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| <b>REVISIONS</b>  |            |                      |   |  |                         |        |                 |
|  <b>Goltens</b><br>Singapore Pte Ltd. |            | SHIP                 |   |  | JP 88 STORK             |        |                 |
|   |            | TITLE                |   |  | BWTS Installation Guide |        |                 |
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| SIZE: A4  | VERIFIED   | GC                   |   |  | SHEET:- 1 OF 21         |        |                 |

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## Contents

|   |    |
|---|----|
| 1. Introduction .....                             | 3  |
| 2. BWT System Arrangement.....                    | 4  |
| 2.1 Location of Filter and Backflush pump.....    | 7  |
| 2.2 Location of UV Assembly.....                  | 7  |
| 2.3 Location of Flow meter and Control Valve..... | 8  |
| 2.4 Location of Sampling Point.....               | 8  |
| 3. Electrical.....                                | 9  |
| 4. Points to Note .....                           | 10 |
| 5. Remarks.....                                   | 20 |
| 6. Conclusion .....                               | 21 |

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## 1. Introduction

This report intends to describe the installation of BIO-SEA Ballast Treatment System retrofit on board 'JP 88 STORK'.

The ballast system is operated by either one of Bilge/Ballast/Fire Pump or Bilge/G.S/Fire Pump of 60 m<sup>3</sup>/hr x 6 bar, located in the engine room starboard side. A 1 x 60 m<sup>3</sup>/h BIO-SEA Ballast Treatment System is considered as per Owner's request.

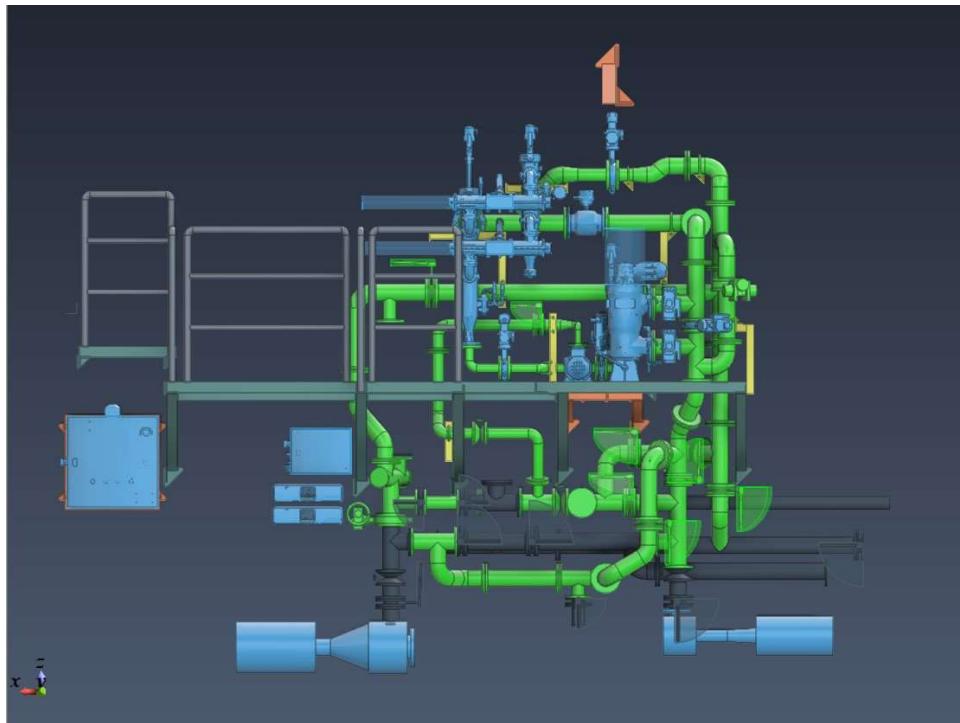
BWT system from BIO-SEA is integrated into the existing ballast system with some existing piping modifications.

This BIO-SEA BWT system consists of the following components.

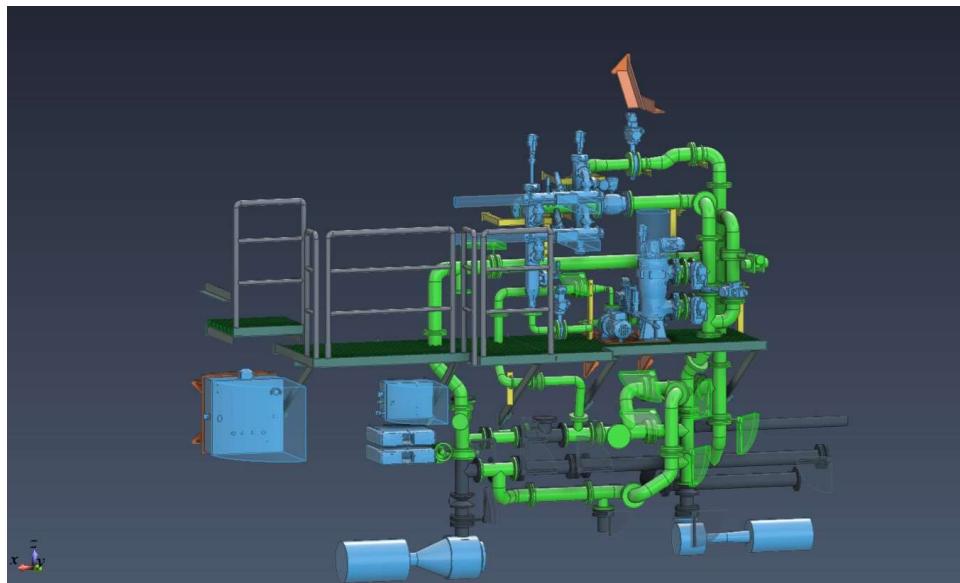
- Filter
- UV Assembly
- Back flush pump
- Control Cabinet
- Switch Board Cabinet
- Electronic Ballast (ELC)

The BWTS equipment Filter, U.V reactor, Back Flush Pump, Switch Board Cabinet, ELC and Control Cabinet are arranged in the Starboard side of Engine Room.

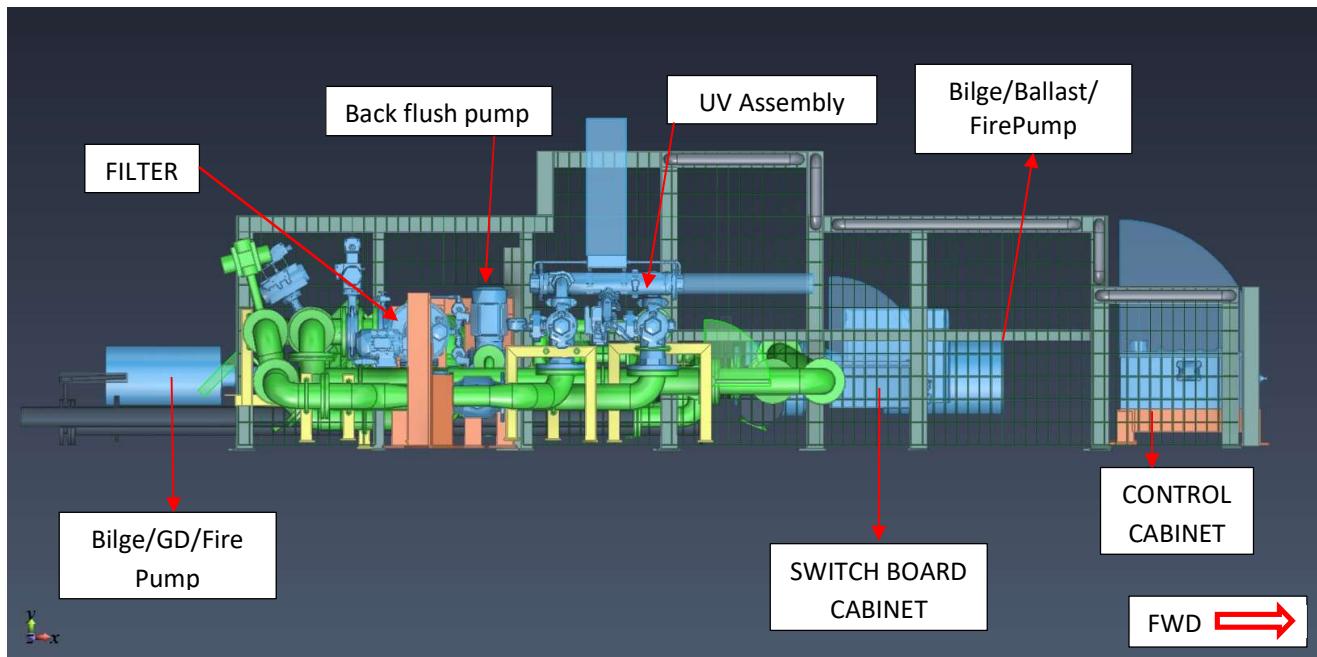
## 2. BWT System Arrangement



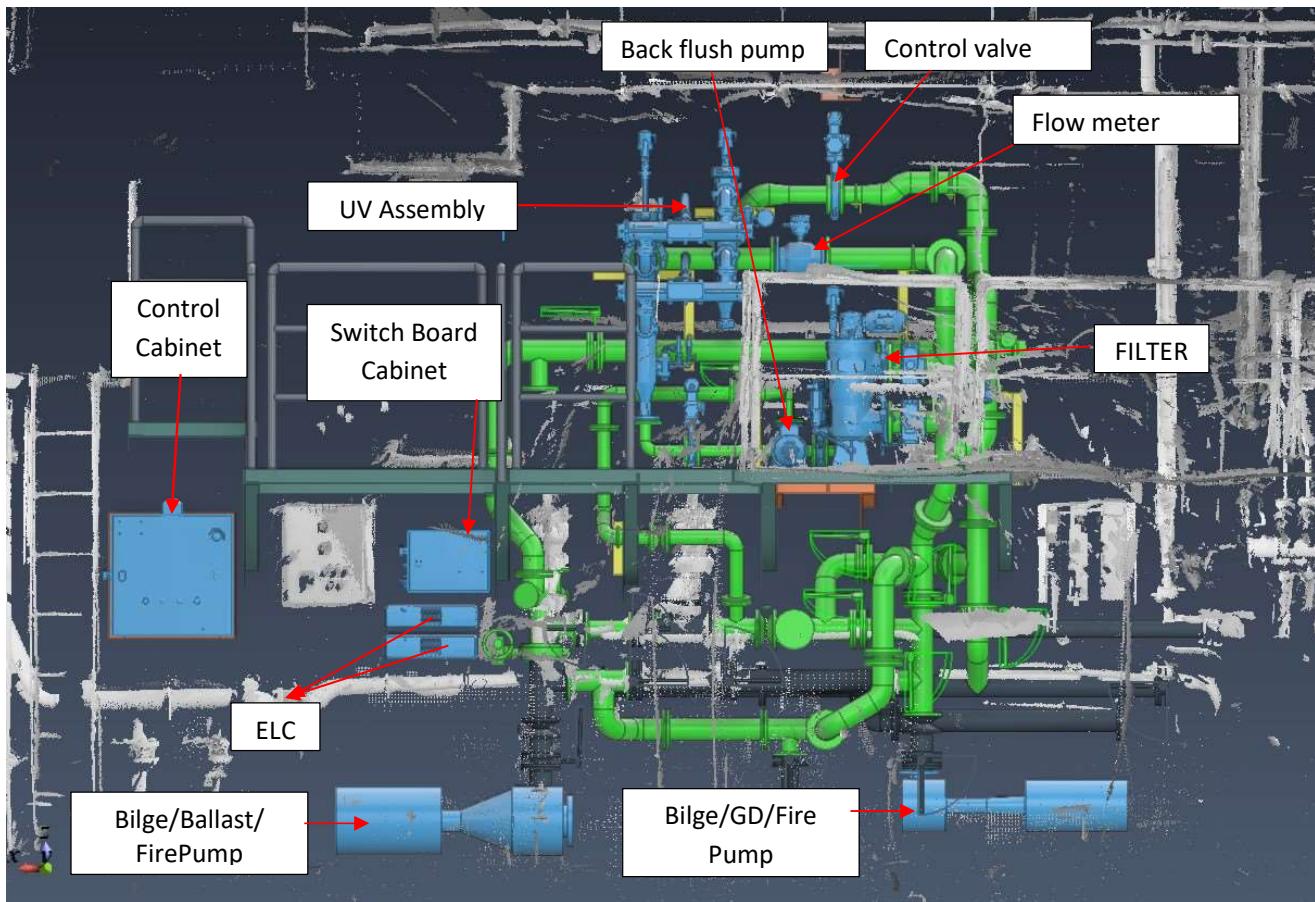
Ballast water treatment system overall layout (View looking STBD.)



Ballast water treatment system overall layout (Isometric View)



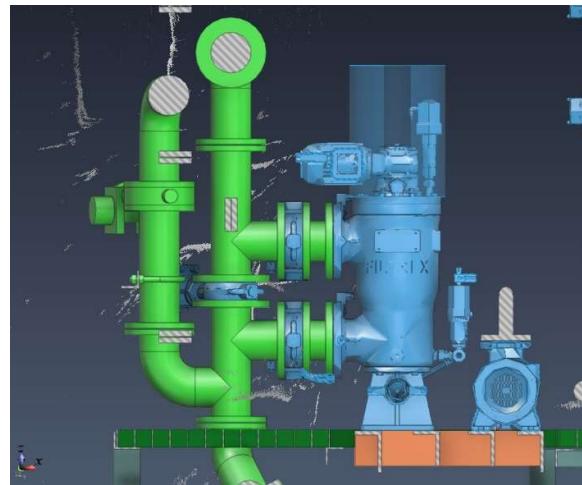
Ballast water treatment system overall layout (Plan View)



Ballast water treatment system overall layout (Looking STBD)

AFT 

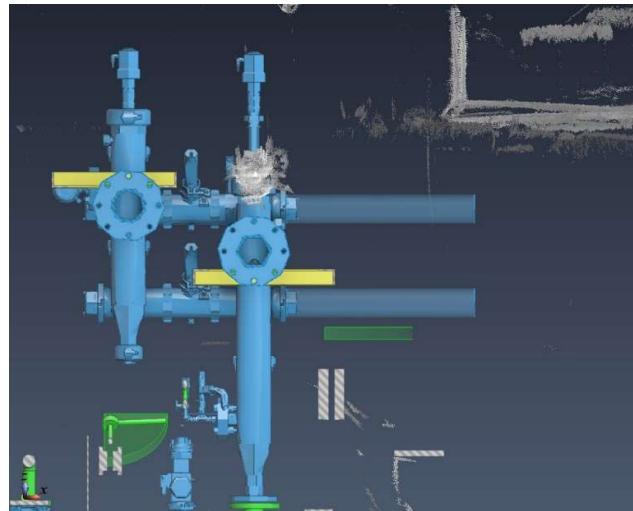
## 2.1 Location of Filter and Backflush pump



FWD ➡

Arrangement of Filter and Back flush Pump (View Looking Port.)

## 2.2 Location of UV Assembly



Arrangement of UV Assembly  
(View Looking Port.)

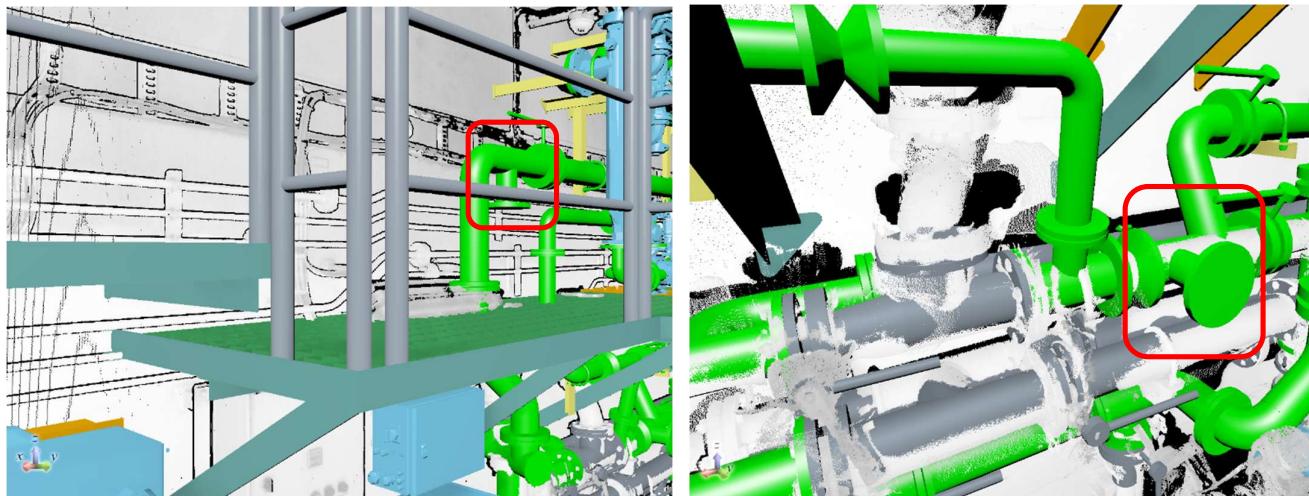
FWD ➡

## 2.3 Location of Flow meter and Control Valve



Arrangement of Flowmeter and Control Valve (View Looking FWD)

## 2.4 Location of Sampling Point



Location of Sampling Point (View Looking AFT)

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### 3. Electrical

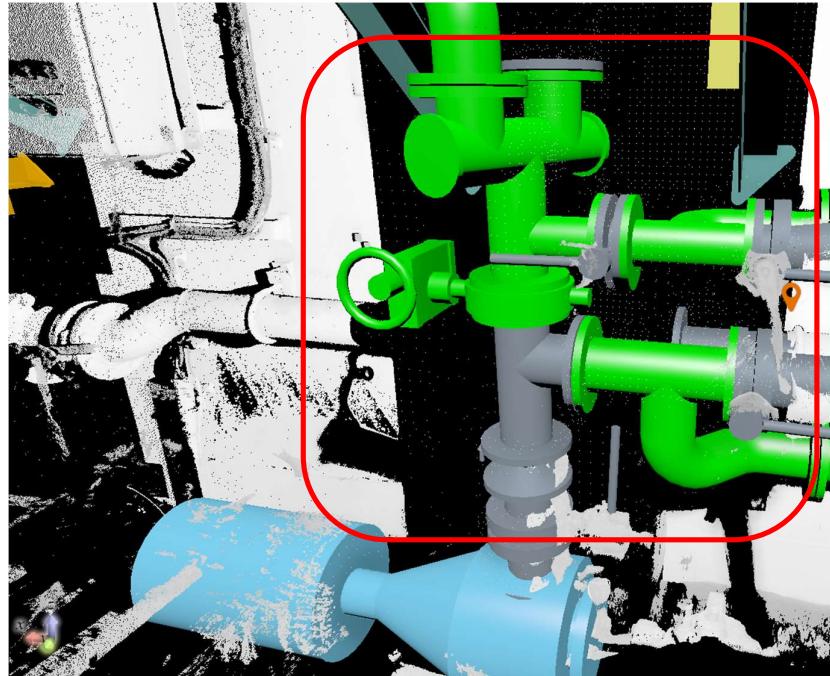
From the Vessel's electric load analysis, it is observed that sufficient power is available for the installation of BWTS system.

BWTS Electrical equipment are placed in the model as per the available spaces. Existing switchboards need to be modified in order to accommodate the additional BWTS Load. Details of those are updated in the wiring diagram of power



#### 4. Points to Note

- Existing Bilge/ Ballast/ Fire Pump discharge manifold to be modified as shown.



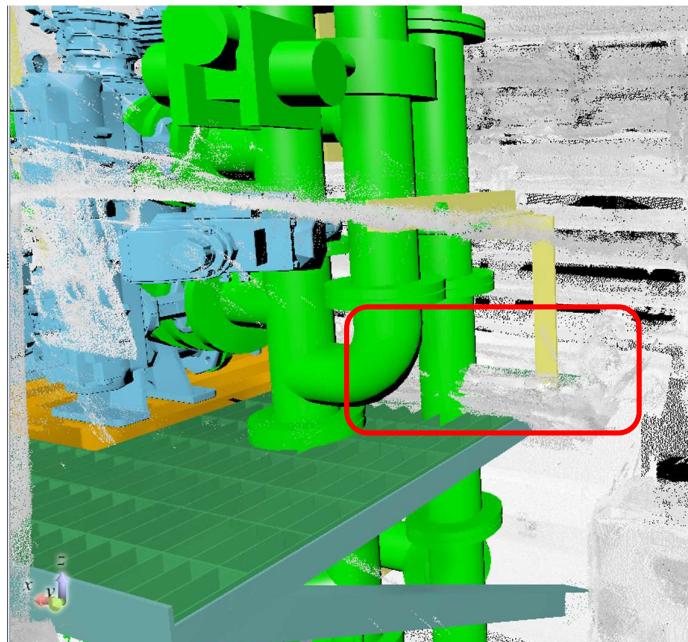
(View Looking STBD.)

- Bilge/GS/Fire Pump discharge manifold to be modified as shown in the marked location.



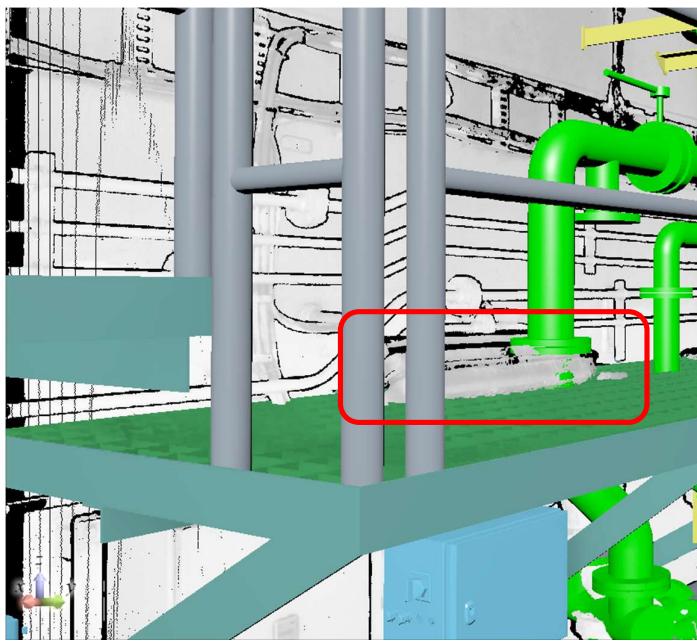
(View Looking STBD.)

- Electrical light clashing with the new BWTS pipes and platform to be suitably modified onsite.



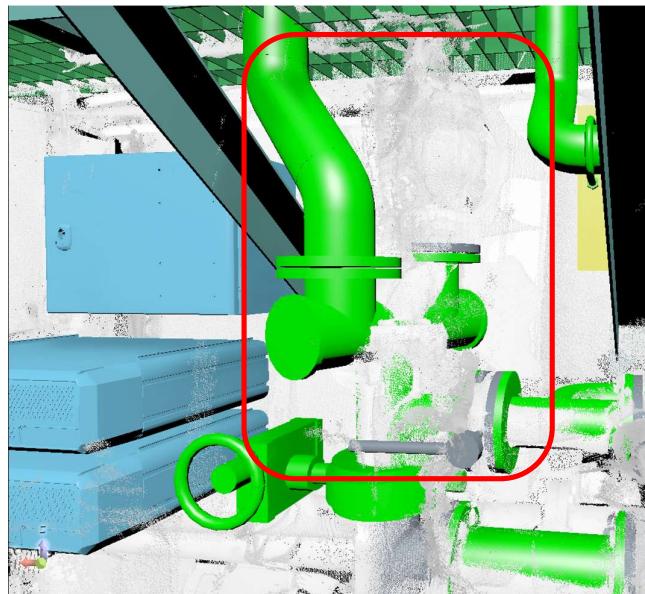
(View Looking STBD.)

- Electrical light clashing with the new BWTS pipes and platform to be suitably modified onsite.



(View Looking AFT).

- Existing overboard pipe arrangement in the marked location to be modified as shown.



(View Looking STBD.)

AFT →

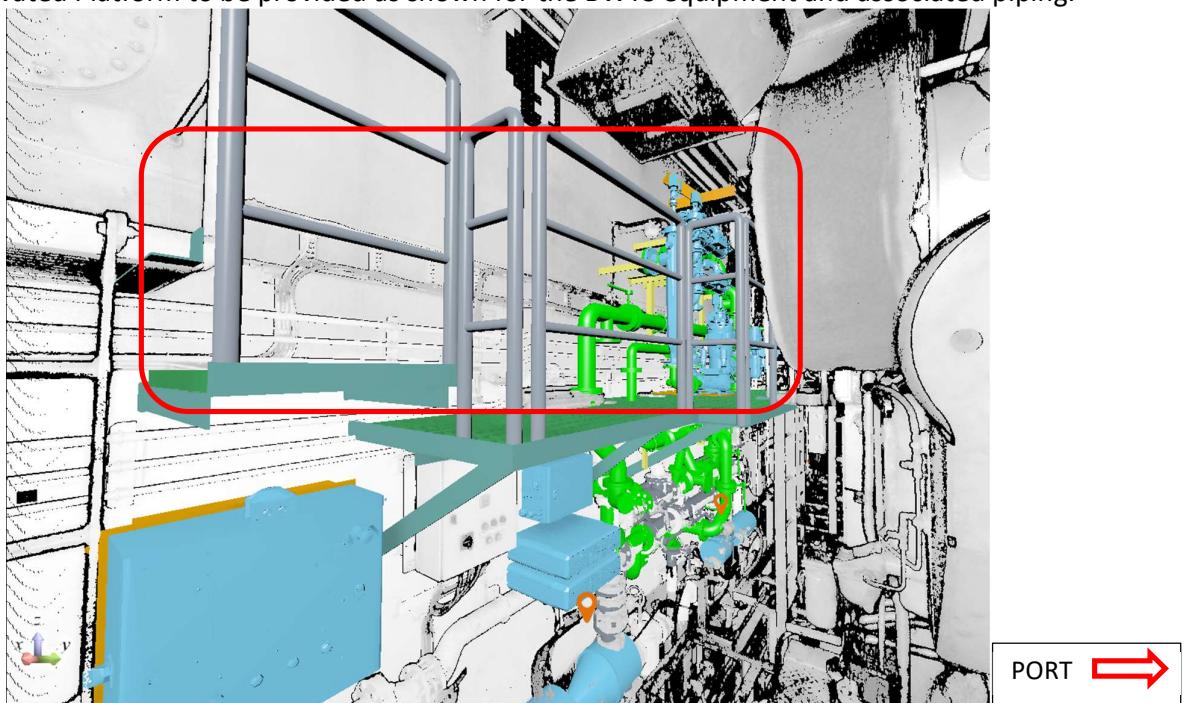
- Scan doubling issue in the highlighted area. The connecting spool to be suitably adjusted onsite.



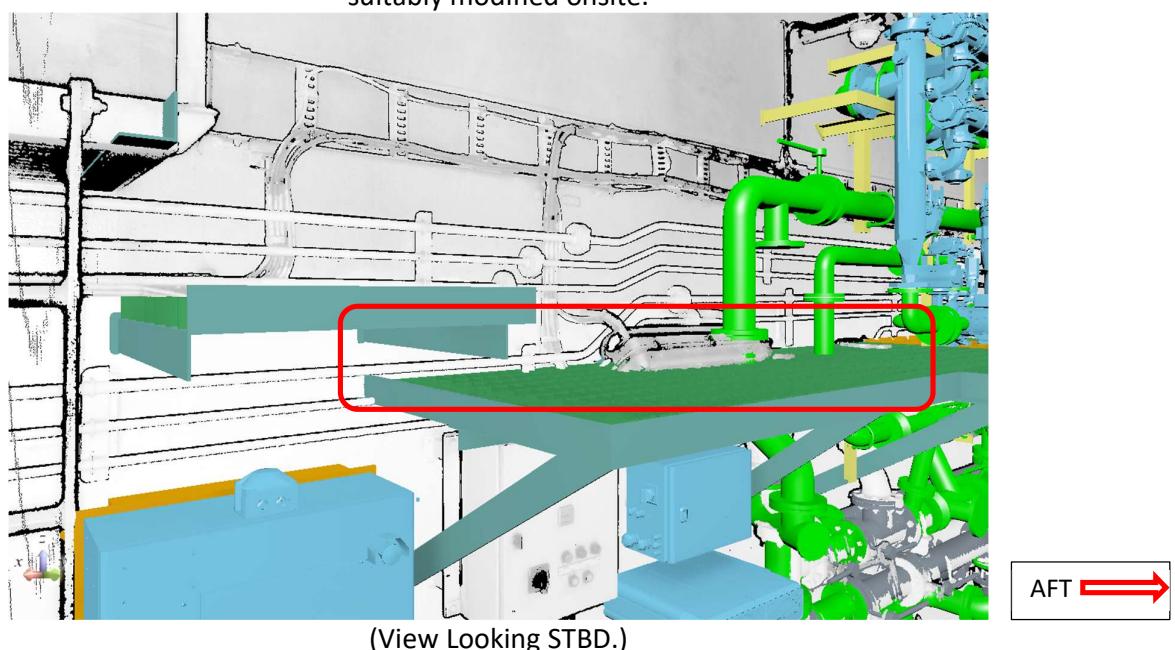
(View Looking AFT.)

PORT →

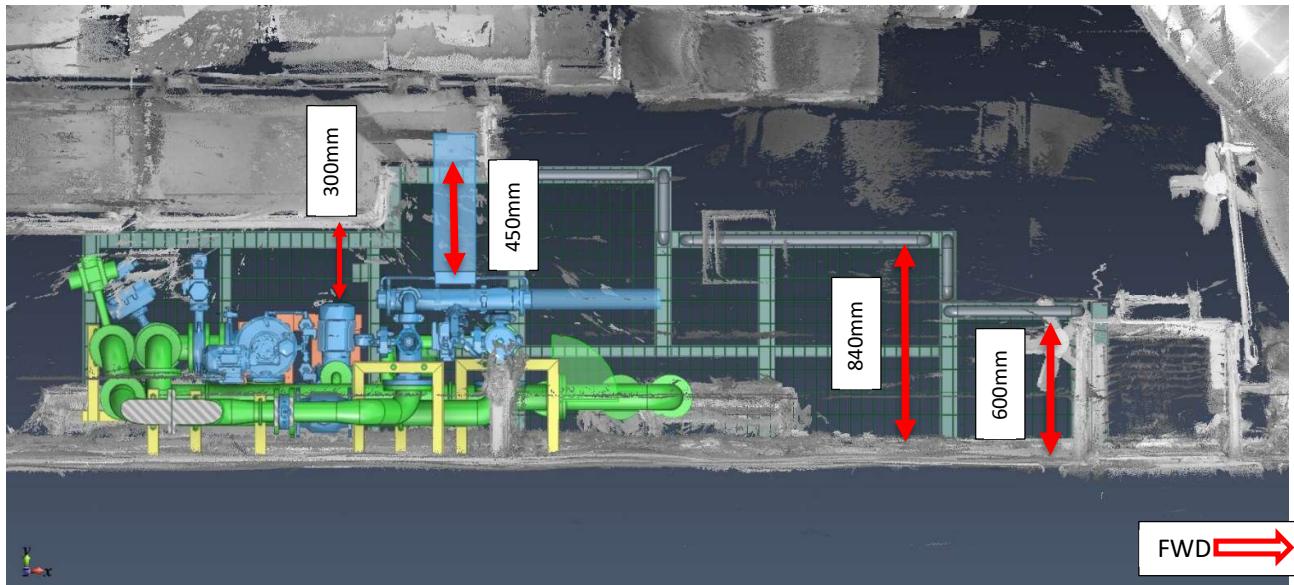
- An elevated Platform to be provided as shown for the BWTS equipment and associated piping.



- Existing small bore piping clashing in the marked location with the new elevated platform to be suitably modified onsite.

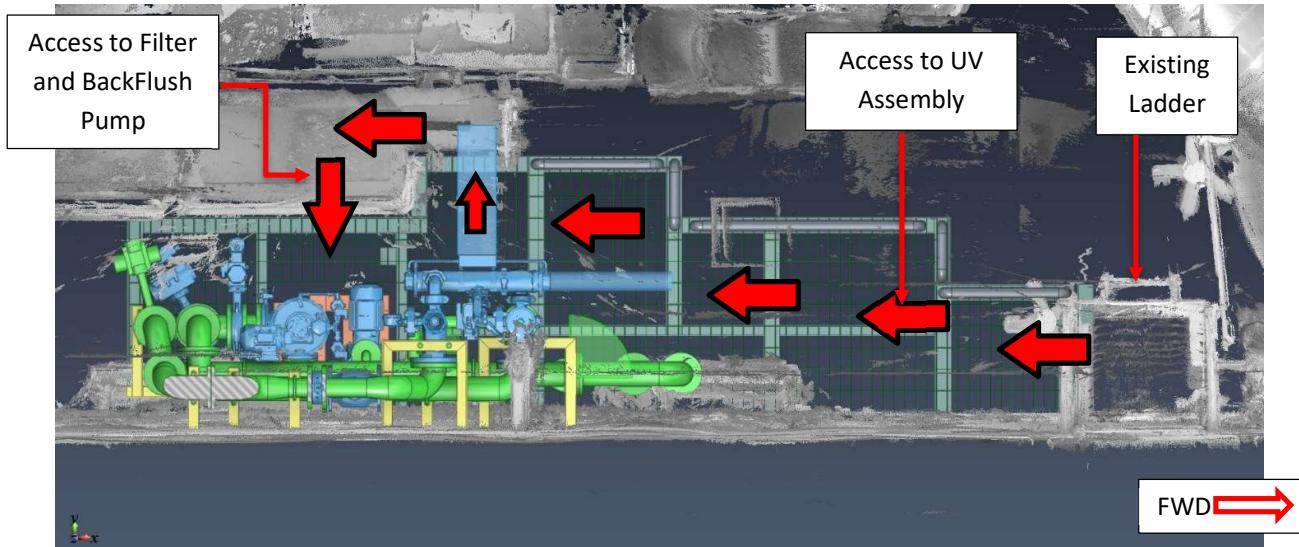


- New elevated platform maximum available walking spaces are marked as below.



(PLAN VIEW.)

- New elevated platform access path is as marked below.



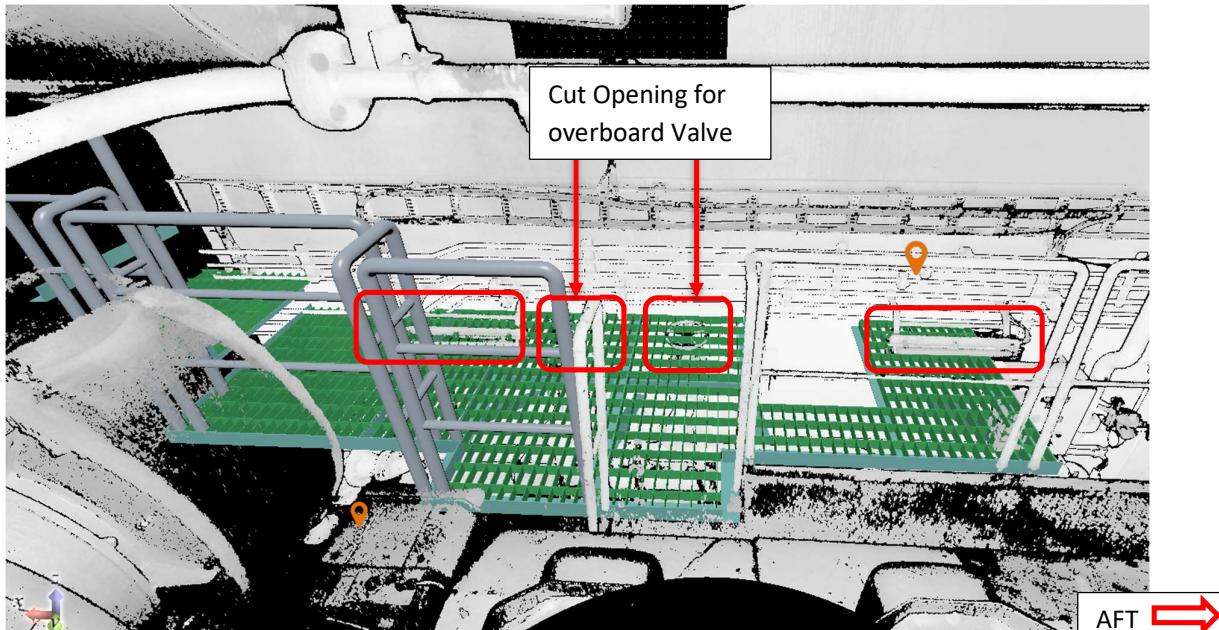
(PLAN VIEW.)

- The marked modifications to be suitably done onsite for easy access to the BWT equipment via Engine Platform.

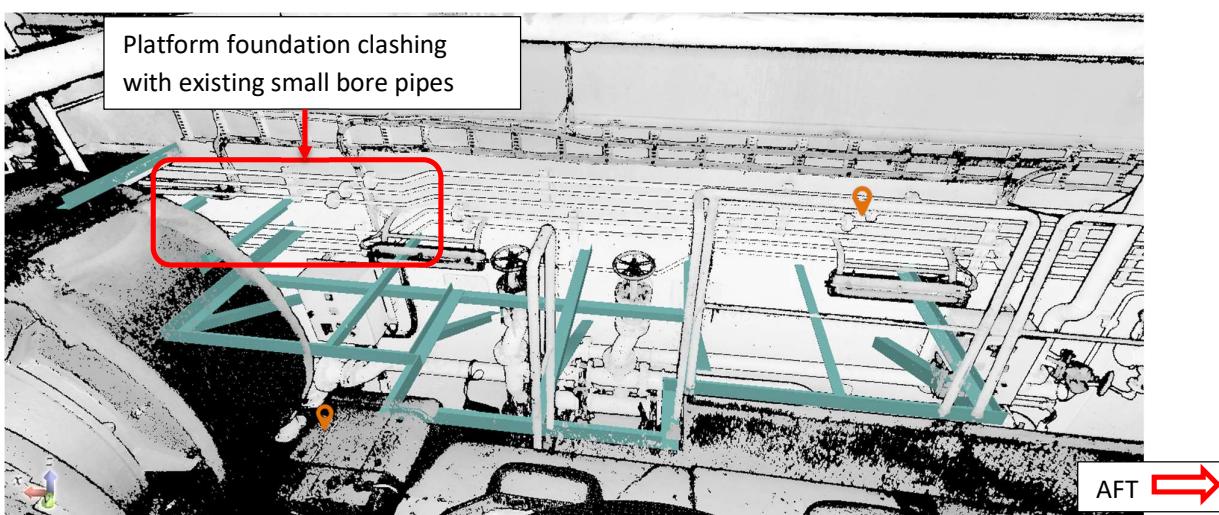


(PLAN VIEW.)

- The electrical lights in way of the elevated platform should be suitably relocated onsite.
- A cut opening shall be provided for the OBD Valves easy access.
- Existing small bore pipes in way of platform foundation shall be suitably modified onsite.

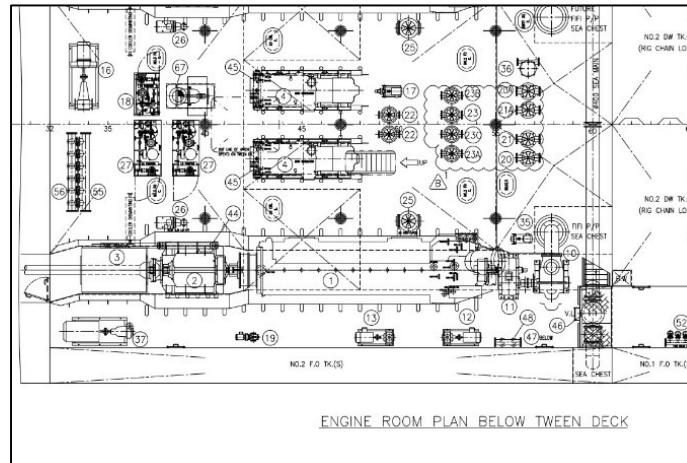


(View Looking STBD.)



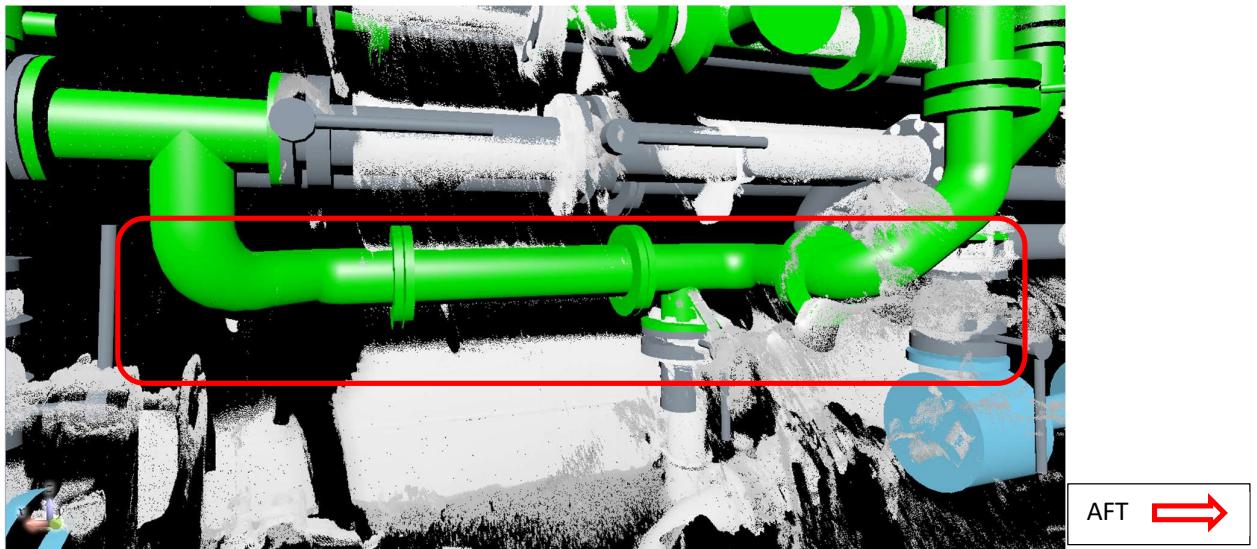
(View Looking STBD. Without grating)

- The elevated platform foundation landing bulkhead shares boundary with No.2 FO TK (S). Proper care shall be taken during hot work on this bulkhead.



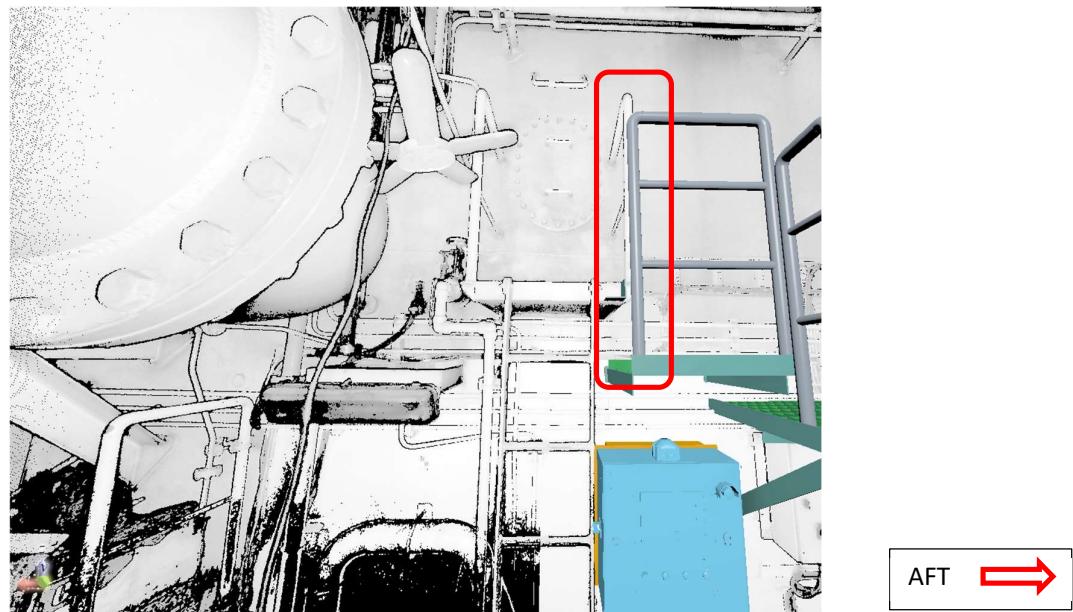
(Excerpt from Machinery Arrangement.)

- The existing 80A pipe in the marked location to be modified as shown below.



(View Looking STBD)

- The existing hand rail in the marked location to be removed.



(View Looking STBD)

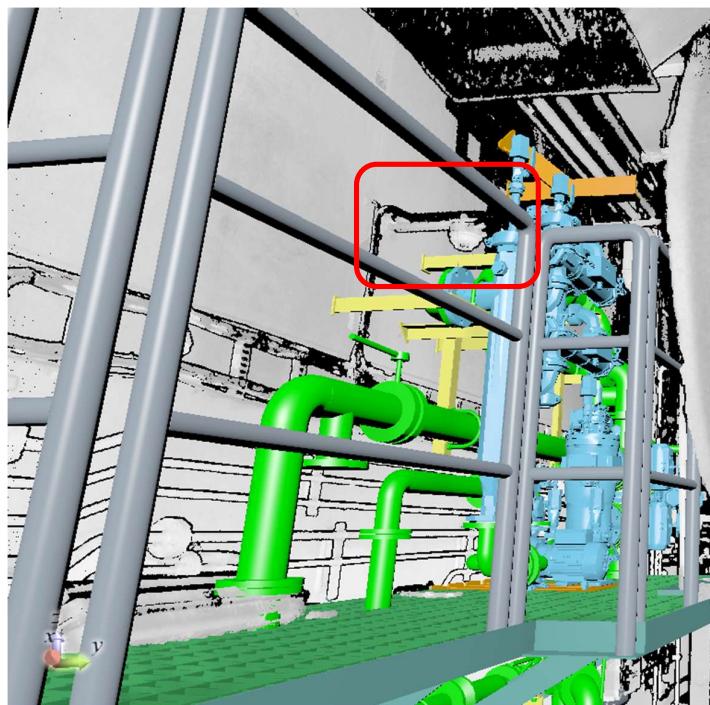
- The existing ladder in the marked location to be cut and welded to the new platform suitably onsite.



(View Looking FWD)

STBD →

- The existing electrical item in the marked location to be relocated suitably onsite.



(View Looking AFT)

PORT →

## 5. Remarks

- In general, existing gratings, grating supports and handrails to be modified in the areas where new BWTS equipment are placed and same shall be carried out as per site convenience.
- Some existing pipe supports to be cut and modified during the installation of new BWTS system and same to be carried out suitably at site.
- The utility connections tapping from Fresh water and Compressed air system as detailed in the P&ID are to be suitably Tie in at site.
- In general, the drain lines are suitably terminated at site to the bilge wells.
- The locations where valves not accessible, provision to be provided to access the valve like reach rod or small platforms suitably at site.
- Scan doubling issue has been observed, care to be taken during installing the Tie-In points.

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## 6. Conclusion

Effort has been put to minimize modifications to the existing ballast system as well as existing ship elements.

The flow analysis performed, and the pump can generate sufficient flow and pressure.

To conclude, 1 X 60 m<sup>3</sup>/h BIO-SEA Ballast Treatment system can be installed on board "JP 88 STORK" keeping the above-discussed points under consideration.