

# PROJECT SHEET

SHELL BIJUPIRÁ & SALEMA DECOMMISSIONING PROJECT  
FPSO Fluminense Tow

## BOSKALIS

Boskalis is a leading global dredging and marine expert. With safety as our core value we offer a wide variety of specialist activities to the oil&gas and renewable 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

Shell was the owner of FPSO Fluminense which operated in the Campos basin since 2003. At the end of the FPSO design life in 2024 Shell commenced the unit decommissioning and recycling. The FPSO was moored in a water depth of approximately 750m with external turret and a taut mooring system consisting of 9 mooring lines composed by chain and polyester sections. The unit was producing by means of 10 risers and 3 umbilicals connected to the FPSO turret.

Modec Internacional was operating the FPSO since 2003 and in current project context have performed all the unit shut down operations prior the risers and mooring line disconnection.

In line with Brazilian environmental regulations the disconnection of the FPSO has to be performed by retrieving from the sea all mooring, risers and umbilical components. All these components must be cleaned on vessel deck offshore from marine growth and all the organic material collected and sealed to prevent spillage back into sea in order to prevent as much as possible the invasive spread of sun coral. Once cleaned, the subsea components have to be sent to shore for further disposal and the FPSO towed for decommissioning to M.A.R.S. recycling yard in Frederikshavn, Denmark (Modern American Recycling Yard).

## FEATURES

Company	Subsea 7 International Contracting Limited
Location	Tow from Brazil offshore Campos field to Frederikshavn port, Denmark
Period	June to August 2024
Contractor	Boskalis Long Distance Towage B.V.
Vessel - Installation	Boka Summit, Boka Glacier, Boka Striker



A FPSO tow with two leading ocean tugs and one escort tug. Also note trailing on the back of the FPSO the messenger lines for the two emergency towing lines hanging on the FPSO side that can be deployed without any assistance from the unmanned FPSO

Subsea7 was awarded the entire decommissioning scope but performed only the risers and umbilical disconnection and disposal. Boskalis was subcontracted by Subsea7 to perform the mooring disconnection and the tow to Denmark. During mooring disconnection phase Subsea7 was in charge to receive ashore the FPSO mooring components and transport them to disposal site.

## SCOPE

Boskalis project personnel were first mobilized onboard the FPSO to prepare for station keeping and subsequent towing operation prior to mooring line disconnection campaign. The FPSO preparation consisted in installing the FPSO forward winches, emergency tow lines and test together all related components.

Once the FPSO was free from her mooring lines the Client operated the complete unmanning of the FPSO. Subsequently the tow of the unmanned Fluminense FPSO commenced with two leading ocean tugs connected at FPSO bow and one assisting escort tug.

Towing was performed at an average speed of approximately 6.5 knots until Client requested to slow down the convoy due to issues at the destination port where Client did not obtain the authorization to enter in time.

A bunker stop was planned and performed in Las Palmas using the escort tug as a temporary towing tug on port and starboard side to allow the towing tugs to sail to shore to refill. All changes of towing lines configuration were

performed from the tugs themselves due to unmanned FPSO.

At Frederikshavn arrival the three Boskalis ocean tugs handed over the FPSO to eight harbour tugs. Boskalis project personnel was taken back onboard the FPSO to coordinate the harbour operation.

The handover operation between Boskalis ocean tugs and harbour tugs was performed about two miles away from the port entrance. The tow inside the port of Frederikshavn and the berthing operation was executed in a single daylight operation.

### OFFSHORE EXECUTION

FPSO preparation:

- Procurement of towing lines.
- Procurement and installation of FPSO forward winches and HPUs to connect to towing lines.
- Testing of FPSO equipment utilized for station keeping and subsequent tow.

FPSO tow:

- Tow following planned tow route with two leading tugs connected to FPSO and one escort tug.
- Bunker operation of all tugs in Las Palmas.
- Frederikshavn harbour operation to bring FPSO to alongside M.A.R.S. quay.

### FACT & FIGURES

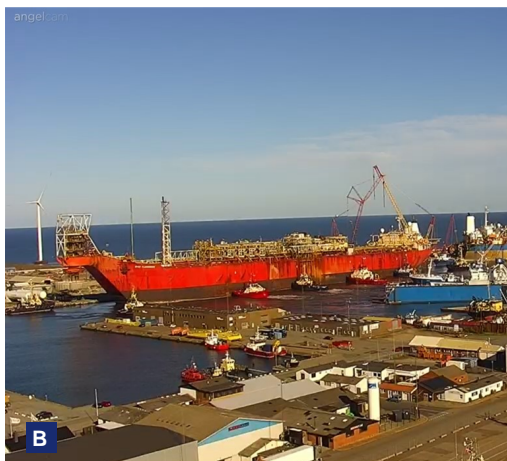
The tow was performed with Boskalis vessels Boka Summit and Boka Glacier as leading tugs and Manta as escort tug. Manta was replaced with Boka Striker after the bunkering operation in Las Palmas.



**C** FPSO Fluminense tow route from Brazil to Denmark



**D** FPSO berthing operation in Frederikshavn, Denmark using harbour tugs



**B** FPSO Fluminense safely moored alongside M.A.R.S. yard in Frederikshavn port, Denmark