

# PROJECT SHEET

**FPSO ARMADA STERLING V**  
TRANSPORT AND INSTALLATION

## BOSKALIS

Boskalis is a leading global marine contractor and services provider. With safety as our core value, we offer a wide variety of specialist activities to the oil & gas and renewables sectors. These activities include marine installation and decommissioning, seabed intervention, marine transport and services, subsea services and marine survey. In addition, Boskalis is a global dredging contractor, provides towage and terminal services across the globe and delivers marine salvage solutions.

By understanding what drives our clients we are able to provide the solutions that enable them to meet their specific business goals. For this reason we are constantly looking for new ways to broaden and optimize our offering and are committed to expanding our proposition, supported by our financial strength. With our committed professionals in engineering, project management and operations, 500 specialized vessels and an unprecedented breadth of activities in 90 countries across six continents we help our clients in the offshore industry push boundaries and create new horizons.

## INTRODUCTION

Boskalis was contracted by the Armada 98/2 joint venture (Shapoorji Pallonji and Bumi Armada) for a full Lumpsum Turnkey FPSO installation project. The project originally comprised 2 phases, but due to delays in hull conversion works (by Sembcorp in Singapore) the installation was delayed for one installation season. The company provided items (suction piles, chain, buoy and FPSO) all had to be picked up from Singapore/Batam area, transported to the East coast of India (Kakinada) for import and thereafter brought to the Krishna Godavari 98/2 field for installation.

## FPSO ARMADA STERLING V (KRISHNA GODAVARI 98/2 FIELD & PROJECT)

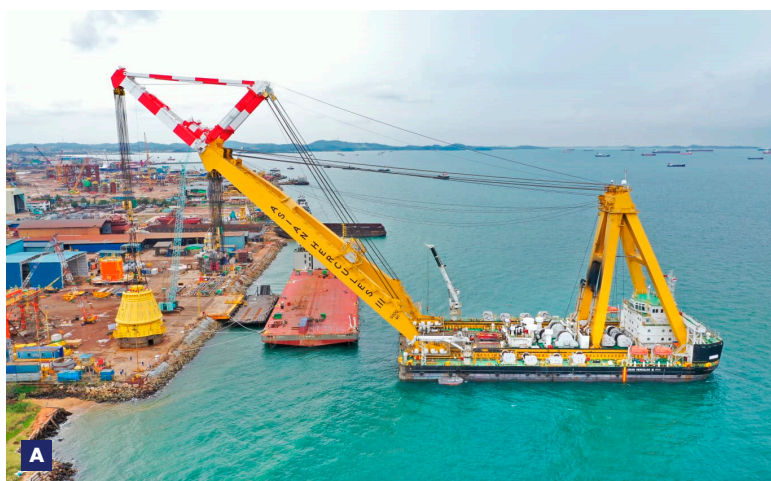
The project Scope of Work comprised the Transportation and Installation of:

- Suction piles and anchor chain (Phase 1)
- Subsea Turret Production Buoy and Spiral Strand Wire (2A)
- Tow, station keeping and installation of the FPSO Armada Sterling V

- A** Phase 2A – Load-out of STP buoy onto Giant 5 by Asian Hercules III
- B** Phase 2A – STP buoy installation with BW 130, Stark and Southern Ocean

## FEATURES

Client	Armada 98/2 JV (Shapoorji/Bumi Armada)
Location	Krishna Godavari 98/2 field
Contractor	Boskalis Offshore Marine Contracting BV



## SCOPE

**Phase 1** – Suction Pile and chain installation/pull test

**Phase 2a**– Installation of spiral strand wire and

**Phase 2a**– Transport and installation of STP (subsea) buoy

**Phase 2b**– Tow, station keeping and hook-up of FPSO and

**Phase 2b**– Installation of Sea Water Lift Risers



**OFFSHORE EXECUTION**

**PHASE 1**

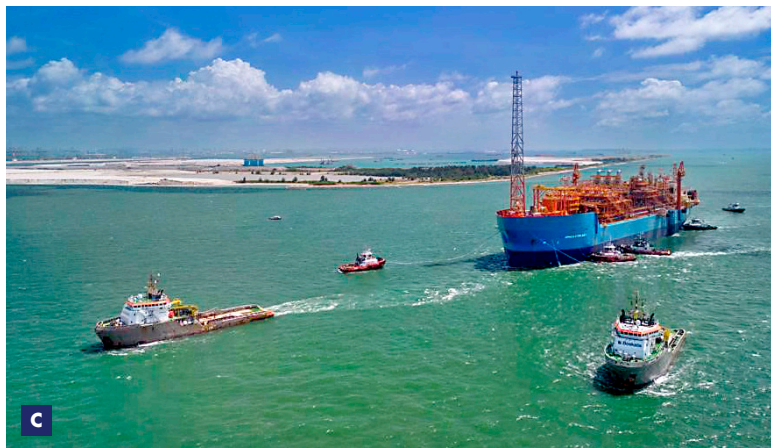
This Phase comprised the load-out of the 9 suction piles in Batam onto the Southern Ocean and the transport of the chain from China to Singapore by geared vessel. The chain was prepared and then loaded in the AHT Maersk Minder and onto the Giant 5. The Southern Ocean installed the 9 suction piles in the field in India. Thereafter the Maersk Minder picked up the chain at anchorage and subsequently installed and pre-tensioned each anchor leg assembly. A final as-built survey was done to confirm all components were installed within the required tolerances.

**PHASE 2A**

This Phase 2A comprised a campaign in Batam for the full system integration testing of the buoy. Thereafter the Asian Hercules III was mobilized to Batam to load-out the buoy onto the Giant 5. The Giant 5 was towed by the Bridgewater 130 to East coast India. The Asian Hercules III discharged the buoy at anchorage for the subsequent local tow from Kakinada port to the KG 98/2 field. The Southern Ocean, outfitted with the 5 Spiral Strand Wire reels was already installing all 9 SSW to the chain ends. To assist the Southern Ocean was also outfitted with a Hang-off platform and tensioner. Finally the buoy was submerged using the clump-weight to enable connection of the mooring connector to the buoy. Finally the buoy was debalasted to the correct water depth for the final FPSO hook-up campaign (Phase 2B).

**PHASE 2B**

This Phase comprised the tow, station keeping and hook-up of the FPSO. The FPSO was picked up from Singapore/Sembawang shipyard and towed to India. The Boka Fulmar was connected to ensure station keeping within the tolerances. Finally the buoy could be connected using the winch on the FPSO. As completion works, Boskalis had to do a final as-built survey and to install 2 Sea Water Intake risers by divers.



**PLANT & EQUIPMENT**

- Southern Ocean for Phase 1 suction piles, Phase 2A STP buoy and Phase 2B preparations and diving operations
- Maersk Minder for chain installation
- Giant 5 for transport of chains and the STP buoy from Batam to India
- Bridgewater 130 (DP2 AHT) for tow of Giant 5 and STP buoy
- Asian Hercules III (Asianlift) for load-out and discharge of STP buoy
- Stark (DP2 AHT) for tow of STP buoy
- Boka Alpine and Glacier for towing of the FPSO in phase 2B
- Boka Fulmar for escort of the tow and station keeping of the FPSO during hook-up



- C** Phase 2B – Towing of the FPSO Armada Sterling V (departure Singapore)
- D** Phase 2B – Assembly and installation of Sea Water Lift Riser
- E** Phase 2B - STP turret pulled into the FPSO and locked in place.

