



SAAB

SABERTOOTH

VERSATILITY IN
NEW DIMENSIONS



EXTREME VERSATILITY

Underwater operations face a vast array of challenges that require a vehicle with multi-role capabilities and cutting-edge technology. This inspired Saab to create Seaeye Sabertooth, a combination of Saab Seaeeye military and commercial ROV/AUV technology.

With deepwater capability, long excursion range, advanced AUV functionality and a six degrees of freedom control system, Seaeeye Sabertooth is the perfect example of Saab's **thinking edge** in action.

Available in single and double hull versions, Seaeeye Sabertooth is a very powerful but lightweight platform for inspection, maintenance and repair (IMR).

For example, its small size, tether-free operation and manoeuvrability ensure easy and safe access inside and around complex structures, making it ideal for autonomous IMR of subsea installations, tunnels and for offshore survey work.

OPERATIONAL CONCEPT

The Seaeeye Sabertooth has three operation modes:

AUTONOMOUS

The vehicle can be instructed to perform a specific task such as transit to a specific location or to perform a pre-programmed inspection. The autonomous system has behaviour-based architecture and the navigation is supported by an Inertial Navigation System (INS) and Doppler Velocity Log (DVL). In autonomous mode, the Seaeeye Sabertooth is very well suited for survey work. Several types of sensors may be integrated and the behaviour-based control system enables it to react to sensor data and autonomously interrupt a programmed mission, take additional sensor readings and resume the mission.

OPERATOR ASSISTED

The vehicle is given step-by-step instructions from an operator over an optical through-water communication link. Operations are subject to behavioural constraints such as minimum distance within surroundings, minimum altitude and speed. Each step is then verified by video or sonar data and sent back via the through-water communication link.

MANUAL OPERATION

The vehicle can be operated manually via fibre optic tether, an optical through-water communication link or a radio link, but with assistance from the INS. This mode is typically used during the final approach to a docking node or during intervention. For tunnel work, an inspection may be programmed ahead of time, monitored, interrupted for extra inspections and resumed by the operator. In case of fibre breakage, the pre-programmed mission is continued.



POWER IN DEEP WATER

SYSTEM OVERVIEW

The versatile Seaeye Sabertooth is powered either by battery or via a tether. If used as a subsea resident system, the Seaeye Sabertooth is housed at the docking unit where its batteries can be recharged. The docking unit allows for sensor data and video to be uploaded to the surface and new instructions to be downloaded to the Seaeye Sabertooth.

The vehicle can free swim autonomously to the docking unit. The vehicle can remain at the docking station 24/7 for more than six

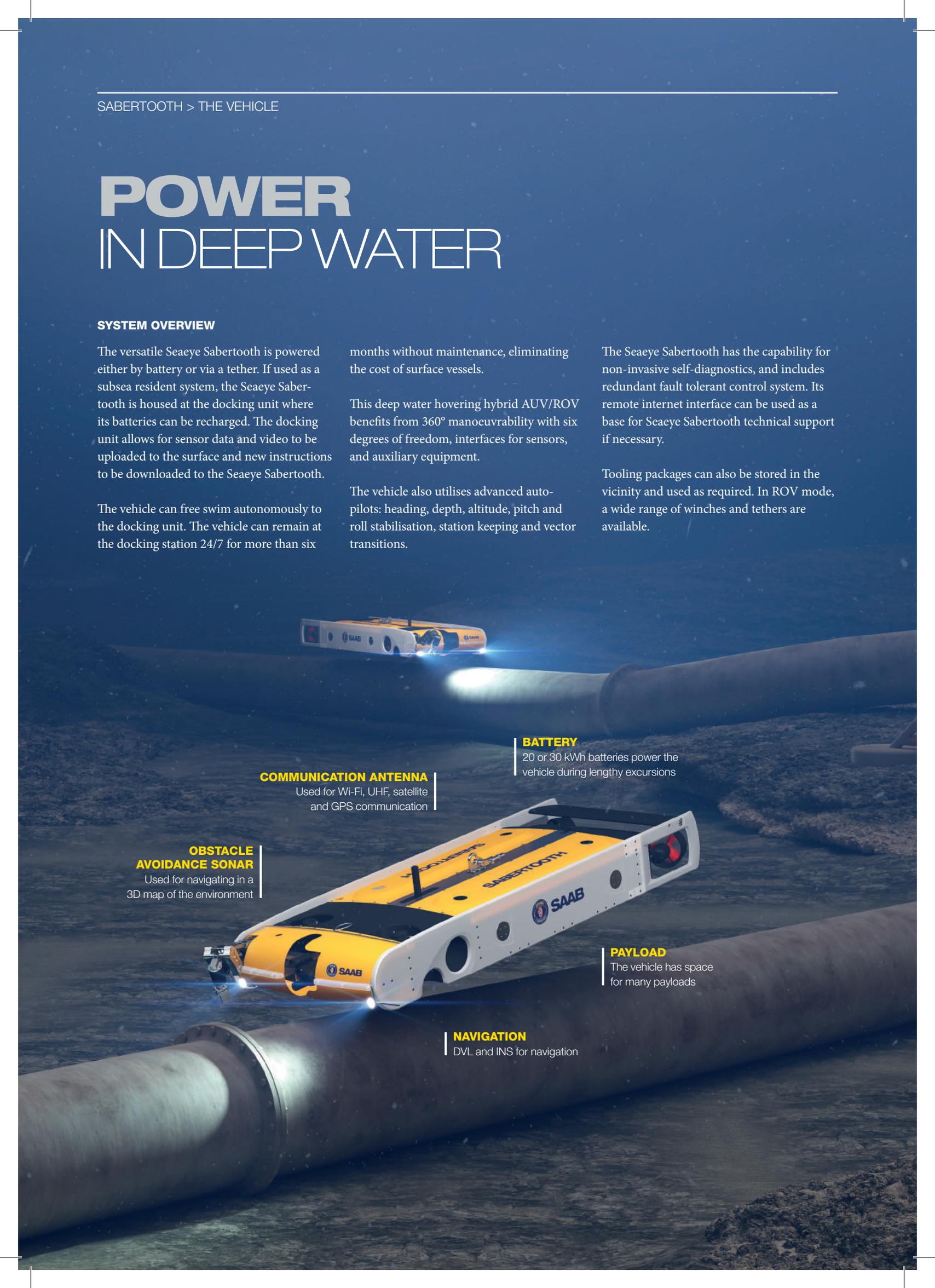
months without maintenance, eliminating the cost of surface vessels.

This deep water hovering hybrid AUV/ROV benefits from 360° manoeuvrability with six degrees of freedom, interfaces for sensors, and auxiliary equipment.

The vehicle also utilises advanced auto-pilots: heading, depth, altitude, pitch and roll stabilisation, station keeping and vector transitions.

The Seaeye Sabertooth has the capability for non-invasive self-diagnostics, and includes redundant fault tolerant control system. Its remote internet interface can be used as a base for Seaeye Sabertooth technical support if necessary.

Tooling packages can also be stored in the vicinity and used as required. In ROV mode, a wide range of winches and tethers are available.



COMMUNICATION ANTENNA

Used for Wi-Fi, UHF, satellite and GPS communication

OBSTACLE AVOIDANCE SONAR

Used for navigating in a 3D map of the environment

BATTERY

20 or 30 kWh batteries power the vehicle during lengthy excursions

PAYLOAD

The vehicle has space for many payloads

NAVIGATION

DVL and INS for navigation

SYSTEM SPECIFICATIONS

SABERTOOTH	SINGLE HULL	DOUBLE HULL
DEPTH RATING	1200 msw	1200 msw (3000 msw)
LENGTH	3600 mm	3700 mm (4094 mm)
HEIGHT	450 mm	450 mm (670 mm)
WIDTH	660 mm	1400 mm (1350 mm)
LAUNCH WEIGHT	650 kg	1200 kg (1500 kg)
THRUSTERS	4 SM4 + 2 SM9	6 SM9
LIGHTS	2 LED lamps, equivalent to 400W Halogen	2 LED lamps, equivalent to 400W Halogen
DEPTH SENSOR	DigiQuartz	DigiQuartz
INTERFACES	Cameras, sonars, tooling motor, RS232/RS485, GB Ethernet, additional Saab Seaeye intelligent devices	Cameras, sonars, tooling motor, RS232/RS485, GB Ethernet, additional Saab Seaeye intelligent devices
STANDARD AUX VOLTAGES	24 VDC and 250 VDC (unreg)	24 VDC and 250 VDC (unreg)
AUTO FUNCTIONS	6 DOF, heading, depth, altitude	6 DOF, heading, depth, altitude
FORWARD SPEED	5 knots	4 knots
THRUST FORWARD	100 kgf	100 kgf
THRUST LATERAL	40 kgf	90 kgf
THRUST VERTICAL	80 kgf	160 kgf
BATTERY CAPACITY	10 kWh	30 kWh
ENDURANCE	>8 hours	>14 hours



OPERATOR CONSOLE

POWER	500 W 240 VAC
NETWORK TO DOCKING	100 MB Ethernet station
HEIGHT	0.6 m
WIDTH	0.8 m
DEPTH	0.8 m

DOCKING STATION

POWER	3 kW 3-phase 400 VAC
NETWORK TO DOCKING	100 MB Ethernet station
DEPTH RATING	3000 msw
HEIGHT	3.2 m
WIDTH	3.2 m
DEPTH	5.7 m

PAYLOAD EXAMPLES

- SIDE-SCAN SONAR
- MULTI-BEAM SONAR
- SUB-BOTTOM PROFILES
- MANIPULATOR ARMS
- TORQUE TOOL
- CP STAB
- MAGNETOMETER



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SAAB DEVELOPS **HIGH TECHNOLOGY**
UNDERWATER SYSTEMS THAT ENABLE
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MULTI-ROLE CAPABILITIES

