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# Deepwater Asia Congress 2011

May 19<sup>th</sup>, 2011

Christian LEFEVRE

**B** | BOURBON

Building together a sea of trust

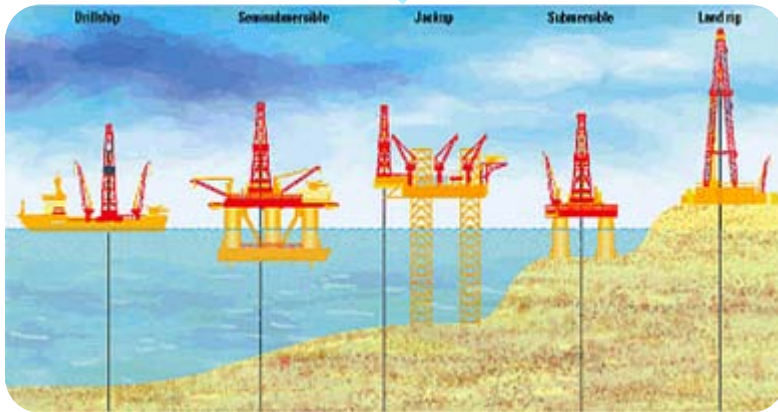
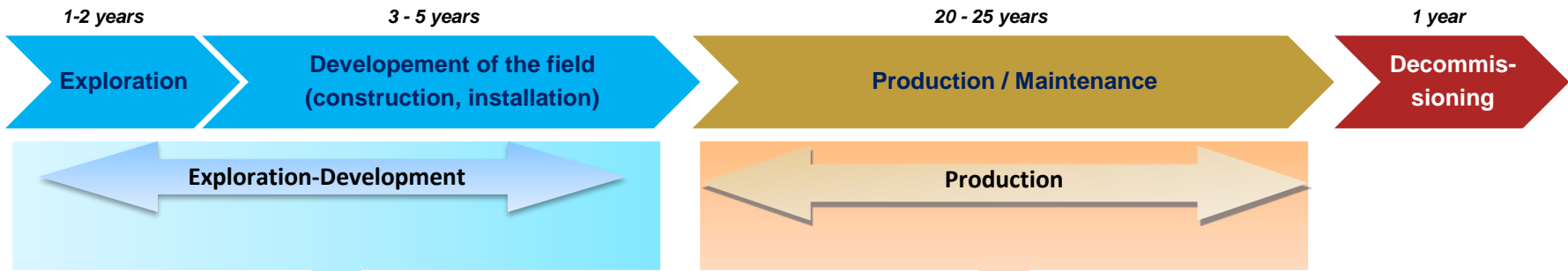


## OSV Segmentation

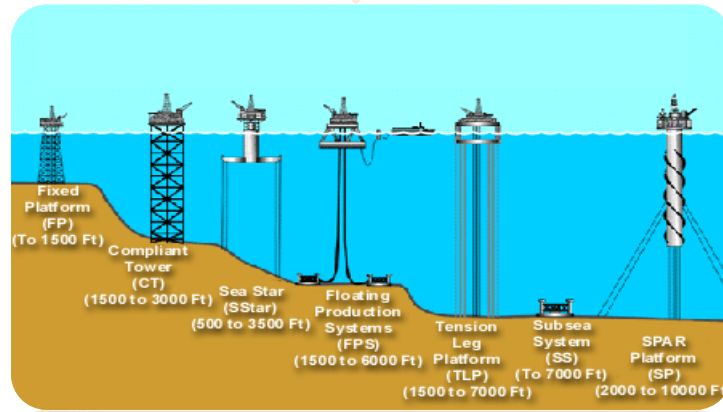


# Life cycle of offshore fields

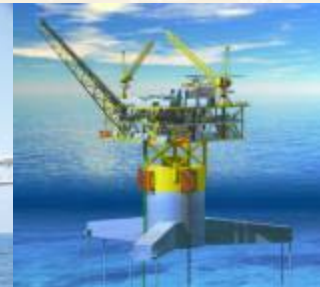
## From shelf ... to deepwater



**Drilling rigs**



**Offshore Production units**



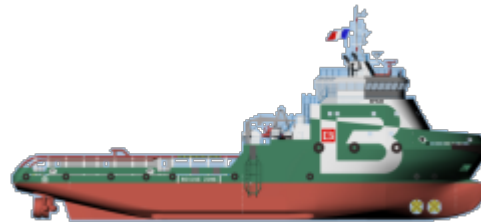


**Supply of offshore installations**



**PSV**  
**Platform Supply Vessel**

**Support to anchored drilling rigs**



**AHTS**  
**Anchor Handling Tug Supply vessel**

**Assistance to tanker lifting**



**Tug Boat**

**Urgent equipment transport**  
**Crew change**



**FSIV**  
**Fast Support Intervention Vessel**



**Crew change**



**Fast Crew Boat**

**Maintenance (top side)**



**MSV  
Maintenance Support Vessel**

**Subsea IMR**



**Subsea Offshore Support  
vessel**



# Offshore structure type determines offshore support vessel type

## Shallow water drilling units





# Offshore structure type determines offshore support vessel type

## Exploration

| SHALLOW WATER OFFSHORE  |   |
|---|---|
| Means / Offshore structure  | OSV vessels   |
| <u>DRILLING UNITS:</u><br><b>JACK-UP</b>  | <u>Displacement / Towage:</u><br>2 small AHTS 60 to 80 t BP<br><br><u>Offshore supply :</u><br>1 small PSV 1000 to 3000 t DWT or 1 FSIV |
| <u>DRILLING UNITS:</u><br><b>SEMI-SUBMERSIBLE</b><br><b>1<sup>st</sup> GENERATION</b> | <u>Displacement / Towage / Offshore supply :</u><br>2 AHTS up to 120 t<br><br><u>Personnel/equipment transport:</u><br>1 FSIV           |

| DEEP OFFSHORE   |  |
|---|--|
| Means / Offshore structure  | OSV vessels  |
| <u>DRILLING UNITS:</u><br><b>ANCHORED SEMI-SUBMERSIBLE</b>            | <u>Displacement / Towage:</u><br>2 large AHTS 150 to 200 t BP<br><br><u>Personnel transport / Equipement :</u><br>1 FSIV                               |
| <u>DRILLING UNITS:</u><br><b>DP SEMI-SUBMERSIBLE OR DP DRILL SHIP</b> | <u>Displacement / Towage:</u><br>2 PSV medium & large (depending on distance and storage needs)<br><br><u>Personnel/equipment transport:</u><br>1 FSIV |



# Offshore structure type determines offshore support vessel type

## Field development

### SHALLOW WATER OFFSHORE

| Means / Offshore structure   | OSV vessels  |
|--|--|
| <b><u>DRILLING UNITS:</u></b><br><b>JACK-UP</b>  | <b><u>Displacement / Towing:</u></b><br>2 small AHTS 60 to 80 t BP<br><br><b><u>Offshore supply:</u></b><br>1 small PSV 1000 to 3000 t DWT or 1 FSIV |
| <b>TENDER DE FORAGE</b>  | <b><u>Anchor handling &amp; towage:</u></b><br>2 AHTS 60 to 80 t BP<br><br><b><u>Personnel/equip. transport:</u></b><br>1 FSIV - Crew Boat           |
| <b><u>CONSTRUCTION / INSTALLATION :</u></b><br><b>CONSTRUCTION BARGE</b><br><br><b>PLATFORM INSTALLATION &amp; PIPE LAYING</b><br><br><b>BARGE HOTEL</b> | **** AHTS 60 to 120 t BP<br><br>** FSIV - Crew Boat<br><br>* PSV 1000 to 3000 t DWT  |

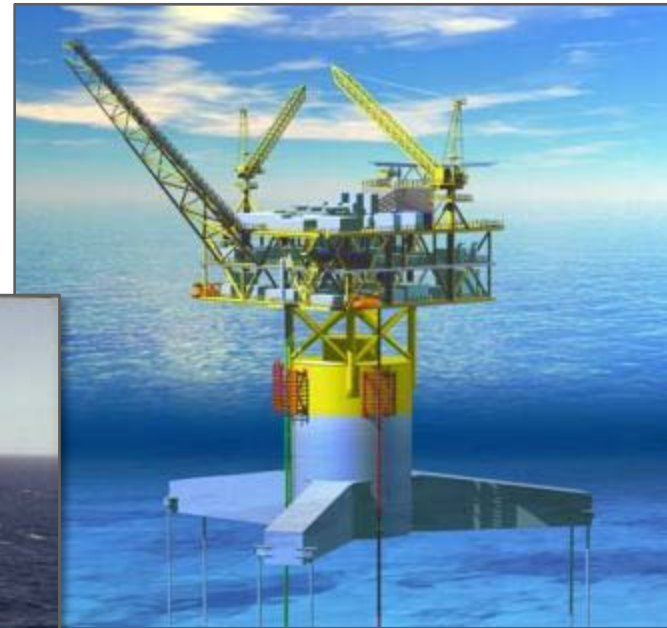
### DEEP OFFSHORE

| Means / Offshore structure   | OSV vessels  |
|--|--|
| <b><u>DRILLING UNITS:</u></b><br><b>ANCHORED SEMI-SUBMERSIBLE</b>  | 2 large AHTS 150 to 200 t BP<br>1 FSIV<br><br>2 PSV medium - large<br>1 FSIV - Crew Boat                     |
| <b>DP SEMI-SUBMERSIBLE OR DP DRILL SHIP</b>  |  |
| <b><u>CONSTRUCTION / INSTALLATION:</u></b><br><b>CONSTRUCTION &amp; LAYING VESSELS (DP)</b><br><br><b>SUBSEA INSTALLATION VESSELS (DP)</b> | ** PSV small & medium<br>* FSIV<br>* Crew Boat<br>* AHTS 80 t<br>* Tugs 80 t<br>* Large AHTS 150 to 180 t BP |



# Offshore structure type determines offshore support vessel type

## Production units





# Offshore structure type determines offshore support vessel type

## Production / Maintenance

### SHALLOW WATER OFFSHORE

| Means / Offshore structure | OSV vessels   |
|----------------------------|---|
| FIXED PRODUCTION PLATFORM  | <ul style="list-style-type: none"> <li>*** small PSV - Utility Boat</li> <li>*FSIV (supplying)</li> <li>•Crew Boat</li> </ul> |
| FSO                        | <ul style="list-style-type: none"> <li>** Tugs or small AHTS</li> <li>* Crew Boat</li> </ul>                                  |
| WORK BARGE                 | <ul style="list-style-type: none"> <li>** Tugs or small AHTS</li> <li>** Crew Boat</li> <li>* PSV small or medium</li> </ul>  |
| JACK-UP                    | <ul style="list-style-type: none"> <li>* PSV 1000 to 3000 t DWT</li> </ul>  |
| STIMULATION VESSEL         | <ul style="list-style-type: none"> <li>** Small AHTS 60 to 80 t BP</li> </ul>   |
| MAINTENANCE VESSEL         | <ul style="list-style-type: none"> <li>* Crew Boat</li> </ul>   |

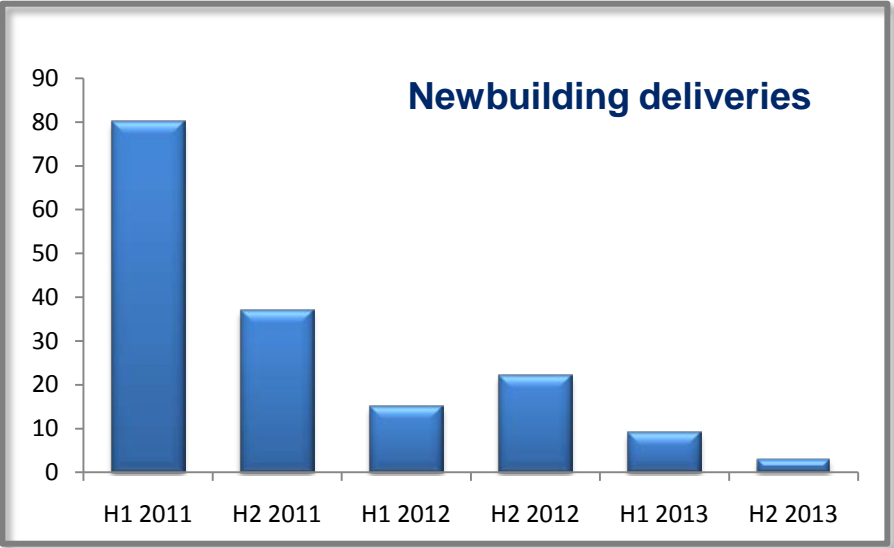
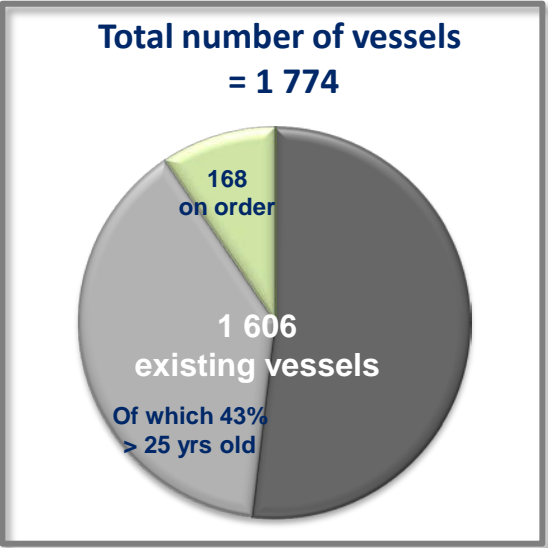
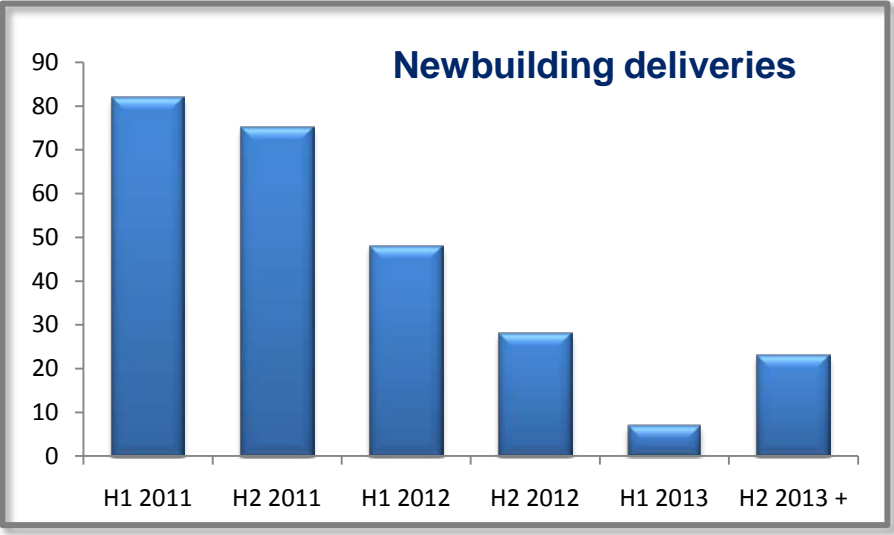
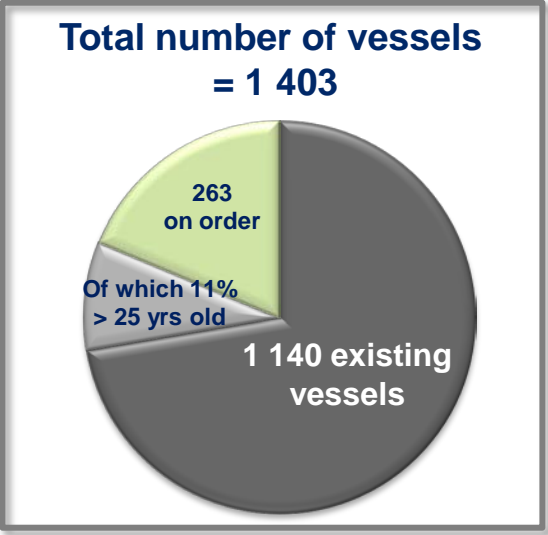
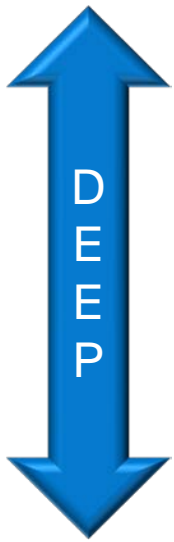
### DEEP OFFSHORE

| Means / Offshore structure      | OSV vessels   |
|---------------------------------|---|
| FPSO<br>OR<br>TLP               | <ul style="list-style-type: none"> <li>*** PSV 3000 to 4500 t DWT</li> <li>** FSIV - Crew Boat</li> <li>** Tug - AHTS 80 to 120 t BP</li> </ul> |
| IMR VESSELS<br>1 to 2 per field |   |
| DRILL SHIP                      | <ul style="list-style-type: none"> <li>** PSV 3000 to 4500 t DWT</li> </ul>   |
| WORK OVER VESSEL                | <ul style="list-style-type: none"> <li>** PSV</li> </ul>  |
| STIMULATION VESSEL              | <ul style="list-style-type: none"> <li>* Large PSV as support vessel</li> <li>* Crew Boat</li> </ul>  |

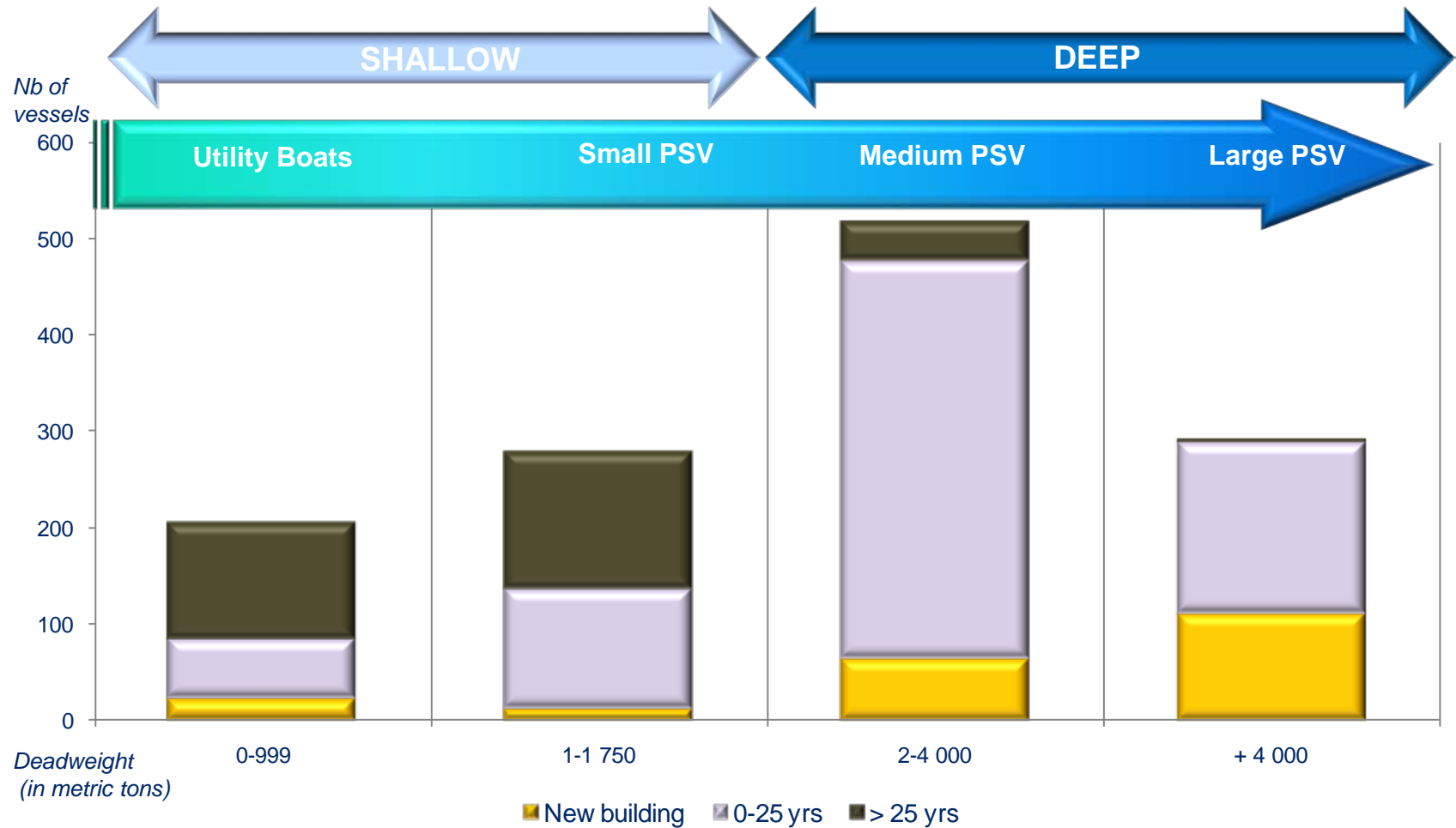


# OSV worldwide market

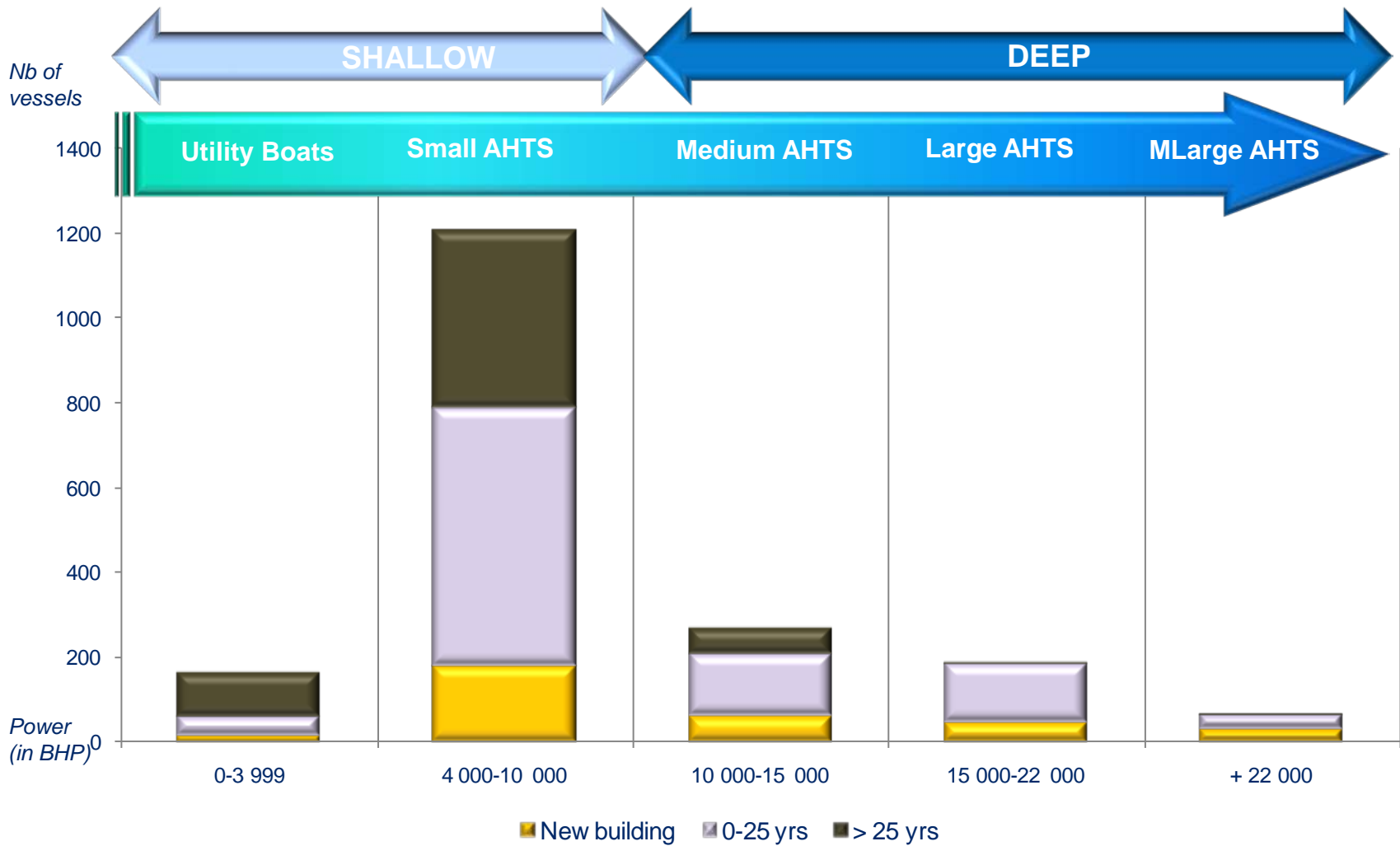
*PSV & AHTS Deep / Shallow*



Sources: ODS Petrodata/BOURBON, March 2011



Source: ODS Petrodata, BOURBON, March 2010



Source: ODS Petrodata, BOURBON, March 2010



**New drilling units, production trees, production floaters require new OSV**



Larger and more powerful high standard vessels built to meet the requirement of the deepwater market

- Dynamic positioning
- Greater cargo capacities
- Special product tanks: liquid mud, brine, base oil, methanol
- Specialized equipments: crane, deepwater winch, oil recovery, firefighting
- Speed (crewboats)



**Suitable OSV per segment**



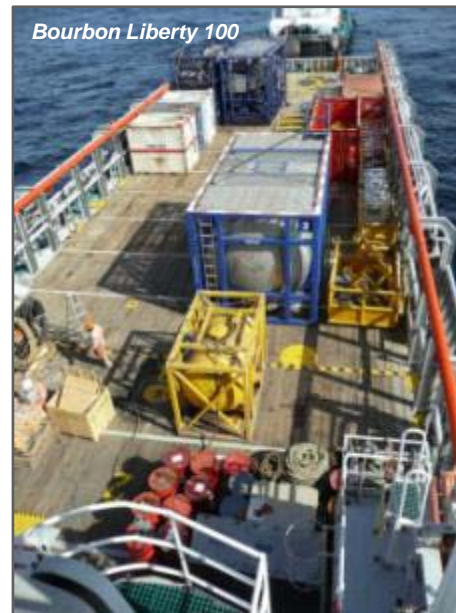
# PSV: Platform Supply Vessels



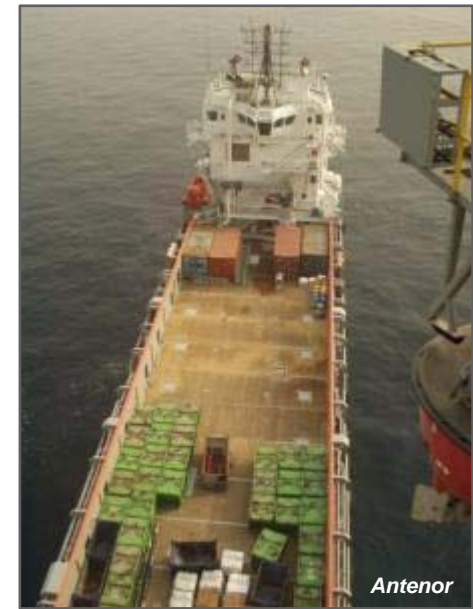
*Bourbon Helios*



*Bourbon Helios*



*Bourbon Liberty 100*



*Antenor*



- 3,100 T DWT
- 73m x 16.5m
- 675 m<sup>2</sup>
- Methanol Capacity
- DP II
- Diesel Electric



- DWT > 4,000 T
- LOA > 80m
- Breadth > 19m
- Deck Area > 800 m<sup>2</sup>
- DP II
- Diesel Electric



| Traditional shallow water PSV |  | Medium size deepwater PSV              | Large deepwater PSV                    |
|-------------------------------|--|--|--|
| Length:                       | 60 m                                       | 73 m                                   | 89 m                                   |
| Deadweight:                   | 1,000 t                                    | 3,100 t                                | 4,450 t                                |
| Liquid mud:                   | 100 m <sup>3</sup>                         | 1,092 m <sup>3</sup>                   | 1,200 m <sup>3</sup>                   |
| Methanol:                     | nil  | 171 m <sup>3</sup>                     | 290 m <sup>3</sup>                     |
| Deck space:                   | 334 m <sup>3</sup>                         | 689 m <sup>2</sup>                     | 1,017 m <sup>2</sup>                   |
| Propulsion:                   | 2 fixed pitch propellers<br>1 bow thruster | 2 azimuth thrusters<br>2 bow thrusters | 2 azimuth thrusters<br>3 bow thrusters |
| Dynamic positioning:          | nil  | DPII                                   | DPII                                   |

# AHTS: Anchor Handling Tug Supply



*Bourbon Surf*



*Bourbon Orca*



*Luzolo*





- 70m x 17.20m
- 170 T bollard pull
- 500 m<sup>2</sup>
- DP II





- 87.70m x 18m
- 237 T bollard pull
- 500 m<sup>2</sup>
- DP II





| Traditional shallow water AHTS |   | Medium size deepwater AHTS | Large deepwater AHTS |
|--------------------------------|---|----------------------------|----------------------|
| Length:                        | 58 m  | 70 m                       | 90 m                 |
| Power:                         | 4,000 HP                                      | 15,600 BHP                 | 21,400 BHP           |
| Bollard Pull:                  | 50 t  | 170 T                      | 237 t                |
| Winchpull:                     | 70 t  | 400 t                      | 500 t                |
| Liquid mud:                    | nil   | 400 m <sup>3</sup>         | 560 m <sup>3</sup>   |
| Propulsion:                    | Twin fixed pitch propellers<br>1 bow thruster | 2 bow thrusters            | 3 bow thrusters      |
| Dynamic positioning:           | nil   | DPII                       | DPII                 |



*Bourbon Rhesos*



*Bourbon Rhode*





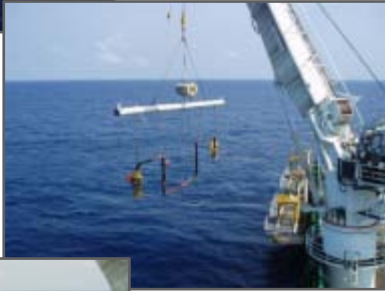
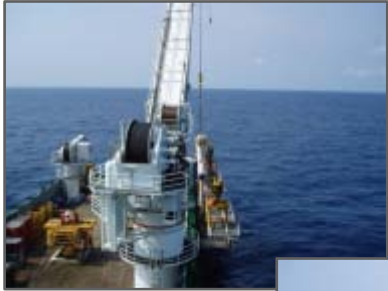
# Crewboats

## *Surfer 3600*



- Length: 36 m
- Beam: 6.70 m
- Cruising speed: 40 knots
- Range: 480 miles
- 50 Business Class accommodation







# Subsea support vessel

*Inspection Maintenance Repair*



- LOA > 100m
- Breadth: 21m
- Deck Areas > 1200 m<sup>2</sup>
- DP III
- Diesel Electric
- Subsea Crane: 150T
- 105 Accommodation



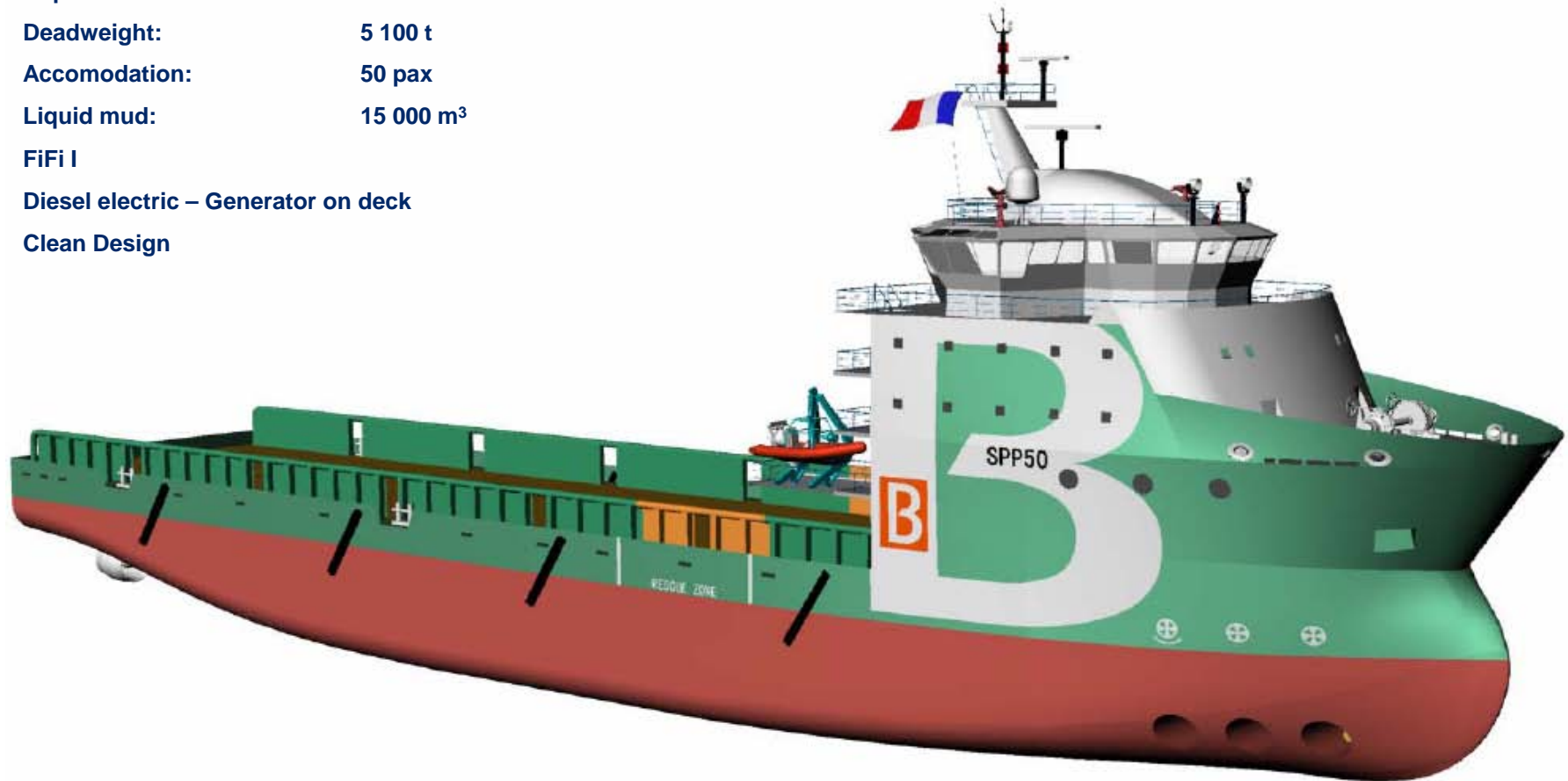
**Market trend for  
ultra deepwater**



# Market trend for ultra deepwater

*Very large PSV*

- Length overall: 92 m
- Breadth: 19.60 m
- Depth moulded: 7.80 m
- Deadweight: 5 100 t
- Accommodation: 50 pax
- Liquid mud: 15 000 m<sup>3</sup>
- FiFi I
- Diesel electric – Generator on deck
- Clean Design





Safe AHTS  
No funnels  
Closed stern  
Pre lay features



LxB-90x23m  
BP 250t cont.  
Hybrid prop.  
Flexi tanks  
FiFi1  
Clean Design  
50 accommodation

Options:  
NMD Rescue  
NOFO  
Ice 1B/De Ice

4 drums/500t  
4 secondaries: each 2.000m/208mm



- Deepwater offshore requires new larger, more powerful, DP2 offshore support vessels
- Existing traditional support vessels will not do the job in deeper water
- Competent crew and management staff will be the key success factor for safe and reliable operations



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