13 to 14. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #1 - Line #4)
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 13 to 14. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #1 - Line #5)
- All piping (3/4" Nom. Dia.) and supports associated with the Main Engine Pre-Lube Line pipe b/w frame 13 to 14. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #1 - Line #1)
- All piping (1 1/4" Nom. Dia.) and supports associated with the Main Engine Pre-Lube Line pipe b/w frame 13 to 14. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #1 - Line #2)
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 13 to 14. This pipe will need to be cut out. (Appendix B – Photo #1 & 2 - Line #6)
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 14.5 to 15.5. Flanged pipe shall be retained for reinstallation. (Appendix B – Photo #3 - Line #6 continued)

If new material is required the Contractor shall supply.

### 3.3.2.2 MAIN ENGINE ROOM STRIP-OUT – PORT

The Contractor shall remove, as a minimum, the following material [Photo 4 & 5] from the outboard side of the port outboard engine support girder:

- Steel floor plate and floor support structure b/w frame 13 to 15. To be retained for reinstallation.
- Two (2) Battery packs, battery pack securing frame, steel floor plate and floor support structure b/w frame 13 to 15. To be retained for reinstallation.

### 3.3.3 INSTALLATION

#### 3.3.3.1 MAIN ENGINE ROOM – STARBOARD

The Contractor shall install three (3) limber holes through the web of the outboard main engine girder. The limber holes are to be drilled through the girder web with the use of a Magnetic Drill. Each limber hole shall be located as specified in Drawing 15058-800-S-001. (See Appendix A) Care shall be taken to protect the shell plating IWO each new limber hole.

The Contractor shall re-install, all items saved for re-installation. These are:

- Steel floor plate and floor support structure b/w frame 13 to 16.
- All piping (2" Nom. Dia.) and supports associated with the Sea Water Cooling Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 - Line #3)

- All piping (1" Nom. Dia.) and supports associated with the Main Engine Pre-Heat Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 - Line #4)
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 - Line #5)
- All piping (3/4" Nom. Dia.) and supports associated with the Main Engine Pre-Lube Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 - Line #1)
- All piping (1 1/4" Nom. Dia.) and supports associated with the Main Engine Pre-Lube Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 - Line #2)
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 13 to 14. (Appendix B – Photo #1 & 2 - Line #2) New piping will need to be installed. Connections will be flanged.
- All piping (3" Nom. Dia.) and supports associated with the Seawater Cooling Line pipe b/w frame 14.5 to 15.5. (Appendix B – Photo #3 - Line #6 continued)

If new material is required, the Contractor shall supply. There will be a requirement to flange pipes which have been cut to gain access to the foundation. The contractor shall identify the piping systems requiring such treatment.

### 3.3.3.2 MAIN ENGINE ROOM – PORT

The Contractor shall install three (3) limber holes through the web of the outboard main engine girder. The limber holes are to be drilled through the girder web with the use of a Magnetic Drill. Each limber hole shall be located as specified in Drawing 15058-800-S-001. (See Appendix A)

The Contractor shall re-install, all items saved for re-installation. These are:

- Steel floor plate and floor support structure b/w frame 13 to 15.
- Two (2) Battery packs, battery pack securing frame, steel floor plate and floor support structure b/w frame 13 to 15.

If new material is required the Contractor shall supply.

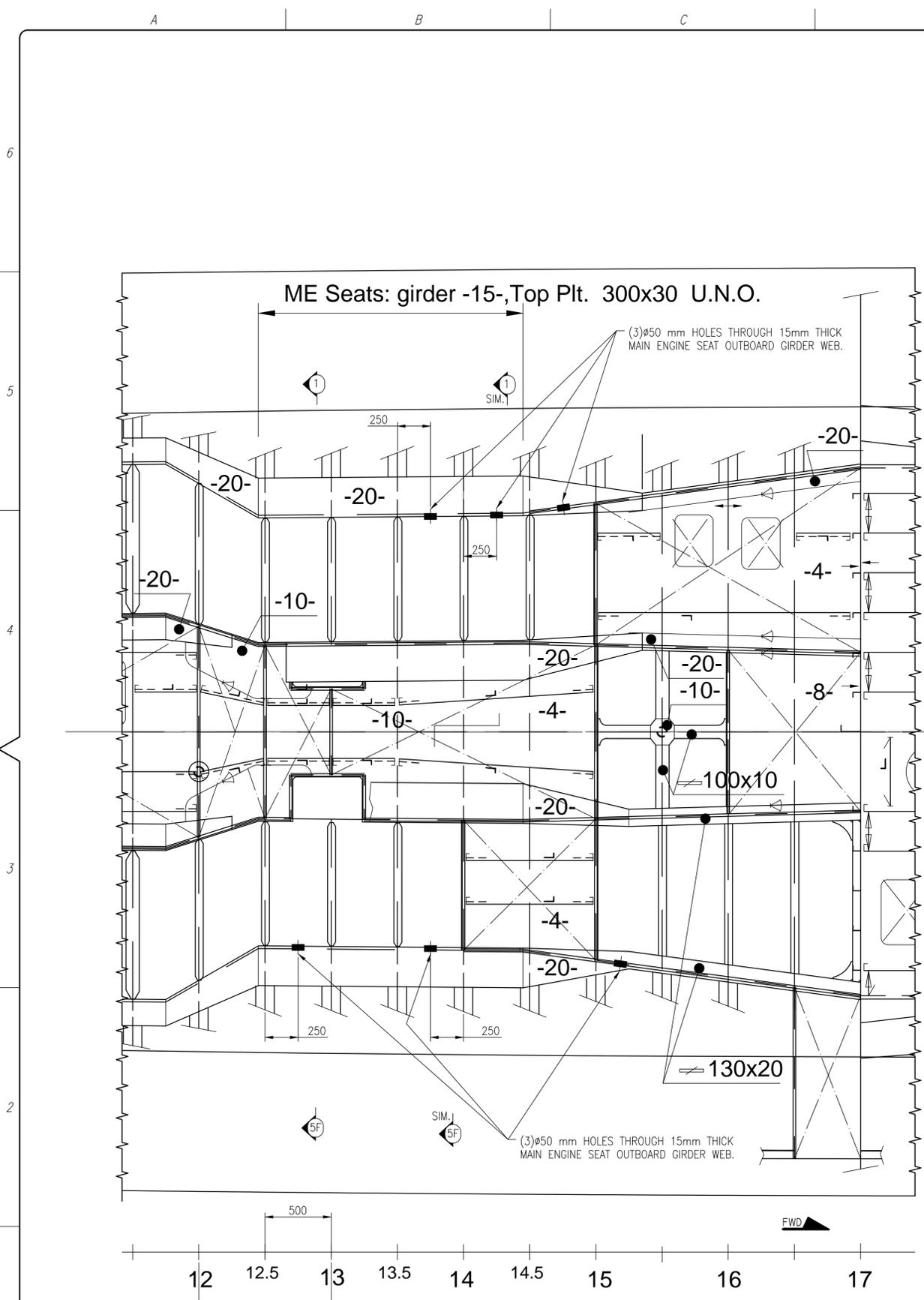
## 4 INSPECTIONS, TESTS & TRIALS

### 4.1 GENERAL

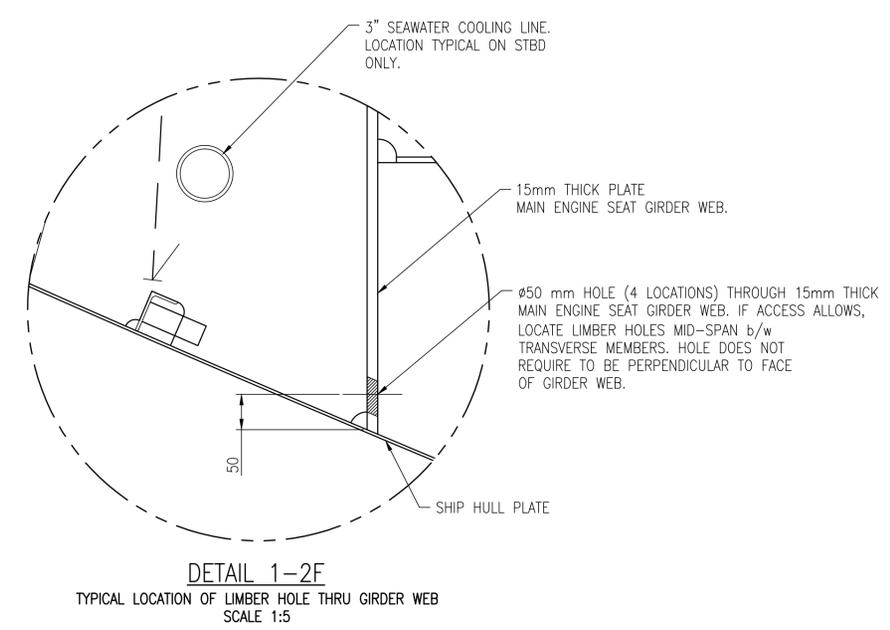
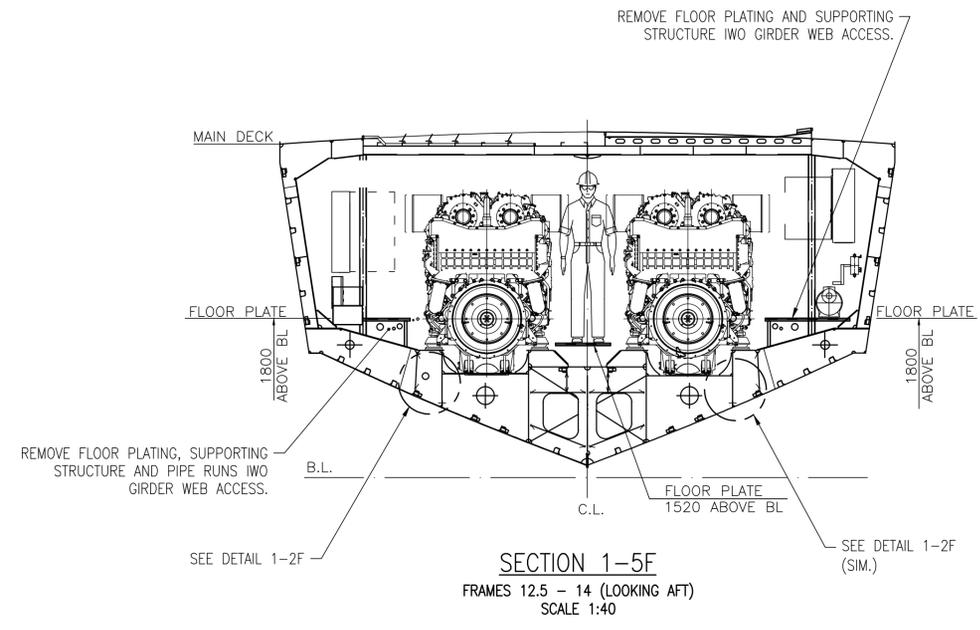
The testing of the new systems will be conducted by the Contractor. The trialing of the systems will be determined by Owner. The inspection and approval of the new limber holes will be by the technical authorities. All piping systems which were removed to provide access to the engine foundation and then reinstalled shall be trialed.

## **Appendix A      REFERENCES**

1. Allswater Structural Drawing No. 15069-800-S-001 – Main Engine Room Limber Hole Additions.



**PLAN 1-1B**  
STRUCTURAL ENGINE SEATS AND TANK TOP PLAN  
SCALE 1:20



**DETAIL 1-2F**  
TYPICAL LOCATION OF LIMBER HOLE THRU GIRDER WEB  
SCALE 1:5

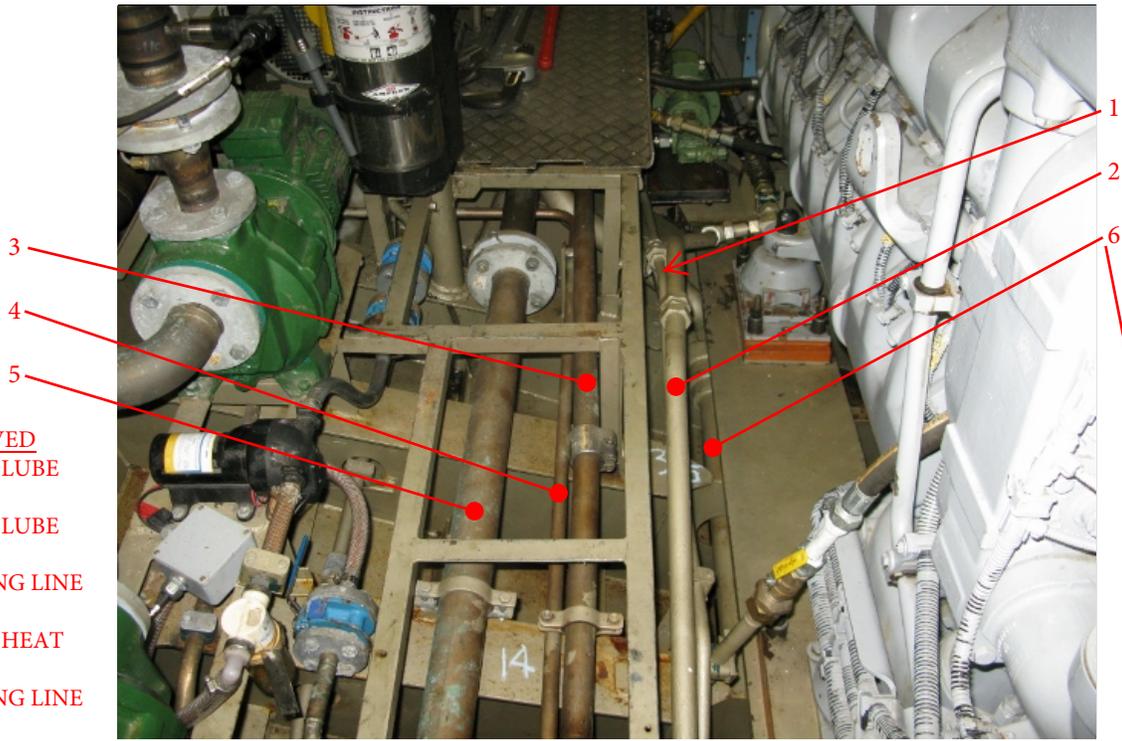
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- GENERAL NOTES:**
1. THE CONTRACTOR SHALL ENSURE THAT ALL BILGES AND SPACES WITHIN THE ENGINE ROOM ARE TO BE DRY, CLEAN AND CERTIFICATES PROVIDED FOR GAS FREED SPACES PRIOR TO ANY HOT WORK AND APPROPRIATE FIRE WATCHES ARE PLACED.
  2. THE PIPE SECTIONS TO BE REMOVED ARE TO BE ISOLATED AND DRAINED WITHIN THE APPROPRIATE SYSTEM BEFORE REMOVAL.
  3. THE CONTRACTOR SHALL ENSURE THAT, AFTER VERIFICATION OF THE INSTALLATION, ANY DISTURBED STEELWORK, PIPING, WIRE CONDUIT, ELECTRICAL WIRING AND/OR WIRE FASTENINGS, PAINT COATINGS WILL BE RETURNED TO THE AS FOUND CONDITION.
  4. ALL NEW STEELWORK, PIPING, AND WIRE CONDUIT ARE TO BE PRIMED AND PAINTED WITH MARINE PAINT (TWO COATS).
  5. ALL ITEMS REMOVED AND IDENTIFIED AS ITEMS TO BE RE-INSTALLED ARE TO BE TAGGED AND SAFELY STORED FOR RE-INSTALLATION. THE CONTRACTOR IS TO ENSURE THAT ALL NEW PIPES ARE TO BE APPROPRIATELY IDENTIFIED, RECORDED AND "TAGGED".

- REFERENCES:**
1. IRVING SHIPBUILDING DRAWING: AF6099-100000-02 PROFILES AND DECKS
  2. IRVING SHIPBUILDING DRAWING: AF6099-200000-01 ENGINE ROOM ARRANGEMENT PLAN

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	TITLE: MAIN ENGINE ROOM - LIMBER HOLE ADDITIONS	
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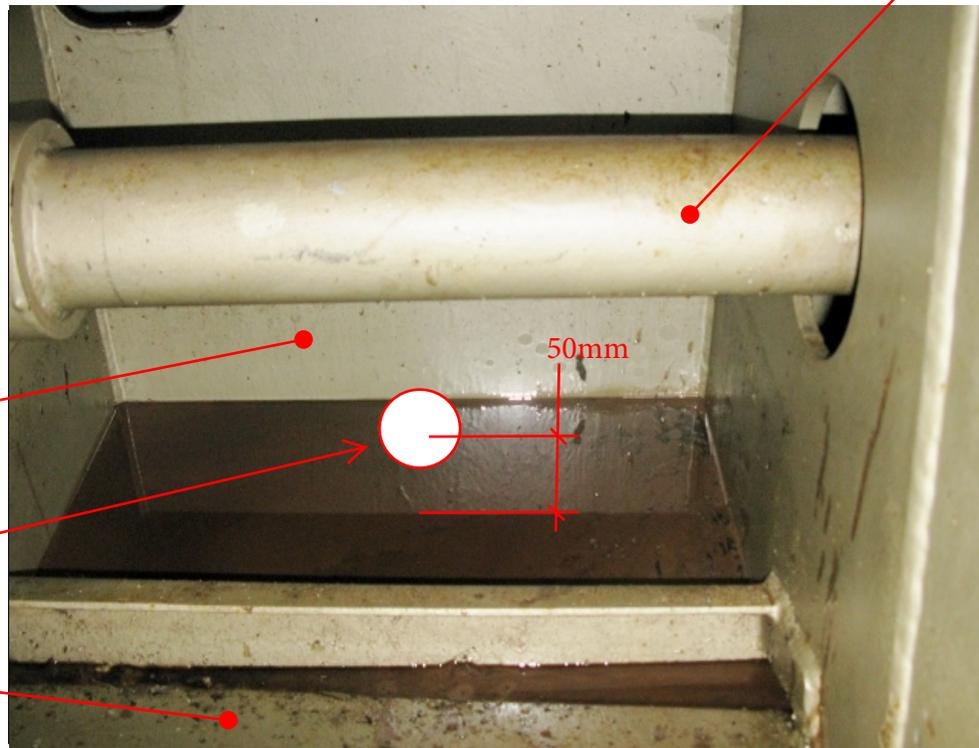
## **Appendix B    PHOTOS**



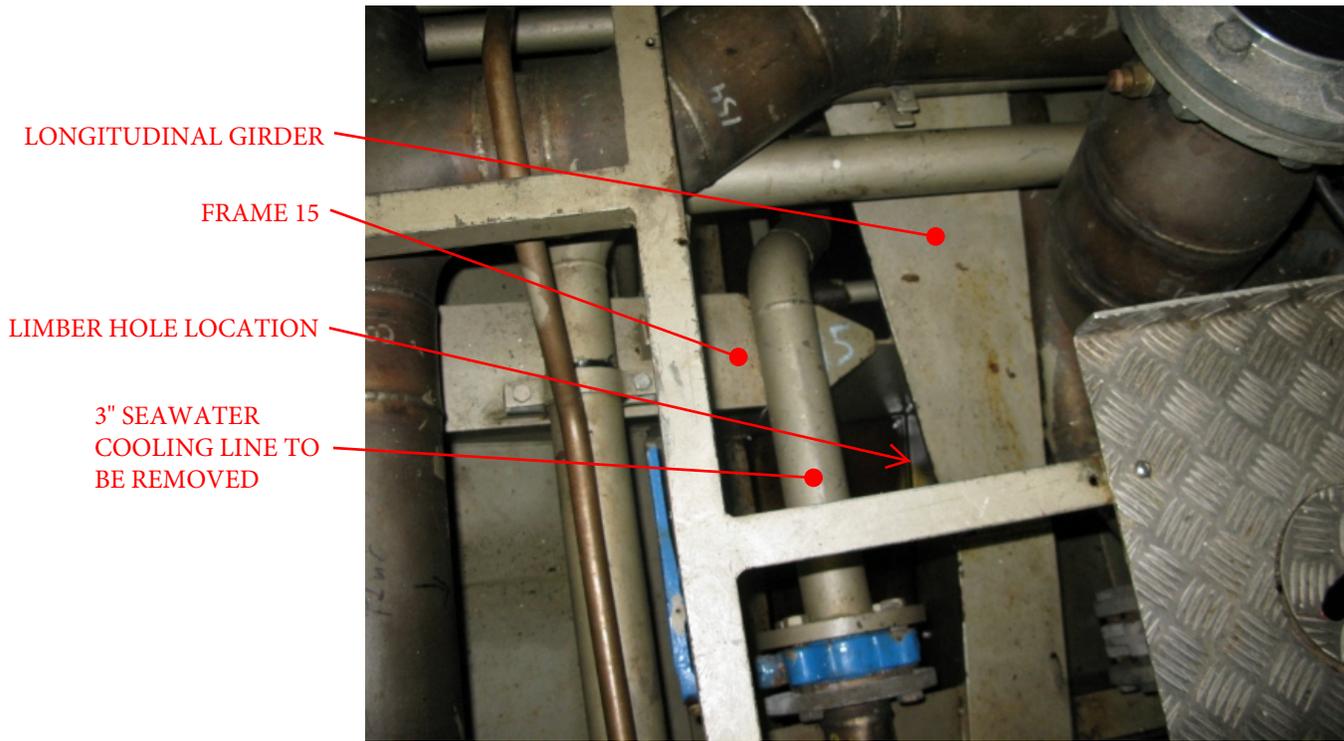
**PIPING TO BE REMOVED**

- 1. MAIN ENGINE PRE-LUBE (3/4")
- 2. MAIN ENGINE PRE-LUBE (1 1/4")
- 3. SEAWATER COOLING LINE (2")
- 4. MAIN ENGINE PRE-HEAT LINE (1")
- 5. SEAWATER COOLING LINE (3")
- 6. SEAWATR SUPPLY TO FIRE PUMP/BILGE LINE (3")

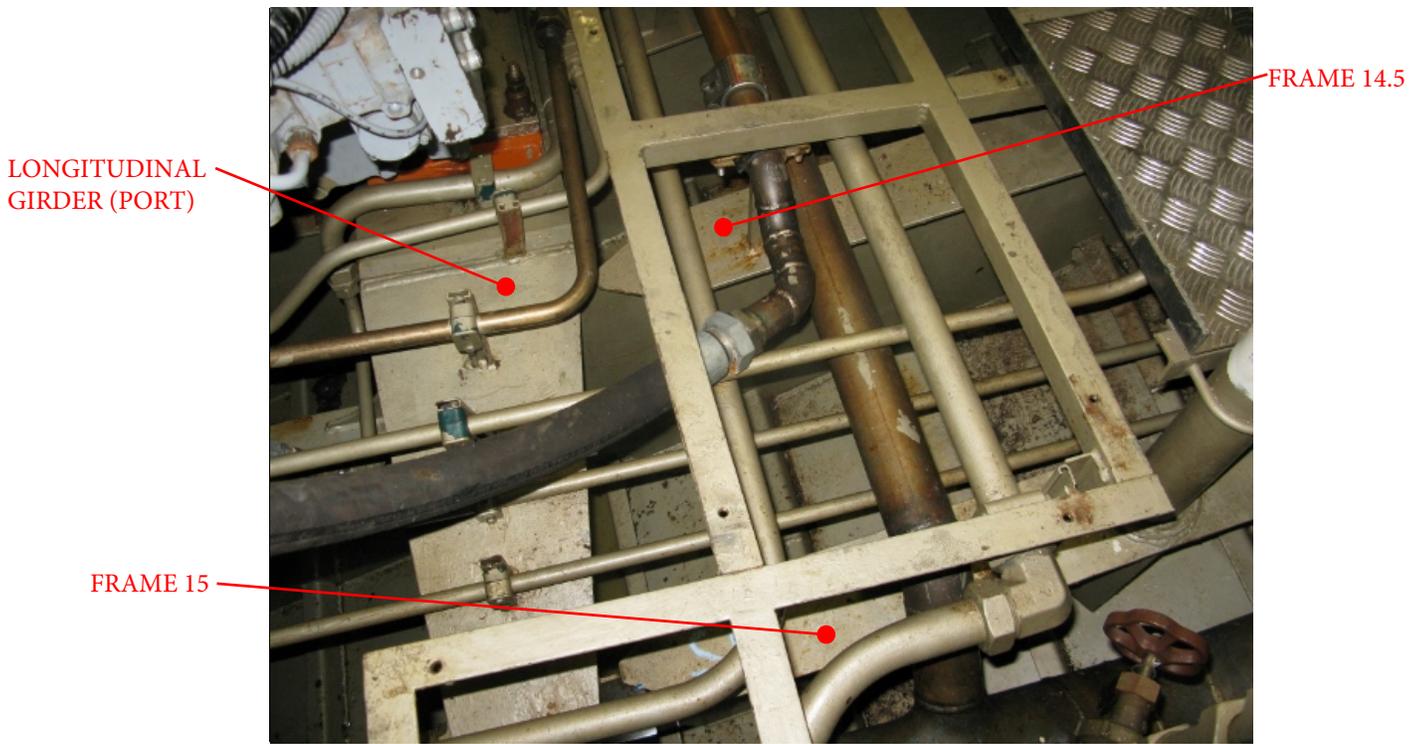
1. Main Engine Room - Outboard view of Stbd engine (looking aft). Piping to be removed IWO access to outboard web-face of engine support girder.



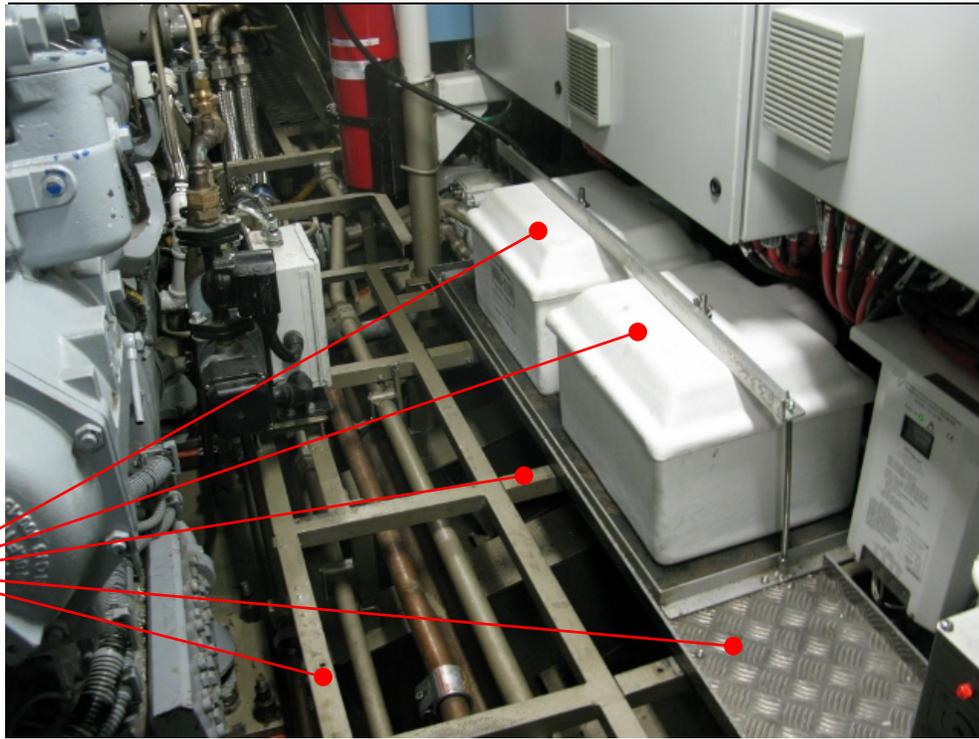
2. Main Engine Room - View of standing water against outboard engine support girder (Stbd) b/w transverse frames 13 & 13.5 (looking port). 3" Seawater Cooling pipe in foreground to be removed to gain working access to girder web.



3. Main Engine Room - View of outboard engine support girder (Stbd) & frame 15 (looking aft). 3" Seawater Cooling pipe in foreground to be removed to gain working access to girder web.



4. Main Engine Room - View of outboard (Port) engine support girder (looking aft).



TO BE REMOVED b/w  
FRAMES 13 - 15

5. Main Engine Room - View of outboard (Port) engine support girder. Battery packs, steel floor plate and floor support structure to be removed.