



SAIPEM SUBSEA FIELD DEVELOPMENT SOLUTIONS

Helping operators to unlock reserves

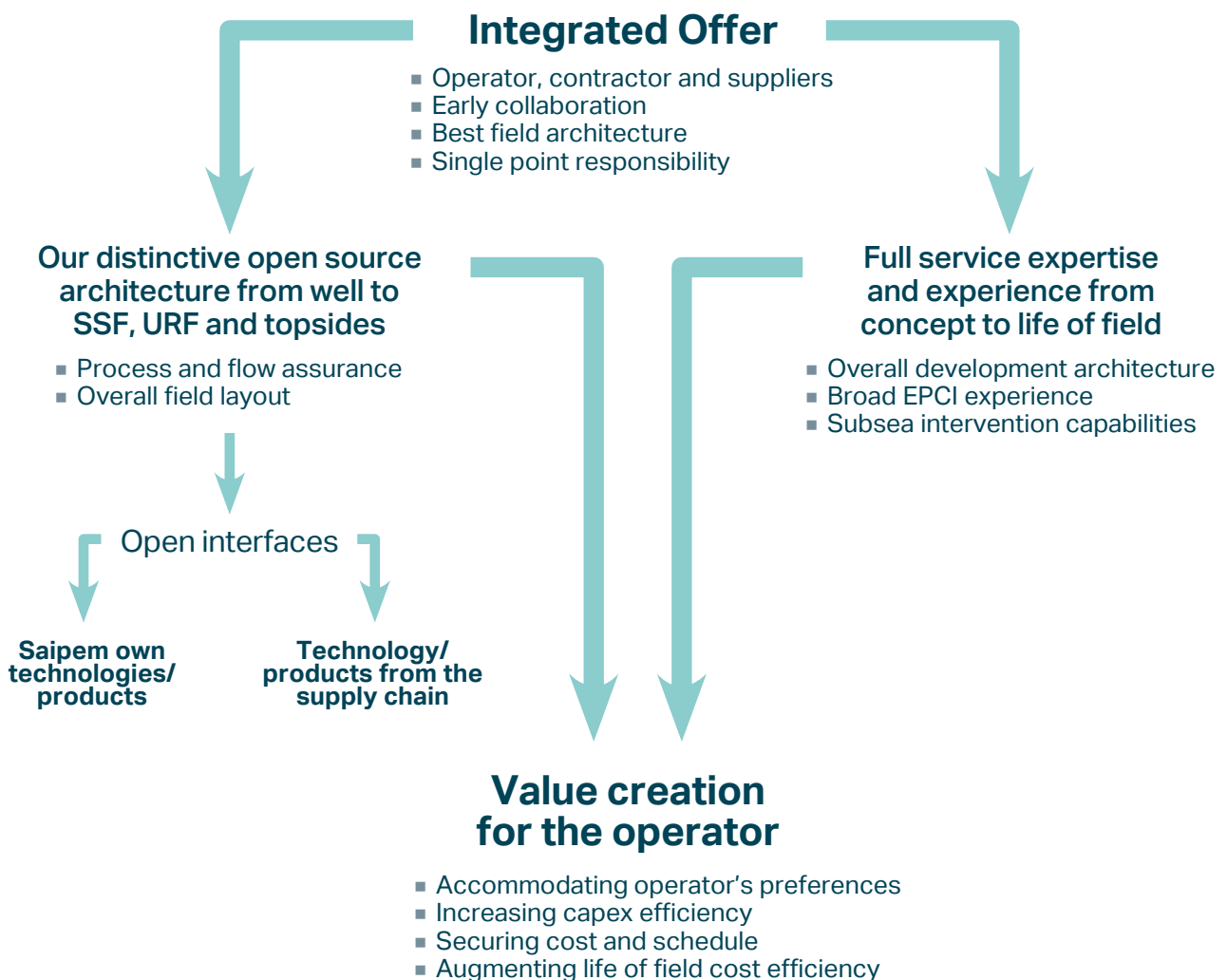


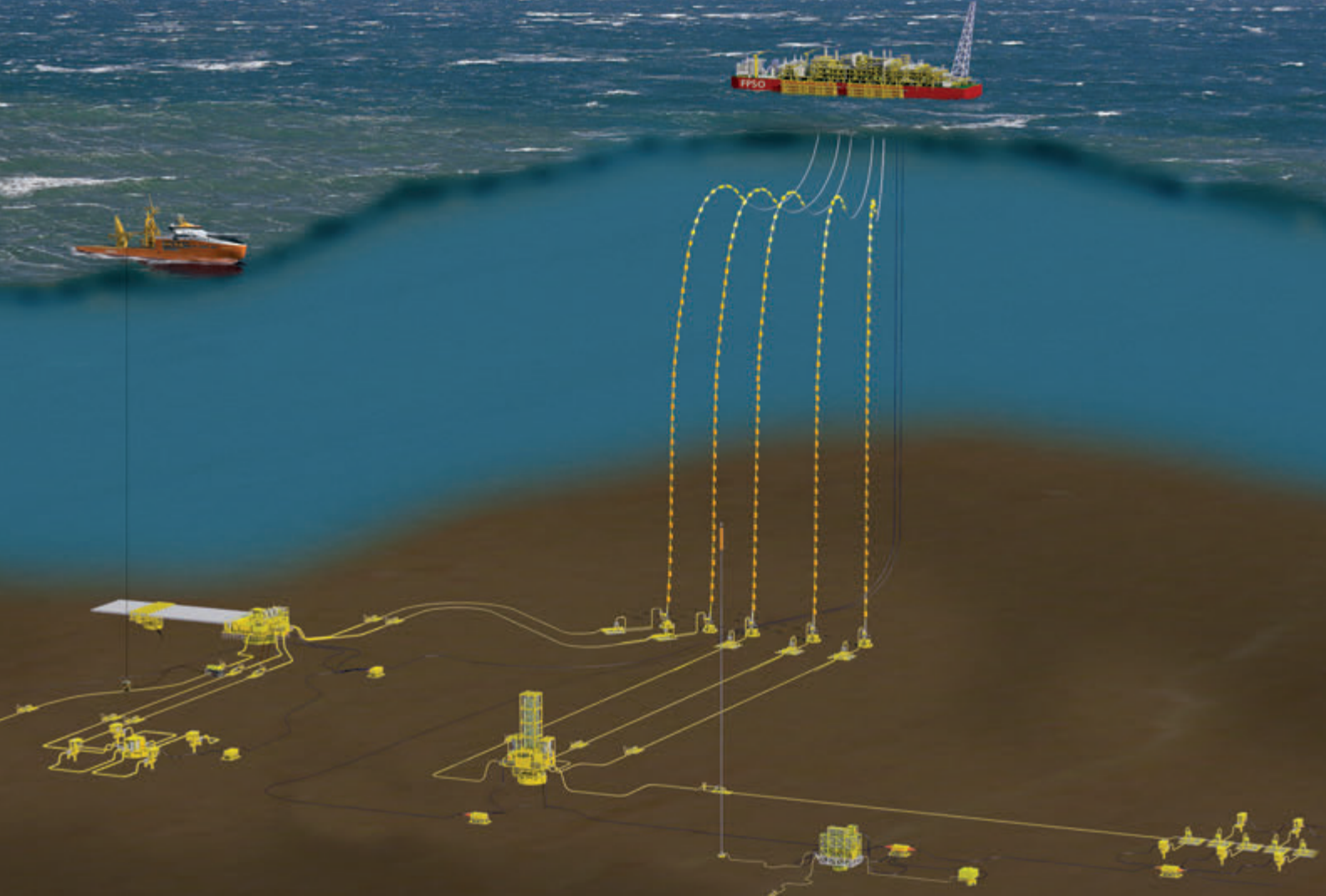
OUR INDUSTRIAL MODEL

VALUE CREATION FOR THE OPERATOR

A full offer **from well to topsides** and **from concept to life of field**, based on both **our own technologies** and third parties supplies integrated within **an open source architecture** thanks to standard interfaces.

Designs, products and technologies are backed **in any contractual scheme** by outstanding **project execution capabilities**, such as engineering, fabrication and subsea construction fleet, to provide **budget and schedule assurance for cost effective field developments** as proven by our top class track record.





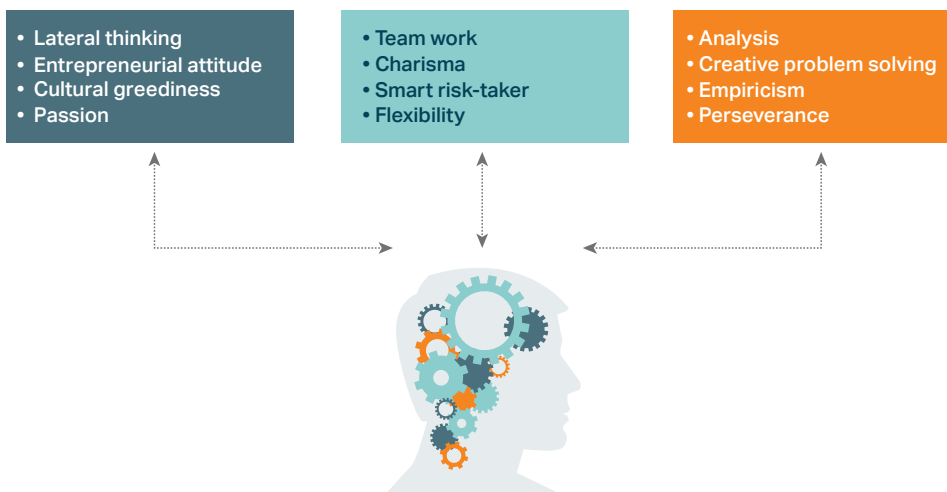
INNOVATION IS OUR STRATEGIC LEVERAGE

- Young innovative thinkers and cross-discipline specialists collaborating on strategic themes
- Open innovation with the ecosystem

Our long tradition of frontier operations in harsh environments, remote areas and deep waters now has a further impulse for a **new step-change innovation strategy** by adopting **new digital technologies and methodologies** along with conventional technology development.

We have therefore launched our **Innovation Factory**, an idea incubator to:

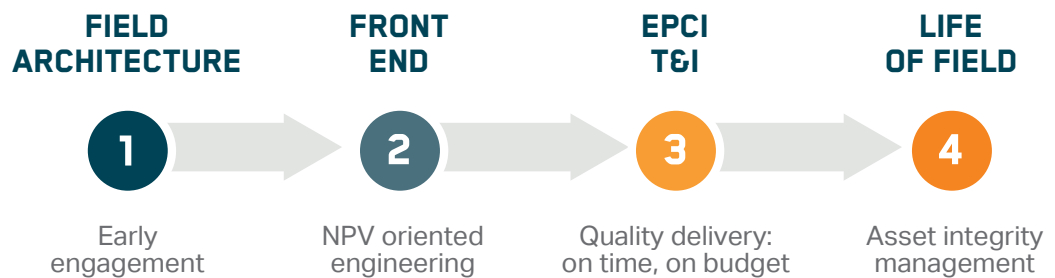
- ➔ test fast prototype solutions;
- ➔ address challenges of the energy sector;
- ➔ boost productivity;
- ➔ enhance our competitive advantage.



THE VALUE PROPOSITION

A COMPLETE RANGE OF SERVICES

Strong competences on all project phases - from conceptual design to execution and operation - enable optimum performance and minimum costs.



SAIPEM'S BEST IN CLASS SUBSEA SYSTEMS OFFER

UMBILICALS, RISERS, FLOWLINES AND FULL BUNDLING OF SPS

We have designed and installed most of the existing deepwater riser and flowline concepts from within our vast experience of large, complex EPCI global projects.

FROM WELL TO SURFACE: SAIPEM'S STRATEGIC AGREEMENT WITH **AKER SOLUTIONS** WILL SECURE OPTIMIZED AND INTEGRATED FIELD DEVELOPMENT CONFIGURATION FROM THE EARLY STAGES OF THE PROJECT, SMOOTH INTERFACES AND RELIABLE EPCI DELIVERY, COST EFFECTIVE LIFE OF FIELD SERVICE DELIVERY

16 MAJOR URF EPCI PROJECTS COMPLETED OR IN PROGRESS



Sapinhoá Norte & Iracema Sul - Petrobras
P55 - Petrobras

Egina URF - Total
Bonga North East - Shell
Usan URF - Total
Akpo - Total

East Hub - Eni
Kizomba A, B & Satellites - Exxon
Rosa - Total

Zohr - Eni
WDDM ph. IV, VI, VIIIb, IXa - Burullus

Liwan 3-1 - Husky Oil

THE SUBSEA FACTORY TO UNLOCK RESERVES

For longer offset distances, deeper waters, mature fields, viscous oil, low temperatures, we can integrate all functions and hardware needed to deliver a full subsea factory.

Our role is further strengthened by our development and qualification of a unique set of proprietary subsea processing technologies for deep waters:

- **Multipipe** - a gas/liquid separator
- **SpoolSep** - a gas/liquid-liquid separator
- **SPRINGS®** - a subsea seawater desulphation and injection system



THE PRODUCTS' PORTFOLIO

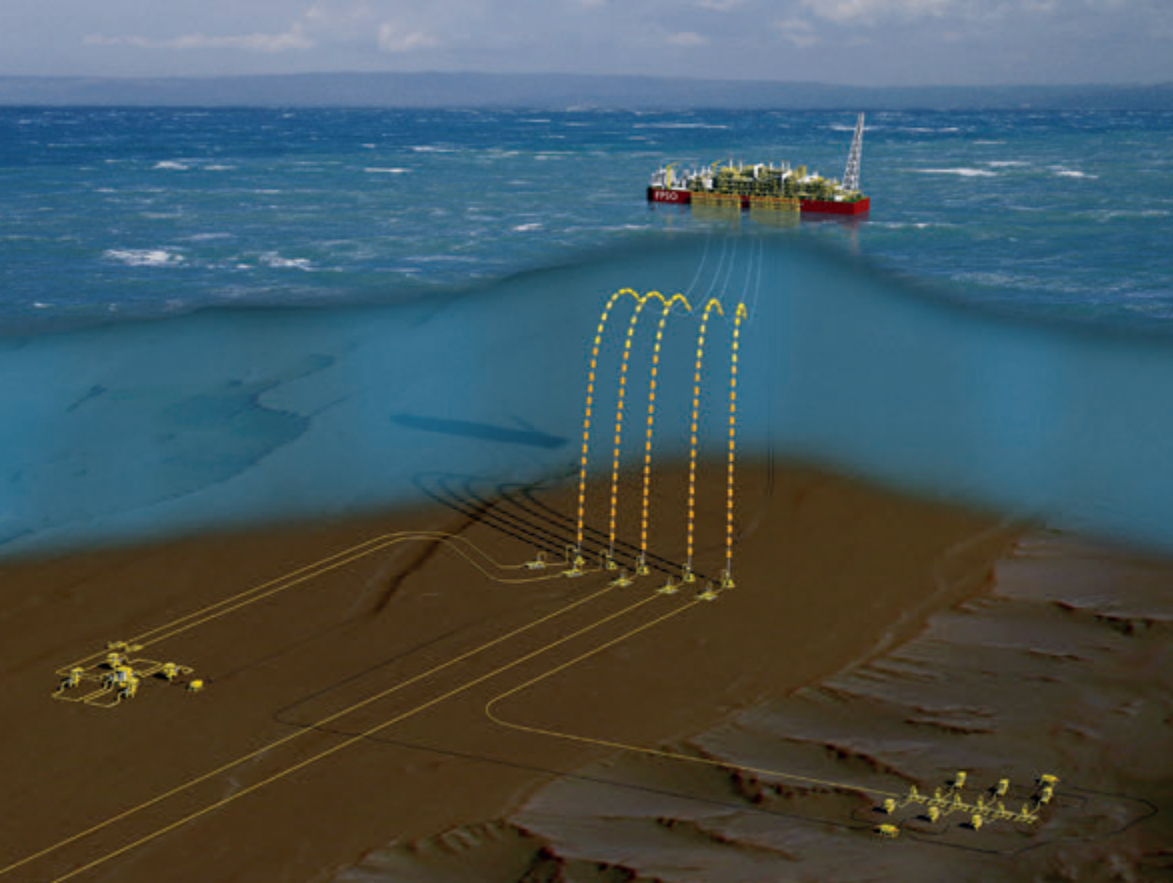
SUBSEA AND URF SYSTEMS

Open source architecture to unlock the supply chain.

Saipem also provides a full range of offshore products including subsea structures, offloading and mooring systems.

- Versatility for most scenarios
- Outstanding skills with welding and materials (metallic/non-metallic)
- Matching original designs and fleet
- Targets: flow assurance and deep water





Our latest concept SIR - Single Independent

Riser: Saipem proprietary design extending riser application to ultra deep waters; enhanced static and dynamic behaviour; lower sensitivity to currents

87 RISERS INSTALLED IN DEEP WATER

Compliant with all types of environment, field layout, water depth, etc.

- Steel Catenary Riser (Akpo for Total)
- Steel Hybrid Riser (Kizomba A and B for Exxon, Egina & Usan for Total)
- Hybrid Riser Tower (Rosa for Total)

COST EFFECTIVE SOLUTIONS: FLOWLINE CONCEPTS FOR SOUR SERVICE AND FLOW ASSURANCE

Non insulated / wet insulated / pipe in pipe (sliding, swaging, forged pieces) with any of these additional optional solutions:

- liners (clad or plastic liner) - fusion bonded joint to J-lay plastic lined pipes, to obtain plastic liner fatigue life higher than steel
- upset ends - significant improvements in welding times and J-lay rates with high fatigue performance
- electric heated trace PIP - the most efficient active heating solution for longer and larger tie-back lines installed in rigid J-lay

allowing the flowlines to accommodate a broad variety of design conditions (e.g. sour service, corrosion in water injection lines, fatigue) while ensuring safe preservation and continuous monitoring.

THE PRODUCT PORTFOLIO

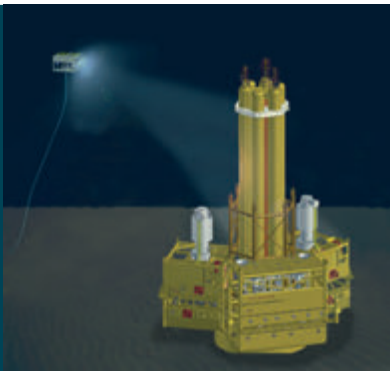
THE SUBSEA FACTORY ENHANCES FIELD DEVELOPMENT ECONOMICS

By bringing semi-finished products to the surface or closing the seawater cycle on the seabed cycle. Featuring a new industrial model

based on open source architecture, interface standardization, modularity, also leveraging on very strong process competence and experience.

THREE MAJOR SUBSEA TECHNOLOGIES DEVELOPED AND QUALIFIED

Guarantee better flow assurance



MULTIPIPE subsea gravity gas-liquid separator

Vertical pipes working in parallel for gravity separation; flexible design to cope with a wide range of applications and requirements (high pressure, high flowrate, slugs, etc.)

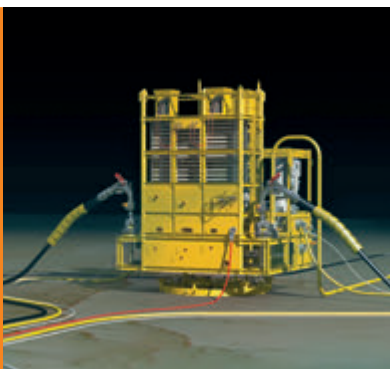
Maximize oil recovery through subsea produced water separation and reinjection



SPOOLSEP subsea gravity liquid-liquid separator

Horizontal pipes for subsea gravity separation; subsea water debottlenecking allowing tie-back of new wells; produced water treatment, jointly developed with Veolia, with hydrocyclones for deoiling and desanding

Better sweep of the reservoir and the removal of the subsea water injection network leading to savings on topside weight and deck space



SPRINGS® subsea seawater treatment for injection

Nano-filtration membranes for the removal of sulphates prior to injection into the reservoir; a simple process that is both easy to operate and maintain.



1st JIP completed with Total and BP to validate separator performances

2nd JIP completed with Total, Petrobras and Eni for the qualification of the whole subsea station



Under industrialization

Tests in a multiphase loop at CETIM Nantes



Qualification in progress

Deepwater tests performed with Saipem's Subsea Tests Unit (STU) offshore Congo



Under Industrialization



PROJECT EXECUTION AND LIFE CYCLE CAPABILITIES

ENGINEERING & CONSTRUCTION

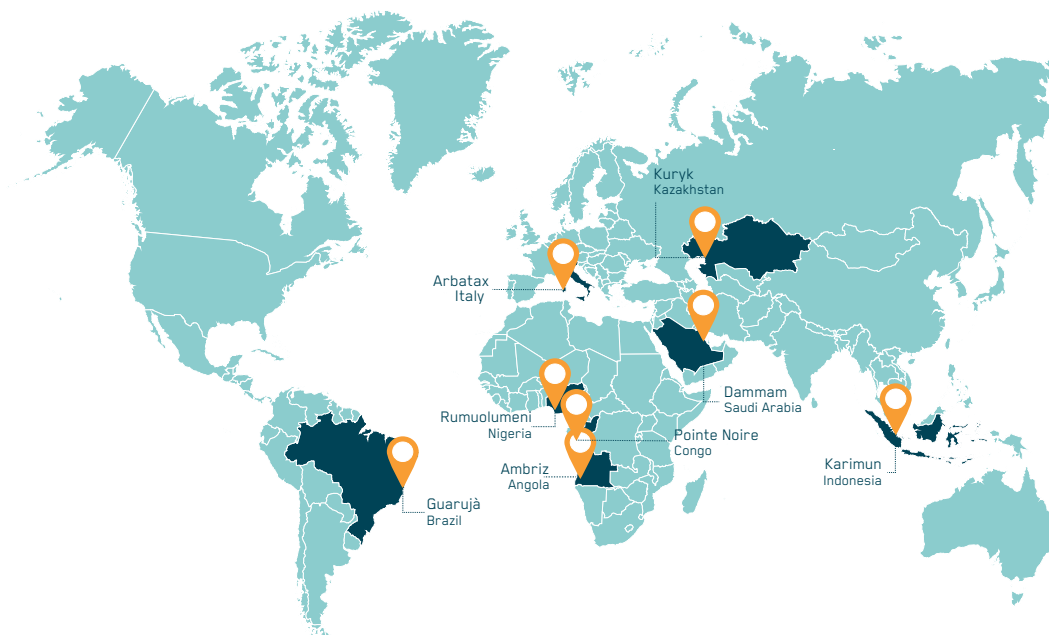
TOP QUALITY ENGINEERING TO ACHIEVE THE BEST FIELD ARCHITECTURE AND MAXIMUM OPERATOR RETURN

Early engagement, field architecture studies, basic, FEED and detailed design: opportunities for cost reduction from well to surface facilities.

Integrating new technologies and alternative field architectures to optimize flow performance and enhance recovery.

Work together with partners, operators, suppliers.

SAIPEM'S OWN FABRICATION YARDS FOR HIGH EFFICIENCY AND LOCAL CONTENT



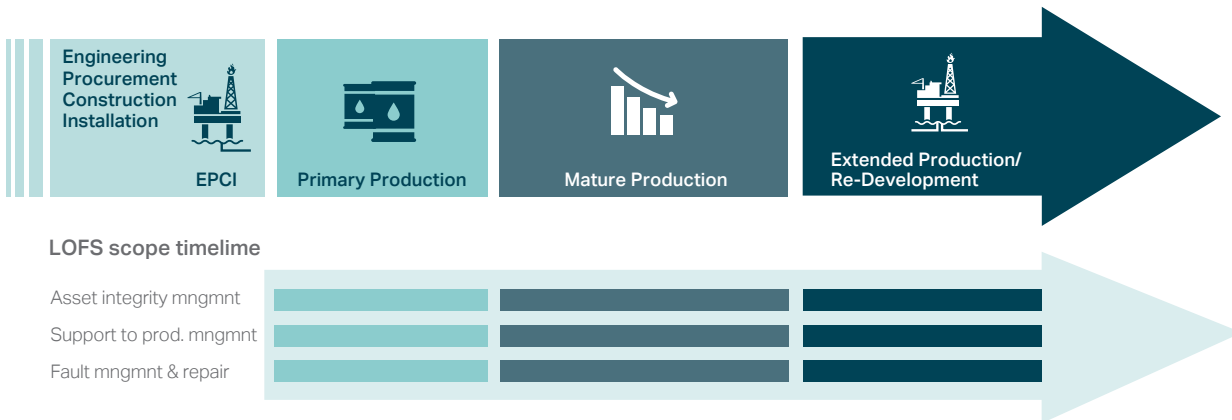
UNIQUE FLEET FOR PIPELAY AND SUBSEA CONSTRUCTION DOWN TO 3,000 M W.D.

S/J-lay, steel/flex reel lay and construction: alignment of original technical solutions with dedicated, fit for purpose installation vessels

- ➔ Saipem FDS
- ➔ Saipem FDS 2
- ➔ Saipem 3000
- ➔ Normand Maximus
- ➔ Castorone
- ➔ ROV fleet

LIFE OF FIELD: EXPERIENCE, ASSETS AND INNOVATION

The Saipem **Life Of Field Subsea** (LOFS) services implement engineering, technologies and intervention capabilities to assist clients in the **transition from the EPCI phase to operations** and then throughout the **subsea field life cycle**, in order to maximize uptime, de-risk operations and support production while optimizing CAPEX/OPEX.



- Uptime maximization
- Operational de-risking and risk management
- Assist Oil/Gas recovery
- CAPEX/OPEX optimization & balance

By managing engineering, technologies and interventions, the pillar competencies of LOFS, Saipem promotes a new, comprehensive, approach to field integrity: a **transition of paradigm** between the old, **reactive**, approach of classic IMR to the new, **preventive**, solution to daily integrity issues.

The HyDrone is a **modular subsea resident intervention platform**, integrated within the **subsea field** for long subsea dives without vessel support. The HyDrone is developed to address the:

- ➔ Sustainability of complex present and future subsea fields
- ➔ Management of operational risk for LOFS critical services/interventions including asset
- ➔ Inspection, early detection of fault (predictive vs. detective), first aid /triage
- ➔ Need to implement solutions for OPEX cost saving by reducing vessel interventions

Subsea damages to pipeline happen and the consequences for the environment, production, safety and reputation are paramount.

Being prepared is therefore more than a choice, **it is an actual need.**

Saipem engineering and technological expertise assist clients with all type of repairs at **various levels of preparedness**, from developing bespoke engineering methods up to a fully engineered emergency pipeline repair system with associated storage, maintenance, testing and operational services.





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