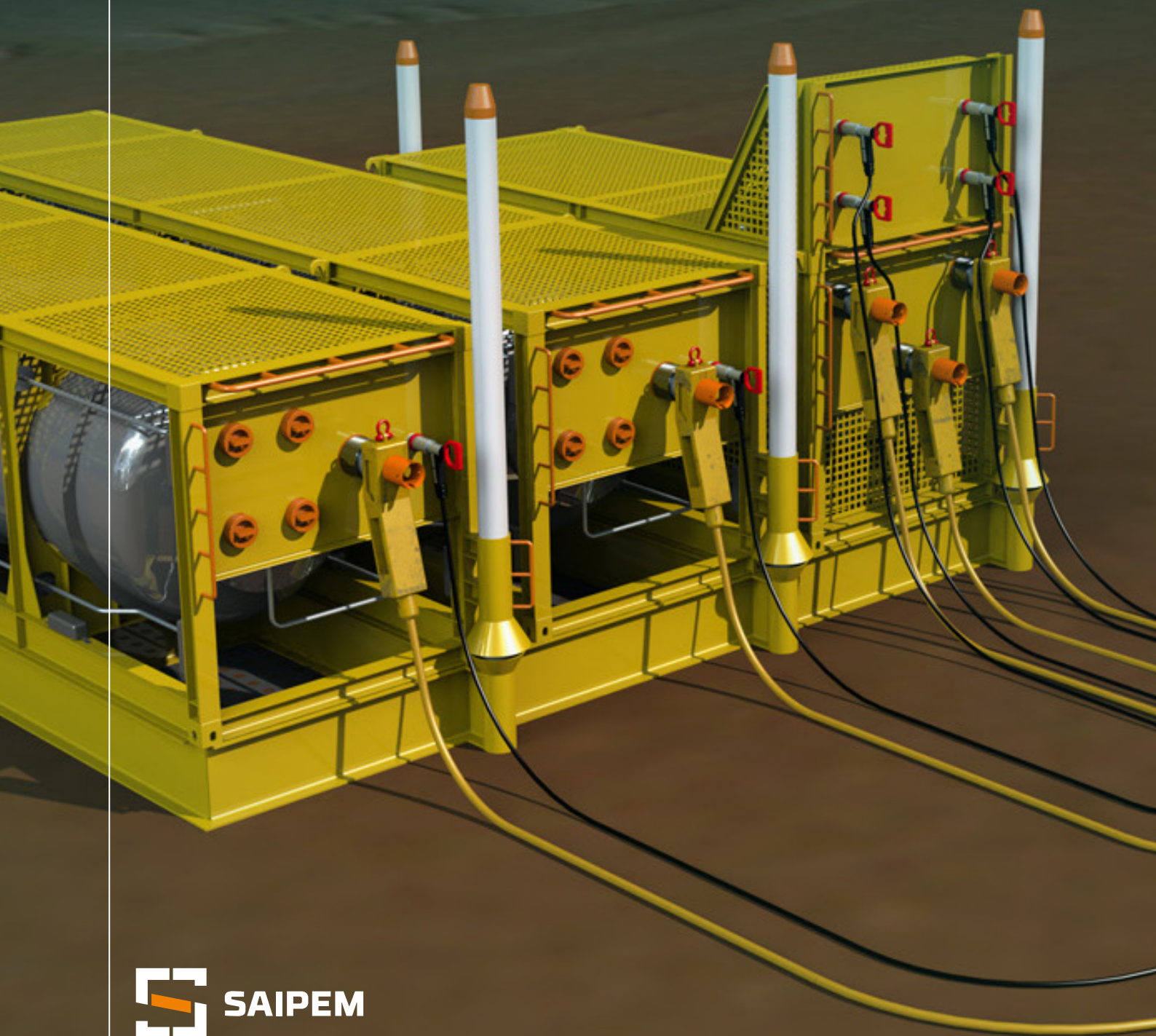


SAIPEM FLUIDEER™

SUBSEA CHEMICAL STORAGE
& INJECTION SOLUTIONS



SAIPEM

FLUIDEEP™: SUBSEA CHEMICAL STORAGE & INJECTION

A SOLUTION FOR SUBSEA CHEMICALS DELIVERY

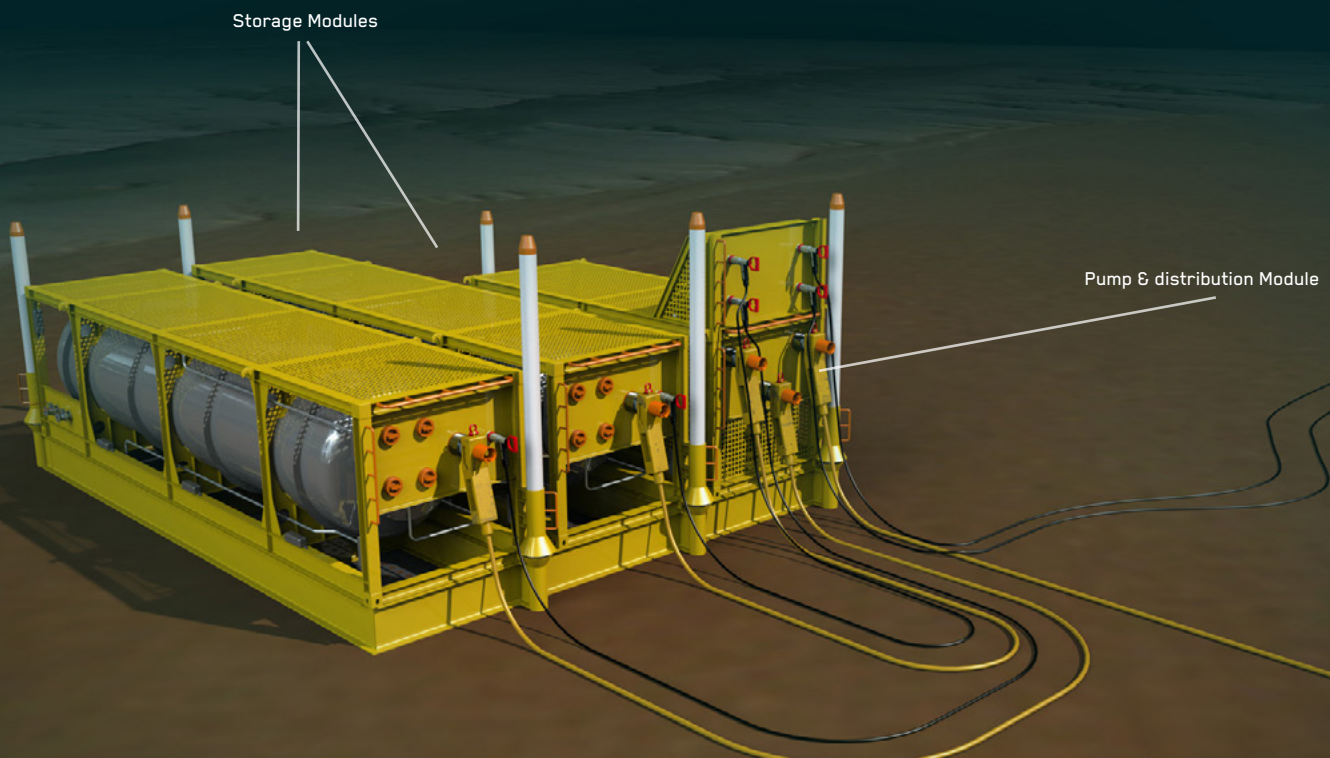
FLUIDEEP™ is a subsea technology for storage and injection of fluids and an alternate to the conventional umbilical for subsea chemicals delivery.

FLUIDEEP™ moves the chemicals storage and injection units from the topsides to subsea. It reduces topsides weight and frees up deck space. It eliminates the chemicals tubing from the umbilical, reducing its complexity and cross-section. It is therefore a strong enabler for long tiebacks to existing facilities or to shore.

FLUIDEEP™ design is modular and features two subsea storage solutions to meet project-driven fluid volume demand to optimize economics. Typical refilling strategy is based on subsea storage units change-out by multipurpose vessel, for onshore refilling at the service base.

MAIN FEATURES

- Wide range of chemical fluids
- Fit for shallow and deepwater projects down to 3000 msw
- Modular design for bespoke configurations
- Two storage technologies: elastomeric bladder and liquid barrier
- Reciprocating pumping technology
- All-electric system
- Redundancy of pumps and power & control distribution



BENEFITS OF THE TECHNOLOGY

- Simplifies cross section and reduces dimension & cost of service umbilical
- Debottlenecking of congested topsides
- Increased safety since no chemicals handling or dedicated personnel on topsides
- Completely all electric, connected only with subsea power and control cable
- Strong enabler for long tieback projects
- Subsea units can be relocated according with project needs

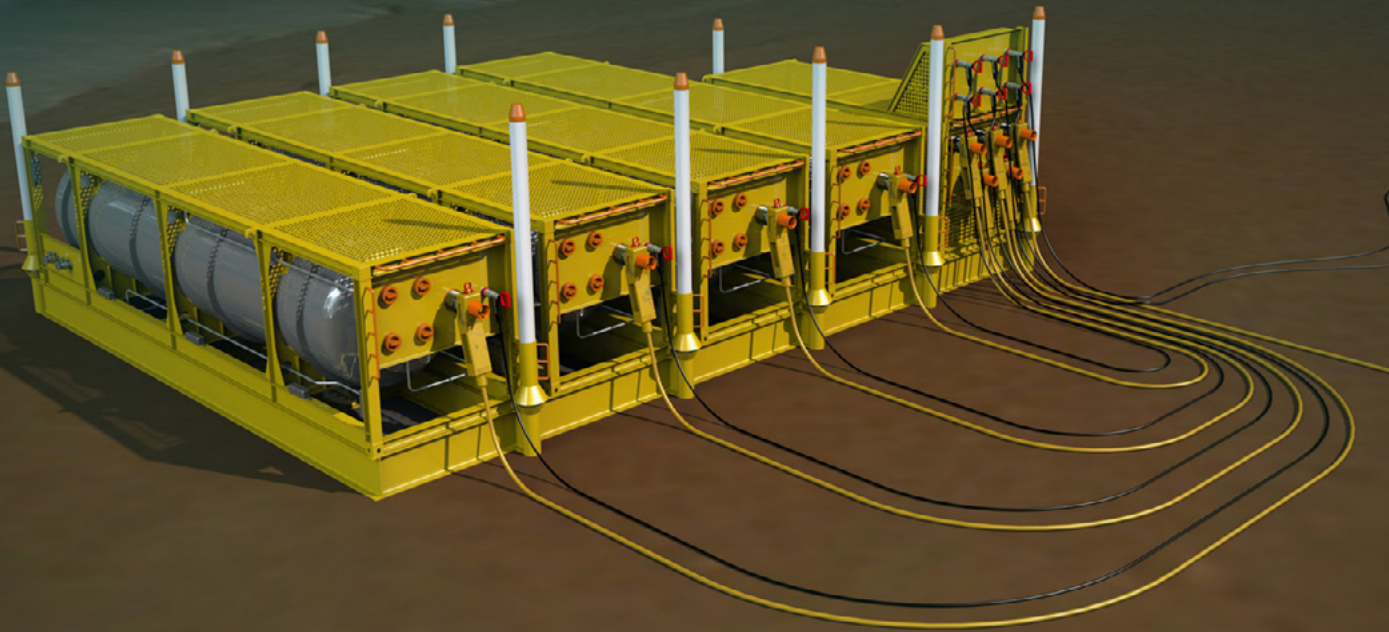
APPLICATION CASES

- Subsea production applications for greenfield and brownfield scenarios reducing assets CAPEX and topsides requirements
- Subsea processing applications
- Subsea carbon capture utilization and storage
- Temporary intervention jobs

FLUIDDEEP™ DESIGN

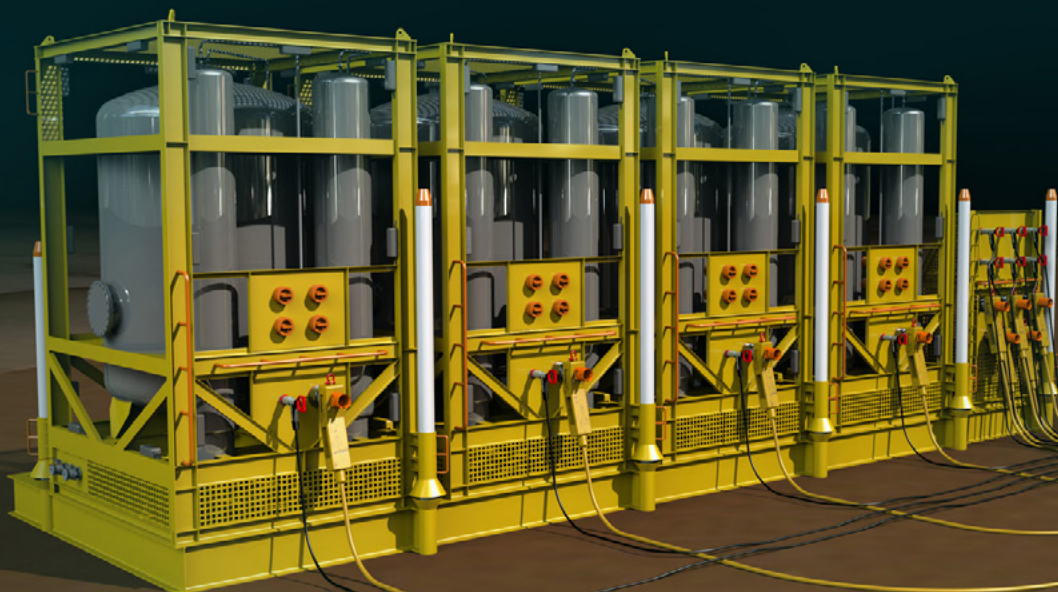
DESIGN DATA	TYPICAL PERFORMANCES
Fluids	Chemicals, barrier fluids and control fluids
Fluid storage unit module	30 m ³ (multiple units to fit larger demand)
Weight per module	< 70,000 kg
Flow rate	< 1L/hr to 5,000 L/hr (multiple units to fit larger demand)
Maximum pressure	Up to 10ksi
System configuration	Multiple, to fit projects demand
Electrical	400Vac, 50/60Hz, 3 Phase
Communication	Fiber optic Ethernet
Topside components	Master control station and electrical power unit

FLUIDEEP™ BLADDER STORAGE DESIGN



FLUIDEEP™ LIQUID BARRIER STORAGE DESIGN

SIMPLIFIES PROJECTS FOR LARGER STORAGE DEMAND

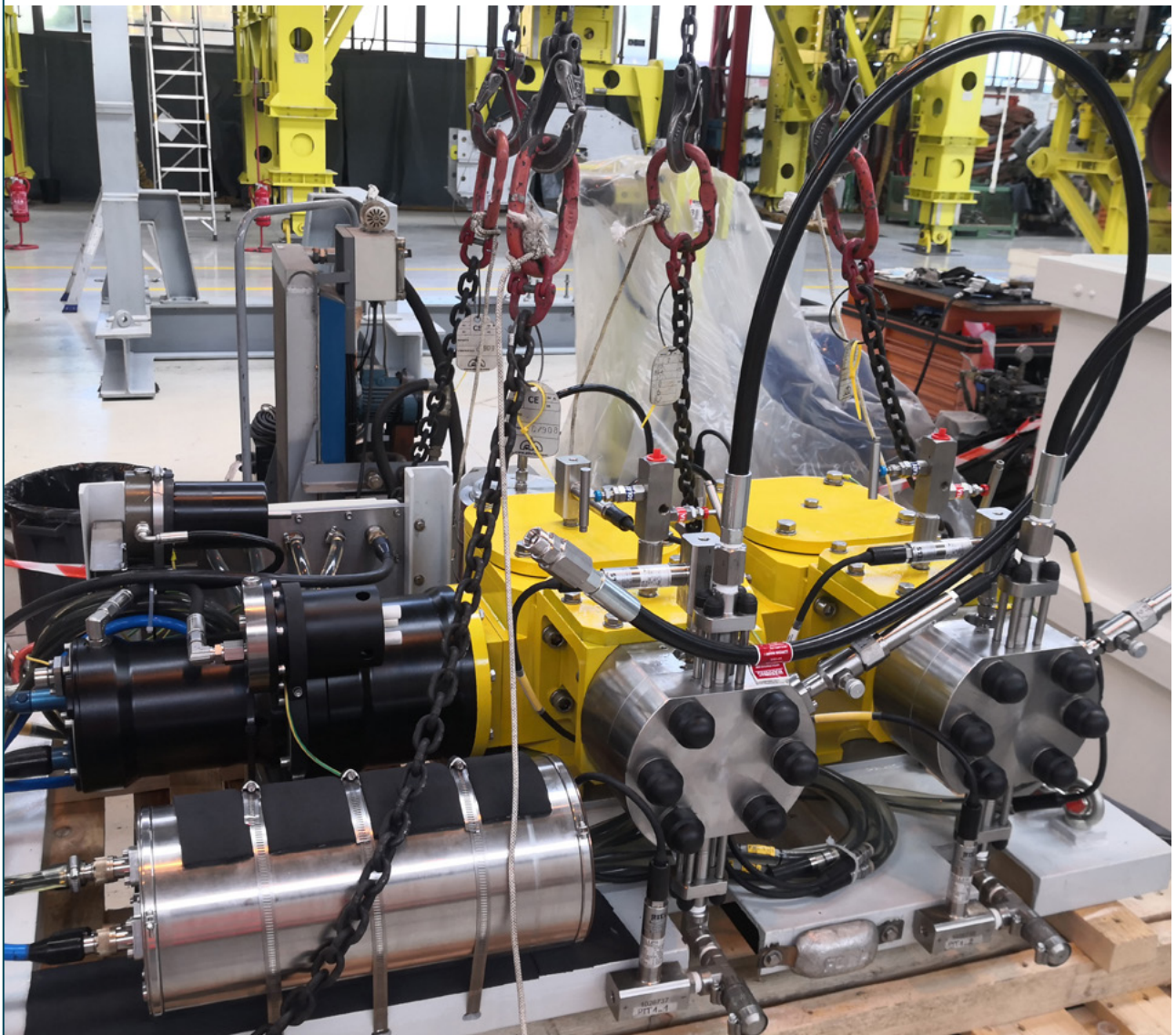


INDUSTRIALIZATION STEP

In advance of deploying the first industrial application, an industrialization programme was undertaken to ensure that every equipment necessary for a full-scale unit was available and qualified.

Several industrial partners were engaged to develop new products or upgrade existing ones, including:

- Chemical injection pump
- Subsea electrical motor & VSD unit
- Electrical actuator for small-bore valves
- Flow metering device
- Elastomeric bladder storage
- Liquid barrier storage





SAIPEM SpA
Via Luigi Russolo, 5
20138 – Milan
Italy

SAIPEM.COM

LET'S KEEP IN TOUCH

