



## **Site Visit Report - August 2021 - Armada 98/2 FPSO**

**Prepared for**

**Bank of Baroda**

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Crandall Energy Consultants Ltd  
Innovation Centre, 2 Venture Road,  
University of Southampton Science  
Park, Southampton, Hampshire SO16  
7NP  
United Kingdom  
tel. +44 (0) 1962 848738

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## Abbreviations

E&I	Electrical and Instrumentation
FPSO	Floating production storage & offloading
GSM	Geostationary Module
HSE	Health, safety & environment
LTA	Lender's Technical Advisor
ONGC	Oil and Gas Corporation Ltd
R&LE	Repair and Life Extension
SPBAG	Shapoorji Pallonji Bumi Armada Godavari Private Limited
SPOG	Shapoorji Pallonji Oil and Gas Pvt Ltd
TMS	Turret Mooring System
VME	VME Process Asia Pacific Ltd

# 1 Executive summary

This report presents the findings of the Lender's Technical Advisor's (LTA) review of the progress of the construction of the Armada 98/2 FPSO in Sembcorp Tuas Boulevard shipyard including the inspection of the premises, offices, fabrication facilities and Ariake FPSO in the yard, carried out by Claude Rouxel, General Manager for Crandall Energy Asia Pacific, based in Singapore, on Thursday the 12th of August 2021.

## 1.1 Inspection Plan

Following a brief HSE induction, the inspection started with a complete visit of the Ariake vessel being converted into the FPSO, including the accommodation block and inside the engine room, the main deck, the E-house and metering module, the turret mooring system, the greenwater protection at the bow, followed by a visit of the topsides modules M30, M31 and M20 under fabrication and assembly.

This visit was carried out under the lead of Tan Suay Tee, Senior Project Manager for Sembcorp and his project team together with the project team of SPOG led by Sanjay Dhir, deputy Project Manager.

It was then followed by a debriefing session with Sanjay Dhir and Bumi Armada's representative, Eli Xanthopoulos.

## 1.2 Conclusions

The consequences of the COVID-19 pandemic have been mitigated and Sembcorp continues to monitor and control the impact on the project schedule by subcontracting significant portions of the work to experienced sub-yards in Batam and Karimun in Indonesia, as well as Sembawang Admiralty yard in Singapore.

The COVID-19 evolution in Sembcorp yard is monitored very closely: all workers, contractors and clients representatives are submitted to a PCR test twice a week as well as all visitors to the yard must show a negative PCR swab test result taken within 72 hours prior to the visit.

In order to accelerate the progress, SPOG have taken their own workers to the yard, mainly to provide support for the piping works: today, close to 300 SPOG workers are working on the project and it will be ramped up through the coming weeks.

The progress is very significant in terms of integration of the modules (E-house and metering), construction/assembly of the turret, pipe-rack and cable racks fabrication and installation, panelling work, E&I etc... in the accommodation, equipment installed in the engine room (all in place) and fabrication of the modules in the yard.

## 2 Key Findings from the Visit

### 2.1 Summary

The following is a summary of the key findings during the site visit and reference should be made to the accompanying project photographs in Section 3 below.

- M20 – Gas Lift Compressor Train A installed. Pipe spool fabrication ongoing and E&I equipment and cable tray installation. Intermediate decks already constructed;
- M31 – Booster export gas compressor Train A installed. All decks fabrication completed. Fabrication and installation of remaining pipe spools, pipe supports and outfitting ongoing. Module well progressed;
- M30 – Module nearly completed. Structural Box Up completed. Piping Spools fabrication in progress. Equipment installation ongoing;
- M60 – E House – Loadout completed, integration ongoing;
- M90 – Metering module. Integration nearly completed;
- Pipe rack under construction following load out and integration of modules;
- Cable racks installation completed;
- Accommodation module painting at deck levels. Various outfitting work and panelling work in progress. EIT cabling ongoing. Installation of modular toilets, panel supports, profiles, insulation, wall panels, flooring, windows, steel doors, external stairs & handrails, pipe supports, telecom etc..;
- TMS – Turret cylinder integrated and painted, waiting for Geo Stationery Module (GSM);
- Helideck, painted, ready for installation;
- For the Engine Room / Pump Room, piping and equipment installation is in progress. Installation of pumps & motors is ongoing. Shop fabrication & installation on board of renewal spools for various piping systems is in progress. Conversion spools fabrication and installation are also in progress. Various system valves installation is in progress. In CCR, EIT Cabinets are in progress of installation.

### 3 Progress photographs taken during the yard visit



**Figure 3-1 View inside the accommodation showing the panelling**



**Figure 3-2 Overall View of the deck showing the E-house, metering skid and TMS.**



**Figure 3-3 Overview of the deck showing one pedestal crane and metering skid**

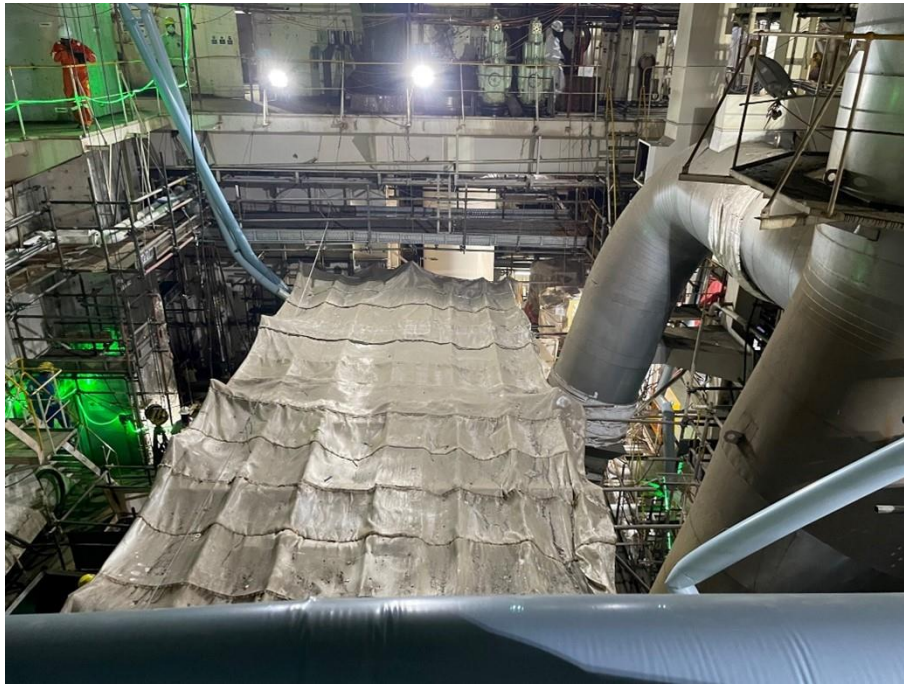


**Figure 3-4 View inside the engine room showing the hole in the deck used to lower down all equipment and that will be closed in the coming days.**





**Figure 3-5 View inside the engine room**



**Figure 3-6 Another view inside the engine room**



**Figure 3-7 View inside the E-house**



**Figure 3-8 Metering skid piping**



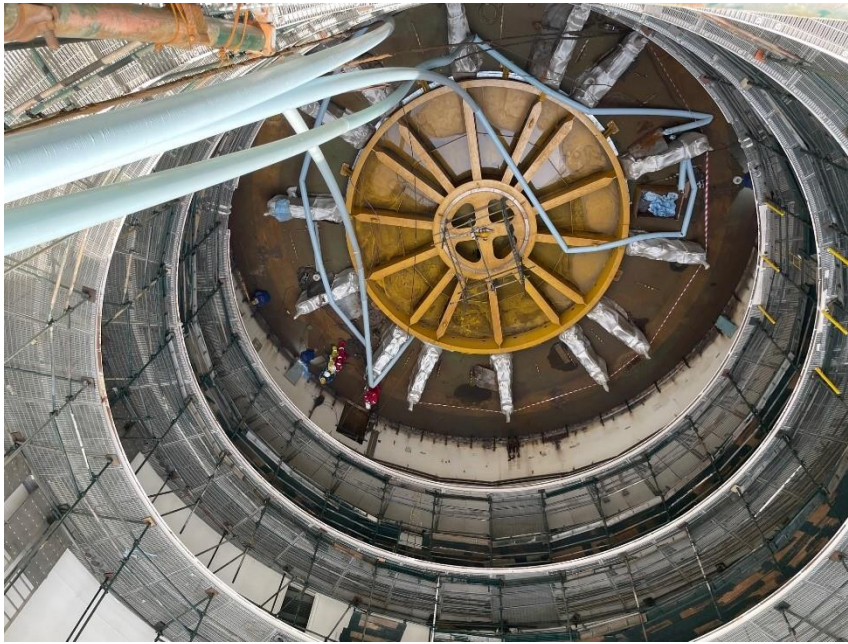
**Figure 3-9 View of Module M60 -E-house**



**Figure 3-10 Underdeck view of Module M90 – metering skid**



**Figure 3-11 View of TMS cylinder**



**Figure 3-12 Inside view of Turret cylinder showing connector at the bottom**



**Figure 3-13 View inside the TMS**



**Figure 3-14 Crane pedestal ready for installation on deck**



**Figure 3-15 Side view showing where the crane will be installed**



**Figure 3-16 Overall view of Module M-30**



**Figure 3-17 Overall view of Module M31**



**Figure 3-18 Overall view of Module M-20**



**Figure 3-19 Decks already built, ready to be installed on top of M20 & 31**





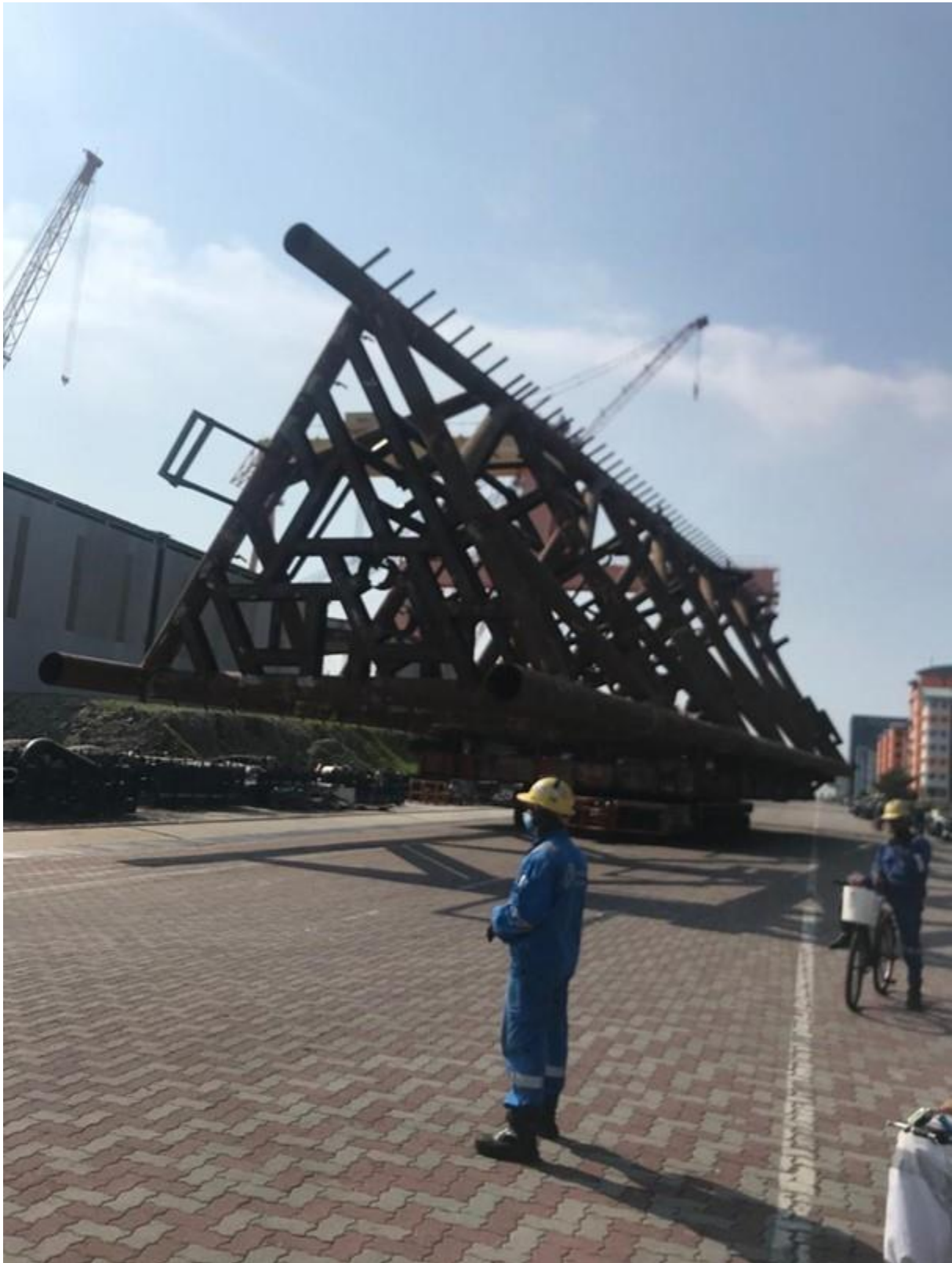
**Figure 3-20 Inside view M30**



**Figure 3-21 Another inside view of Module M30**



**Figure 3-22 View of the Geo-stationery module of Turret at Dynamac (not visited)**



**Figure 3-23 The flare tower under fabrication at Sembcorp**

## 4 Conclusions and Summary

This report represents the findings of the yard visit inspection carried out by Crandall's Claude Rouxel to the Sembcorp yard on 12<sup>th</sup> August 2021.

The consequences of the COVID-19 pandemic have been mitigated and Sembcorp continues to monitor and control the impact on the project schedule by subcontracting significant portions of the work to experienced sub-yards in Batam and Karimun in Indonesia, as well as Sembawang Admiralty yard in Singapore.

The COVID-19 evolution in Sembcorp yard is monitored very closely: all workers, contractors and clients representatives are submitted to a PCR test twice a week as well as all visitors to the yard must show a negative PCR swab test result taken within 72 hours prior to the visit.

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LTA notes that the progress seen in the yard is commensurate with that reported in SPOG's latest monthly report for July 20201 and as reported by LTA in its July Progress report recently issued (1).

## References

1. **Cordall Energy Consultants.** *ONGC 98/2 FPSO Due Diligence - Monthly Report (July 2021).*