Submarine high frequency active sonar for own ship safety and tactics

MOAS provides high detection performances and ensures that the submarine is always in a safe environment to maneuver.

- **Mine & obstacle detection and localization**
  - Safe shallow waters navigation.
  - Mine fields avoidance.
- **Detection of surface obstacles**
  - Highly important for submarine safety when surfacing.
- **Bottom mapping for 3D Navigation**
  - Real-time visualization of seabed (Nav 3D), localization & tracking of contacts.
- **Short range submarines detection**
  - Management of short range situation with very quiet submarines.

**PEDIGREE**

In service at sea.

- 15 systems contracted:
  - **Malaysian Navy**: SSK Scorpene class
  - **Indian Navy**: SSK Scorpene class
  - **French Navy**: SSNs Barracuda & Amethyste class
SUBMARINE WARFARE

MOAS
Mine & Obstacle Avoidance Sonar

OPERATIONAL HIGHLIGHTS

Essential for the safety of submarines operating increasingly in littoral waters, the real-time 3D navigation capability also provides potential for better own ship geographical localization (based on correlation with existing charts or sea-marks).

The MOAS provides also a good short range detection capability of cooperative or non-cooperative platforms in the vicinity.

MAIN CHARACTERISTICS

System features:

• Easy to integrate by shipyards
• Stand alone or fully integrated sonar in S-CUBE sonar suite
• 3D real time visualization for obstacles and bottom mapping
• Automatic 3D localisation enabled by wide band, frequency coded transmission and 3D forward bottom mapping
• Selectable narrow elevation beams and wide frequency band provide very good performance against reverberation, especially in shallow water, and provide high probability of detection against moored mines
• Detection and tracking, low absorption losses and good discretion level
• Automatic detection and tracking provides the operator with the capability to manually send a detected mine or obstacle location to the tactical system
• Display in graphical form uses a Man Machine Interface (MMI) with a high-resolution colour display
• Easy to interface MOAS with combat management system (CMS) and navigation systems (electronic charts)

TECHNICAL FEATURES

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Bandwidth Range accuracy</td>
<td>36 to 72 KHz 1Km approx.</td>
</tr>
<tr>
<td>Bearing Accuracy</td>
<td>1.5° at 54 KHz ahead of submarine</td>
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<tr>
<td>Bearing coverage</td>
<td>≤ 90°</td>
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<tr>
<td>Elevation coverage</td>
<td>Sector of 24°, 12° or 6°</td>
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<tr>
<td>Steerable elevation coverage</td>
<td></td>
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