

# Press kit

*Last updated: September 2009*

## **Bourbon Subsea Services**

**A unique range of modular services of IMR vessels, ROV and engineering**



**BOURBON**

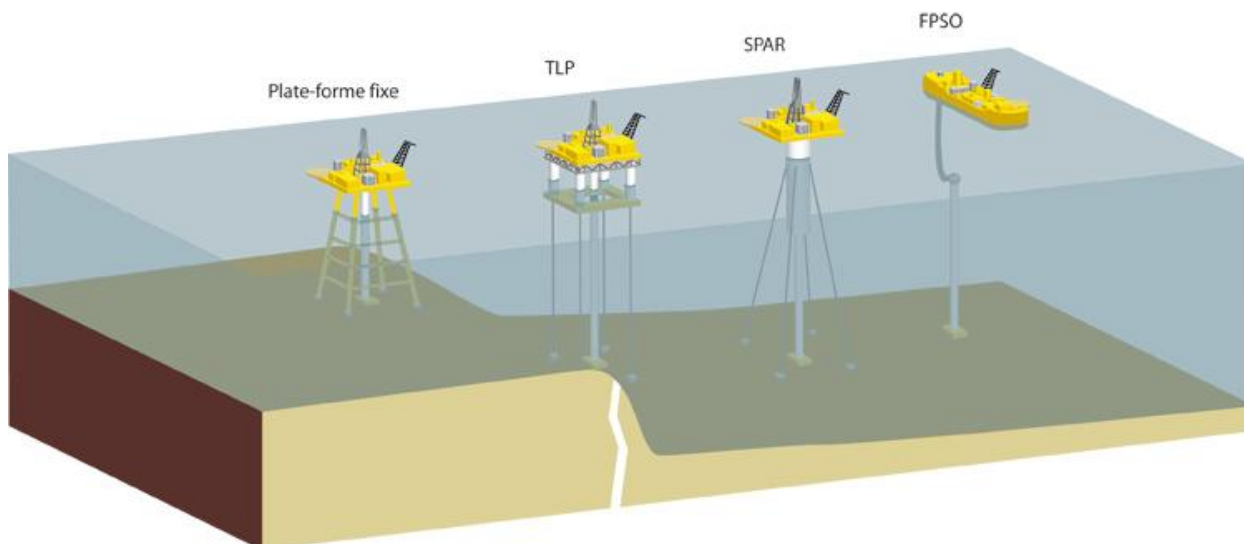
Building together a sea of trust

In 2003, BOURBON commissioned its first deepwater IMR vessel in Angola. Today, BOURBON operates 14 vessels of this type in the world. New subsea and surface structures have appeared. During the 10 to 20 years of a field's operation, these have led to new requirements and expertise in Inspection, Maintenance and Repair. Bourbon Subsea Services is now perfectly positioned to respond to this.

## I. Offshore oil and gas operations, an ever-changing market

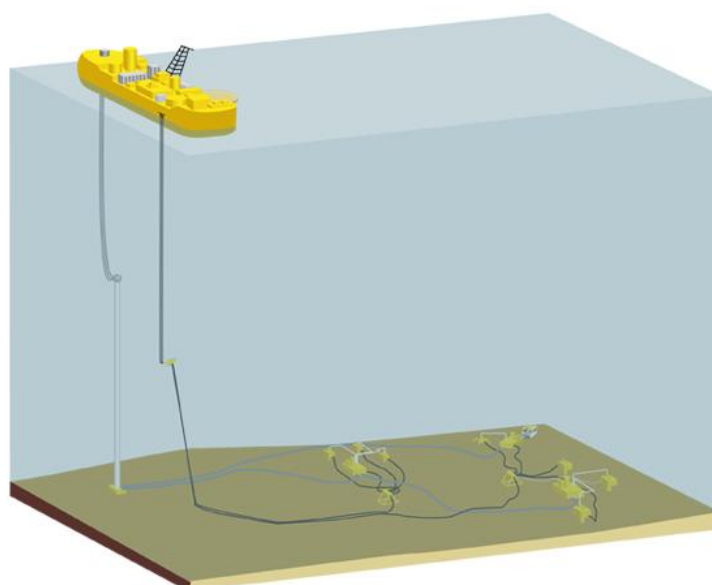
### I. 1. New oil and gas structures

- **Surface structures**



To meet the new needs of the oil companies, new surface structures are appearing regularly (e.g., stationary rigs, tethered semi-submersible rigs) pushing further the depth of production. The most recent and efficient units today are FPSO (Floating Production, Storage and Offloading) - new generation floating oil and gas platforms.

- **Subsea structures**

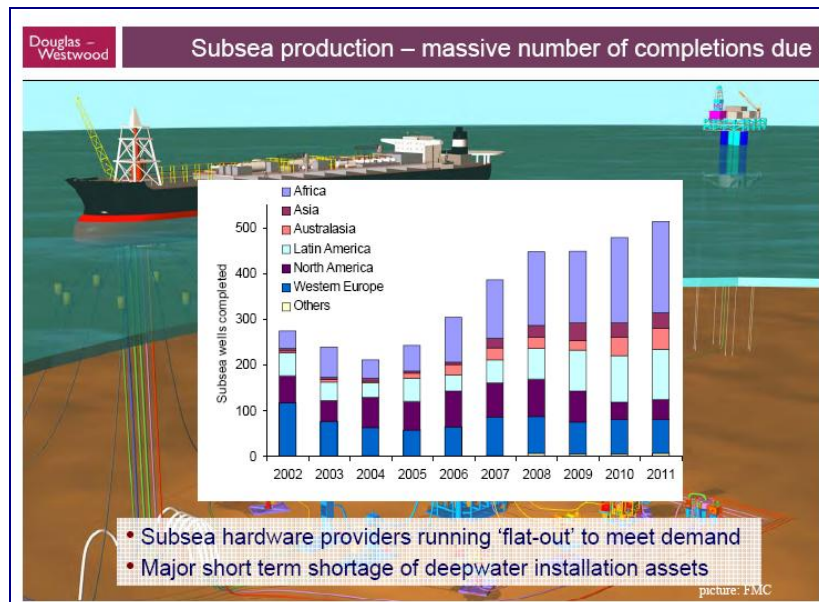


The different subsea structures (well heads, manifolds, etc.) are connected from the sea bed to surface supports through pipelines and control umbilicals.

The pipelines send the oil up to the surface structure or are used to inject gas and water to keep the reservoir under pressure.

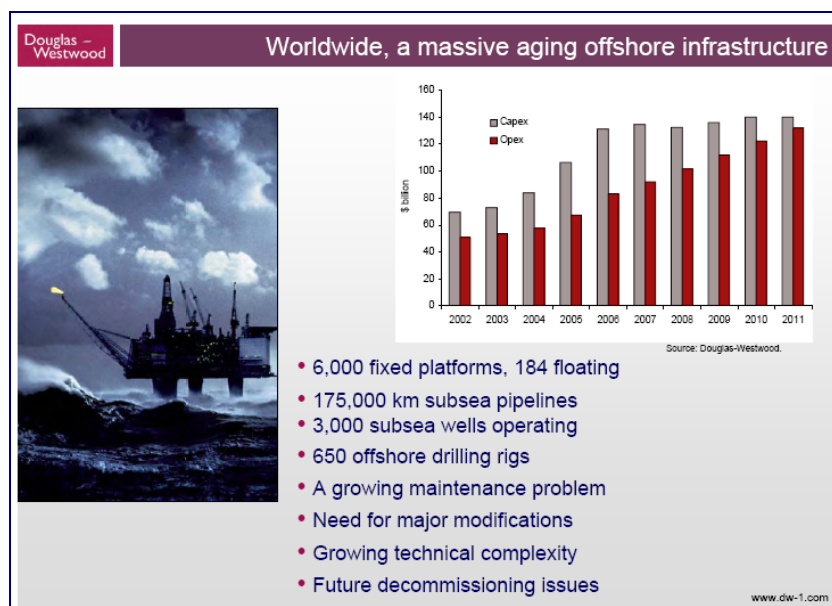
The umbilicals are used to control the different subsea structures.

Due to the geometry and the depth of the offshore oilfields, and to the increase in oil prices, expenditures by the oil companies have increased sharply since 2004.



## I. 2. The appearance of new needs

Over the years, surface and subsea structures have developed and matured, thus leading to the appearance of new needs in terms of Inspection, Maintenance and Repair, the so-called IMR services, requiring dedicated means.



In the case of deepwater subsea structures, these operations cannot be conducted by human beings owing to the deepwater pressure. Thus Remotely Operated Vehicles (ROV) have to be used to carry out these operations successfully. **Cf. Appendix 3**

In this context, BOURBON has expanded its range of services to meet the needs of oil and gas clients seeking contractors that can control all IMR services and that can provide the resources and personnel for both surface and subsea operations.

BOURBON Subsea Services has developed particular expertise in engineering and management of these offshore operations and has a latest-generation fleet of multi-purpose service vehicles (MPSV) and subsea remotely operated vehicles (ROVs).

Even though the recent economic deterioration slow down oil companies' exploration investment, Bourbon Subsea Services vessels were conceived to be multipurpose and to meet clients' needs in terms of :

- maintenance of existing offshore platform,
- development for the connection of new oil well (when investments will resume).

## **II. Bourbon Subsea Services: a response to the new IMR needs of clients**



Bourbon Subsea Services has successfully expanded its range of services and has almost doubled its revenues and staff in 2009. With a fleet of 27 vessels and 11 ROVs in operation or on order, coupled with the know-how of its technicians, the Subsea Services activity counts among its clients the 5 supermajors (Total, BP, Shell, Exxon Mobil and Chevron) as well as independent companies (Hess, CNR) and offshore contractors such as Saipem by offering them flexible and modular services, tailor-made for each operation.

Bourbon Subsea Service offers flexible and adaptable services to the needs of its clients, from the supply of a vessel only to the provision of a vessel, engineering, ROV and management.

BOURBON's Subsea Services Activity includes the following:

### **▪ Engineering and Management services for IMR operations**

Backed by a long experience on the IMR market, Bourbon Offshore Gaia offers recognized expertise in engineering and services, such as installation engineering and a definition of work procedures, design and supply of specific equipment or supervision and execution of offshore installation work, feedback management and updating of trends in subsea structures and project management.

### **▪ Modern, efficient IMR support vessels for subsea and surface operations**

BOURBON offers its clients latest generation IMR vessels, adapted to the specific demands and needs required by deepwater inspection, maintenance and repair interventions. **Cf. Appendix 2**

### **▪ Remotely Operated Vehicles and experienced operators**

DNT-Offshore, BOURBON's latest subsidiary, has six years of experience and a fleet of 10 ROVs to conduct a wide variety of inspection, maintenance and repair operations on subsea structures **Cf. Appendix 4**

All the ROV technicians and supervisors are experienced and trained to BOURBON skills standards and the industry's IMCA standards. In 2008, at its site in Ravenna, DNT-Offshore opened a training center with an ROV piloting simulator that is unique in southern Europe and the Mediterranean, and will enable over 50 operators to be trained over 2 years, in extremely realistic conditions. To prepare for complex or highly sensitive operations, and in order to ensure the best operating and safety conditions, specific simulation programs can integrate all the client's own parameters (structures, equipment, work etc.) and the simulator can be moved if required. It is a vital tool for unrivalled service.

DNT-Offshore has ISO 9001, ISO 14001 and OHSAS 18001 certification and operates in the Mediterranean, Africa, Australia and the North Sea providing visual inspection services and non-destructive tests, monitoring operations for laying pipelines, flowlines, control umbilicals and cables, as well as undertaking general subsea maintenance services. The subsidiary also provides ROV assistance for offshore drilling, diving operations and decommissioning offshore oil & gas fields.

Thus, through its subsidiary Bourbon Subsea Services, BOURBON is able to offer its most demanding clients a full range of modular services based on modern resources as well as recognized experienced personnel, trained in the most recent techniques.

Backed by these assets and investments planned in connection with the Horizon 2012 strategic plan, thanks to which it will be able to expand its fleets of IMR vessels and ROVs, BOURBON now sees promising prospects opening up in this booming market.

## **II. 1. The IMR vessels Fleet**

As of June 30, 2009, BOURBON operates an IMR fleet of 14 modern vessels. These are multipurpose supply vessels (MPSV) whose design and equipment have been adapted to the special features of IMR. These vessels are adaptable to different activities and allows to meet the specific needs of each client.

***Cf. Appendix 2***



Equipped with DP2 and even DP3 dynamic positioning technology and with active heave compensation cranes up to 100 tons at a depth of 3,000 meters of, the IMR vessels also have a large deck capacity and substantial accommodation capacities, up to 100 persons. Especially

suited for IMR operations, these vessels also have all the cargo and logistical support capacities clients need for substantial flexibility of use.

The Supermajors Exxon, Shell, Total, BP, Chevron, as well as other oil companies have already entrusted BOURBON with the maintenance of their deepwater fields in West Africa under long-term contracts since 2004.

The fleet is declined in various types :

- “Light support” vessels, enabling 50 persons on board, with a 10T lifting capacity, up to 2,500 m of depth, associated with one robot,
- « Medium » vessels, enabling 72 persons on board, with a 100T lifting capacity, up to 3,000 m depth, associated to one or more robot,
- « Large » vessels, enabling 100 persons on board, with a lifting capacity superior to 150T.

In order to keep pace with the growth in this new activity, in connection with the expansion of its plan to Horizon 2012, BOURBON placed an order for 10 GPA 696 design IMR vessels in the amount of 450 million euros. These vessels which are specifically adapted to this type of operations will be built in series by Chinese Sinopacific Shipyards at the Zhejiang site and will gradually be added to strengthen the existing fleet.

<i>As of June 30, 2009</i>	<b>No. of units</b>	<b>No. of units on order</b>
<b>Marine Services</b>	<b>312</b>	<b>114</b>
Offshore Support Vessels (OSV)	101	68
Crewboats	206	46
Salvage Tugs	5	-
<b>Subsea Services</b>		
IMR (Inspection, Maintenance and Repair)	<b>14</b>	<b>13</b>
Remotely Operated Vehicles (ROVs)	10	2
<b>Total Offshore Vessels</b>	<b>326</b>	<b>127</b>

In order to guarantee the availability and the reliability of the vessels, Bourbon Subsea Services uses the network of BOURBON bases located in each country where Bourbon Offshore operates. Therefore, Bourbon Subsea Services owns a stock of detached pieces in strategic places for its operations.

Lifting operations being a strategic aspect of these vessels, Bourbon Subsea Services uses a serie of cranes. A team dedicated to lifting devices maintenance was developed in 2009 to ensure maintenance of the current 14 cranes. The team will be completed in 2010 and 2011 to ensure maintenance of the 37 cranes planned for 2012.

Due to its number of cranes, Bourbon is one of the only fleet owner having a specialized department in this field.

## **II. 2. ROV's and experienced operators / DNT-Offshore**

In December 2007, BOURBON acquired DNT-Offshore, a dynamic and innovative Italian company, created in 2002, and specializing in continental or deepwater offshore inspection (up to 4,000 meters) with fully electrical Cougar and Falcon-type ROVs. ***Cf. Appendix 3***

### **▪ A custom-designed service**

DNT-Offshore specializes through the use of electric ROVs in underwater assistance for offshore surveys, construction, drilling and decommissioning of offshore oil fields.

DNT-Offshore offers to oil & gas companies:

- Underwater visual and NDT inspection services (non-destructive test)
- Visual and instrumental pipelines, flowlines, control umbilicals and cables for the routing of survey services.
- Subsea intervention and maintenance services.
- ROV assistance for offshore drilling operations.
- Assistance to locate wreck and to collect debris/equipment

DNT-Offshore offers to main contractors:

- ROV assistance during offshore construction work.
- ROV assistance during operations involving the laying of pipelines, flowlines, control umbilicals and cables and commissioning operations.
- ROV assistance to diving operations.
- ROV assistance in the decommissioning of offshore structures.

### ▪ **A quality service recognized by clients**

DNT-Offshore is ISO 9001 and ISO 14001 certified by LLoyds, a member of IMCA (International Marine Contractor Association). Throughout the world, in Australia, from Africa to the North Sea, numerous oil companies place their trust in DNT-Offshore, companies like ENI, BP (AOIC) and Dolphin Energy. DNT-Offshore also works for contractors and has worked for SAIPEM, Acergy, Allseas, Caldive, DeepOcean, Elettra, EMS, Geolab, Global Industries, Micoperi, and Nautronix...

### ▪ **Specific expertise and skilled personnel**

The employees of DNT-Offshore are highly qualified and trained in the operation and maintenance of electrical ROVs and their specific ancillary equipment.

Personnel are trained and assessed according to the IMCA (International Marine Contractors Association) scheme of competence and to BOURBON Competency and training Standards. They undergo in-house and external training specific to DNT-Offshore's own vehicles.

### ▪ **A Fleet of ten ROVs**

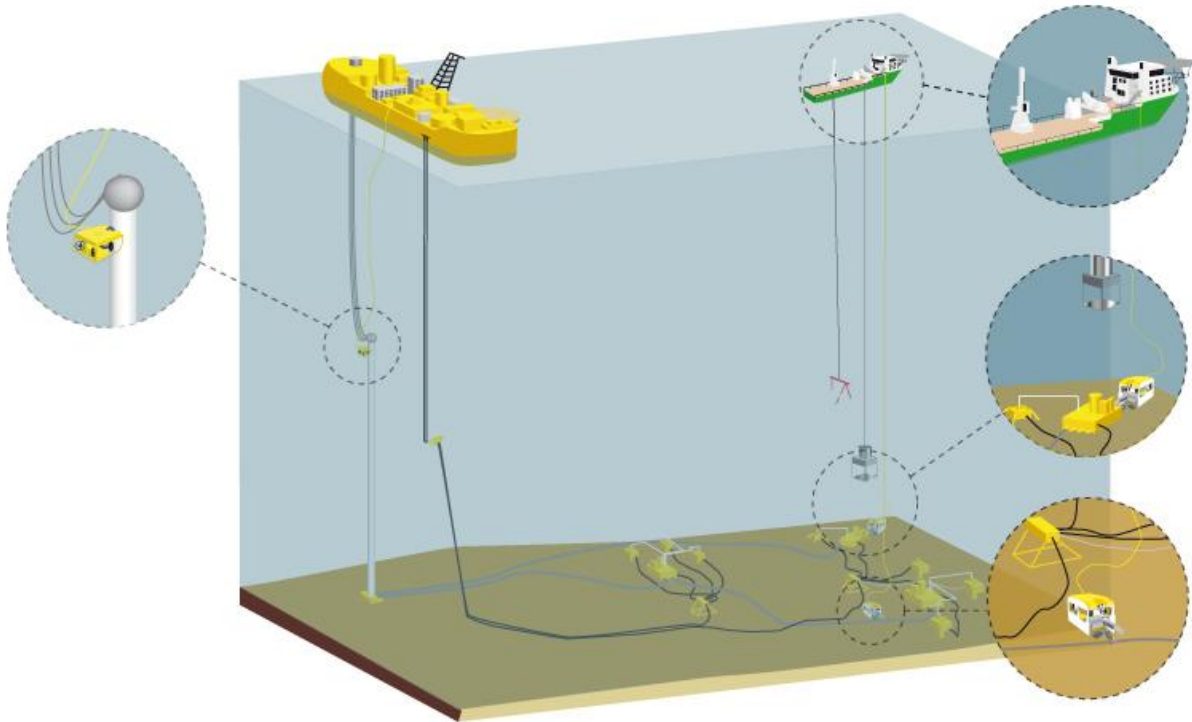
The DNT-Offshore fleet offers flexibility and versatility, comprising the latest internationally recognized Electric ROV classes including:

- Lightweight, highly mobile Observer Classes, recommended for diving work assistance, WROV assistance work and visual inspections in the shallow offshore.
- Free Swimming Electric Compact 600m WROV's recommended for instrumental surveys and light construction works in the shallow offshore.
- Deepwater Electric Compact WROV's capable of working at depths greater than 2000m, recommended for visual and instrumental surveys and light construction work in deep water.

DNT-Offshore will reap the benefits of the BOURBON investment policy and reach the critical size allowing it to take advantage of all the opportunities offered by the IMR market.

For its part, BOURBON will benefit not only from the know-how of a recognized expert in IMR and also a fleet of 10 latest generation ROVs, which, combined with its experience in IMR operations engineering and management, will enable it to provide a global range of services.

Under the Horizon 2012 plan, BOURBON will increase its ROVs fleet from 7 to 21 units by 2012.



### **II. 3. Engineering and Management / Bourbon Offshore Gaia**

#### **▪ A wide offer**

Bourbon Offshore Gaia is a subsidiary of BOURBON that offers a range of IMR operations engineering and management services in deepwater offshore, during the phase of production of the oil fields:

- Installation engineering, Equipment design and Project management
- Offshore IMR operations management and supervision
- Inspections and Maintenance schedules
- Production Support Vessel Interface engineering
- IMR vessels design

*Cf. Appendix 1*

#### **▪ An experience recognized by clients**

With a long experience in this business, the teams of Bourbon Offshore Gaia have performed since the commissioning date of the first BOURBON multipurpose supply vessel (MPSV) in Angola dedicated to the maintenance of a deepwater oil field in 2004:

- Installing more than 200 rigid and flexible connections of various sizes up to 35 meters and 30 tons.
- Installing more than sixty well heads.
- Replacing housing containing the electronics of subsea well heads.

- Connecting or replacing umbilicals and electrical cables associated with subsea connections.
- Controlling manifolds from IMR vessels.
- Replacing electrical control cables over long distances.

Bourbon Offshore Gaia's main clients are Exxon, Total, Mobil, Chevron, Shell, ... With implementation and maintenance engineering contracts during the field production phase, like those entered into with Exxon and Total, in 2007, BOURBON proved its position as a market leader in deepwater offshore IMR in West Africa.

▪ **Dedicated staff, close to the client**

Offering quality client service and offering suitable technical solutions requires the full attention of staff dedicated to resolving the issues facing clients:

- On-board operations officer
- Deck officer on-board
- Specialized crane operators
- Seamen / specialized slingers
- Project manager established locally
- Operations Manager of the IMR vessel fleet
- Engineers
- Project managers

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Thus, in accordance with the strategy announced in the Horizon 2012 Plan, BOURBON will be able to offer its clients a full range of services to assist them throughout an oil field production cycle, during the short exploration and development phase, but above all during the 15 to 20 years necessary for the production and maintenance phase.

In creating its Subsea Services Activity, BOURBON is retaining all its flexibility and continues to offer oil operators a global custom-designed service package which, depending on the client's need, can include IMR vessels support vessels, engineering and management services or the execution of subsea assistance.

This activity, owing to its positioning during the production phase of an oil field, is based mainly on long-term contracts that should allow, as is the case for the fleet of Offshore Support Vessels, (OSV), planned and optimized management of IMR vessels and of the 21 subsea robots that will make up the BOURBON fleet by 2012.

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General characteristics of the ROVs

# APPENDIX 1

## **Bourbon Offshore Gaia, IMR Operations Engineering and Management Services**

### **I. Installation Engineering, Equipment design and Project management**

Bourbon Offshore Gaia has developed specific expertise in installation and maintenance activities during the oil and gas fields production phase.

As of June 30, 2009, Bourbon Offshore Gaia conducted surveys for the installation of some two hundred rigid or flexible subsea connections mainly in deepwater in West Africa, the installation of more than sixty subsea well heads and the replacement of control umbilicals.

#### **Research: professionalism and safety**

In order to conduct operations onboard the maintenance vessels, Bourbon Offshore is engaged in project management and research in the following areas:

- In installation, in stowing and securing special packages.
- Special equipment for assistance with installation.
- Lifting including hydrodynamic calculations due to vessel movement.
- The laying of pipelines on existing subsea equipment or platforms.

Placing safety at the heart of quality and performance, Bourbon Offshore Gaia also offers risk analysis, one of the 4 fundamental principles of the BOURBON Safety Management System.

Thus Bourbon Offshore Gaia analyses internally the risks associated with the operations conducted by the vessels in its fleet and conducts analyses of the risks incurred by clients in the context of specific operations, so as to keep them at a minimum.

#### **The teams of Bourbon Offshore Gaia: skills and ongoing training**

The teams of qualified engineers and technicians carry out the following tasks:

- Research (CAO design, calculations, drafting of procedures).
- Preparing equipment and operations.
- Performing offshore projects.
- Feedback on their experience.

Bourbon Offshore Gaia always strives for excellence by means of feedback in order to improve the quality of procedures and equipment as well as the definition of new vessels.

In addition to their theoretical training, the technicians and engineers receive training in the field onboard BOURBON vessels, working with operations managers, seamen, deck hands or robot pilots.

#### **Design of specific equipment – control over the entire chain**

In the realm of subsea equipment maintenance, it is sometimes necessary to design specific equipment for one or more operations. As such, Bourbon Offshore Gaia has a research department for equipment design.

With the consolidation of DNT-Offshore, Bourbon Subsea Services is now able to offer technical solutions for subsea robotic interventions.

## **II. Offshore IMR operations management and supervision**

At sea, the Operations Manager, working with the Captain, manages inspections, maintenance and repair work.

BOURBON Offshore Gaia provides its clients with an integrated management team composed of the Bourbon Offshore Gaia Operations Manager and the Bourbon Offshore Captain), who manage the unique risks and operations together (Captain/operations manager). The work performed is generally done on producing fields, which present multiple risks; thus communication between the captain and the operations manager is essential.

The operations manager in close coordination with the captain:

- Prepares detailed procedures
- Work permits
- Informs the charterer or the client of operations as they are conducted
- Coordinates preliminary operational meetings
- Coordinates the deck crew (deck officer, crane operators, etc.)
- Positions the vessel based on operations with the bridge officer
- Coordinates and directs the subsea robots for operations or inspections
- Prepares inspection and end-of-mission reports

He may be assisted by a second operations manager or a project engineer depending on the complexity of the operations. A safety manager generally assists him to prevent risks during operations.

## **III. Inspection and Maintenance schedules**

The operations manager onboard the maintenance vessels follows up on the program set by the oil company. He manages inspections in coordination with the ROV teams.

In the case of maintenance vessels under long-term charters, Bourbon Offshore Gaia also does follow-up and comparison among the different inspections in order to determine trends in subsea equipment, for example:

- FPSO anchoring line cables
- Cathode protection of the different subsea elements
- Pipelines, control umbilicals

During the development phase of the field remaining after the field comes on stream, Bourbon Offshore keeps the field's layouts updated as the Bourbon vessel installs the equipment. The layouts are kept updated onboard the vessel and onshore in order to provide the bridge officers and the ROV team an understanding of the subsea and surface architecture.

In order to improve operations and vessel definitions, Bourbon analyzes the type of use and the utilization rates, the different lifting devices and faults in subsea equipment. At the client's request, feedback on the different exploitation phases of an oil field can be produced.

## **IV. Production Support Vessel Interface Ingeniering**

Regarding surface platform maintenance vessels, Bourbon Offshore Gaia assists in defining specific equipment interfaces for:

- Well stimulation vessels
- Test well and storage vessels
- Drilling assistance vessel

Bourbon Offshore Gaia also does risk and installation surveys for clients wishing to install specific equipment (product storage, drilling maintenance pump, etc.) on special vessels. With their expertise, they can guarantee the vessel's classification and flag authority will be maintained, once the changes are made on the vessel.

## **V. IMR vessels design**

During the design phase of IMR vessels, Bourbon Offshore Gaia conducts consultations and defines specific equipments:

- Hoisting methods (crane, winch).
- Fitting the bridge to optimize positions related to the equipment (ROV, crane, winch, mobile installation assistance equipment).
- Fitting of holds and defining the different kinds of products transported (type, volume, density, etc.).
- Communications system between crane operators, ROVs, the bridge and the operations center.
- Defining the maximum number of people onboard and fitting the living quarters, operations and meeting rooms, etc.
- Electrical, hydraulic or air supply for the different pieces of equipment that may be used onboard the vessels.

Multipurpose vessels are defined that can adapt quickly to different kinds of missions, while being economical:

- Support of one or more subsea robots.
- Diving support.
- Support for the laying of cables, flexible cables or small diameter pipe.
- Well stimulation support.
- Drilling support.
- Support for surface platform maintenance.
- Support in the event of a health or fire emergency on the oil fields.
- Transporting packages of varying sizes.

During the construction phase, Bourbon Offshore Gaia supervises the cranes and winches and other specific equipments, makes certain onboard vessel communications systems are put in place as well as interfaces with any mobile equipment used.

By defining the vessels suited to the needs of clients, Bourbon Offshore Gaia can transport equipment completely reliably with the greatest respect for safety rules, and offers its clients more productivity and efficiency in their operations.

# APPENDIX 2

## BOURBON's IMR Fleet / Specific vessels

### I. The current IMR fleet

As of June 30, 2009, BOURBON has a fleet of 14 vessels.

#### Large vessels

- Bourbon Oceanteam 101

#### Medium vessels

- Bourbon Emerald
- Blue Angel
- Bourbon Jade
- Bourbon Opale
- Bourbon Pearl
- Bourbon Peridot
- Bourbon Trieste
- Vissolela

#### Light support vessels

- Bourbon H el ene
- Bourbon Altair
- Bourbon Atlas
- Bourbon Amilcar
- Bourbon Arethuse

### II. The IMR fleet on order

As of June 30, 2009, BOURBON has 13 vessels on order:

- 1 sistership of the Bourbon Oceanteam 101, the Bourbon Oceanteam 104.
- 2 vessels ordered from France's Socarenam shipyard, Bourbon Enterprise and Supporter
- A series of 10 vessels of GPA 696 design ordered from Sinopacific in China.

#### **Bourbon Oceanteam 104**

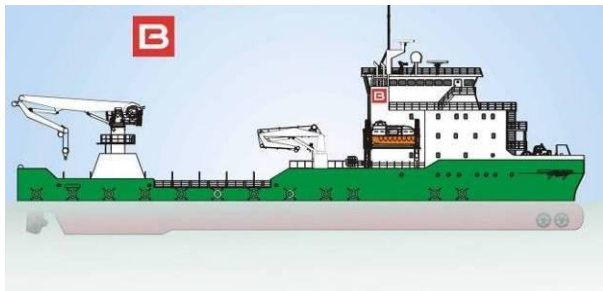


**Delivery: 2010**

#### **Features of the series:**

- Deadweight: 10,000 T
- Dimensions: 137m x 27m
- Deck area: 2,000 m<sup>2</sup>
- DP2
- Diesel Electric
- 1 or 2 subsea cranes AHC
- Housing capacities: 120 à 240 PAX

## 2 vessels ordered from France's SOCARENAM shipyard

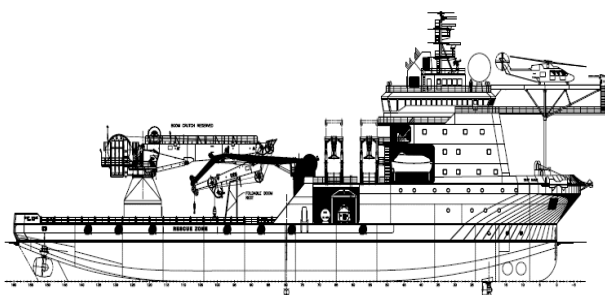


**Delivery: November 2009 and February 2010**

### Features of the series:

- Deadweight: > 2,000 T
- Dimensions : 75m x 19.5m
- Deck area : 850 m<sup>2</sup>
- DP2
- Diesel Electric
- Housing capacities: 103 PAX

## A series of 10 vessels of GPA 696 design



**Delivery: 2010 - 2011**

### Features of the series:

- Deadweight: > 5400 T
- Dimensions: 100m x 21m
- Deck area: >1020 m<sup>2</sup>
- DP3
- Diesel Electric
- Subsea cranes
- Housing capacities: 105 PAX

# APPENDIX 3

## DNT-Offshore, people and Remotely Operated Vehicles

### I. The current ROV fleet

The DNT-Offshore fleet is composed, as of June 30, 2009, of 10 electrical ROVs : 4 Small Electric ROVs, 4 High Capability Electric ROVs, and 2 Work Class ROVs.

#### I. 1. Les ROVs de type FALCON



Seabeed Falcon is a modern, lightweight, highly mobile Observer Class ROV (IMCA Class I / II), recommended for diving and WROV assistance, visual and NDT underwater inspections in the shallow water range. A wide range of sensors and tools is available for The Falcon (i.e. single function manipulator, powered brush for spot cleaning, WTM & FMD ultrasonic gauges, CP probes, low light & SIT cameras, USBL transponders, etc).

#### I. 2. The COUGAR-type ROVs



Seabeed Cougar is a compact electric Work Class ROV (IMCA Class II / III), recommended for light construction work and instrumental surveys in shallow and deepwater range. An impressive number of electric and hydraulic tools are available for The Cougar (i.e. dual multifunction heavy duty manipulators, torque tools, cable/pipe cutters, HP waterjets, AX/VX gasket replacement tools, etc). Pipe Trackers, Dual Head Profilers, Multibeam bathymetric systems and many other sensors can be installed and interfaced simultaneously on The Cougar.

## II. 2. The Work Class ROVs



### **Work Class ROVs**

*Work Class* ROVs are electrical hydraulic vehicles between 75 and 150 horse power; they can transport weight of more than 250 kg thanks to a basket-like structure. They can be used in repair and construction work at depths of as much as 4,000 meters.

Most of them are equipped with two arms, a manipulator and a grabber, and are generally connected to the cage.

2 vehicles of this type were delivered in 2009 and 2 others should be delivered in 2010.

## II. The Horizon 2012 ROV fleet

Among the investments called for in the Bourbon Horizon 2012 strategic plan, BOURBON will expand its range of ROVs and, among them, its Work Class Vehicle fleet.

## III. Specific skills to operate subsea robots

### ▪ **The ROV Supervisor**

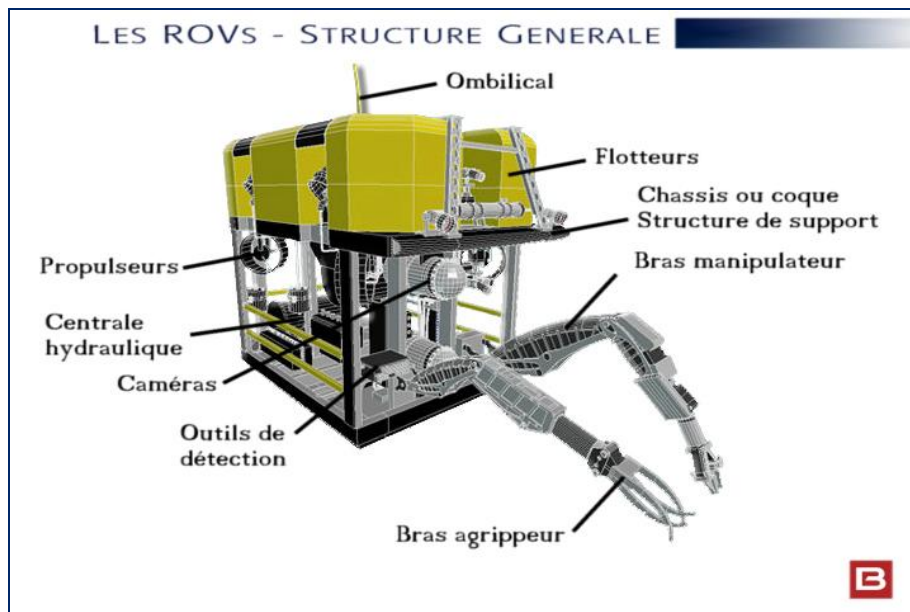
He is responsible for the ROV mission and for abiding by safety and operational standards. His main job is to make sure that the crew responsible for the ROV is in perfect control of all the parameters of the operation. He also sees to it that the contractual terms are complied with, in accordance with the client and BOURBON's operating and safety standards. Lastly, he guarantees the safety of the ROV crew and that both ROVs and their equipment are operational.

### ▪ **The ROV pilot**

The ROV is operated by remote control. The pilot therefore operates in safety at the command post on the bridge of the vessel. He sees to the steering of the ROV and the execution of the work assigned through remote orders from the command post. The ROV pilots are extremely qualified. They are experts in electronics, electricity and electrical engineering, and they also have in-depth knowledge of mechanical hydraulics. Lastly, they have enough knowledge to provide complete maintenance of the ROVs and their equipment during operation.

# APPENDIX 4

## General Characteristics of ROVs



Although they have special features related to the mission and the task performed, ROVs have in common a certain number of characteristics:

- **Support structure** – The "chassis" of the ROV to which all the elements are attached;
- **Floaters** – Used to reduce the apparent weight (weight in the water) of the device to zero;
- **Thrusters** – They allow the ROV to move in three directions (2 for forward/rear movements, 1 transverse thruster to counter currents, 1 vertical thruster for dynamic floatability and depth variations);
- **Cameras and projectors** – The camera is mounted on an adjustable remotely controlled tower and fixed cameras are often added to improve the precision of the steering;
- **Acoustic transponder, navigation system and detection tools** – The acoustic transponder is used to find the relative position of the ROV in relation to the vessel, sonars, gyroscopes, probes and other sensors used to navigate it;
- **Single function gripstick manipulators** – Used to perform tasks for which the ROV is used. Thus the ROV can be equipped with a simple remotely controlled lifting tong like a return arm with 7 or 8 degrees of give that can support a weight of up to 100 kg.
- **Hydraulic Plant** – provides the power needed for the arms;
- **Umbilical and electronic housing** – Enable the ROV to "communicate" with its driver and operating crews.

*The "cage" is a system used at depths greater than 500 meters and consists of a cylinder connected to the vessel that includes a spool for unwinding cable (umbilical) and serves as a weight and fixed base line for the ROV for its deepwater operations. This "cage" is sent down with the ROV to the required depth and allows the ROV to operate in complete safety while preventing the effects of the marine currents that could send the ROV outside its area of activity.*

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