DSIT
AquaShield™
Discover what's down there

DSIT's AquaShield™

A Powerful Underwater Site Security System

Designed with a single purpose in mind – superior performance - the AquaShield™ is the most advanced and capable underwater site security system available. It's whole concept of operation is designed to defeat the combat doctrine of underwater asymmetric threats such as naval commandos and terrorist frogmen.

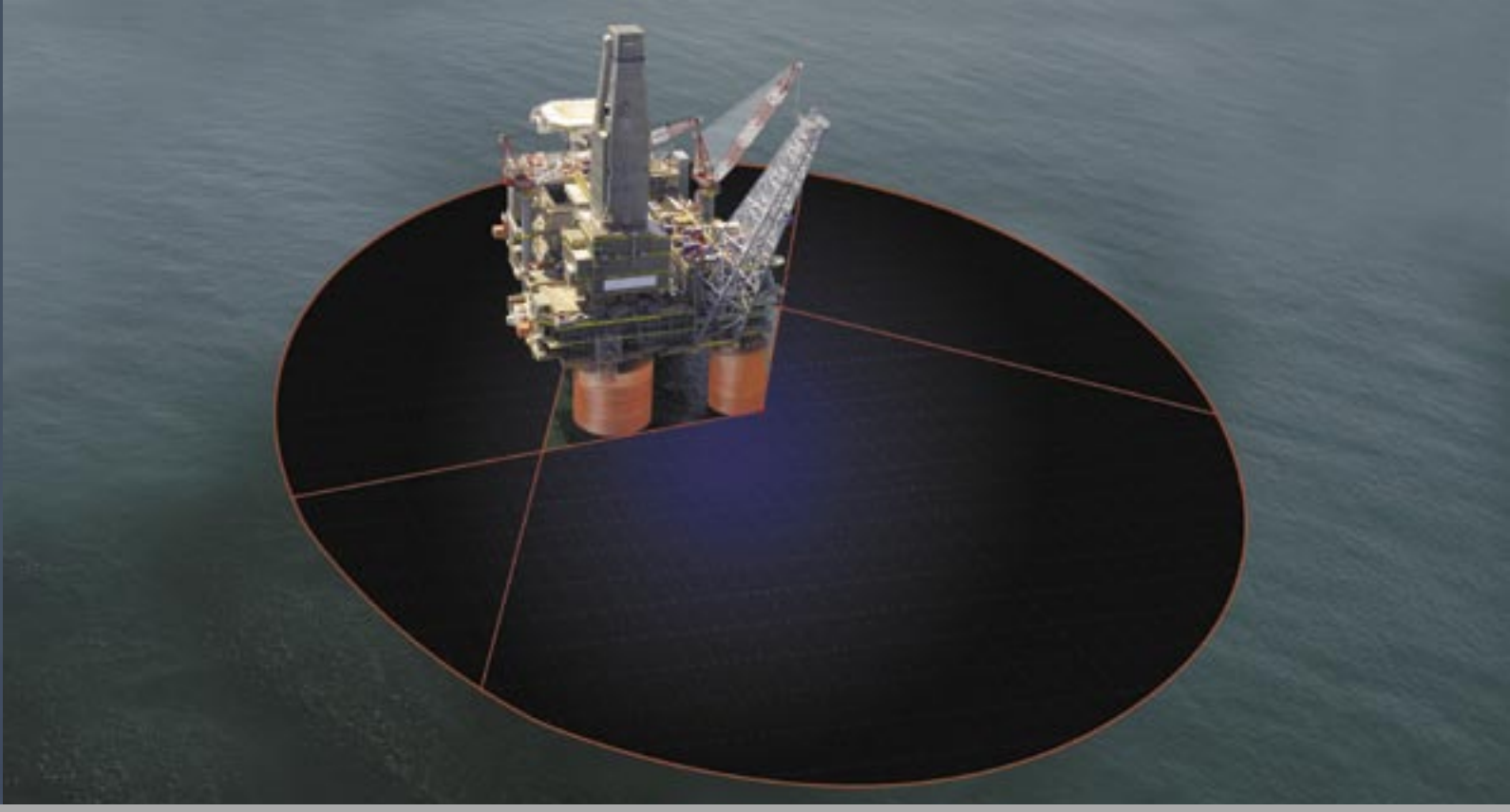
>> System Overview

The AquaShield™ is a 5th generation Diver Detection Sonar (DDS) system, incorporating years of experience accumulated from continuous operation at multiple sites around the world. The system is currently operational in-the-water, protecting naval bases, energy terminals, commercial ports and other high value assets from underwater intrusion. AquaShield's unique modular design enables tailoring of the system to customer requirements and site specific geography. The AquaShield™ offers a very long range of detection for even the weakest of targets, and can easily handle over 1,000 targets simultaneously. The combination of a fully automatic mode of operation, very low maintenance requirements and high system reliability create a highly cost-effective system.

>> PortView™ Harbor Surveillance System

DSIT's PortView™ Harbor Surveillance System (HSS) incorporates the AquaShield™ DDS, search radars, and Day/Night thermal cameras into a comprehensive above and below water Command & Control security system.

DSIT's PortView™ Harbor Surveillance System (HSS)



>> The AquaShield™ Edge

Best Performance Available

- >> Long range of detection – up to 3,000 meters diameter coverage
- >> Provides sufficient time for response
- >> Tailored to detect threats of any size and Target Strength
- >> Can handle more than 1,000 targets simultaneously
- >> Enables the investigation of targets using a special zoom display

Modular and Flexible Architecture

- >> Sensors available in different coverage configurations: 120°, 240°, 360°
- >> The only system with two versions to support customers' maintenance concept:
  - Sea Bed Installation version with built-in underwater electronics
  - Pier Installation version with above water electronic cabinet
- >> Multiple units can work simultaneously and report to the same Command & Display unit

Fully Automatic – No Operator Required!

- >> Automatic detection
- >> Automatic tracking
- >> Automatic classification
- >> Automatic alert

Ease of Integration

- >> Open software architecture supports easy integration with any sensor
- >> Can be incorporated into DSIT's PortView™ Harbor Surveillance System (HSS) or any other C&C system

Enables Pinpoint Response

- >> Highly accurate positioning of threat
- >> Rapid update rate of tactical picture
- >> Option - Real time data communication with response team

User Friendly Displays

- >> Windows-based software with intuitive displays and menus
- >> Includes: multiple display formats, target data, exclusion zones and more

Robust System for Long Term Operation

- >> Built to operate 24/7/365 in all weather and water conditions
- >> Can withstand an explosion of up to 0.2kg TNT at a distance of only 5 meters
- >> Built-in redundancy

Low Cost of Ownership

- >> Proven high reliability – systems operating in the water for years with zero malfunctions
- >> Very little maintenance required

>> The Threat

Any underwater intruder, including:

>> Divers with closed circuit breathing apparatus
>> Divers with open circuit breathing apparatus
>> Swimmer Delivery Vehicles (SDVs)
>> Small submersibles

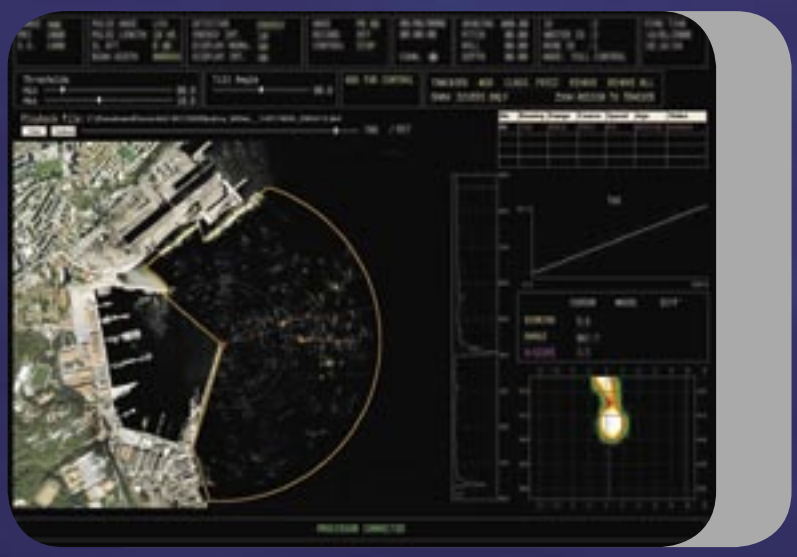
>> Sites to be Protected

AquaShield™ guards the following coastal and offshore sites against underwater intrusion:

>> Naval bases
>> Commercial ports
>> Energy terminals
>> Offshore rigs
>> Other strategic assets

>> The AquaShield™ Operational Concept

The AquaShield™ DDS was developed by a team of multi-disciplinary experts including acoustic and signal processing engineers, naval architects, security experts and naval commandos. This unique think tank designed the system based on relevant threats and realistic operational scenarios. They took into account the challenges associated with weak target detection in shallow waters, heavy vessel traffic and poor bathythermic conditions. They concluded that in order to enable both detection of and response to the threat, the system must be built to allow maximum performance. ***The result is the AquaShield™ DDS - a bigger, more powerful and robust system.***



The AquaShield™ DDS display showing sonar data over satellite image

>> AquaShield™ Specifications

AquaShield™ Configurations

1. Pier Installation (with above-water electronics)
2. Seabed Installation (with underwater electronics)

The AquaShield™ Main Units

>> Underwater Unit
>> Processor Unit
>> Control and Display Unit
>> Junction Box

The Underwater Unit

>> Underwater Front-end Electronic unit (UFE)

>> 1 Transmit Array (Tx) with 360° coverage

>> 1 – 3 Receive Arrays (Rx) depending on the required coverage:
- 1 Rx array for coverage of 120°
- 2 Rx arrays for coverage of 240°
- 3 Rx arrays for coverage of 360°

Special Processing Algorithms

>> Performance Optimization
>> Coherent and Energy Detection
>> Bearing Interpolation
>> CFAR Processing
>> Two Dimensional Normalization
>> Adaptive Threshold
>> Automatic Detection
>> Automatic Tracking
>> Automatic Classification
>> False Alarm reduction
>> Automatic Alert
>> Automatic Elimination of Wakes
>> Static Target Suppression

Display Formats

>> Sonar Data

>> Tactical Picture on:
- Aerial photo
- Satellite Image
- Nautical Chart

>> Overlay of Sonar Data on any type of Tactical Picture

Normal Detection Ranges

Diver with open circuit breathing apparatus	1,000m
Diver with closed circuit breathing apparatus	700m
Swimmer Delivery Vehicle (SDV)	1,500m

Transmit / Receive Parameters

Source Level	220 dB re 1μPa @ 1 meter
Center Frequency	60 KHz
Transmission Modes	CW and LFM
Pulse Width	1- 40 ms
Range Accuracy	Better than 0.5 meter
Bearing Accuracy	0.1°
Transmit Array	40 cm, 32 staves
Receive Array X 3	125 cm, 288 staves
Horizontal Beam-Width	1.1°
Vertical Beam-Width	3° - 10° (automatically / manually)

Interface & Integration

LAN Interface	TCP/IP
Integration	with any C&C system

Recording & Playback

Several modes of data recording and playback enable debriefing of special events

Built In Test (BIT)

>> Constant monitoring of all modules
>> Automatic alert in case of failure

>> About DSIT

DSIT Solutions Ltd., a subsidiary of Acorn Energy (NASDAQ: ACFN), develops and produces sonar applications and Command and Control systems for the defense, commercial, energy and homeland security markets. The company employs a world-class multi-disciplinary team of professionals that are skilled in the latest sonar and Real-Time technologies. DSIT products include: PortView™ Harbor Surveillance System (HSS), EnerView™ Safety and Security C&C for energy sites, Mobile Acoustic Range (MAR), Underwater Acoustic Signal Analysis (UASA), and a wide variety of Sonar Simulators and Trainers.