OFFSHORE PIPELINES

INDEX

SAIPEM TODAY

SAIPEM TODAY IS A WORLD LEADER IN THE GLOBAL SUPPLY OF ENGINEERING, PROCUREMENT, PROJECT MANAGEMENT, CONSTRUCTION AND DRILLING SERVICES WITH DISTINCTIVE CAPABILITIES IN THE DESIGN AND EXECUTION OF LARGE-SCALE OFFSHORE AND ONSHORE PROJECTS.

Saipem has a strong bias towards oil and gas frontiers, namely activities in harsh and remote areas, in deep waters as well as in extremely cold and hot environments, applying significant technological competences in many diverse fields such as gas monetization and heavy oil exploitation.

Saipem is organized in two Business Units: Engineering & Construction and Drilling.

SAIPEM ENGINEERING & CONSTRUCTION

FOLLOWING AN AGGRESSIVE GROWTH STRATEGY, WHICH INCLUDED IN THE LAST DECADE THE ACQUISITION OF MANY CONSTRUCTION, TECHNOLOGY AND ENGINEERING COMPANIES, MOST PROMINENTLY OF SNAMPROGETTI, BOUYGUES OFFSHORE, SOFRESID AND MOSS MARITIME, SAIPEM HAS BECOME ONE OF THE WORLD LARGEST AND MOST COMPLETE ENGINEERING AND CONSTRUCTION COMPANIES IN THE GLOBAL OIL AND GAS MARKETS, ONSHORE AND OFFSHORE.

Ever since its initial steps in the fifties as the construction division of Snam, the pipeline company of the Eni Group in Italy, Saipem has pursued a systematic growth strategy, based on the development of internal assets, expertise and skilled resources, as well as on the acquisition of other players with their own asset bases, such as Micoperi in late eighties, and many others.

In the last decade, Saipem has continued its growth by acquiring Bouygues Offshore and Sofresid in France, Moss Maritime in Norway, IDPE in India and Snamprogetti in Italy, and by carrying out a multibillion investment program into the expansion of its offshore construction and drilling fleets. Since the year 2000, Saipem's market capitalization has grown more than sixfold and its revenues tenfold.(*)

The organizational integration of this considerable asset base, namely the network of engineering centres, fabrication and support yards in several continents as well as the offshore construction fleet, has been completed gradually over the years - most recently with the creation of a unified Business Unit Engineering & Construction, an entity with over 30,000 employees (excluding corporate and BU Drilling staff) from over 100 nationalities, with over 60 permanent establishments and numerous project execution centres around the globe, and with yearly revenues exceeding 10 billion €/y; all held together by outstanding project management skills.

Through the involvement of our global EP(I)C hubs in Milan, Rome and Fano (Italy), Paris (France) and Chennai (India), which operate in connection with a growing number of medium size and smaller regional engineering and project execution centres employing altogether over 7,000 engineers, Saipem balances high project execution quality with a competitive cost and - most importantly - with a major emphasis on local know-how and content.

This well-integrated multicenter approach provides a consistent design and robust execution philosophy on all our projects worldwide. Top priority is provided throughout to all HSEQ aspects.

Saipem therefore offers a complete range of project definition and execution services, offshore and onshore, particularly for the complex "mega-projects" required by the market today: from feasibility and conceptual studies to complex integrated solutions combining design, engineering, procurement, field construction, fabrication and offshore installation; also revamps, upgradings, maintenance, decommissionings, reclamations and decontaminations.

Saipem today operates in virtually every world market, often in remote locations with harsh environmental conditions and challenging logistics, leveraging on its proven experience across the most significant product lines in the oil and gas production onshore, offshore, in deepwater; gas and oil transportation via offshore and onshore pipeline systems; midstream, refining, chemicals, power generation from fossil as well as from renewable sources; environmental industries, maritime works and infrastructure.

This new series, therefore, outlines Saipem's integrated references in engineering and construction markets offshore and onshore, according to individual business and technology lines.

(*) Until Dec. 31, 2010

OFFSHORE PIPELINES

TO DATE, SAIPEM HAS LAID MORE THAN 30,000 KM OF TRUNKLINES AND FLOWLINES, FROM ULTRA-SHALLOW TO DEEPWATER, THROUGH ITS S-LAY AND MORE RECENTLY THROUGH ITS J-LAY TECHNOLOGY.

DURING THE YEARS, SAIPEM HAS EXPANDED ITS LEADING MARKET POSITION THANKS TO A LARGE, STATE-OF-THE-ART SPECIALIZED PIPELAYING FLEET, CONTINUOUSLY IMPROVED AND EXPANDED FOR DEEPWATER OPERATIONS, HARSH ENVIRONMENTS AND DIFFICULT AREAS.

Saipem began its pipelaying activity about fifty years ago in the Mediterranean Sea, with the operations of the *Castoro* Lay Barge, an oil tanker converted in a laybarge by Saipem in 1966 for the Huelva project in Spain.

Since its pioneering pipelines, Saipem has firstly expanded its presence throughout the Mediterranean, where it performed large and challenging projects from North Africa to Europe: for example, in the late seventies, the breakthrough Transmed project in 600 m water depths linking Algeria to Italy, then a world record for deepwater pipelaying operations. Following this avant-garde construction, the pipeline technology has progressed towards increasingly difficult environments.

With its growing fleet of pipelaying vessels, Saipem became a leader also in the development of the North Sea oil & gas infrastructures from the very beginning of that market.
In the nineties, the period of strongest growth of the area, Saipem laid the 660 km long Europipe, bringing gas from the Norwegian North Sea to Germany, and the 800 km long Zeepipe, among the longest pipelines in the world at that time.
The Company continued to be a major player and laid several pipelines even after the peak of the North Sea market, including the Balgzand-Bacton pipeline linking UK to Holland.

Saipem's positioning as a technology leader was reinforced with the investment, at the end of the nineties, in the J-lay technology, first applied on the *Saipem 7000*, allowing to lay in ultra-deepwaters.
Saipem 7000 is the largest heavy lift vessel on the market today, with a crane capacity of 14,000 tons operating in dynamic positioning.

The J-lay tower was employed to lay the Blue Stream pipeline, linking Russia to Turkey through the Black Sea with two 24" pipelines at a maximum water depth of 2,150 m: the most significant and challenging offshore deepwater pipeline ever completed.

In the years 2000, Saipem introduced innovative solutions to deal with very shallow water pipelaying in the Kashagan field (North Caspian Sea). The EPIC contract for a pipeline system was carried out in an isolated area, characterized by freezing temperatures and environment conservation requirements. For this purpose, Saipem developed a fleet of dedicated vessels, many of them built locally, for pipelaying and post-trenching activities.

Saipem's worldwide coverage of pipelaying operations includes today the vast areas of Asia Pacific and of the Middle East, where the Company is deeply rooted and where it established the record of the longest pipeline in the Persian Gulf with the Dolphin project, in 2004-2006.

With the Medgaz project in 2006-

Castoro Lay Barge, a converted oil tanker, the first Saipem pipelayer (1966)

2009, linking Algeria to Spain in water depths up to 2,150 m, Saipem performed a new challenging project with dedicated solutions, both in the design and installation phases, to cope with the critical aspects related to the water depth.

Saipem is currently laying the huge Nord Stream pipeline: two lines, each one 1,224 km long, linking Russia to Germany through the Baltic Sea. Once completed at the end of 2012, the pipeline system will have the capacity to transport 55 billion cubic metres per year (Bcm/y) from the vast reserves of Russia to the EU gas grid.

The current investment in the new pipelayer *Castorone* is reinforcing Saipem's role as the front-runner in the trunklines market. The *Castorone* is designed for the most challenging tasks of the future. She will be capable of laying with very high productivity up to 60" pipes in S-Lay mode or up to 36" in J-lay mode. With her unique J-lay tower capacity of 2,500 t, *Castorone* will be able to install pipelines and trunklines in water depths down to 3,000 m and to cope with the challenges of a new potential production area: the Arctic region.

Today, Saipem's pipelaying activity is spread globally. Saipem has developed a strong presence in all world basins. Thanks to a large and advanced fleet of dedicated vessels, Saipem has become one of the very few really global contractors.

Saipem offers a complete range of services for the definition, design, installation and commissioning of oil and gas transportation systems, from trunklines to export pipelines, from infield flowlines to pipe-in-pipe, from bundles to tie-in and riser systems.

This can be done either on an EPIC (Engineering, Procurement, Installation and Construction) or T & I (Transport and Installation) contractual basis, following the clients' needs and preferences. Moreover, Saipem can offer a package of additional services including:

- Trenching
- Backfilling
- Remotely Operated Vehicles (ROV) services
- Inspection, Repair and Maintenance (IRM) services

For example, underwater intervention capabilities and repair systems have been developed by Saipem during the years, allowing the Company to succeed in projects like the Transmed pipeline repair.

FIELD DEVELOPMENT PROJECTS

IN ADDITION TO THE TRUNKLINES, SAIPEM INSTALLS SMALLER DIAMETER PIPELINES OR FLOWLINES FOR COMPLEX FIELD DEVELOPMENT PROJECTS, IN SHALLOW AND DEEPWATER.

The flowlines, especially in deepwaters, are usually part of larger packages for the development of the subsea systems architecture, on basis of EPIC SURF (Subsea, Umbilical, Risers and Flowlines) contracts. Saipem is a leader in this sector of offshore activity.

Saipem is reinforcing its position in the Field Development market with the new vessel *Saipem FDS 2*, recently delivered and equipped with a J-lay tower to lay in ultradeepwaters.

The laying of small diameter pipelines and export lines can also be associated to the installation of one or more fixed platforms. Saipem has a very strong track record in shallow water combined developments, leveraging its first-class capabilities of pipelaying and ultra-heavy lifting.
Please refer to the parallel "Fixed Offshore Production Facilities" brochure for more details

THE TREND TOWARDS DEEP AND ULTRA-DEEP WATERS

THROUGH THE STEEP-S TECHNIQUE, THE S-LAY METHOD GOES DEEPER AND DEEPER WITH UNBEATEN EFFICIENCY, WHILE THE NEWER J-LAY METHOD REMAINS UNIQUE FOR ULTRA-DEEP WATER LAYING.

S-lay

The S-lay conventional method of installation takes its name from the shape of the S-configuration of the suspended pipe from the stinger to the seabed.

Individual lengths of pipes are welded on the pipelay vessel and deployed horizontally over the stern down a stinger, which supports and guides the pipe as it enters into the water.
The pipe is held under tension as it leaves the vessel.
The length and curvature of the stinger, as well as the available tension, are key elements in maintaining pipe integrity.

The S-lay is the method of choice for the installation of large diameter trunklines in traditional waters, while for small diameter pipelines the reel-lay method is employed as well.

The technique allows high lay rate, even for large diameter pipes, hence it is the technology of choice in many markets today.

Saipem owns a large fleet of pipelaying vessels equipped in S-mode, like the *Castoro II,* the *Crawler,* the *Castoro Sei,* the *Castoro 7*, the *Castoro Otto*, the *Castoro 10*, the *Semac 1*, the *S 355* and the *Castorone*, under construction.

Saipem has continuously developed additional technical improvements in its S-lay fleet since the beginning of its activities, stretching its capabilities to achieve new records: a key of its success.

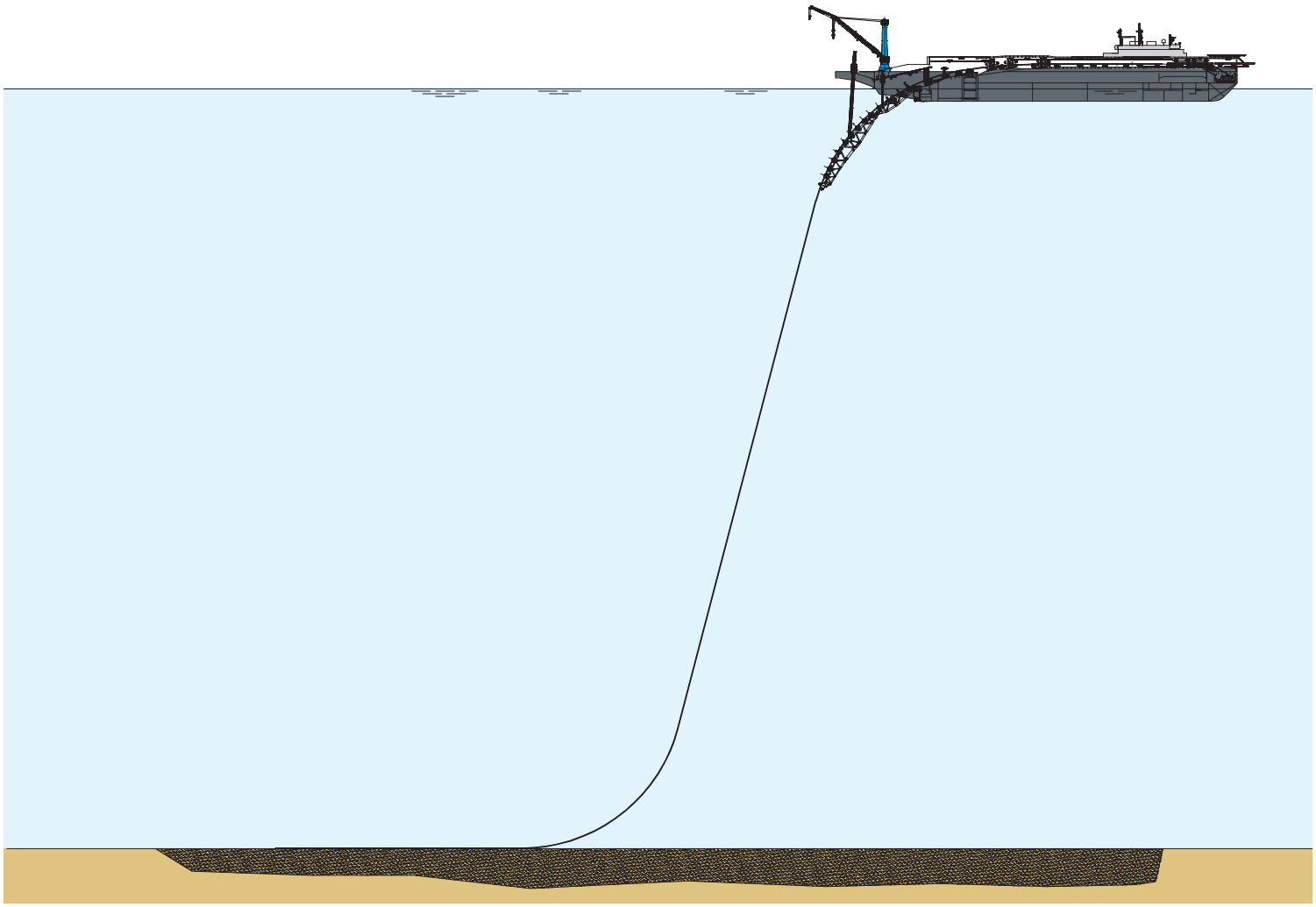
In the eighties, the *Castoro Sei* extended its S-lay capabilities by upgrading the tensioning capacity and reassessing the design and installation criteria. This has allowed installation of the following pipelines:

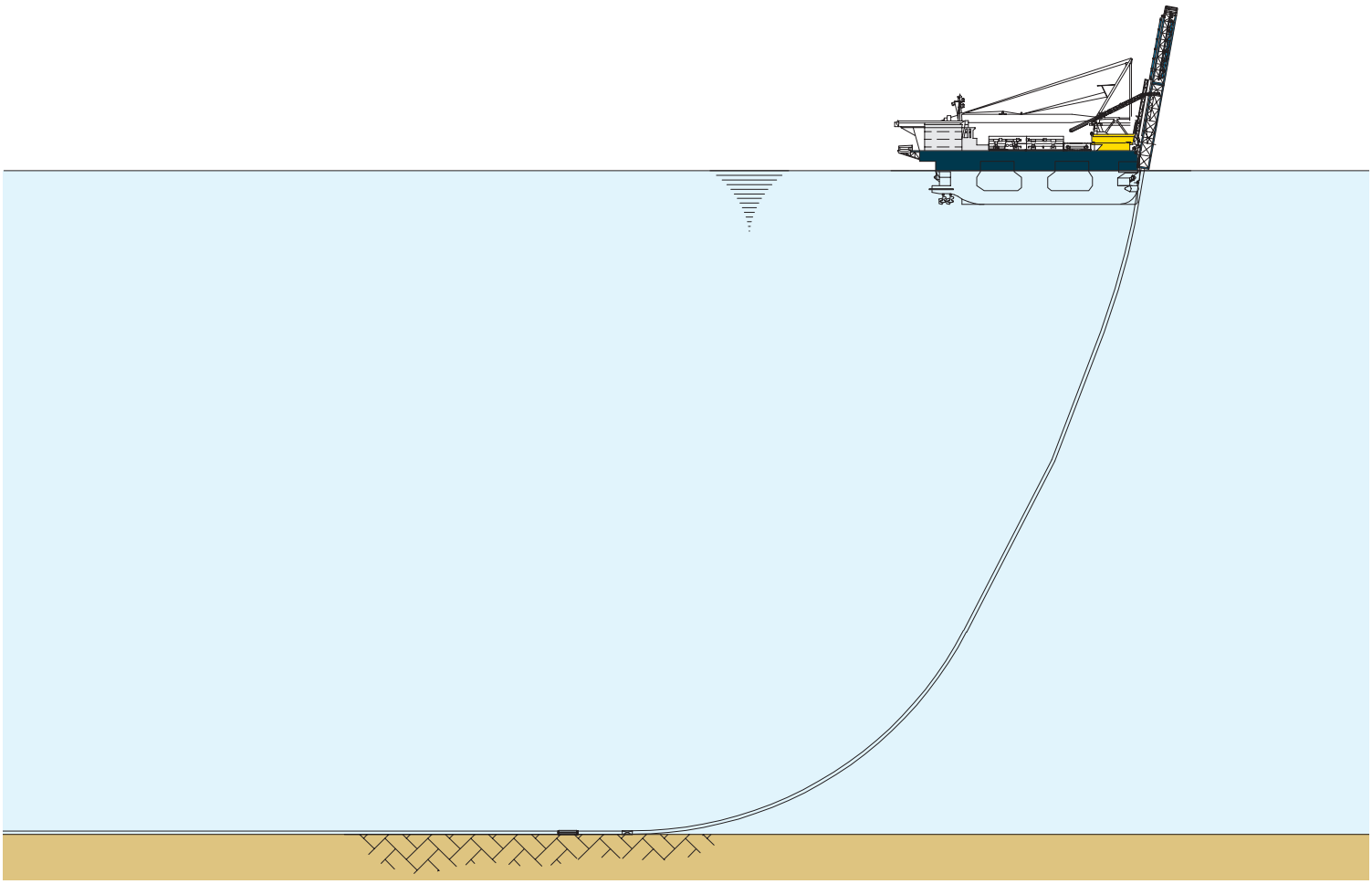
- The Transmed project (1979-1981),

  crossing the Channel of Sicily in a water depth of more than 600 m, that represented a milestone in the industry for several years.

- The Greenstream Project (2002-2004), whereby the Company achieved another outstanding achievement in the S-laying mode at about 1,230 m water depth.

The new vessel *Castorone* will further the S-lay technology in order to operate with the highest efficiency in waters deeper than 2,000 m thanks to innovative solutions, such as the pipe prefabrication process with triple joint, as well as novel firing line, stinger and loading/storage system.






SAIPEM
SAIPEM 7000

J-lay

The newer J-lay method is the method of choice for the installation in deep waters: the pipe is deployed vertically into the water forming a 'J' curve from the surface to the seabed.
Several pipes are pre-assembled into 'strings' of pipes, which are then upended in a vertical position in a specially built tower on the lay vessel. Here, they are welded together and lowered at a near vertical angle to the seabed.

The main advantages of the J-lay system are the reduction of the stress imposed on the pipeline as well as the decrease of the distance to the touchdown point, since the line is lowered straight down into the water. This brings a corresponding reduction in the pipelay vessel's tensioning requirements for the sake of pipeline integrity.

Moreover, the J-lay technique is more accurate in terms of pipe positioning.

Saipem's largest or most modern vessels, such as the *Saipem 700*0, the *Saipem FDS* and the *Saipem FDS 2*, all use the J-lay technique. The new *Castorone* will be equipped with a J-Lay tower as well. Indeed, Saipem's flagship *Saipem 7000*, originally a ultra-heavy lift vessel, was upgraded in 1999 with the J-lay tower in order to become a combined lifting and pipelaying vessel. The vessel is equipped with a J-lay tower self-erecting and removable by the vessel's own cranes. She can lay in 'J' mode quad-joint pipelines with an outside diameter from 4" to 32".

The J-lay innovation was a breakthrough for Saipem, reaching unprecedented water depths, in excess of 2,000 m.

The *Saipem 7000* has used this technique to lay pipes on the Blue Stream project (1999-2003), consisting of two 390 km long 24" pipelines, reaching a 2,150 m water depth in the Black Sea: an absolute record for the whole industry in terms of technical difficulty.

With the Medgaz project (2006-2009), Saipem reached again the outstanding water depth of 2,150 m water depth in J-lay mode.
The recent *Saipem FDS* 'Field Development Ship' is an advanced DP multipurpose vessel, equipped with a J-lay tower capable of laying up to 22" diameter pipelines in deep water. Quad-joint pipelines up to 52 m can thus be laid. In the last ten years, the vessel was the main actor in the execution of some of the most challenging deep water fields in West Africa, such as Kizomba A, Kizomba B and Rosa.

The newly built *Saipem FDS 2* is equipped with a J lay tower designed to lay 52 m long quad-joint strings. The pipe diameter ranges from 4" to 36".

The *Castorone*, under construction, will be also equipped with a J-lay tower to lay pipe up to 36", when required. The design of the J-lay tower has been made in order to minimize the timing needed to switch between the S-lay and J-lay modes.

TECHNOLOGY INNOVATION

THE WIDE RANGE OF SERVICES OFFERED TO SAIPEM'S CLIENTS IS BASED ON CONTINUOUS INNOVATION AND UNDERSTANDING OF MARKET NEEDS.

SEVERAL NEW TECHNICAL DEVELOPMENTS ARE INCORPORATED IN OUR FLEET OR IN OUR PIPELAYING TECHNOLOGIES.

From the very beginning of its pipelaying activities, Saipem has always been committed to developing new methods and new vessels. This commitment has led Saipem to continuously establish new records in ultra-deep as well as in ultra-shallow waters.

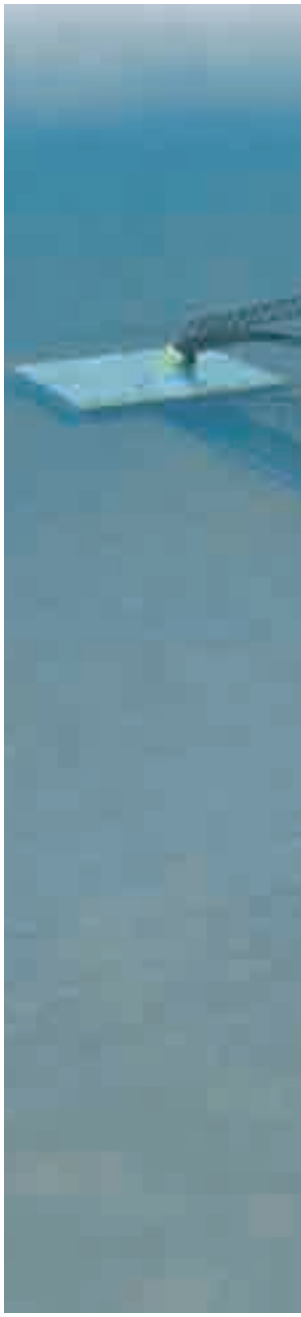
In addition to innovations incorporated in its fleet and equipment, Saipem has also developed new pipeline engineering procedures for operations in harsh environments, deep waters and high pressures and temperatures.

Internal development, R&D and joint industry projects were dedicated to develop the basic disciplines of pipeline technology: rooting, metocean environment, marine geotechnics, line pipe material, flow assurance, strength and performance during installation and in service, risk analysis, inspection, maintenance, repair.
Tools, equipment and procedures so developed have often become industry standards through the certification of Det Norske Veritas.

Today Saipem continues to develop and innovate with programs aimed at strengthening and further extending the laying capabilities in ultra-deepwater frontiers (e.g. the new vessel *Castorone*, the J-lay technology, the new systems of abandonment/recovery of pipelines), in ultra-shallow waters (Kazakhstan) and in the Arctic environments.

Together with the innovations in the project execution approaches, Saipem is improving the competitiveness of its fleet, with new patented methods and equipment for welding and field joint coating, as well for improving the reliability of its processes and its equipment, and mitigating the risks during operations.

Saipem's technology programs pay special attention to the environment: for example, research for trenching in environmentally sensitive areas, new pipelaying technologies minimizing the environmental impact on the ecosystems, such as the Posidoniae meadows, etc..



ULTRA-SHALLOW WATERS

DEDICATED FLEET AND SYSTEMS FOR LAYING, TRENCHING, POST TRENCHING AND BACK FILLING IN EXTREMELY SHALLOW WATERS.

For the Caspian Sea, Saipem has developed a dedicated fleet - consisting of the laybarge *Castoro 12*, the trenching barge *Saipem TRB*, the ancillary vessels *TRB Tenders*, the Ersai vessels and the new post-trenching barge *Castoro 16* - that is capable of operating in ultra-shallow waters, high temperature ranges, harsh and difficult environments, all thanks to advanced laying and trenching technologies.

Saipem has developed not only a dedicated fleet, but also new equipment and tools fitting the needs of the projects in those very particular requirements, such as a system allowing to pull pipe strings up to 9 kilometres long, to tow them to the laying position while floating, to plunge, to trench and to post-trench them. An additional patented system has been developed to maintain the trajectory of the pipe during launching.

Because of the physical and environmental characteristics of the Caspian Sea, the design, the construction and operations of safe vessels with a low environmental impact became a primary technological objective for the entire Kazakhstan's Kashagan project.

Low environmental impact solutions for laying and burying in the presence of ice and in very shallow water have been designed, built, tested and optimized. Trunklines have been installed under the seabed by minimizing the amount of excavated soil.

TRB Tenders

In particular, for the trench, post-trench and backfilling phases, Saipem has developed a system of small ultra-light vessels initially called 'Mondine' (Italian for 'rice weeders') – now TRB Tenders (Trenching and Backfilling Tenders) - designed for operations in the transition zone, where no other craft can operate.

The *TRB Tenders* were the ancillary vessels of the *Saipem TRB* (Trenching Barge), operating in combination with the laybarge *Castoro 12*. They enabled the excavation of a trench of the desired depth and the burying of the pipe at the same time, using the material removed during the excavation for backfilling without contaminating the surrounding environment.

The pipes were then covered by the excavated soil to protect the pipe from ice, leaving the seabed as flat as possible and minimising the environmental impact.

This new system allowed to avoid the dredging of a wide canal to enable the access to 'standard' vessels, which would have required the excavation of huge amounts of soil with serious physical and biological effects, especially on the seabed sediments and on the benthic community.

ARCTIC PROSPECTS

The experience gained in sub-arctic regions like the Sakhalin II project, in far eastern Russia, with the laying of pipelines in Piltun A, Piltun B and Lunskoye fields, and in arctic-like regions like the Caspian, with the execution of the challenging Kashagan project, allowed Saipem to generate an extremely valuable know-how as well as numerous highly innovative technical developments, to be utilized for future potential prospects in the Arctic environments, characterised by severe needs for ice management, ice scouring, deeper trenching etc.

In the Saipem fleet, the new vessel *Castorone*, under construction, is specifically fitted for Arctic operations.

CASTORONE

CONCENTRATION OF TECHNOLOGY AND EFFICIENCY
THE MOST ADVANCED PIPELAYER IN THE WORLD IN OPERATION FROM 2013

DYNAMICALLY POSITIONED DEEPWATER LAYBARGE FOR HIGH PRODUCTIVITY OPERATIONS IN EXTREME ENVIRONMENTS.

DESIGNED TO MEET THE CHALLENGES OF THE PRESENT AND FUTURE TRUNKLINE MARKET

- HIGH PRODUCTIVITY VESSEL FOR LARGE PIPELINES IN SHALLOW WATER.
- HIGH PRODUCTIVITY VESSEL TO S-LAY TRUNKLINES IN ULTRA-DEEPWATERS OVER 2,000 M.
- J-LAY VESSEL FOR TRUNKLINES IN ULTRA-DEEPWATERS OVER 3,000 M.
- SPECIALLY EQUIPPED FOR ARCTIC ENVIRONMENT.

Distinctive characteristics incorporating Saipem proprietary technologies and technical excellence:

- Class 3 Dynamic Positioning
- Ice Class A0 (IA Baltic)
- Transit speed 13 knots
- High storage capacity – about 20,000 t
- Utilizing the most advanced Saipem welding, coating and quality control systems
- Equipped to install in-line heavy bulky items
- Upgradable to unmanned loading and offloading of pipe joints

Frontier S-lay Capabilities

- S-laying capability in dynamic positioning mode with pipes diameter up to 60"
- Unique capability to join 18 m long pipes in a high productivity process
- Prefabrication of pipe strings 36 m long – 3 pipes of 12 m with triple joint or 2 pipes of 18 m with double joint
- Stinger specifically designed to allow optimized laying for any pipe diameter and water depth, through a continuous control of the pipe overbend stresses
- Stinger containing three articulated adjustable sections allowing to be configured from shallow to ultradeep water without abandoning the pipe - a unique feature in the market
- 7 welding stations for shallow water pipelaying
- Pulling capacity of 750 t - holding capacity 975 t
- System allowing to control the unexpected flooding of the pipe to maintain safe laying conditions
- Holding capacity of 1,500 t for flooded case scenario

J-lay potential

- Designed for future installation of a fixed tower for triple joint J-lay in excess of 3,000 m water depth
- Designed to switch offshore from S-lay to J-lay during operations within the same project to best fit route and water depth requirements with minimum time losses
- Weather vaning with J-lay tower in vertical position

Above Water Tie-In Potential

- Designed for future installation of up to 10 above water tie-in davits for easy completion of shore-shore trunklines

Please refer to the "E&C Offshore Construction Fleet" brochure for a more detailed description.

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Australia	Inpex	Gas Export Pipeline on the Ichthys LNG Project	EPIC
U.S.A.	Discovery Producers LLC	Keathley Canyon Connector Gas Export Pipeline	T & I

GAS EXPORT PIPELINE ON THE ICHTHYS LNG PROJECT – AUSTRALIA

The Ichthys Project is expected to produce 8.4 million t of LNG and 1.6 million t of LPG per annum, along with approximately 100,000 barrels of condensate per day at peak.

Gas from the Ichthys Field, in the Browse Basin, approximately 200 km offshore of Western Australia, will undergo preliminary processing offshore to remove water and extract condensate, prior to the longest trunkline ever laid in Asia Pacific.

Saipem's scope of work, under an EPIC contract, consists in the Engineering, Procurement, Construction and Installation of a 889 km, 42" subsea pipeline, in water depths of up to 275 m, connecting the offshore central processing facility to the onshore processing facility in Darwin.

Offshore activities will be carried out by the new Castorone pipelaying vessel, while the recently upgraded Semac 1 pipelay barge will be employed for the shallow water section.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
889	42"	Castorone - Semac 1	max 275	Under Exec.
350	20"	Castorone	100 - 2,100	Under Exec.

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Brazil	Petrobras	Guara & Lula Northeast Gas Export Pipelines	EPIC
Brazil	Petrobras	Lula NE - Cernambi Gas Export Pipelines	EPIC

LULA NORTHEAST - CERNAMBI AND GUARA & LULA NORTHEAST EXPORT PIPELINES - BRAZIL

Two EPIC contracts:

- The first, awarded in May 2011, to install the Guara & Lula-Northeast export pipelines, including a 54 km, 18" line connecting the Guara FPSO vessel to a gathering manifold in the Lula field and a 22 km, 18" line connecting the Lula-Northeast FPSO to the same manifold.

- The second, awarded in December 2011, to install the Lula Northeast Cernambi gas export line, 18" in diameter and 19 km long, connecting the field of Cernambi to a central manifold in the Lula field.

Both pipelines are being installed in water dephts between 2,100 m and 2,200 m by the new vessel Saipem FDS 2, utilizing the J-lay technology.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 5 4- 1 X 2 2	18″	FDS 2	2,100 - 2,200	Under Exec.
19	18″	FDS 2	2,200	Under Exec.

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Norway	Statoil	Gudrun Sigrun Development Project - Installation of Pipelines	T & I
United Kingdom	Centrica Resources	York Development Pipelines	EPIC
Russia	Nord Stream	Nord Stream Pipeline	T & I

NORD STREAM PIPELINE - RUSSIA TO GERMANY

The two 48" natural gas sealines of 1,220 km each, linking Vyborg (Russia) to Greifswald (Germany) through the Baltic Sea, will be the longest and heaviest underwater pipeline system ever built. The two lines will supply 55 bcm per year of gas to the European Union energy grid.

On the average, 3 km of pipes (8,000 - 9,000 t) are laid daily, for an uninterrupted operation throughout the year.

The installation of Line 1 started in April 2010 and was successfully completed in May 2011. Saipem is employing Castoro Sei and Castoro 10 as main vessels, as well as a multitude of smaller support ships.

Throughout, particular attention was paid to respecting the environment, e.g. by maintaining the birds' and fishes' natural habitats.

With this project, Saipem established the world record for the pipelaying of the largest trunkline (48" diameter) with high grade material (X70 grade).

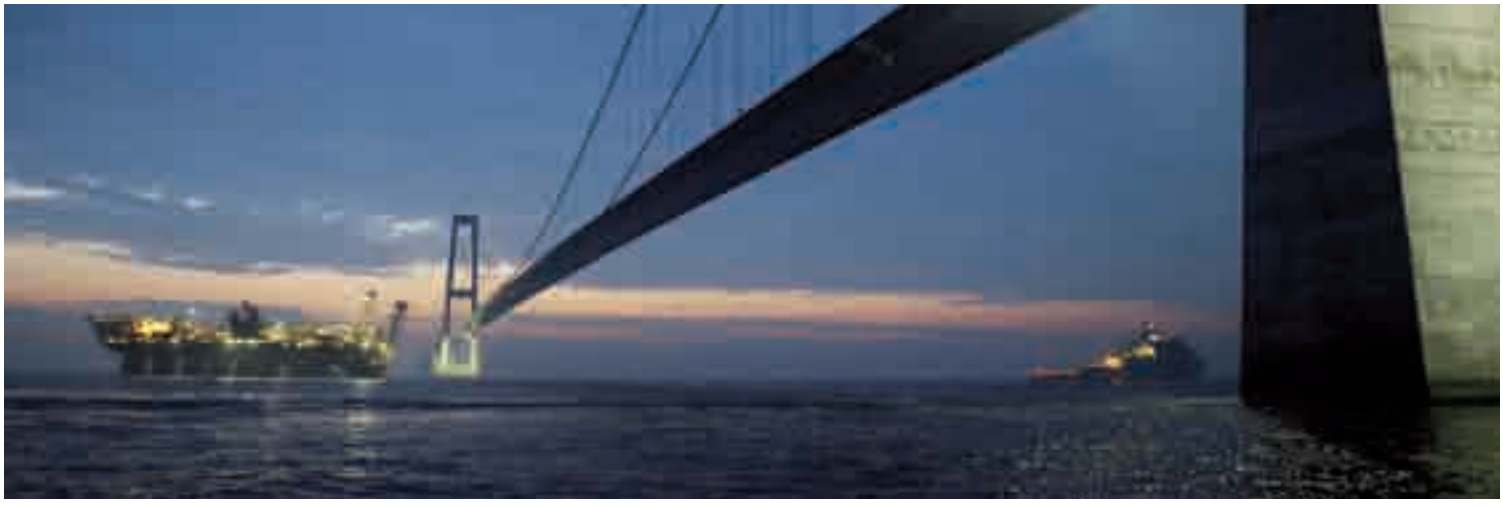
LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 5 5- 1 X 5 7	12" - 14"	Castoro 7	113	Under Exec.
2 X 3 4	3" - 16"	Castoro 7 - S 355	max 44	Under Exec.
2 X 1,220	48"	Castoro 10 - Castoro Sei	max 210	Under Exec.

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Saudi Arabia	Saudi Arabian Oil Company	Al Wasit Program: Arabiyah and Hasbah Combined Offshore / Onshore Facilities	EPIC (Sealines + Platform)
Papua New Guinea	Esso Higlands/Esso Australia	PNG LNG EPC2 - Offshore Pipeline	EPIC
U.S.A.	Chevron	Walker Ridge Export Pipeline (Jack and Saint Malo fields)	T & I
U.S.A.	Enbridge Offshore Facilities	Big Foot Oil Export Lateral Pipeline	T & I
Saudi Arabia	Saudi Arabian Oil Company	Maintain Potential Facilities LTA 2008-2012	EPIC (Sealines + Platform)
Italy	Snam Rete Gas	Livorno FSRU - Offshore Pipeline	T & I
Spain	UTE ACS - Cobra Castor	Castor Underground Gas Storage Development: Gas Pipeline	T & I
Venezuela	PDVSA Gas SA	Dragon Cigma Pipeline	T & I
Nigeria	Mobil Producing Nigeria	Usari - Idoho Pipeline Replacement	T & I
Angola	Total E&P Angola	Block 17 Gas Export Pipeline Project - Phase 1	EPIC (Sealines + Subsea)
Brazil	Petrobras	Urugua' - Mexilhao Pipeline	T & I (Sealines + Subsea)
China	China Offshore Oil Engineering	Ledong 22-1 / 15-1 Gas Field Pipelines	T & I
Angola	Cabinda Gulf Oil Company	Takula GPP Pipelines Project	T & I
Norway	Statoil	Pipeline Installation of Gjoa Export Pipelines	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
2 X 1 3 0- 2 X 75 3 X 5 0- 2 X 2 0	4" - 36"	Castoro II - Castoro Otto	40 -60	Under Exec.
407	36"	Castoro 10 - Semac 1	max 110	Under Exec.
226	24"	Castorone	max 2140	Under Exec.
59	20"	Castorone	max 1,714	Under Exec.
1 X 42 - 1 X 8 - Others	42"	Castoro II	max 42	Under Exec.
28	32"	Castoro 7	max 112	Under Exec.
21	30"	S 355	60	Under Exec.
110	36"	Castoro 7	30 - 140	2011
28	24"	Crawler	30 - 40	2011
1 X 2 7- 1 X 4 0	16"	Castoro II - FDS - Saipem 3000	max 1,200	2010
175	18"	FDS	1,300	2010
1 X 2 0- 1 X 9 9	12" - 24"	Semac 1	100	2009
1 X 1 9- 1 X 5	6" - 24"	Castoro II - Saipem 3000	max 65	2009
1 X 1 3 0- 1 X 5 5	16" - 28"	Castoro 6	140 - 370	2009



PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Spain	Enagas S.A.	Balearic Islands Pipeline	T & I

BALEARIC ISLAND PIPELINE - SPAIN TO IBIZIA TO MALLORCA

These two 20" submarine natural gas pipelines from Spain to the Island of Ibiza and from Ibiza to Mallorca, for an overall lenght of 270 km in 995 m of maximum water depth, were executed under challenging conditions:

- Deep waters
- Protected environment
- Difficult weather conditions

Saipem performed the pipelaying and the pulls at shore approaches using the Castoro Sei.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 1 2 3- 1 X 1 4 5	20"	Castoro Sei - Crawler	max 995	2009

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Algeria	Medgaz S.A.	Medgaz - Algeria to Spain	EPIC

MEDGAZ - ALGERIA TO SPAIN

One of the most challenging offshore projects, crossing the ultradeepwaters of the Alboran Sea in water dephts up to 2,155 m.

Saipem developed dedicated solutions, both for the design and installation stages, to solve critical problems related to the water depth.

The shore approach in Spain was critical also from an environmental point of view.

In order to avoid interference with fishing activities, a 15 km long pipeline section was buried at water depths between 200 and 950 m.

The laying operations were performed by the vessels Saipem 7000 and Castoro Sei.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
210	24"	Castoro Sei - Crawler - Saipem 7000	max 2,155	2009

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Nigeria	Total Upstream Nigeria Limited	Akpo Field Development	EPIC (Sealines + Subsea)
Australia	Eni Australia	Black Tip Development	EPIC (Sealines + Platform)
Kazkhstan	Agip KCO	Kashagan Field Development Project - Trunklines and Production Flowlines	EPIC

KASHAGAN FIELD DEVELOPMENT PROJECT – EXPERIMENTAL PROGRAMME TRUNKLINES AND PRODUCTION FLOWLINES - KAZAKHSTAN

The Kashagan field, located in the North Caspian Sea (Kazakhstan), is one of the largest oil finds discovered in the past three decades.
The development of this complex project was a major challenge due to the need to operate in very shallow waters, from 4 m in Kashagan East to 0 m near shore.

The ultra-shallow water depth, combined with extreme environmental conditions, led Saipem to developing unique innovative solutions. In particular, Saipem built a fleet of dedicated vessels for pipelaying and post-trenching, including the pipelay barge Castoro 12, the trenching barge Saipem TRB and the ancillary TRB Tenders.

The EPIC contract for the pipeline system was carried out in an isolated area, characterized by freezing temperatures and major attention to the conservation of the environment.

Saipem has executed several tasks, including the hook-up and commissioning of Complex ‘D’ and Island 'A' Offshore Facilities. The trunklines and production flowlines project mainly consisted in laying 3 offshore trunklines about 70 km long, in addition to onshore pipelines about 30 km long. Flowlines, umbilicals, power and fibre optic cables were laid as well.

With this project, Saipem established the industry record for the longest pipeline shore pull in floating conditions of 10 km for two lines of 28” and one line of 18”.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
150	16"	FDS	max 1,300	2009
108	18"	Castoro Otto	50	2009
3 X 7 0- 3 X 6	10" - 28"	Castoro 12	4 - 8	2009

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Italy	Eni Exploration & Production	Eni E&P Frame Agreement 2009: inst. Annamaria B platform and sealines	T & I (Sealines + Platform)
Angola	Cabinda Gulf Oil Company	Malongo Terminal Oil Export Pipeline	T & I (Sealines + Subsea)
United Kingdom	ConocoPhillips (U.K.)	Viking Pipeline	EPIC
Egypt	Burullus Gas Company	Sequoia Joint Development Project	EPIC (Sealines + Subsea)
Italy	Terminale GNL Adriatico	Adriatic LNG Project	T & I
Taiwan	Chinese Petroleum Company	Taichung-Tunghsiao-Tatan Offshore Gas Pipeline System	EPIC
Tunisia	British Gas	Hasdrubal Offshore Pipeline	T & I
Thailand	PTT Exploration and Production	Third Transmission Pipeline Part 3	T & I
Egypt	Petrobel	Denise Project - Sealine Installation	T & I
Thailand - Malaysia	Trans Thai Malaysia	JDA A18 - B17 Gas Pipeline Project	T & I
Congo	Eni Congo	Awa Paloukou Sealine and Platform Installation	EPIC
Egypt	Rashid Petroleum Company (Rashpetco)	Rosetta Phase III Development Project	T & I
Angola	Total E&P Angola	Rosa SURF Development	EPIC (Sealines + Subsea)
Italy	Eni Exploration & Production	Frame Agreement 2004 - 2008 - Year 2006 (sealines)	T & I
United Kingdom	Talisman Energy (UK)	Tweedsmuir Project - Production Pipeline Installation and Associated Services	T & I
Norway	Statoil ASA	Tampen Link Pipeline	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 3 7- 1 X 3	3" - 18"	Crawler	60	2009
30	42"	Castoro II - Saipem 3000	max 35	2009
27	16"	Castoro Sei	11 - 35	2009
24	22"	FDS	70 - 119	2009
15	30"	Crawler	max 30	2009
1 X 4 1- 1 X 8 5	36"	Semac 1	max 85	2008
1 X 9 6- 1 X 10	18"	Crawler	60	2008
87	42"	Castoro Otto - Semac 1	68 - 79	2008
61	32"	Crawler - S 355	68	2008
50	42"	Castoro Otto - Semac 1	54 - 62	2008
36	10"	Castoro II	80	2008
19	18"	S 355	max 160	2008
1 X 5 5- 1 X 4 0	8" - 10" - 12"	FDS - Saipem 3000	1,400	2007
1 X 6 5- 1 X 4 0	3" - 10" - 16"	Crawler	30 - 140	2007
54	12" - 18"	Castoro Sei	134 - 140	2007
23	32"	Castoro Sei	139 - 145	2007

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Nigeria	Mobil Producing Nigeria	East Area Projects EPC2A (Additional Oil Recovery AOR Project)	EPIC (Sealines + Platform)
Russia	Sakhalin Energy Investment Company	Sakhalin II Phase 2 Project Development (pipelines & cables)	EPIC
Norway	Norsk Hydro	Ormen Lange Project - Deepwater Pipelines Installation and Tie-Ins	T & I
Qatar	Dolphin Energy	Dolphin Export Pipeline and Sealines	EPIC

DOLPHIN EXPORT PIPELINE – QATAR TO UAE

One of the largest trans-border energy projects ever undertaken in the Middle East.

The project consisted in the installation of:

- two 36" sealines about 80 km long to transport the production stream from the wellheads to Ras Laffan for treatment, processing, store and preparation to export (Upstream part of the project)
- a 48"offshore export pipeline about 360 km long from Ras Laffan in Qatar to Taweelah in the UAE (Midstream part of the project).

The capacity of the export pipeline is 3.2 bscfd of natural gas.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 5 3- 1 X 2 1	18" - 20"	Saipem 3000 - S 355	30	2006
2 X 4 1- 2 X 1 7 2 X 1 4	14"	Castoro 10 - Castoro II Castoro Otto - Semac 1	30	2006
2 X 2 1	30"	Saipem 7000	550	2006
1 X 3 6 1- 1 X 8 3 1 X 6 7	36" - 48"	Castoro II - Castoro Sei	55	2006

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
United Kingdom	Nexen Petroleum UK	Buzzard Pipelines and Subsea	EPIC (Sealines + Subsea)
The Netherlands	BBL Company	BBL Project: Gasline from Balgzand to Bacton	T & I
Hong Kong	Hong Kong Electric	Lamma Power Station Extension: Supply and Installation of Submarine Gas Pipeline	EPIC
United Kingdom	BP Exploration	Rhum Sealines Installation and Commissioning	T & I
Libya	Agip Gas	Bahr Essalam Gathering Pipelines and Export Trunklines	EPIC
Australia	ConocoPhillips Pipeline Australia Pty	Bayu Darwin	T & I
Iran	IOOC - Iranian Offshore Oil Company	Sirri Island to Kish Island Pipeline	EPIC
United Kingdom	Conoco Phillips	Saturn	EPIC
Croatia	INAgip	Ika, Ida and Ivana Gas Fields Platforms and Pipelines Installation	T & I (Sealine + Platform)
Thailand	PTT Exploration and Production Public	Bongkot Field Development Project Phase IIIc- Package 2 (C350 and C351)	EPIC (Sealine + Platform)

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 2 9- 1 X 2 8	10" - 18"	Castoro Sei	100	2006
230	36"	Castoro Sei	0 - 50	2006
92	20"	Castoro 10	max 35	2006
44	16" - 22"	Castoro Sei	120	2005
2 X 1 0 7- 1 X 2 4	10" - 22" - 36"	Castoro Sei - Crawler	141 - 190	2005
502	26"	Semac 1	80	2005
83	12"	S 335	max 102	2005
43	14"	Castoro Sei	30	2005
37	16"	Crawler	45 - 60	2005
22	22"	Castoro 10 - Castoro II - Castoro Otto	80	2005

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Libya	Greenstream	Greenstream - Libya Gas Transmission System	T & I

GREENSTREAM - LIBYA GAS TRANSMISSION SYSTEM

The 516 km long Greenstream gas pipeline (Libyan Gas Transmission System - LGTS), running from Mellitah in Libya to Gela in Sicily, Italy, still represents the longest sealine laid in the Mediterranean Sea and one of the biggest challenges ever faced in terms of design and complexity.

The depth and the slope of the seabed, the close attention to the environment and the very tight timetable made the Greenstream project a challenge with high technology content.

The sealine crosses the sea at points where the depth reaches 1,127 m: an outstanding achievement for a large diameter pipe laid in S-lay mode.

With the Greenstream project, Saipem established the record of deepest pipelaying with anchors.

To operate in deep water it was necessary to make some modifications to the Castoro Sei, in particular to the whole mooring system: innovative monitoring systems provided the technical state of stress of the tube during launch operations in real time; the launch ramp was also revised to optimize the timing and increase the average daily production.

The gas produced at the Wafa field in the desert and at the Bahr Essalam offshore field is transmitted by pipeline to Mellitah, on the Libyan coast, for treatment; a part is compressed and exported to Sicily through the Greenstream pipeline, while the other is destined to the local market.

For this project, Saipem employed the vessels Castoro Sei and Crawler.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
516	32"	Castoro Sei - Crawler	max 1,127	2004

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Thailand	TTM (Trans-Thai Malaysia)	Trans Thailand - Malaysia (TTM) Gas Pipeline	T & I
Indonesia	TotalFinaElf	Peciko Field Development Phase IV (PCK4 EPSC2)	EPIC (Sealine + Platform)
Iran	Agip Iran	South Pars Phases 4 and 5 - Offshore Sealines	T & I
Australia	Woodside	TSEP (2nd Trunkline)	T & I
United Kingdom	Shell	Goldeneye	EPIC
United Kingdom	Ramco Oil & Gas	Seven Heads	T & I
Denmark	DONG A/S	Nini and Cecilie	EPIC
Russia	Blue Stream Pipeline Company	Blue Stream	EPIC

BLUE STREAM - BLACK SEA

The Blue Stream, a gas transport system consisting of twin 24" diameter pipelines long about 380 km each crossing the Black Sea from Russia to Turkey, at a maximum water depth in excess of 2,150 m, can be considered the most challenging deepwater pipeline ever completed for the combination of water depth and diameter.

In addition to such challenging combination, the very difficult seabed conditions on both Turkish and Russian sides and unfavourable weather conditions made the project a milestone in the entire industry.

The deepwater sections were installed by the vessel Saipem 7000 using the J-lay method, while the shallow water sections, up to 380 m, were installed by the Castoro Otto using the conventional S-lay method.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
276	34"	Castoro 10 - Semac 1	max 55	2004
70	24"	Saipem 3000 - Castoro 10 - Castoro II	50	2004
1 X 1 0 0 1 X 9 0	32" - 4"	S 355	max 85	2004
128	42"	Castoro II - Semac 1	120	2003
101	20"	Castoro Sei	120	2003
35	18"	Castoro Sei	105	2003
32	14"	Castoro Sei	58	2003
2 X 380	24"	Saipem 7000 - Castoro Otto	max 2,150	2002

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Norway	Norsk Hydro	Grane	T & I
Vietnam	BP	Nam Con Son	T & I
U.S.A.	Elf Exploration	Canyon Express Project	EPIC
Indonesia	Conoco Indonesia	ADGF Project	EPIC (Sealines + Subsea)
Congo	Elf Congo	Direct Line Nkossa to Djeno	EPIC
United Kingdom	Shell	Penguin	EPIC
Canada	Sable Offshore	Sable Island (Tier 2)	T & I
Norway	Statoil	Mikkel	T & I
Italy	Eni Divisione Agip	Frame Agreement 1999-2003 - Year 2001	T & I
The Netherlands	Noordgastransport	G17a	T & I
Argentina	Gazoducto Cruz del Sur	Rio De La Plata	EPIC
Norway	Norsk Hydro	Vesterled	T & I
United Kingdom	Phillips Petroleum Co. UK	Jade	EPIC
Angola	Texaco Panama	Joint Terminalling Project	EPIC
Norway	Norsk Hydro	Snorre B	EPIC
United Kingdom	Texaco North Sea UK	Erskine	T & I
Nigeria	Mobil Producing Nigeria	Oso 2y-2 Development Project	EPIC (Sealines + Platform)

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 5 0- 1 X 2 0 4	18" - 28"	Castoro Sei	356	2002
362	26"	Semac 1	125	2002
176	12"	FDS	100 - 2,210	2002
99	18"	Castoro II	80	2002
62	12"	Castoro Otto	0 - 170	2002
62	16" - 22"	Castoro Sei	180	2002
52	14"	Castoro 10	67	2002
38	18"	Castoro Sei	250	2002
1 X 3 2- 1 X 1 3	10" - 20"	Crawler	40	2001
65	18"	Castoro Sei	30	2001
56	24"	Saibos 230	5	2001
53	32"	Castoro Sei	120	2001
17	16" - 20"	Castoro Sei	75	2001
14	16"	Castoro Otto	40	2001
1 X 1 0- 1 X 4 2	8" - 16"	Castoro Sei	350	2000
30	16" - 20"	Castoro Sei	90	2000
1 X 2 1- 1 X 1 0	16"	Castoro Otto - Saibos 230	20	1999

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER
THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
United Kingdom	Statoil	Europipe II Pipelay, Trenching and Tie-in	T & I

EUROPIPE I AND II - NORWAY TO GERMANY

Saipem was the main contractor for the development of the Norwegian gas processing and transport system, with the laying of Europipe and Zeepipe projects.

Saipem laid in 70 m water depth about 600 Km of Europipe I, pipeline running from the Draupner E riser platform in the North Sea to a receiving terminal at Dornum in Germany, that became operational in 1994.

The vessels employed were Castoro Sei, Castoro 10, Castoro 2 and Bar 331.

Saipem also laid 310 km of the 42" natural gas pipeline Europipe II in 80 m water depth, linking the Kårstø processing plant north of Stavanger to a receiving terminal at Dornum in Germany, that became operational in 1999.

The vessels employed were Castoro Sei, Semac 1 and Bar 331.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
310	42"	Castoro Sei - Semac 1	80	1999

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Norway	Norsk Hydro	Oseberg Gas Line	T & I
Qatar	Ras Laffan LNG	Trunkline from Onshore LNG Plant to 'Central Platforms Complex' Offshore	EPIC
Norway	Statoil	Troll Oljeror II Pipelay	T & I
Croatia	INAgip	Ivana A Platform and Sealines	T & I (Sealines + Platform)
Indonesia	Total	Peciko Field Development	EPIC
Egypt	Petrobel	Sealine in Egypt	T & I
Norway	Norsk Hydro	Troll Oljie Gas Pipeline	EPIC
India	Reliance	Jamnagar Offshore Facilities	EPIC
Italy	AMAT	Imperia Waterline	EPIC
United Kingdom	Shell	ETAP	T & I
China	CNOOC	Ping Hu	T & I
Myanmar	Total	Yadana Project	EPIC
Denmark	Dangas	South Arne to Nybro	T & I
United Kingdom	Elf	Elgin / Franklin Trenching	Trenching
The Netherlands	Noordgas-Transport	L10 - D15	T & I
U.S.A.	Transco	Mobile Bay Expansion and Extension Project	T & I
U.S.A.	Pemex	Cantarell (EPC 7)	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
110	36"	Castoro Sei	118	1999
90	32"	Castoro V	60	1999
85	16"	Castoro Sei	520	1999
67	16"	Crawler	43	1999
57	24"	Castoro V	50	1999
40	24"	Castoro II	na	1999
31	16"	Castoro Sei	360	1999
24	48"	Castoro II - Castoro V	30	1999
21	36"	Castoro II - Crawler	60	1999
2 X 2 2	10" - 16"	Castoro Sei	93	1998
1 X 2 9 & 1 X 3 6 4	10" - 14"	Castoro V - Semac 1	89	1998
344	36"	Castoro V - Semac 1	145	1998
286	24"	Castoro Sei	90	1998
191	34"	Far Sovereign	90	1998
140	36"	Semac 1	30	1998
90	24"	Castoro Otto	50 - 86	1998
85	36"	Castoro 10	40	1998

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Congo	Agip Recherches Congo	Kitina Project	EPIC (Sealines + Platform)
Mexico	Pemex	Cantarell Sealine	T & I
Nigeria	Mobil Producing Nigeria	Usari Development Project	EPIC
Azerbaijan	Azerbaijan International Oil Company	Chirag 1	T & I
United Kingdom	Britannia	Britannia Export	T & I
United Kingdom	BP	ETAPS	T & I
Norway	Statoil	Norfra	T & I
United Kingdom	Interconnector	Interconnector	T & I
U.S.A.	Shell	Destin Dome	T & I
United Kingdom	BP	Cleeton - Ravenspurn	T & I
United Kingdom	BHP	Liverpool Bay	T & I
Indonesia	Pertamina	Balikpapan - Samarinda Multiproduct Pipeline	EPIC
Norway	Norsk Hydro	Visund	EPIC
United Kingdom	British Gas	Armada	T & I
Norway	Statoil	Haltenpipe P91	T & I
Thailand	PTT	Tantawan	EPIC
Mexico	Pemex	Dos Bocas	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
65	14"	Castoro Otto	137	1998
21	36"	Castoro Otto	45	1998
1 X 2 8- 1 X 1 9	24"	Castoro Otto	16 - 25	1997
1 X 4 8- 1 X 1 8 1	16" - 24"	Vessels provided by client	120	1997
1 X 4 5- 1 X 1 9 0	14" - 28"	Castoro Sei	153	1997
1 X 3 5- 1 X 2 2 1 X 7 5- 1 X 1 4	16" - 24"	Castoro Sei	94	1997
1 X 4 2 9 1 X 1 0	42"	Castoro 10 - Castoro II	30	1997
231	40"	Castoro 10 - Semac 1	135	1997
100	36"	Castoro 10 - Castoro Sei	120	1997
1 X 2 0- 1 X 5 8	16" - 36"	Castoro 10 - Castoro Sei	50	1997
32	12"	Castoro Sei	29	1997
30	10"	na	30	1997
1 X 2 7- 1 X 8	16"	Castoro Sei	385	1997
2 x 2 4	10"- 20"	Castoro Sei	88	1996
247	16"	Castoro Sei	305	1996
53	24"	Castoro V	70	1996
41	36"	Semac 1	25	1996

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
The Netherlands	Clyde	P2 / P6	T & I
Norway	Norske Shell	Troll Phase II P10/P11	T & I
Spain	European Maghreb Pipeline Ltd.	Gibraltar Strait Crossing	EPIC

GIBRALTAR STRAIT CROSSING - MOROCCO TO SPAIN

These two 45 km long pipelines, 22", were a challenging project due to a water depth of 396 m, severe seabed roughness, high current velocities (surface, intermediate and bottom) underneath a busy shipping lane.

In addition, the majority of the works had to be performed during the winter period in order to allow the summer tourist season and local fishing activities.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
38	10"	Castoro Sei	80	1996
2 X 6 3	36"	Castoro Sei	360	1995
2 X 4 5	22"	Castoro II - Castoro Sei	396	1995

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
United Kingdom	Conoco	Jupiter	EPIC
Thailand	PTT	Pipeline from Erawan Riser Platform (ERP) to Landfall at Rayong	T & I
Norway	Statoil	Zeepipe II (1st Season + 2nd season)	T & I

ZEEPIPE - NORWAY TO BELGIUM

In different seasons of work, Saipem laid about 730 km, 40", of the Zeepipe I - the world's longest offshore pipeline installation at that time, running from the Sleipner A Platform in Norway to a receiving terminal at Zeebrugge in Belgium.

In addition, the Company also laid two pipelines of 20" and 30" for about 270 km.

Zeepipe I become operational in 1993.

Saipem also laid about 300 km of the 40" Zeepipe II gasline, at 365 m water depth.

The project was performed by the EMC (European Marine Contractors), a joint venture between Saipem and Brown & Root. In 2002, Saipem acquired the full ownership of the joint venture.

The vessels employed were Castoro Sei, Semac 1, Castoro II, Castoro 10 and Bar 331.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 1 4- 1 X 1 9	12" - 18"	Castoro 10 - Castoro Sei	34	1995
413	36"	Castoro V - Semac 1	60	1995
1 X 2 2 5- 1 X 6 8	40"	Castoro Sei and others	365	1995

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Norway	Statoil	Troll Oljeror	T & I
Qatar	Qatar Liquefied Gas Company	Qatargas Upstream Development Contract C008	T & I
United Kingdom	Premier Transco	S.N.I.P.	EPIC
Italy	Enel	Oil Line Montalto di Castro - Torre Valdaliga	T & I
Italy	Snam	Crossing of the Strait of Messina (Transmed 4th and 5th lines)	EPIC
Italy	TMPC	Transmed (4th and 5th lines)	EPIC

TRANSMED - TUNISIA TO ITALY

This project strongly contributed to Saipem's technical advances in the offshore pipelaying activity, rapidly pushing the water depth to new records.

The laying of the 20" and 26" subsea pipeline in the Channel of Sicily at a depth of more than 600 m was a technical record that represented a milestone in the industry, unchallenged for several years.

The Phase I, completed in 1981, consisted of the crossing of the Strait of Messina and of the Channel of Sicily, from Cape Bon (Tunisia) to Mazara (Italy), with 3 subsea pipelines of 20", for a total length of about 510 km.

In Phase II, completed in 1994, two more 26"sealines were laid, for a total length of about 340 km.

The project was executed with the vessels Castoro Sei, Castoro II, Ragno Due and Bar Protector.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
82	16"	Castoro Sei	538	1995
82	32"	Castoro V	max 80	1995
41	24"	Castoro Sei	180	1995
33	16" - 20"	Crawler	70	1995
2 X 1 5	26"	Castoro II - Castoro Sei	max 610	1994
2 X 155	26"	Castoro II - Castoro Sei	max 610	1994

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
China	Arco China	Trunkline Yacheng - Hainan Island	T & I

TRUNKLINE YACHENG - CHINA

The 707 km long, 28" trunkline was laid from offshore Hong Kong to Yacheng field, south of Hainan Island area in China.

It was the Asia's longest subsea pipeline and one of the longest in the world.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 7 0 7 1 X 9 3	1 4 "- 2 8 "	Semac 1 - Castoro V	88 - 120	1994

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Norway	Statoil	Europipe (1st Season + 2nd season)	T & I
United Kingdom	Conoco	Caister Murdoch	T & I
Tunisia	British Gas	Miskar Gas Field Development	T & I
China	Arco China	Pearl River Estuary	T & I
Thailand	Thai Oil Public	Sealine, CALM, Plem installation	EPIC (Sealines + Subsea)
Trinidad	Amoco/Brown & Root	Platform and Sealines Installation Galeota Point	T & I (Sealines + Platform)
Thailand	PTT	Bongkot - Erawan - Khanom	T & I
The Netherlands	Unocal	Horizon	T & I
Congo	Elf Congo	Pipelaying on The Tchibouela, Yanga, Sendji and Tchendo Fields	EPIC
Norway	Statoil	Zeepipe (2nd Season)	T & I
Norway	Statoil	Zeepipe (1st Season)	T & I
United Kingdom	Total	Bruce (2nd Season)	T & I
United Kingdom	Mobil	Sage	T & I
Italy	Agip	Vomano - Platform Giovanna; Platform Annabella Platform Brenda	T & I
United Kingdom	Mobil	Beryl	T & I
Brazil	Pecten Brazil Explor.	Sealine Merluza Field	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
1 X 4 3 2 1 X 1 6 8	40"	Castoro 10 - Castoro II - Castoro Sei	70	1994
1 X 1 7 6 1 X 1 1	16" - 26"	Castoro 10 - Semac 1	92	1994
122	24"	Crawler	60	1994
70	28"	Castoro V - Semac 1	na	1994
40	4"	Castoro V	na	1994
1 X 2 2 7 1 X 2 1 3	10" - 24"	Castoro Otto	max 80	1993
1 X 1 6 0 1 X 1 6 5	24" - 32"	Castoro V	80	1993
48	10"	Semac 1	30	1993
35	8"	Bos-215 - Bos-400	98	1993
1 X 2 2 7 1 X 2 1 3	20" - 40"	Castoro Sei - Semac 1	82	1993
1 X 3 9 2 1 X 1 2 0 1 X 3 9	30" - 40"	Castoro Sei - Semac 1	82	1992
119	24"	Castoro Sei	135	1992
23	30"	Semac 1	120	1992
1 X 3 8 1 X 1 3	12" - 18"	Castoro II	60 -120	1991
324	30"	Semac 1	117	1991
187	16"	Castoro Otto	130	1991

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
United Kingdom	Total	Bruce (1st Season)	T & I
Congo	Agip Recherches Congo	Sealine from ZAF-1 to Shore Zatchi Field	T & I
United Kingdom	Arco	Pickerill	T & I
Egypt	WEPCO	Installation Sealine and Platform	T & I (Sealines + Platform)
Qatar	Qatar Gen. Petr. Co.	Installation Sealines Offshore Qatar	EPIC
Malaysia	Sarawak Shell Berhard	MLNG Plant (Bintulu)	T & I
United Kingdom	BP	Miller	EPIC
Brazil	Petrobras	Gas Trunkline from Cabiunas to Enchova	T & I
United Kingdom	Shell	Sole Pit	T & I
Brazil	Petrobras	Garoupa - Albacora	T & I
India	ONGC	South Bassein Project	T & I
United Kingdom	Britoil	Amethyst Phase I	T & I
United Kingdom	Hamilton	Ravenspurn North	T & I
United Kingdom	Amerada Hess	Ivanhoe / Robroy	T & I
United Kingdom	Shell	Tern Eider	T & I
United Kingdom	Conoco	Sealines in Valiant Field	T & I
Congo	Agip Recherches Congo	ZAF 1 Platform	EPIC (Sealines + Platform)

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
130	24"	Castoro Sei	135	1991
76	18"	Castoro Otto	60	1991
58	24"	Semac 1	20	1991
22	12"	Castoro Otto	na	1991
2 X 8 0	12" - 34"	Castoro V	na	1990
1 X 1 1 0- 1 X 1 3 0	18" - 36"	Castoro V	70	1990
240	30"	Castoro Sei	102	1990
115	18"	Castoro Sei	max 100	1990
1 X 2 4- 1 X 7 3	16" - 24"	Castoro Sei	22	1989
120	16"	Castoro Sei	180	1989
97	30"	Castoro II - Castoro V - Crawler	max 70	1989
48	30"	Castoro Sei	23	1989
25	24"	Castoro Sei	50	1989
1 X 2 3- 1 X 4 0	8" - 14"	Semac 1	140	1988
1 X 1 6- 3 X 1 3	8" - 16"	Semac 1	167	1988
119	36" - 4"	Castoro 10 - Castoro Sei	30	1988
21	10"	Castoro Otto	90	1988

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
United Kingdom	Conoco	Installation Trunkline from Theddlethorpe Terminal to GSS Platform	T & I
United Kingdom	BP	Installation Trunkline from Dlimington Terminal to Cleston Platform	T & I
United Kingdom	Arco Producing Oil Co.	Thames	EPIC
Italy	Agip	Pipeline/Installation in the Adriatic Sea	T & I
United Kingdom	NAM	Pipeline Installation between L13-FC1 Platform and K-15-FAI	T & I
Italy	Agip	Pipeline/Flowlines in the Adriatic Sea	T & I
United Kingdom	Shell Expro UK	Pipeline installation in the Fulmar Field	T & I
United Kingdom	Shell Expro UK	Pipeline installation in the SE Indefatigable Field	T & I
The Netherlands	Amoco Netherlands	Trunkline/Flowlines in the North Sea	T & I
Italy	Agip	Pipeline in the Adriatic Sea	T & I
Egypt	WEPCO	Sealine and Riser in Abu Qir Gas Field	T & I
Saudi Arabia	Aramco	Zuluf Project Field	EPIC
Denmark	DONG/DORAS	Sealine Crossing Storebaelt Channel	T & I
The Netherlands	Mobil Producing Netherlands	Sealine in the North Sea for Mobil Pr. Netherlands	T & I
The Netherlands	NAM	Sealine from Platform K15 FB to Challantsoog	T & I
The Netherlands	Placid	Pipeline Installation in the North Sea	T & I

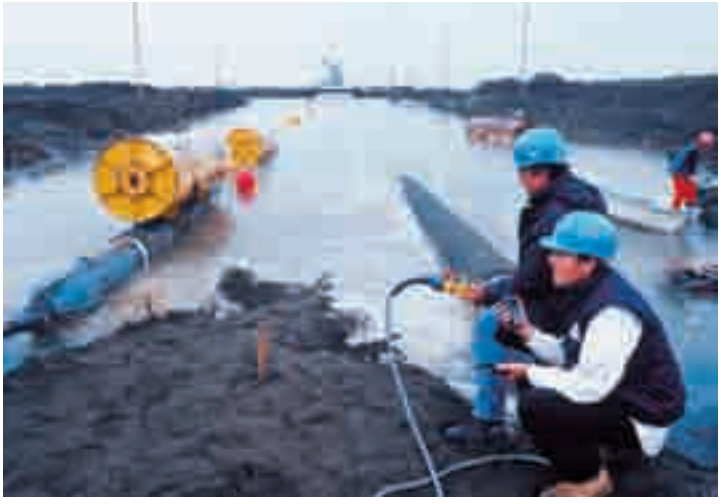
LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
120	36" - 4"	Castoro Sei	max 38	1987
1 X 2 0- 1 X 5 8	16" - 36"	Castoro Sei	max 54	1987
90	24"	Castoro Sei	max 35	1986
85 (Total)	2" - 14"	Castoro II	max 40	1986
16	18"	Castoro Sei	max 36	1986
1 X 6 1- 1 X 2 8	10" - 14" - 24"	Castoro II	max 70	1985
295	20"	Castoro Sei	max 125	1985
107	30"	Castoro Sei	max 35	1985
1 X 4 0- 1 X 1 4	10"	Castoro Sei	max 30	1985
36	16" - 3"	Castoro II	max 40	1985
19	18"	Castoro II	max 17	1985
68	48"	Castoro Otto	max 40	1984
1 X 2 1 9 1 X 6 0	20"- 30"	Castoro Sei	max 50	1983
79	20"	Castoro Sei	max 37	1983
69	24"	Castoro Sei	max 48	1983
29	14" - 2"	Castoro Sei	max 30	1983

PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Italy	TMPC	Transmediterranean Pipeline from Tunisia to Sicily (3 sealines)	T & I
United Kingdom	BP Petroleum Dev.	Trunkline from Magnus to Ninian Field	T & I
United Kingdom	BP Petroleum Dev.	Flowlines in the Magnus Field	T & I
Spain	Chevron	Construction and Installation of Sealine at Tarragona	T & I
Italy	Snam	Transmed - Crossing of the Strait of Messina (Italy - Sicily)	T & I
Italy	Agip	Platforms and Sealines/Risers Installation	T & I (Sealine + Platform)
Qatar	Qatar Gen. Petr. Co.	Sealines and Risers Installation Offshore Qatar	T & I
Egypt	APCC - SUMED	Petroleum Marine Terminal - Crude Oil Submarine System at Alexandria	T & I
Abu Dhabi	ABB	Sealines Installation in Umm Shaif, Zakum, El Bunduk Fields	T & I
United Kingdom	BP	Forties Field	T & I
United Kingdom	BP	Sealines Installation Forties Field	T & I
Iran	OSCO	Sealines Installation Ganaweh - Kharg Island	T & I
Italy	SAROM	Sealine Installation Offshore Ravenna	T & I
Italy	Agip	Sealine Installation Offshore Ravenna	T & I

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
3 X 155	20"	Castoro Sei	max 611	1981
92	24"	Castoro Sei	max 188	1981
35	6"	Castoro Sei	max 185	1981
47	12"	Castoro II	max 160	1980
43 (Total of 3 lines)	20" - 26"	Castoro V	max 360	1979
60	10" - 3"	Castoro II	max 75	1978
2 X 8 3- 1 X 3 6 1 X 5 6- 1 X 2 0	6" - 24"	Castoro V	36	1977
76 (Total)	26" - 48"	Castoro V	34	1976
210	8" - 40"	na	35	1974
103	32"	Castoro II	100	1974
76	32"	Castoro II	135	1973
42	52"	na	40	1973
18	48"	Castoro V	28	1973
35	10" - 14"	Castoro II	35	1972



PROJECT REFERENCES

OFFSHORE PIPELINES APPROX. LONGER THAN 20 KM AND WIDER THAN 12"

LOCATION	CLIENT	PROJECT	SCOPE OF WORK
Italy	Agip	Sealine Installation Offshore Ravenna	T & I
Italy	API	Sealines Installation Offshore Falconara	T & I
Iran	SIRIP	Sealines Installation - Now Rouz	T & I
Spain	Gulf	Huelva	T & I

HUELVA PROJECT - SPAIN

The historic beginning of Saipem's offshore pipelaying activities in 1966.

The project consisted in several pipelines totalling 16 km, wide from 6" to 30", laid in a water depth of 23 m offshore Spain.

All design work for the converted laybarge used for the project – a converted oil tanker that was re-christened Castoro – were carried out in-house by Saipem. At the time, the barge was without accommodation quarters and the transfer of personnel to a tendering vessel in a relatively hostile weather was always quite adventurous.

The project became the foundation for several other pioneering projects in the Mediterranean Sea and Middle East carried out by Castoro.

LENGTH (km)	DIAMETER (inches)	MAIN VESSELS	WATER DEPTH (m)	ON STREAM
79 (Total)	3" - 14"	Castoro II	35	1971
17	40"	Castoro II	33	1971
2 X 9 4- 1 X 1 6	18" - 36"	na	40	1970
16 (Total)	6" - 30"	Castoro	23	1966

NOTES