DRONES FOR MARITIME AND OFFSHORE MISSIONS, OPPORTUNITIES AND CHALLENGES

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_CONTENT

❖ Surveillance and detection services
❖ Commercial ship services
❖ Off-Shore installation services
❖ Inspections
❖ Other maritime services
❖ Challenges
The Commercial Market—Not Consumer or Military—Will Drive the Industry Forward
OVER THE OPEN SEA OR NEAR HARBOURS

Surveillance and detection (of incidents)

The drone as an eye in the sky and a “tattletale”
LONG ENDURANCE DRONES FOR SEARCH AND RESCUE
OVER THE OPEN SEA OR NEAR HARBOURS
<table>
<thead>
<tr>
<th>Main Service</th>
<th>N systems</th>
<th>OP. Flight Time</th>
<th>MTOM</th>
<th>Take-off</th>
<th>Particularities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multipurpose maritime surveillance</td>
<td>1</td>
<td>&gt; 12 h</td>
<td>1150 kg</td>
<td>Runaway</td>
<td>EO/IR, AIS, EPIRB Satcom, Maritime (SAR) Radar, Anti-icing</td>
</tr>
<tr>
<td>Multipurpose maritime surveillance</td>
<td>2</td>
<td>&gt; 8 h</td>
<td>150 kg</td>
<td>Runaway</td>
<td>EO/IR, AIS, EPIRB</td>
</tr>
<tr>
<td>Emissions monitoring/ Multipurpose maritime Surveillance</td>
<td>2</td>
<td>6 h</td>
<td>25 kg</td>
<td>Runaway</td>
<td>EO/IR, AIS, EPIRB, SOx/NOx sniffer</td>
</tr>
<tr>
<td>Emission monitoring</td>
<td>1</td>
<td>6 h</td>
<td>30 kg</td>
<td>Runaway</td>
<td>EO/IR, AIS, SOx/NOx sniffer</td>
</tr>
<tr>
<td>Multipurpose maritime surveillance</td>
<td>2</td>
<td>4 h</td>
<td>&gt;150 kg</td>
<td>Landing area &lt;5x5m² (vessels)</td>
<td>EO/IR, optical scanner, AIS, EPIRB</td>
</tr>
<tr>
<td>Emissions monitoring/ Multipurpose maritime Surveillance</td>
<td>2</td>
<td>4 h</td>
<td>&gt;150 kg</td>
<td>Landing area &lt;5x5m² (vessels)</td>
<td>EO/IR, AIS, SOx/NOx sniffer</td>
</tr>
<tr>
<td>Multipurpose maritime surveillance/ Pollution response (from vessels)</td>
<td>2</td>
<td>&gt; 35 min</td>
<td>&lt;3 kg</td>
<td>Landing area &lt;4x4m² (vessels)</td>
<td>EO/IR (not via RPAS-DG)</td>
</tr>
</tbody>
</table>
OVER THE OPEN SEA OR NEAR HARBOURS

Communication:

The drone as an “enabler”

- Testing and calibrating ships’ antennas.
OVER THE OPEN SEA OR NEAR HARBOURS

Maersk Tankers Successfully Completes Drone Delivery to Vessel at Sea
OVER THE OPEN SEA OR NEAR HARBOURS

Examples of drone missions at sea and offshore;

- With increased drone capabilities and the possibility of using 3-D technology to image offshore installations in the near future, the sky’s the limit.
Examples of drone missions at sea and offshore:

- Inspecting tanks and other confined spaces on ships
OVER THE OPEN SEA OR NEAR HARBOURS

Challenges;

➢ Insurance will rise to the forefront for commercial operators.

➢ Algorithm-driven autonomous drones will be game changers.

➢ Swarm intelligence will allow multiple drones to collaborate

➢ Legal challenges – no harmonized legislation yet

➢ Permission to fly – flight authorization

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Amazon's giant 'dystopian' delivery-drone
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