Block 15-06 East Hub Development Project

Armada Olombendo FPSO – Naming Ceremony

>> Singapore - 14th October 2016 <<

FPSO Project in brief

The FPSO has been converted from an existing double-hull trading tanker "ARMADA ALI" (ex. "M.T. OSPREY") and is classified by ABS with facilities to perform the following main functions:

- Receive produced fluids from subsea fields and process the produced fluids
- Treat and inject produced water and/or sea water for reservoir pressure maintenance
- Treat and manage produced gas for injection
- Store treated oil and offload oil to shuttle tankers

The FPSO will be located in approximately 450 m water depth at south-east of Cabaça North field and at north-east of Cabaça South-East field. The FPSO is owned by Bumi Armada and its conversion has been undertaken in Singapore at Keppel Shipyard. Process Modules have been fabricated at Dyna-Mac Yard. Sonamet Yard at Lobito (Angola) has fabricated 5 Topside Modules and the suction piles for the mooring of the FPSO at the offshore site.

Vessel Info

Year of Fabrication: 1999	Deadweight Tonnage: 302,000
Classification: ABS	Overall Length: 382 m
Design Life: 20 years	Breadth: 58 m
Water Depth: 450 m	Storage Capacity: 1,700,000 bbls

FPSO nameplate capacities

Crude Oil Production: 80,000 bbls/d	Water Injection: 120,000 bbls/d	
Total Liquid Production: 110,000 bbls/d	Total Gas Production: 120 mmscfd	
Prod. Water Production: 90,000 bbls/d	Gas Injection: 100 mmscfd	Main Power Generation: 3x21 MW Dual Fuel Turbines

Armada Olombendo FPSO - HSE Commitment

Project Management Commitment: demonstrate leadership on site encouraging people to work in a safe manner with personal examples and conducting regular site inspections with provision of relevant observations.

| Eni Hand Safety Campaign

FPSO Project HSE Performances at 30th September 2016

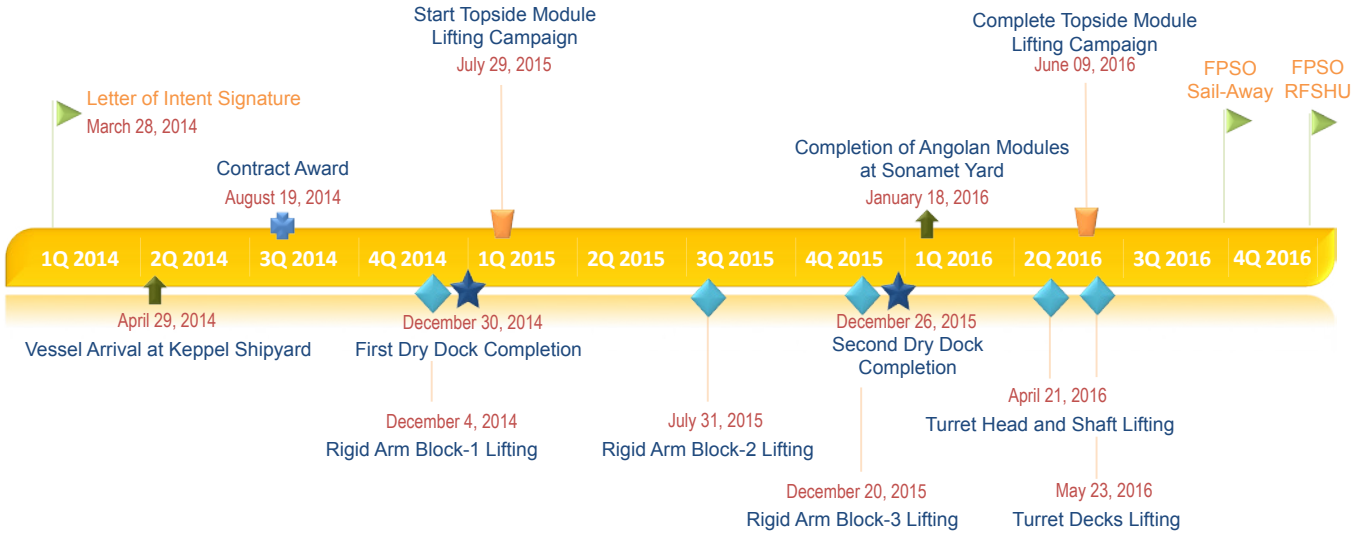
Total Project Manhours (including Sonamet Yards): 17,740,764
Total manhours w/o LTI at Singapore Yards: 17,038,323
Lost Time Injury Frequency Rate (LTIFR): 0.06
Total Reportable Injuries Rate (TRIR): 0.40
First Aid Case Rate (FACR): 0.06

"The Mass Tool Box Talk at Keppel Shipyard takes place every Monday morning and involves all the Armada Olombendo FPSO project work force. Positive and Negative observed behaviors are discussed by all managers with the workers in order to reinforce the safety culture of the worksite"

| Commemoration 10 millions manhours without LTI – Keppel Shipyard

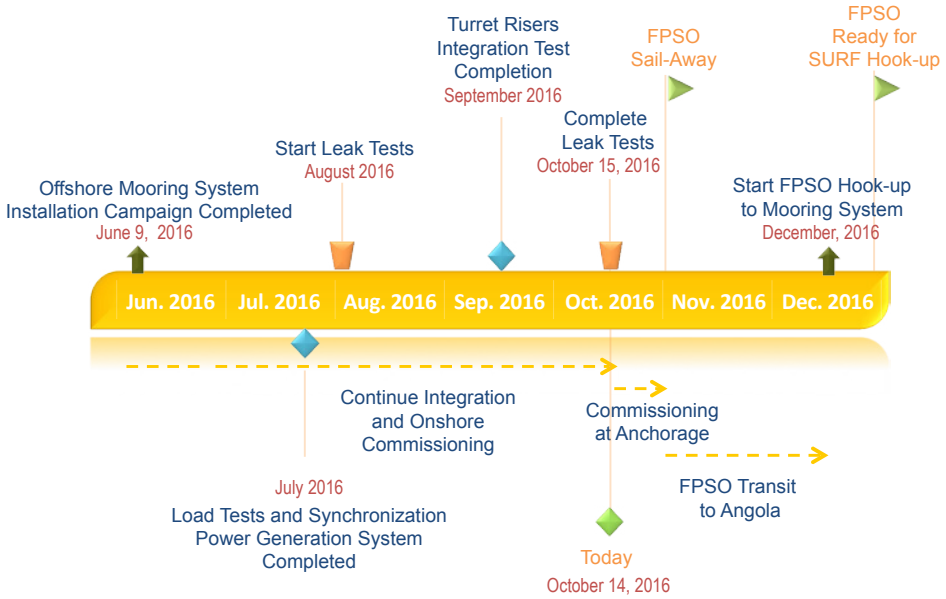
| Mass toolbox talk at Keppel Shipyard

FPSO Project Timeline

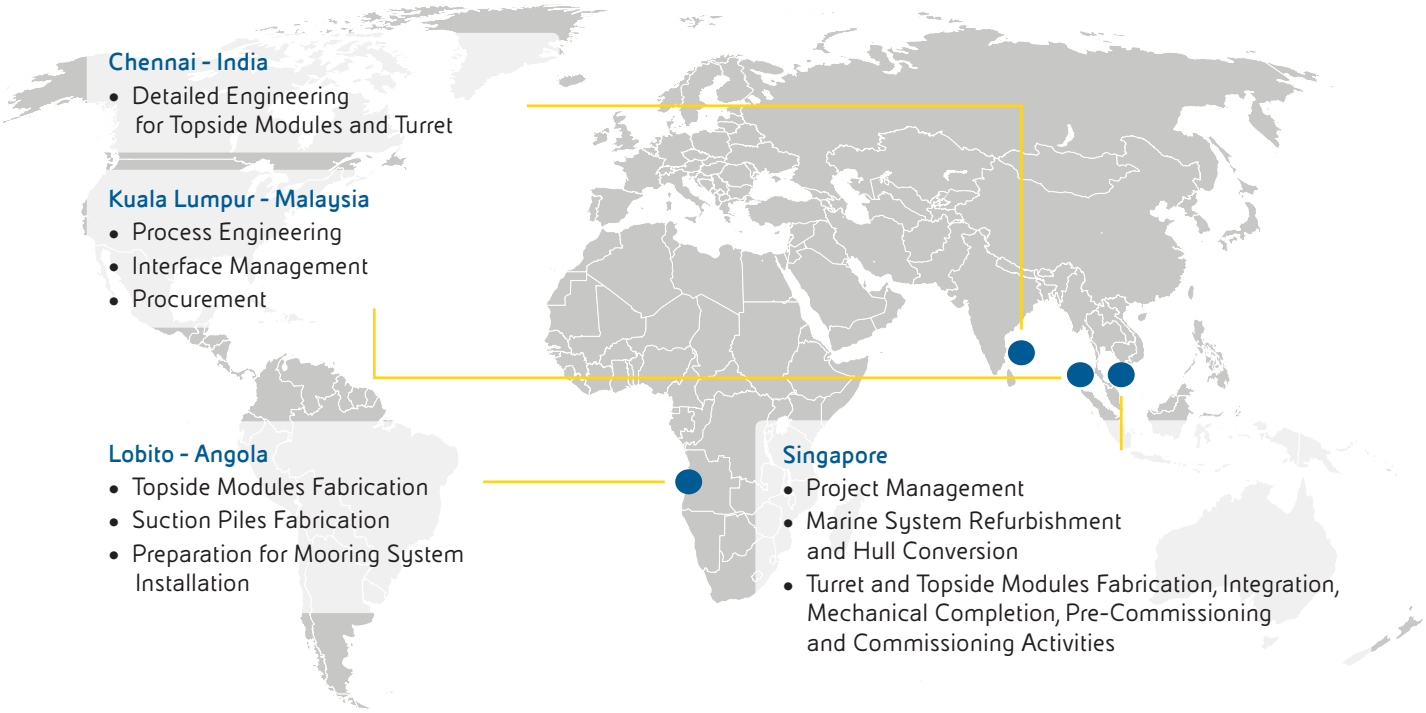


"After the completion of the Integration and Commissioning activities at Keppel Shipyard, the FPSO will sail to the Offshore Site in Angola in about 40 days. Once Offshore, the FPSO will be hooked-up to the pre-installed mooring system and subsequently all the preparatory activities will be completed to have the FPSO Ready for SURF Hook-up (connection of the FPSO to the Subsea, Umbilicals, Risers and Flowline system)"

FPSO Completion Phase Look-Ahead



FPSO Project Execution Strategy



Construction and Completion Strategy

Keppel Shipyard
- Hull conversion and Marine System refurbishment works
- Turret Fabrication
- Utilities Modules Fabrication
- Integration and Mechanical Completion

Sonamet Yard: 9 Suction Piles and 5 Topside Modules

Dyna-Mac Yard: 6 Process Modules

ABB/Mc Pec Yard: E-House Module

Boskalis: Offshore Mooring System Installation and FPSO Hook-up

Bumi Armada is responsible for all activities and provide all services required for the pre-commissioning and commissioning activities for all systems and subsystems of the FPSO.

"Most part of the fabrication activities of the entire FPSO project are executed in Singapore in two main yards (Keppel Shipyard and Dyna-Mac Yards)"

Keppel Shipyard Detailed Scope of Work

Hull conversion and marine system refurbishment

- Bow Modification and Hull Steel Renewal
- Rigid Arm Fabrication and Installation
- New emergency diesel generators
- Accommodation upgrade
- CCR for topside monitoring and control system
- Main engine retained for self-propulsion voyage to site
- Modification of deck arrangement to cater for the installation of the topside modules
- Modification of the instrumentation and control systems
- New deck pedestal cranes and Helicopter deck with supporting structures

"As part of the Steel Renewal Scope, Keppel Shipyard has executed the full condition assessment of the hull to determine all the area subject to repair or replacement"

| Main deck modifications

| Second dry dock completion

Turret Fabrication

- Turret Head
- Turret Shaft
- Turret Decks
- Gantry Structure
- Swivel Installation

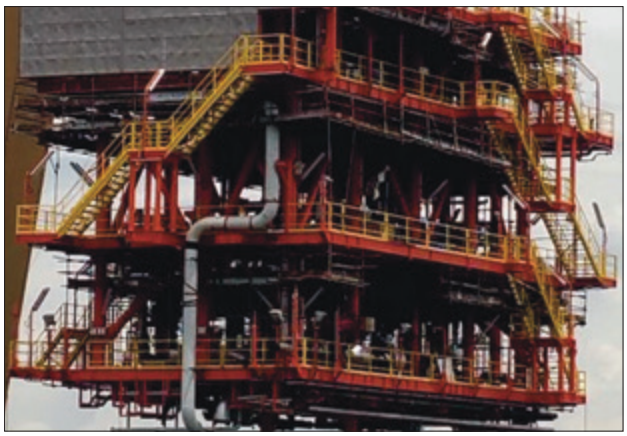
Topside modules fabrication

- Commissioning Laydown Area
- Flare Tower
- Flare KO Drum Module
- Utilities Module
- Produced Water
- Methanol Injection Module
- Essential Diesel Generator
- Inlet Manifold Module

"Keppel Shipyard has also performed the overall Topside Modules and Turret Integration activities up to the final Mechanical Completion while Pre-commissioning and Commissioning activities are executed under Bumi Armada responsibility"

| Turret head and shaft

| Turret gantry structure



| Inlet manifold module during lifting onboard

Dyna-Mac Yard Detailed Scope of Work

Process modules fabrication

- Structural Fabrication and Assembly
- Piping Fabrication and Installation
- Equipment and Electrical & Instruments Installation
- Mechanical Completion Activities

| M30 - Oil stabilization

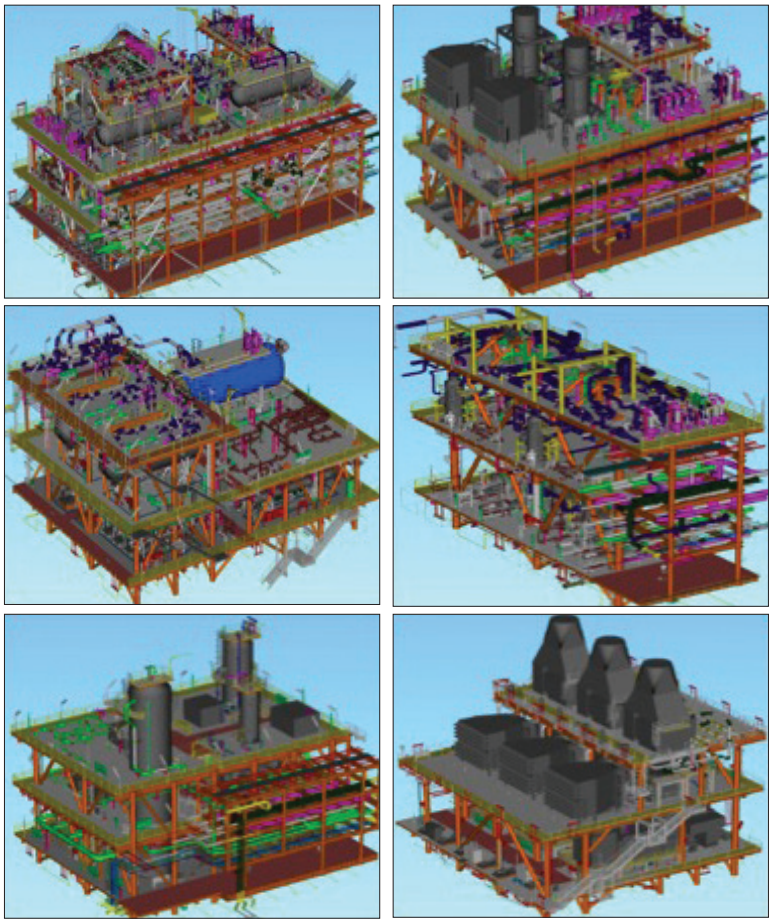
| M31 - Mp/hp reinj. compression

| M32 - Production separation

| M34 - Scrubber & cooler

| M52 - Injection water

| M75 - Power generation



"After completion the Topside Modules have been loaded out from Dyna-Mac Yard and lifted onboard the FPSO at Keppel Shipyard using Heavy Lift Floating Cranes"

Main achievements at Dyna-Mac Yard

| Mar. 2016 - Power gen. module load out

| May 2016 - Water injection module load out

| May 2016 - Production separation module load out

| Jun. 2016 - Gas compressors scrubbers/coolers module

| Jun. 2016 - Gas compression module load out

"Exotic Piping pre-fabrication has been performed at Dyna-Mac Pandan (West Yard) in a dedicated Air-Conditioned Exotic Piping Workshop"

| Jun. 2016 - Oil stabilization module load out

Heavy Lifting Campaign - Main Achievements - 2014/2015

| Dec. 2014 - Rigid arm block-1

| Jun. 2015 - Methanol tank

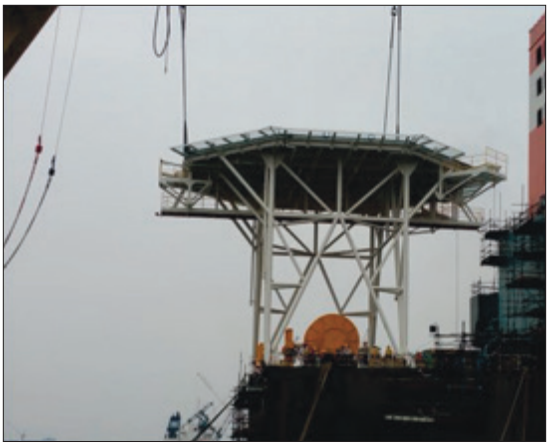
| Jul. 2015 - Laydown area (m96)

| Jul. 2015 - Rigid arm block-2

| Sep. 2015 - Seawater lift pumps caissons

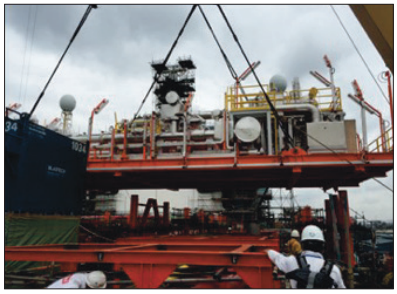
| Dec. 2015 - Rigid arm block-3

"The Lifting and positioning of the Rigid Arm Block 2 was executed using Asian Hercules III (5,000 tons capacity) and it has been among the most challenging lifting of the entire project"



| Nov. 2015 - Helideck

Heavy Lifting Campaign - Main Achievements - 2016



| Jan. 2016 - E-House module

| Jan. 2016 - Fiscal metering module

"E-House Module fabrication and mechanical completion by ABB and Mc Pec Yard was achieved in a record time of 8 months. The timely achievement of the lifting milestone of the E-House has allowed to start timely the electrical integration activities onboard the FPSO which are critical for the project completion"

| Jan. 2016 - Utilities module

| Feb. 2016 - Essential diesel generation module

| Feb. 2016 - Flare system module

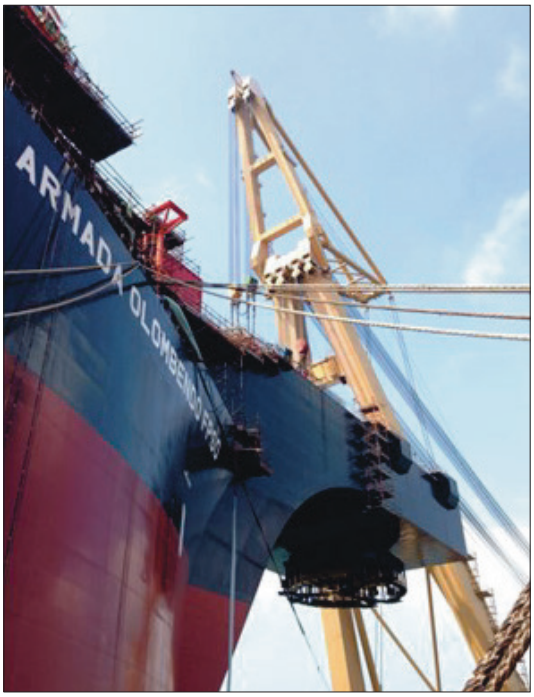
"The Topside Utilities Modules have been fabricated at Keppel Shipyard (East Yard Area) and subsequently lifted onboard for final integration and commissioning"

| Mar. 2016 - Power generation module

"The Power Generation Module was fabricated at Dyna-Mac Yard. Shifting of the module (weight of 1,890 tons) inside the yard and its lifting were extremely challenging activities completed safely"

| Apr. 2016 - Flare tower (lower section)

| Mar. 2016 - Produced water treatment module



| Apr. 2016 - Turret head and shaft

| May 2016 - Methanol injection and diesel flushing

"The lifting of the Turret Head and Shaft on the rigid arm has been among the major heavy lift executed for the entire project (2,272 tons)"

| May 2016 - Water injection module

| May 2016 - Inlet manifold module

| May 2016 - Production separation module

| May 2016 - Turret decks

"Production Separation Module was fabricated at Dyna-Mac Pandan Yard (West Yard). Module has been transported to Keppel Shipyard through barge and then lifted onboard using Asian Hercules II Crane"

| May 2016 - Turret lower gantry

Jul. 2016 - Upper gantry

Jun. 2016 - Swivel

"The lifting of the Swivel and of its access structure has presented several challenges due to the overall height of the assembly on top of the decks and Lower gantry structure"

Jun. 2016 - Oil stabilization module

Local Content - Main Achievements: 9 Suction Piles completed

| May 2016 - 9 Suction piles ready for pick-up by installation vessel

"As part of the Local Content Plan, several fabrication activities have been executed in Angola at Sonamet Yard in Lobito. 9 Suction Piles for the mooring of the FPSO have been completed at Sonamet Yard"

| May 2016 - Chains offloading completed at Sonamet yard

Local Content - Main Achievements:
5 Topside Modules completed

| Feb. 2016 - Chemical injection module

| Feb. 2016 - Sulphate removal module

| Feb. 2016 - Laydown area/tote tanks module

| Feb. 2016 - Laydown area module

"Five Topside Modules have been fully fabricated in Angola at Sonamet Yard in Lobito. Modules were completed on schedule in December 2015 and delivered to Keppel Shipyard for final integration"

| Apr. 2016 - Sea water treatment module

Main Applied Technologies - Main Roller Bearing - (ThyssenKrupp Rothe Erde)

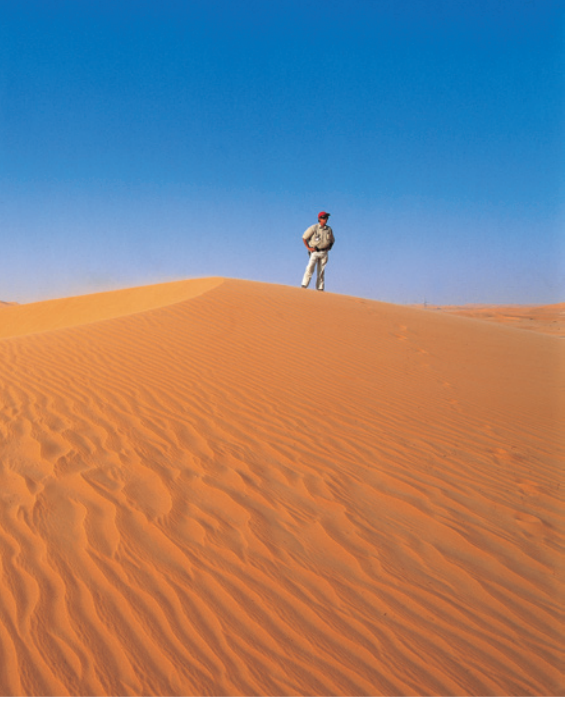
| Main roller bearing during assembly at Keppel Shipyard

"Main Roller Bearing system comprises of a segmented three (3) raceway roller bearing system located on the turret head and shaft structure. The slewing bearing is designed in such a way that it will transfer loads to the FPSO hull through the turret head structure and resist the horizontal, vertical and radial loads"

Main Applied Technologies - Sulphate Removal Membranes (Veolia)

| Membranes housing vessels on sulphate removal module (module 50)

"The Sulphate Removal membrane units are designed to achieve a guaranteed sulphate level in the injection water of < 20 mg/l to avoid scale deposition into the reservoir. The nanofiltration membrane is arranged as a spiral-wound element. A housing vessel contains 6 elements in series with the feed being introduced at one end of the vessel, the reject being collected at the opposite end and the permeate collected in a central annular tube"



Our Mission

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We are working to build a future where everyone can access energy resources efficiently and sustainably.

Our work is based on passion and innovation, on our unique strengths and skills, on the quality of our people and in recognising that diversity across all aspects of our operations and organisation is something to be cherished.

We believe in the value of long term partnerships with the countries and communities where we operate.

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