

PROJECT SHEET

SHELL BIJUPIRÁ & SALEMA DECOMMISSIONING PROJECT
FPSO Fluminense disconnection campaign

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

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 International 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. recy

FEATURES

Company	Subsea 7 do Brasil Serviços Ltda.
Location	Brazil, Bijupirá & Salema field (170 NM NM from Rio de Janeiro)
Period	May 2024
Contractor	Boskalis do Brasil Dragagem e Serviços Marítimos Ltda
Vessel - Installation	Falcon, Manta, Boka Summit, Boka Glacier, Boka Center



A The Station keeping of FPSO Fluminense with 4 tugs and Boka Falcon ready to cut a mooring line

cling yard in Frederikshavn, Denmark (Modern American Recycling Yard). 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.

Boskalis TMS (Tug Management System) was installed onboard all station keeping tugs and the mooring master was coordinating from FPSO the tug positions and pulling forces during mooring line removal execution.

Boskalis executed the station keeping of the FPSO during the mooring disconnection campaign by means of four ocean tugs. The heading tolerance was particularly tight (+/-2.5deg) and was driven by the FPSO winch installed on geostationary part of the FPSO and related cable going through rotating part during mooring line disconnection. In addition to the heading the position of the FPSO was also important to be kept as close as possible to the nominal center of the mooring system to avoid the mooring lines to drag on sea-bottom and damage subsea infrastructures.

Boskalis vessel Boka Falcon was used as decommissioning vessel. She was equipped with two W-ROVs and a cutting tool. Each of the mooring lines were cut subsea as close as possible to anchor points where a forerunner steel wire was connecting the FPSO anchors to the bottom chain. The cutting tool onboard Boka Falcon was deployed using the vessel crane with AHC (Active Heave Compensation) to absorb vessel vertical motions. Once each mooring line was cut subsea the line was retrieved from the bottom and stored in Boka Falcon chain lockers or on the special handling drum. A chain cleaning tool and a polyester rope cleaning tool working with pressurized water jets were installed on deck of Boka Falcon and run during entire mooring line retrieval to remove marine growth and operated remotely to avoid personnel to come in close proximity of lines under tension.

Ultimately the mooring components were transported to shore and offloaded to Subsea7 nominated yard.

OFFSHORE EXECUTION

FPSO station keeping operation:

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

Mooring line disconnection operation:

- Procurement of subsea cutting tool, chain cleaning and polyester rope cleaning tools.
- Cutting and retrieving from sea nine FPSO mooring lines.
- Cleaning of nine mooring lines and collection of marine growth.
- Offloading operation of nine mooring lines at Client nominated yard.

FACT & FIGURES

The station keeping operation was performed with Boskalis vessels Manta, Boka Centre, Boka Summit and Boka Glacier.

The mooring line disconnection was performed with Boka Falcon CSV (Construction Support Vessel).



B FPSO Fluminense from Boka Falcon deck during mooring line retrieval



C Boka Falcon subsea cutting tool



D Boka Falcon polyester rope cleaning tool