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Unmanned Surface Combat System

Environment

Emergence of Asymmetric/Unconventional Threats
Requires Different Capabilities to Counter/Thwart



High Value Asset Threat



Homeland Threat



Suicide Bomber/Israeli Navy



Small Attack Boat Threat



USS COLE Bombing

Clear Operational Need

Asymmetric/Unconventional Threats Drive Need for:

- Fixed/Mobile High Value Asset Security
- Harbor and Port Security
- Maritime Intercept Operations
- Surveillance and Reconnaissance
- Riverine Operations

What's Needed?

Capability to Detect and Respond Rapidly to Potential and Emergent Threats in Military and Public Environments

- Protect Waterways and Oceans
- Persistently Survey Wide Maritime Areas
- Remove or Distance Humans from Hazards
- Detect Hostile Intent via Remote or Automated Means
- Operate Continuously: 24/7, All Weather
- Remain Affordable

Why An Unmanned Surface Vehicle?



- Dramatically Reduces Risk To Personnel And High Value Assets
- Optimally Performs The Hazardous Missions – Day And Night
- Provides Mission Flexibility With Reconfigurable Mission Modules
- Can Provide Real-time Input To Wider Tactical Picture
- Proportionate And Scalable Response



Why PROTECTOR?

Proven in real world operations

**PROTECTOR is an unmanned, integrated Combat System for
Force Protection/Anti Terror Missions**

Ready for Deployment Now

Protector Is:

Control

- Sea or Shore-based Control Unit with ability to hand-off unit control

Platform

- Length: 9-11 m.
- Propulsion: Water Jet
- Engine: Diesel
- Payload: 1000 Kg.

Security Payload

- Spotlight
- Public Address

Communication

- Data Link
- Video Link
- Audio Link

Mission Modules

- Anti-Terror/Force Protection
- Modular Design supports other missions
 - SOF
 - Anti-Surface Warfare
 - Electronic Warfare

Navigation

- Radar
- GPS
- Nav. Lights
- Nav. Camera



Advanced Electro-Optical System - Toplite

Multi-Sensor Electro-Optical payload

CAPABILITY

- Day & Night Surveillance
- Highly stabilized mount
- Automated Target Tracking



SENSORS

- FLIR
- Low Light TV
- Laser Range Finder

In U.S. Inventory

Naval Stabilized Gun - Mini Typhoon MK49 MODO

Day & Night Sight

In U.S. Inventory

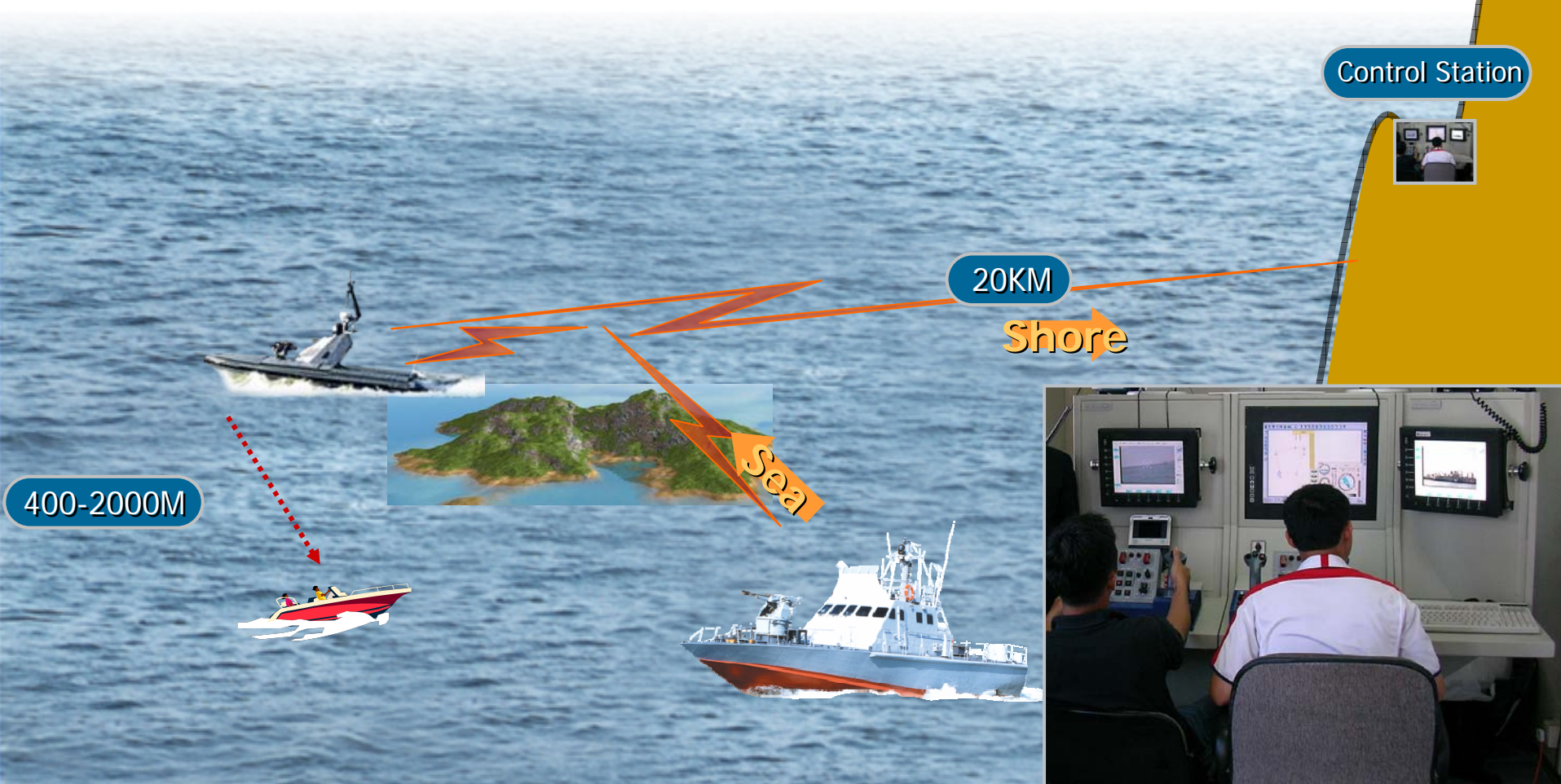
Ammunition Box

Lightweight, Remote Controlled,

Stabilized Machine Gun System



Robust, Proven NLOS Communications Link



Controlled from Sea or Shore with 'hand off' capability

PIONEER

"During its time in theatre, Resolution was tasked with assisting the protection of the Al-Basrah Oil Terminal from terrorist attacks, according to MINDEF"

THE NEXT WAVE



"Protector had 'proven to be highly effective' ... vessels challenged by the USV had turned away immediately"

Singapore

BY RICHARD S...

Singapore's Ministry of Defence (MINDEF) has acknowledged the hitherto undisclosed purchase of Rafael Protector unmanned surface vehicles (USVs) to support maritime security and interdiction operations recently undertaken by the Republic of Singapore Navy (RSN) in the northern Arabian Gulf.

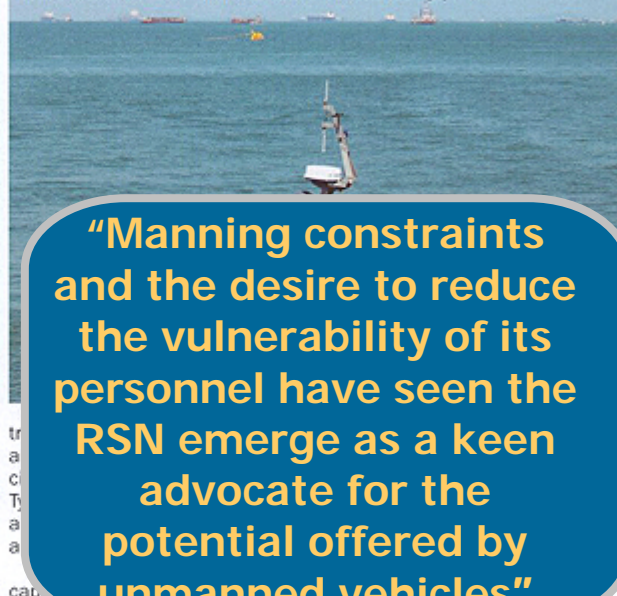
The Singapore Armed Forces' house journal *Pioneer* acknowledged that a small number of Predator USVs were acquired from Rafael, Israel's Armament Development Authority, last year to operate on the landing ship *RSS Resolution* during its three-month deployment to the gulf, which was completed in March 2005. During its time in theatre, *Resolution* was tasked with assisting the protection of the Al-Basrah Oil Terminal from terrorist attacks, according to MINDEF.

Pioneer noted that Protector had "proven to be highly effective", adding: "In the northern Arabian Gulf, the [USV] was deployed for more than eight hours at a go." Line-of-sight communications and control exercised from aboard *Resolution*, with operators reporting that vessels challenged by the USV had turned away immediately. It is understood that the line-of-sight conditions enabled the ship to maintain control of the Protector vehicle at ranges of up to 18 n miles.

Protector is based on a 9 m rigid-inflatable boat adapted for remote operator control. The mission load comprises a Toplite elec-

"Singapore...acknowledged ...purchase of ...Protector to support maritime security and interdiction operations ... in the northern Arabian Gulf"

One of the RSN's Rafael-supplied Protector unmanned surface vehicles seen during demonstrations at the recent IMDEX Asia 2005 event in Singapore.



"Manning constraints and the desire to reduce the vulnerability of its personnel have seen the RSN emerge as a keen advocate for the potential offered by unmanned vehicles"

... the Protector USV 'off the shelf', the RSN is also a participant in the US Navy's Spartan Scout USV advanced concept technology demonstration programme, which is exploring the concept of a USV that is able to flex between roles using interchangeable mission modules. A developmental Spartan vehicle was recently taken to Singapore for trials and demonstration purposes.

Current Status

- Protector Actively Being Used with Weapon for High Value Asset Protection and Area Surveillance
- Protector Bought by 3 Navies and counting
- Product Improved with 360 Viewer
- Protector Asset is Available for User Operational Evaluation Now

PROTECTOR  **USV**

Rafael • BAE Systems