Subsea Dispersant & Debris Removal

Subsea application of dispersant reduces the amount of oil coming to the surface and this in turn:
- Reduces exposure of surface vessels and personnel to volatile organic compounds (VOC)
- Reduces the need for surface recovery, in situ burn, and surface dispersant operations, reducing exposure of response personnel to accidents during these operations

**Provided By Client**
- Authorization to apply dispersants
- Dispersant chemical
- Coiled tubing and pump unit
- Monitoring equipment

**General Specifications**
- Rated to 10,000 psi (689 bar)
- Routing manifold
- Distribution manifold
- Hoses. 2x 500ft of 1-in SpirStar 10,000 psi rated hose
- Applicators
- API 17H high-flow connectors

**Key Facts**
The two hardware kits for the subsea application of dispersant at a flowing subsea BOP include:
- Debris-clearing equipment with cutting tools to gain access to the blowout preventer (BOP) when necessary
- Flying leads, distribution manifold, and dispersant wands to inject dispersant at multiple locations
- Air-freightable and stored in two strategic locations for rapid global deployment
- Available for use in a variety of international metocean conditions
Debris Clearance

In the event that the rig LMRP package fails to separate during EQD sequence, there is a high probability that debris will hinder the installation of the capping stack onto the primary drilling BOP.

An ROV survey will be conducted as soon as practical to determine the presence of debris over well center. If debris is located, a detailed record of the locations and types of debris will be made for planning purposes. A database of BOP, LMRP, and riser components will be referenced to ensure that proper tooling is used. Equipment will be mobilized as required for the specific debris removal operations and a suitable marine asset will be selected from the field fleet.

The area within a 50 ft radius of well center will be cleared to prepare for the capping stack install. In addition to the tubular members (i.e., riser, pipe, etc.), the LMRP will need to be removed to gain access to the BOP upper interface.

Status

- (1) Set of shears ready for shipment and staged in Aberdeen
- (1) Set of shears ready for shipment and staged in Singapore
- Set consists of (1) model 2500 & (1) model 660

Field Ready

- Field proven to 5,000 fsw (1,524 m)
- External hydrostatically tested to 10,000 fsw (3,048 m)
- Operated subsea via SHPU/ROV

General Specifications

<table>
<thead>
<tr>
<th>Model 2500</th>
<th>Model 660</th>
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<tbody>
<tr>
<td>Weight</td>
<td>Weight</td>
</tr>
<tr>
<td>47,000 lbs (21.3 mt)</td>
<td>13,700 lbs (6.2 mt)</td>
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<tr>
<td>Jaw Opening</td>
<td>Jaw Opening</td>
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<tr>
<td>46 in. (116 cm)</td>
<td>32 in. (81 cm)</td>
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<tr>
<td>Shear Force @ 5,500 psf</td>
<td>Shear Force @ 5,500 psf</td>
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<tr>
<td>3,317 lbs (1.5 mt)</td>
<td>1,625 lbs (0.7 mt)</td>
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Shears cutting pipe

Shears positioned to cut riser

Shears cutting riser