Offshore & OSVs
Market, Trends & Classification

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Istanbul
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## ABS Market Share in Offshore

<table>
<thead>
<tr>
<th>Existing &amp; Current Offshore Units</th>
<th>Jackups</th>
<th>Drillships</th>
<th>Semisubs</th>
<th>Submersibles</th>
<th>Total</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>496</td>
<td>98</td>
<td>130</td>
<td>2</td>
<td>726</td>
<td>74.0%</td>
</tr>
<tr>
<td>DNV</td>
<td>36</td>
<td>56</td>
<td>89</td>
<td>0</td>
<td>181</td>
<td>18.5%</td>
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<tr>
<td>LR</td>
<td>9</td>
<td>1</td>
<td>4</td>
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<td>14</td>
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<tr>
<td>BV</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>13</td>
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<tr>
<td>Other</td>
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<td>0</td>
<td>10</td>
<td>0</td>
<td>47</td>
<td>4.8%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>581</strong></td>
<td><strong>160</strong></td>
<td><strong>238</strong></td>
<td><strong>2</strong></td>
<td><strong>981</strong></td>
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</tr>
</tbody>
</table>

**ABS Share**

- **85.4%**
- **61.3%**
- **54.6%**
- **100.0%**
- **74.0%**
Deepwater Production

Total Production by Water Depth

Source: Infield
Offshore Unit Populations by Type

- Population of offshore units by type including both existing and on-order as of 1Q 2013
- OSVs both new and on order account for more than 4,500 vessels (excludes <60m LOA <10m Beam)
Subsea Wells Increasing

- Drivers for subsea support vessels of all types
  - Growing number of subsea wells needing workover
  - Growing number and complexity of subsea pipelines
  - More hardware going subsea
  - ROV support, construction, Inspection, Maintenance & Repair (IMR)
OSV World Fleet: Diversity Increasing

**OSV World Fleet by Type**

- **Supply (PSV)**, 25%
- **Patrol Vsl**, 7%
- **Anchor Handling/Tug/Supply (AHTS)**, 33%
- **Safety Standby Vsl (AHTS/Supply/PSV/Tug)**, 5%
- **Research Vsl**, 4%
- **Anti Pollution Vsl (OSRV)**, 4%
- **Oceanographic Vsl**, 3%
- **Maintenance/Utility Vsl**, 3%
- **Diving Support Vsl**, 3%
- **Offshore Maintenance Utility**, 3%
- **Seismic Survey Vsl**, 3%
- **Fire Fighting Vsl**, 1%
- **Geophysical Research Vsl**, 1%
- **SAR Vsl**, 1%
- **Ice Breaker/Offshore Tug/Supply**, 1%
- **Survey Ship ROV Support**, 1%
- **Pipe Carrier/Platform Supply Vsl**, 1%
- **Offshore Support Vsl**, 1%
- **Oil Well Stimulation Vsl**, 0%
- **Naval Vsl (SAR)**, 0%
- **Ice Breaker/Bouy Tender**, 0%
- **Salvage/Mooring Vsl**, 0%
- **Self Elevating Wind Turbine Installation Vsl (WTIV) (Wind IMR)**, 0%

*Source: Fairplay Shipdata Aug 2011*
OSV World Fleet

Global OSV Existing Fleet by Class
60m > LOA and 10m > Beam

- DnV: 32%
- ABS: 28%
- LR: 7%
- Other & NC: 33%

Global OSV Fleet On Order by Class
60m > LOA and 10m > Beam

- DnV: 29%
- LR: 9%
- Other & NC: 27%

Source: Fairplay Shipdata May 2013
Today’s OSVs

- OSVs – today’s designs are larger, more powerful and multi-purpose
- Larger and faster OSVs needed to meet the support demands of going farther offshore to support deepwater drilling and subsea operations

<table>
<thead>
<tr>
<th></th>
<th>Legacy Boats</th>
<th>New Generation Deepwater Boats</th>
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<tbody>
<tr>
<td>Length</td>
<td>57m – 70m</td>
<td>67m – 130m +</td>
</tr>
<tr>
<td>Brake Horsepower</td>
<td>4,000 – 15,000</td>
<td>8,000 – 45,000</td>
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<tr>
<td>Winch Rating (tons)</td>
<td>80 – 300</td>
<td>250 – 600</td>
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<tr>
<td>Dynamic Positioning</td>
<td>NONE</td>
<td>YES – DP-2</td>
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</table>
ABS OSV Rule Enhancement

- A stand-alone, consolidated set
- Addresses current industry trends
- Consolidates existing Rule requirements
- Requirements developed for new service types
New Developments

- Support offshore alternative energy
  - Wind turbine installation, maintenance and repair
- Environmental considerations
  - LNG as fuel
  - Power and propulsion system optimization for reduced fuel consumption
- Support offshore oil and gas exploration and production in Arctic and sub-Arctic waters
  - Arctic OSVs
- Development in Brazil pre-salt fields
  - Doubled need for OSVs till 2020
Function Combinations

- Economic motivation
- Safety principles
  - Keep dangerous machinery away from personnel
  - Keep HNLS away from personnel
  - Keep HNLS away from ignition sources and heat
- Technical feasibility

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Functions</th>
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<tbody>
<tr>
<td>Support</td>
<td>WI/WS/WT</td>
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<tr>
<td>Transport</td>
<td>Crew</td>
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<tr>
<td>Emergency Services</td>
<td>SSR</td>
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## Coordination of Multiple OSV Notations

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<tr>
<th>Transport</th>
<th>Personnel</th>
<th>Supply</th>
<th>HNLS</th>
<th>Dive/ROV</th>
<th>AH/TOW</th>
<th>Pipe Lay</th>
<th>Heavy lift</th>
<th>Wind-IMR</th>
<th>WI-WS-WT</th>
<th>SSR</th>
<th>OSR</th>
<th>FFV</th>
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- **Advantage**
- **Case-by-Case**
- **Disadvantage**
Trends in OSV Class Notations

Green Passport: GP

Environmental Protection: ENVIRO or ENVIRO+

Habitability: HAB(WB), HAB+(WB) or HAB++(WB)

Dynamic Positioning, enhanced DP notations

Low Temp Environments: CCO

IACS UR Polar Class: PC
Summary & Conclusions

- The Offshore market is predicted to stay strong, especially deepwater developments.
- Increased numbers of deep-sea production sites and subsea wells will drive demand for capable OSVs.
- ABS Rules and Guides have been developed to provide the appropriate notations for today's modern OSV designs and systems.
- All ABS Rules & Guides are available for download free of charge on the ABS website at www.eagle.org.