Skipsey Tide
Vessel delivering flexible, efficient offshore stimulation using the FlexSTIM system

APPLICATIONS
- Large-volume, high-pressure stimulation operations
- Complex stimulation treatments
- Acid fracturing treatments

BENEFITS
- Increases operational flexibility and job frequency with storage and blending capacities that accommodate operations from large acid fracturing jobs to small squeeze treatments
- Minimizes nonproductive time by delivering high-pressure stimulation operations even in rough seas up to Sea State 5
- Maximizes operational efficiency and accuracy with experienced vessel and stimulation crews, state-of-the-art data acquisition and automation systems, and fit-for-purpose pumping and blending equipment

FEATURES
- Installed horsepower: 6,650 hhp
- Noncorrosive fluid storage capacity: 1,966.1 m³ [12,364 bbl]
- Corrosive fluid storage capacity: 378 m³ [2,380 bbl]
- Liquid additive storage capacity: 112.5 m³ [707 bbl]
- Blending capacity: 15.9 m³ [100 bbl] of corrosive fluid

Skipsey Tide is an offshore supply vessel that has been outfitted with storage, mixing, and pumping equipment, using the FlexSTIM® modular offshore stimulation system. Skipsey Tide was surveyed by American Bureau of Shipping (ABS) and complies with the relevant sections of the ABS Offshore Stimulation Vessel Rules to maintain classification status to perform well stimulation operations. The vessel is capable of delivering stimulation services worldwide.

The Skipsey Tide is capable of staying on station in challenging sea conditions. Bow and stern thrusters maximize maneuverability when controlled by the proven Kongsberg K-Pos dynamic positioning system. They enable the vessel to automatically maintain station to platforms, semis, and jack-up rigs.

Stimulation equipment and instrumentation improve operations
At the heart of the vessel is the blending and pumping system that executes complex stimulation treatments. Careful planning of the overall package permits the preparation of stimulation fluids ranging from VDA® viscoelastic diverting acid to SXE® emulsified acid and the precise control of additive concentrations over a full range of treatment rates. The system comprises
- five diesel-driven high-pressure pumps capable of delivering 6,650 hhp
- several storage tanks lined with corrosion-resistant fiberglass-reinforced plastic that can hold raw acid before it is mixed into designed treatment concentrations
- ten liquid additive tanks fitted with independent computer-controlled injection pumps
- two 50-bbl blenders capable of blending viscoelastic, emulsified, and polymer-based fluids.

All phases of the stimulation treatment are controlled remotely from a central control room. Continuous monitoring and control of critical parameters ensure the highest degree of quality control and assurance.
Treatments are delivered through a flexible treating line with a quick-disconnect coupling that enables rapid vessel movement if required in an emergency.

**Automation ensures efficiency and accuracy**

The stimulation control center includes a main control room and an instrument and equipment interface room, with an onboard laboratory nearby to monitor quality control of all fluids.

The control console remotely operates pumps, blenders, and valves. Instrument feedback from flowmeters, pressure gauges, and tank levels is presented in digital form. Essential parameters in the stimulation operation are displayed in real time and include:

- blender fill levels
- flow rates of each fluid and additive
- downstream pressures of each pump
- venting pressures of the pressure relief valve
- pressure and rates of treating fluid at critical points in the system
- cumulative volumes pumped.

Data is recorded in real time at 1-s intervals and fed into the FracCAT* fracturing computer-aided treatment system. This system comprises hardware and software for monitoring, recording, and reporting all types of stimulation treatments. Its real-time displays and plots present a clear picture of the treatment as it occurs, providing decision-makers with real-time detailed job information from the surface to the perforations.

Job information may be viewed onshore using the InterACT* global connectivity, collaboration, and information service. The InterACT service enables real-time data sharing via a permanent satellite link, thus maximizing efficiency of engineering resources.

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**Skipsey Tide Vessel Specifications**

**Marine data**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length, m [ft]</td>
<td>72 [236]</td>
</tr>
<tr>
<td>Breadth moulded, m [ft]</td>
<td>16 [53]</td>
</tr>
<tr>
<td>Depth moulded, m [ft]</td>
<td>5 [17]</td>
</tr>
<tr>
<td>Max. loaded draft, m [ft]</td>
<td>5.8 [19]</td>
</tr>
</tbody>
</table>

**Performance**

- Speed at 85%, knots: 11
- Speed at 100%, knots: 12
- Crash stop, s: 58

**Capacities**

- Deadweight, Mg at 5.9-m draft [tonUS at 19.2-ft draft]: 4471.9 [4,929.4]
- Freshwater, m³ [bbl]: 1,966 [12,365]
- Potable water, m³ [bbl]: 218 [1,371]
- Fuel oil, m³ [bbl]: 833 [5,241]

**Thrusters**

- Bow thrusters (2), kW: 880
- Stern thrusters (2), kW: 1,600

**Auxiliary engines**

- Generators (2), kW: 300
- Diesel generators (2), kW: 320

**Accommodations**

- One-person cabins: 5
- Two-person cabins: 22
- Hospital: 1
- Total berths: 49

**Anchoring equipment**

- Windlass, tonUS: 10
- Anchors (2), kg [lbm]: 2,460 [5,423]
- Chain cable (2) length and diameter, m × mm [ft × in]: 247.5 × 38 [812 × 1.5]

**ROV support**

- ROV plug-in wiring connections from deck

**Stimulation data**

**Treatment pumps**

<table>
<thead>
<tr>
<th>Treatment pumps</th>
<th>Total pump power, kW [hhp]</th>
<th>4,958.9 [6,650]</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-pressure pump 1</td>
<td>Nominal plunger size, in</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Max. pressure, MPa [psi]</td>
<td>83 [12,000]</td>
</tr>
<tr>
<td></td>
<td>Max. rate, m³/min [bbl/min]</td>
<td>2.5 [15.5]</td>
</tr>
<tr>
<td>High-pressure pumps 2 and 3</td>
<td>Nominal plunger size, in</td>
<td>4½</td>
</tr>
<tr>
<td></td>
<td>Max. pressure, MPa [psi]</td>
<td>138 [20,000]</td>
</tr>
<tr>
<td></td>
<td>Max. rate, m³/min [bbl/min]</td>
<td>1.4 [8.7]</td>
</tr>
<tr>
<td>High-pressure pump 4 front</td>
<td>Nominal plunger size, in</td>
<td>3¼</td>
</tr>
<tr>
<td></td>
<td>Max. pressure, MPa [psi]</td>
<td>69 [10,000]</td>
</tr>
<tr>
<td></td>
<td>Max. rate, m³/min [bbl/min]</td>
<td>0.9 [5.6]</td>
</tr>
<tr>
<td>High-pressure pump 4 rear</td>
<td>Nominal plunger size, in</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Max. pressure, MPa [psi]</td>
<td>103 [15,000]</td>
</tr>
<tr>
<td></td>
<td>Max. rate, m³/min [bbl/min]</td>
<td>0.6 [3.7]</td>
</tr>
</tbody>
</table>

**Acid blenders and centrifugal pumps**

<table>
<thead>
<tr>
<th>Raw acid centrifugal pumps (2) max. rate, m³/min [bbl/min]</th>
<th>5.56 at 827 kPa [35 at 120 psi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6- × 8-in blending centrifugal pumps (2) max. rate, m³/min [bbl/min]</td>
<td>5.56 at 827 kPa [35 at 120 psi]</td>
</tr>
<tr>
<td>Auxiliary 5- × 6-in blending centrifugal pump (1) max. rate, m³/min [bbl/min]</td>
<td>1.9 at 310 kPa [12 at 45 psi]</td>
</tr>
</tbody>
</table>

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