

# ***NAVAL COMBAT SYSTEMS***

***Market Report 2015***



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This report is available as a complimentary resource for all those involved within the industry and those attending Naval Combat Systems 2015, taking place in London, UK (28 - 29 July 2015).

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## Introduction

Naval Combat Systems include Weapon, Sensor, Communications and EW Systems and can constitute well over 50% by value of the cost of warships and submarines. The Market for Naval Surface-to-Air Missile Systems and Naval Air Surveillance and Tracking Radars, for example, is forecast to exceed \$10 billion over the next 10 years. Meanwhile, the Market for Naval Sensors is forecast at over \$20 Billion in the next decade. These sensors include Electro-Optical/Infra-Red (EO/IR) Systems.

Relatively few navies have so far embraced the IRST as a part of their above-water sensor mix. However, two factors - one technological, one operational - are now rebalancing the equation. First, technology is witnessing a step change with the emergence of a new generation of staring-array IRSTs using distributed sensor apertures to overcome ship-fitting constraints and provide uninterrupted omnidirectional surveillance, wide elevation coverage and rapid data refresh.

Secondly, the current pattern of maritime operations puts greater emphasis on improved situational awareness against surface threats. So whereas the IRST was originally conceived to perform a horizon search function against low-elevation ASCMs, there is now a recognition that the technology has an important contribution to make to surface surveillance in littoral environments, particularly in the face of the growing fast inshore attack craft (FIAC) threat.

Navies are also continuing to invest in new electronic attack technologies to counter advanced radar threats. Novel ECM techniques are being explored to counter monopulse seekers and inverse synthetic aperture radars as onboard jammers continue to be developed for many navies around the globe. At the same time, to counter the whole spectrum of threats to naval surface vessels, multi-layered ship defence systems are crucial, including soft-kill systems such as naval decoys. The market for Naval EW Systems is also forecast to exceed \$10 billion over the next decade.

The world's navies are also relying more and more heavily on secure communications. The preferred method of naval communications has been to adopt a navalised form of internet, which permits free-form messaging, including graphics and video, but questions remain about how secure it is.

At the same time, more nations are joining maritime coalitions, especially in the fight against piracy and human trafficking and this presents many challenges, one of the most important being the ability to communicate securely and effectively.

Also, as Unmanned Underwater (UUVs) and Surface Vessels (USVs) are increasingly being used to prosecute naval operations, a networked approach to their most efficient use is becoming more important.





**Denmark**

There are plans for new Air Search Radars and a Surface-to-Air Missile System for the 4 Thetis Class Frigates.

**Finland**

Patria has completed upgrading the Finnish Navy's Ruuma-class fast attack boats. The upgrade involved fitting Rheinmetall MASS decoys; Saab's 9LV Mk4 combat management system; the Simrad ST2400 variable-depth sonar; the Ericsson Sea Giraffe radar; Bofors Electronics' 9LV 225 fire control radar; and a Purono navigation radar. Their MBDA Mistral short-range surface-to-air missile systems were removed from the vessels. The upgrade will keep the vessels in service into the 2020s.

**France**

3 La Fayette-class ships were scheduled to be upgraded with new sonar systems under the LPM 2013 programme.

4 Triomphant class SSBNs are being upgraded to carry the M51 submarine-launched ballistic missile (SLBM).

The programme to replace the country's 6 Rubis-class SSNs with 6 Suffren-class SSNs is now well under way, with the first vessel, Suffren, expected to be operational by 2019.

The Suffren class will be armed with the new DCNS F21 heavyweight torpedo, which is planned to enter service with France's SSBNs and SSNs from 2016, the MBDA Missile de Croisiere Naval (MdCN) naval cruise missile, derived from the SCALP/Storm Shadow air-launched cruise missile, 150 of which are planned to be delivered by 2019; and the Exocet SM39 Block 2 cruise missile, which is under consideration for a further upgrade.

Consorzio SIGEN is the Elettronica (Italy)/Thales (France) joint venture which is developing the Electronic Warfare System (EWS) for the Franco-Italian Horizon Destroyer and FREMM frigate programmes.

**Germany**

The Phase III Upgrade (2012-2016) of the 4 Brandenburg Class Frigates includes an improved AAW Capability incorporating the Evolved Sea Sparrow Missile (ESSM). Germany may become the first European nation to embark on integrating the Raytheon Standard Missile 3 (SM-3) onto its naval vessels.

The Ship Infra-Red Monitoring, Observation and Navigation Equipment (SIMONE) is being delivered for the F.125 Frigates of the German Navy.

**Greece**

Greece's Type 209/1200 submarine HS Okeanos has completed its Neptune II mid-life upgrade programme. The programme included the fitting of a new sonar array, combat management system, optronic periscopes and Sub-Harpoon launch capability.

**Netherlands**

The Tactical Ballistic Missile Defence (TBMD) Upgrade for the 4 De Zeven Provinciën-class Frigates, has been ring-fenced in recent defence cuts.

The Royal Netherlands Navy is currently assessing the upgrade of the M-Class frigates, including possible EW upgrades. The replacement programme for these vessels is planned from 2020.

**Poland**

36 Saab Bofors Dynamics RBS 15 Mk3 anti-ship/anti-surface missiles have been fitted on Poland's Orkan-class fast attack craft. These vessels are also equipped with the Giraffe Agile Multi-Beam 3-D search radar system.

Poland plans to accelerate its purchase of a second coastal defence missile battalion as a result of the current crisis in Ukraine.

Poland was the first export customer for the shore-based version of the NSM for a complete coastal defence missile battalion with 6 launchers and 12

missiles. An additional 38 missiles were ordered in 2010.

At full strength, the NSM battalion will include 50 all-weather surface-to-surface missiles with a range of up to 200 km.

### Romania

The Romanian Navy plans to upgrade its Type 22 frigates, including the CIC, a close-in weapon system and surface-to-surface main weapons. The anti-air, anti-surface and anti-submarine sensors will also be replaced.

The Romanian Navy may bring back into service the sole submarine in its inventory, the Delfinul, which is a Project 877E 'Kilo'-class diesel-electric boat bought from the Soviet Union in 1986.

A new communications system is a key requirement for this boat.

### Spain

There is an F-100 Class Frigate BMD upgrade requirement.

### Sweden

During 2014 the Gotland-class submarines commenced their mid-life upgrade (MLU), which includes a new sonar suite, a new diver's lock-out, a non-hull penetrating optronic mast and the replacement of the Stirling Mk2 air-independent propulsion (AIP) system with a Mk 3 version.

Rafael's Digital Shark jammer has been supplied to the Swedish FMV and FOI as part of a research programme to assess the contribution of an onboard ECM system to overall survivability. It is fitted on the Goteborg class Corvette 'Gavle.'

### Turkey

The new LST's combat management system will be a variant of Havelsan's GENESIS model. Armament will include 2 OTO Melara' Fast Forty 40 mm guns, 2 Phalanx close-in weapon systems, and 2 Aselsan 12.7 mm STAMP stabilised remote weapon stations.

The Next-generation Turkish Frigate 2000 (TF-2000) air defence frigate will be a locally designed frigate,

with a displacement of more than 6,000 tonnes and it will have a strong anti-air warfare focus centred on a multi-function radar (MFR) and Raytheon's Standard Missile-2 (SM-2) area air-defence missile system.

Aselsan is developing an X-band MFR test-bed that will de-risk and demonstrate MFR technologies for the TF-2000 programme.

### U.K.

The Daring class destroyer, HMS Daring, has begun a capability upgrade in Portsmouth, during which it will be the first of 4 of the 6 Daring-class ships to receive 2 quadruple Harpoon anti-ship missile launchers recycled from decommissioned RN Type 22 frigates. A Type 45 BMD capability upgrade is also planned.

The Future Local Area Air Defence System (FLAADS) - Sea Ceptor, is under development. It will be fitted on the planned Type 26 frigates.

EW Requirements include: the increased digitisation of RESM equipment; the need for advanced RF, IR and EO countermeasures; and a desire to integrate various soft-kill components under software control.

The ACCOLADE technology demonstration programme, is a joint UK/France effort for the development of a new, Active Radar Frequency Decoy. The demonstration concluded in 2014.

Under a separate TPD known as ELOPE, Thales UK in Belfast was contracted to investigate a future EO/laser countermeasure. ELOPE is intended to de-risk technologies for a future MIDAS increment.

Maritime Integrated Defensive Aids Suite (MIDAS): this programme has been superseded in the U.K. by the DAS-SS programme - the current fixed, 6-barrel decoy launchers would also be replaced with a new generation launcher.

### Type 23 Capability Sustainment Programme (CSP)

DAS-SS: the Type 23 is expected to get the new decoy launcher and the decoys that will emerge from the various MIDAS-related work streams.

MEWSS/UAT spiral development will roll in progressive improvements to the Electronic Warfare Support Systems, and under Future Maritime Radar Electronic Surveillance (FMRES) the ships will be fitted with the latest fully digital Radar Electronic Support Measures (RESM) already being fitted to the Type 45 Destroyer.

Fleet Exercise Web (FEXWEB) is a Royal Navy owned unclassified internet co-ordination tool used by EU naval forces engaged in counter-piracy operations. Mercury is a highly secure internet environment, which has been developed to replace FEXWEB and is owned by EUNAVFOR.



# LATIN AMERICA

**Brazil**

The Brazilian and South African Navies are discussing a possible joint development of a medium-range surface-to-air missile system to meet their requirements for this class of weapon.

**Colombia**

The Colombian Navy's Almirante Padilla-class frigate upgrade programme includes installation of a Smart-S Mk 2 3D surveillance radar, Sting-EO Mk 2 radar/EO system, Mirador EO fire control system, VIGILE 200S electronic warfare system, SKWS communications systems, and Terma decoy launchers.

Thales has also upgraded the Altesse intelligence/communication system on the four frigates of the class.

The Colombian Navy commissioned its second 1,723-tonne 20 de Julio-class ocean patrol vessel on the 17th March, the 7 de Agosto which is armed with twin 40 mm guns, a 20 mm gun, and two .50 cal remote weapon stations (RWS).

The Colombian Navy expects to buy a total of six OPV 80s by 2019, and unconfirmed reports suggest that the navy is undertaking studies to equip its future OPVs with surface-to-surface and surface-to-air missile systems.

2 LSDs are planned for procurement, with an armament which includes 2 20 mm guns and a close-in weapon system (CIWS).



# ASIA-PACIFIC

**Australia**

The RAN'S ANZAC upgrade programme has benefited from a series of incremental update packages. One of the most important has involved the fitting of the RIM-162 Evolved Sea Sparrow Missile (ESSM), which offers improved kinematic performance and a significantly expanded engagement envelope.

In addition, under Project SEA 1348 Phase 3A, all 8 ANZAC ships have received the RGM-84L Harpoon Block II anti-ship missile.

Other changes have included the introduction of the Nulka active missile decoy system (each ANZAC ship has received 4 quad launchers).

An ESM upgrade is bringing Sceptre-A up to a replacement standard known as Centaur; introduction of a multilink capability (adding Link 16 and Variable Message Format datalink capabilities alongside Link 11), and the replacement of the Mk 46 Mod 5 lightweight torpedo with the Eurotorp MU90 Impact torpedo under Joint Project 2070/Project Djimindi. The ASMD programme, under the umbrella Project SEA 1448 Phase 2, provides a robust area air-defence capability to defeat the latest generation of anti-ship missiles.

Also introduced under SEA 1448 Phase 2B is a new navigation radar system based on 2 Kelvin Hughes SharpEye I-band radars.

There are also aspirations to provide the class with a Long Range Persistent Subsurface Detection Capability under Project SEA 1100 Phase 4. Intended to provide an enhanced anti-submarine warfare (ASW) capability, SEA 100 Phase 4 projects an ability to employ a towed-array sonar.

Royal Australian Navy Project Sea 1657 (Cuttlefish) is a Technology Demonstration Programme (TDP) to develop and demonstrate an advanced counter-surveillance countermeasures capability. The prototype system was taken for live tests by the Australian Defence Science and Technology Organisation (DSTO) in 2012.

**China**

The Luyang III class (Type 052D) guided missile destroyers (DDG) incorporate an enhanced version of the indigenously developed Type 346 Dragon Eye active phased-array radar. The vessels have provision for one bow-mounted sonar and towed array sensors each and are armed with 6 Yu-7 324 mm torpedoes that can carry a 45 kg warhead over a range of 14 km.

Aircraft engagement is undertaken with 64 HHQ-9B vertical launching system (VLS) cells. The Luyang III class's guns include one H/PJ38 130 mm main gun and one Type 730 30 mm gun.

**India**

The Indian Navy (IN) completed installation test firing (ITF) of a BrahMos anti-ship cruise missile from first-of-class Project 15A destroyer Kolkata (D63) on the 9th June 2014.

The BrahMos is already fitted on several Russian built Rajput (Kashin II-class) destroyers and Talwar-class frigates.

The Kolkata's anti-submarine warfare capability comprises indigenously developed twin-tube torpedo launchers, RBU-6000 SMERCH-2 rocket launchers, and the Hull Mounted Sonar Array Next Generation. The locally designed CMS-15A combat management system integrates all the weapon systems and sonars.

Pipavav Defence and Offshore Engineering has revealed plans to establish a facility in Hyderabad to manufacture missiles and torpedoes for the Indian Navy (IN).

The DRDO (Defence Research and Development Organization) plans to test-fire the Nirbhay - an indigenously designed cruise missile - to an anticipated range of 1,000 km.

The Nirbhay's maiden test-firing was in March 2013. The Nirbhay would initially be fitted onto Indian Navy warships. 7 Project 17A Frigates are planned, equipped with Barak-2 surface-to-air missiles.

**Indonesia**

The Indonesian Navy (Tentera Nasional Indonesia - Angkatan Laut: TNI-AL) has fitted 2 of its KCR-40-class anti-ship missile craft with the AK-630 close-in weapon systems (CIWS).

Based on its performance on Clurit and Kujang, the AK-630 may be mounted on the other TNI-AL KCR-40-class missile craft.

The Indonesian Navy's (TNI-AL's) new Klewang-class missile patrol craft will incorporate a radar with wider coverage, missiles with longer range and a new composite material hull, compared to the class' original design.

The trimaran will also include Saab's new Sea Giraffe 1X 3D compact radar and be armed with 4 RBS15 Mk3 surface-to surface missiles.

The ship's radar and weapons will be managed via a Saab 9LV Mk4 combat management system (CMS), which includes the CEROS 200 air defence fire control director.

The Indonesian Navy will equip a total of 4 Ahmad Yani (Van Speijk)-class guided missile frigates and one Kapitan Pattimura (Parchin I)-class corvette with low-probability-of-intercept (LPI) radars.

Up to 20 locally built 2,400 tonne frigates are planned to be acquired, based on the SIGMA 10514 design, from 2017. These will be fitted with anti-air missiles.

**Japan**

2 Atago Class and 4 Kongo Class Destroyers are to receive the SM-3 Missile for Ballistic Missile Defence (BMD).

The JMSDF is expected to deploy a sea-launched variant of the Type 12, which will replace the Type 90 SSM.

The helicopter carrier Izumo will be equipped with an OQQ-22 bow-mounted sonar for submarine prosecution, while defence against anti-ship missiles will be provided by 2 Raytheon RIM-116 Rolling Airframe Missile SeaRAM launchers.

**Malaysia**

The Royal Malaysian Navy's Second Generation Patrol Vessel, Littoral Combat Ship programme of 6 vessels, will incorporate a short-range air defence system.

Other key equipments include the DCNS SETIS combat management system, the Thales Nederland SMART-S Mk 2 3-D multibeam radar, Rheinmetall's TME0 Mk2 TMX/EO radar/electro-optical tracking and fire control system, and the Thales Captas-2 low frequency, variable depth sonar.

BAE Systems is preparing to considerably expand its existing joint venture with Malaysian company Boustead Heavy Industries Corporation (BHIC) to incorporate the manufacture of naval gun systems for the Royal Malaysian Navy and possibly the wider South east Asian region. BAE Systems is to transfer technologies to the BHIC Bofors JV for licensed production of the Bofors 57 Mk 3 guns within Malaysia, under offset obligations attached to the medium calibre programme.

**Myanmar**

An indigenously built class of fast attack craft (FAC) to replace older Chinese Hainan-class vessels is progressing with the first vessel already reportedly launched and a second vessel under construction. The 49 m FACs are armed with 4 Chinese C-802 (CSS-N-8 'Saccade') anti-ship missiles and one Russian 30 mm AK-630 close-in weapon system.

**New Zealand**

New Zealand's Ministry of Defence has signed a contract with MBDA for the procurement of the Sea Ceptor anti-air guided weapon system to satisfy the Local Area Air Defence component of the Royal New Zealand Navy's ANZAC Frigate Systems upgrade project.

Compared with the Australian ANZAC Frigates, the RNZN's 2 vessels have been the subject of only modest combat system upgrades. Examples include the installation of the Phalanx close-in weapon system (CIWS) and the addition of the Mini-Typhoon/Toplite package for force protection against asymmetric threats.

The Frigate Systems Upgrade (FSU) project covers the upgrade of the surveillance, combat and self-defence capabilities of the New Zealand ANZAC frigates. It includes the replacement of CMS hardware and software, new radars, electronic detection and other above-water sensors, improved anti-ship missile decoys, a torpedo defence system, an upgrade to the hull-mounted sonar, and the replacement of the RIM-7P NATO SeaSparrow point-defence missile system with a more capable Local Area Air Defence (LAAD) system (Sea Ceptor). Integral to the upgraded frigates' combat system will be a new Lockheed Martin Canada CMS known as CMS 330.

### Philippines

The Philippine Navy (PN) is planning further upgrades for its 2 ex-US Coast Guard Hamilton-class cutters, including upgrades for navigation, propulsion, communication, surveillance, and weapon systems.

The PN is also planning to fit the vessels with an anti-submarine warfare capability and surface-to-surface missiles, although funding limitations may determine the full extent of the modernisation programme.

AAW Upgrades for 2 Frigates were included in the 2013 budget. 6 AAW Frigates are included in the 15 year plan.

### Singapore

The Republic of Singaporean Navy 'Formidable Class' stealth frigates are fitted with MBDA Aster 15 missiles, with Aster 30 planned for fitting longer-term.

### South Korea

The FFX Batch II ships include several innovations, aimed at enhancing their anti-submarine warfare capability. This includes a vertical launch system (VLS) suitable for the Hong Sang Eo (Red Shark) stand-off ASW weapon.

The KSS-III submarine programme is for up to 9 vessels and the boats are expected to be equipped with Hyunmu-3C cruise missiles.

6 more Aegis-equipped KDX-2X Destroyers are also planned (from 2019-2026).

### Taiwan

Taiwan's Republic of China Navy (RoCN) indigenously designed twin-hull missile corvette carries 8 Hsiung Feng II (HF-2) and 8 ramjet-powered Hsiung Feng III (HF-3) anti-ship missiles. Tuo Jiang is also reported to be armed with an Otobreda 76 mm gun, 4 12.7 mm machine guns for close-range ship defence, and a Mk 15 Phalanx close-in weapon system to defeat incoming missiles and hostile aircraft. Upon completion of its sea trials, the corvette will be fitted with anti-ship missile systems.

6 mine countermeasures vessels (MCMVs) are to be procured, with an Atlas Elektronik remote sweeping system and a hull-mounted sonar provided by Thales U. Lockheed Martin will provide the command-and-control system.

### Thailand

The Royal Thai Navy plans to buy 9 RIM-162 Evolved Sea Sparrow Missiles, together with associated equipment, in a deal worth \$18 million.

### Vietnam

An Oto Melara MARLIN single 30 mm gun is fitted forward of the bridge on the SIGMA 9814 corvettes being acquired by the Vietnam People's Navy (VPN). The corvettes will also be fitted with MBDA VL MICA anti-air missiles and an Oto Melara 76 mm medium-calibre gun.

It is also believed that the ships will also be fitted with MBDA MM40 Block 3 Exocet anti-ship missiles, Thales Nederland SMART-S Mk 2 surveillance radar, STIR 1.2 EO Mk 2 fire-control radar and a TACTICOS combat management system.



# NORTH AMERICA

**Canada**

The Royal Canadian Navy's first modernised Halifax-class frigates, HMCS Calgary (FFH 335) will test the integration of its Evolved SeaSparrow Missiles (ESSMs).

Canada's Halifax-class modernisation and life extension programme covers the upgrade of the 12-ship fleet. The refits include updates to command and control and electronic warfare systems, the Bofors 57 mm gun, and the Harpoon missile system, in addition to the installation of a Thales Smart S Mk II medium-to-long-range surveillance radar suite and a Telephonics Identification Friend or Foe Mode S/5 interrogator system.

Common Equipment, Common Network and Common Cryptographic Gear are required for the Royal Canadian Navy (RCN) - the RCN may operate in legacy modes if no technical solution is available to new networking requirements, or integrate specific mission fits that satisfy information exchange Requirements.

**U.S.A.**

The Zumwalt class destroyers are expected to provide naval surface fires support with a battery of 2 Advanced Gun Systems that will fire Long-Range Land Attack Projectiles with a range of 63 nautical miles.

The destroyers will also feature 2 Mk 46 30 mm gun systems plus an 80-cell Mk 57 peripheral vertical launch system capable of firing a range of missiles including Evolved Sea-Sparrows, Tomahawk land-attack missiles, and Standard Missile-3s.

The US Navy (USN) has released the first high-quality images of a Laser Weapon System (LaWS) demonstrator installed on board the interim Afloat Forward Staging Base USS Ponce.

Data gathered from the LaWS at-sea demonstration will be fed into the Office of Naval Research's (ONR's) SSL Technology Maturation (SSL-TM) programme.

From LCS 17, the future USS Indianapolis, the Freedom variant of the Littoral Combat Ship (LCS) will carry the Airbus Defence and Space TRS-4D multi-function radar, replacing the TRS-3D installed on earlier vessels.

Another new item planned for Freedom-class variants from LCS 17 onwards will be the Raytheon SeaRAM launcher for the Rolling Airframe Missile (RAM), replacing the 21-cell Mk 49 launcher.

The bow of the US Navy (USN) Virginia-class nuclear-powered attack submarine was redesigned with a new Large Aperture Bow array and 2 87-inch Virginia Payload Tubes that each launch 6 Tomahawk land attack cruise missiles.

The US Naval Sea Systems Command (NAVSEA) has launched a competition to recapitalise the shipborne EA capability currently embodied in the (V)3 and (V)4 variants of the AN/SLQ-32 EW suite. Under the SEWIP programme, the US Navy plans to improve the performance of the legacy SLQ-32 shipboard EW system. The SEWIP Block 3 Engineering and Manufacturing Development phase is currently planned to run from Fiscal Year 2013-16, leading to production and fielding in the FY2017 timeframe.

The U.S. Navy Surface Ship Torpedo Defence (SSTD) Initiative includes the Countermeasure Anti-Torpedo (CAT) and Torpedo Warning System (TWS) development programmes. IOC is in FY 2018. U.S. Navy Comms. At Speed and Depth (CSD) will allow 2-way networked links with submarines and other undersea vehicles while they are submerged at normal operating depths and travelling at speeds required to perform tactical operations.

The U.S. Persistent Littoral Undersea Surveillance Network (PLUSnet) is the world's most sophisticated underwater network. It enables tactical and acoustic communications between submarines and a variety of UUVs and AUVs.

Tactical Undersea Network Architectures (TUNA) is a DARPA initiative to explore the application of small-diameter optical fibre and buoy relay nodes. The programme is split into 3 phases, with phase 1 a 15 month modelling, simulation, design, analysis and scaled component technology development and demonstration section.

Combined Enterprise Regional Information Exchange System (CENTRIXS) was developed by the U.S. military and provides classified coalition networks, called enclaves, which enable information sharing. However, not every country can afford to buy CENTRIXS and participating navies use different terms and definitions which may not match.



# MIDDLE EAST AND AFRICA

**Equatorial Guinea**

The combat systems of the frigate, Wele Nzasare are an improvement on the corvette Bata's capabilities, with 76.2 mm AK-176 guns fitted both fore and aft, 2 MS 227 multi-barrelled rocket launchers fitted forward and 2 30 mm AK-630M guns for close-in defence.

Primary sensors include a radar on the foremast, 2 navigational radars and a mast located Delta-M radar.

**Israel**

The Israeli Navy has begun fitting phased-array radars on Sa'ar 5 and Sa'ar 4.5 class corvettes as part of a wider weapons and electronics upgrade.

In addition, the Sa'ar 5's Barak 1 air-defence missiles have been replaced by longer-range Barak 8s.

The Navy's Weapon Systems Division has also fitted a new, rotating phased-array radar on one of the Israeli Navy's 8 Sa'ar 4.5-class missile craft. The new radar represents a digital upgrade from the older, analogue radar systems and is integrated with the vessel's existing Barak 1 air-defence missiles.

The Israeli MoD has approved the allocation of a \$800 million budget to the country's navy in order to buy 4 new surface vessels, planned to protect Israel's growing economic waters. The vessels will be equipped with advanced radar and an Mk 41 vertical launch system capable of firing both long range air defence and surface to surface missiles. The Israeli Navy is becoming increasingly concerned by anti-ship missile proliferation in the region, specifically the acquisition of P-800 Yakhont supersonic anti-ship cruise missiles (ASCMs) by Syria.

**Jordan**

The Royal Jordanian Naval Force (RJNF) has an urgent requirement for one or 2 coastal patrol boats, armed with an MSI Defence Systems 30 mm gun, two .50 cal and two 7.62 mm machine guns, missile detection and chaff decoy systems, and 4 tonnes of ballistic protection.

**Nigeria**

The first of the Nigerian Navy's (NN's) 2 P-18N offshore patrol vessels (OPVs) was launched by the China Shipbuilding & Offshore International Co

(CSOC) on the 27th January 2015.

The P-18N's armament includes a single 76 mm NG-16-1 gun with a TR47 fire-control radar, as well as 2 30mm and 2 20 mm guns.

The vessels also appear to carry a Chinese Type 348 search radar as well as Kelvin Hughes SharpEye tactical navigation and situational awareness radar system.

**Seychelles**

The Seychelles Coast Guard Type 62 patrol boat 'Etoile' has an armament comprising a forward 30 mm gun and 2 pintle-mounted 12.7 mm machine guns.

**South Africa**

There is a requirement to replace the 76mm gun on the 4 Valour Class frigates.

**Tunisia**

The 6 P270TN patrol boat's command, control, communications, and navigation system includes Simrad and Sperry Marine radars, an electro-optical sensor and satellite communications (satcoms), all integrated by AlmavivA.

The 6 P350TN patrol craft are fitted with a command, control, communications and navigation system that includes Simrad and Furuno radars, an optronic sensor and satcoms.

Although the patrol boats are being delivered without armament, they can be equipped with 20-30 mm guns and machine guns.

**U.A.E**

The U.A.E. Navy will incorporate electronic security measures, multi-spectral decoy launchers and torpedo launchers on its Abu Dhabi Class Corvettes and a similar EW fit to its Falaj-2 patrol vessels, 2 of which are under contract, with 2 more on option.



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Procuring state-of-the-art technology is a key driver for naval forces. However, the added complexity of new systems creates management and implementation challenges that make the balancing act between cost and capability more difficult to manage. As worldwide threats continue to evolve, different navies need to adapt to their environments and the debate on the issues underpinning modernisation has become multi-faceted.

What is for certain is that the rapid technological advances of the past 30 years- advances that have transcended the life cycle of many ship designs- have created an operating environment where integrated combat systems are a must-have capability for the modern naval warfighter. In recognition of this and because of the demand from our military and industry partners, Defence IQ have launched the Naval Combat Systems conference- a conference designed to explore the value and advantages of specific system programmes and of a variety of surface vessels' contingent combat capability.

The Naval Combat Systems conference now forms part of Defence IQ's naval conference series, which includes our established Surface Warships and OPV events. Preparations are already underway to ensure that the 2015 event will deliver on the high expectations of this portfolio and the conference is set to help signpost exciting new developments in the sector for our community.

**Key topics to be addressed at conference include:**

- Challenges that the end-user is facing whilst using the current generation of combat systems
- Current programmes and future modernisation plans
- Outstanding requirements and the projected capability of future systems
- Impact on mission performance, at both an operational and tactical level
- The rise of modularity and multi-mission capability
- Sea-based missile defence systems
- Methods of system integration and how this issue has become the focal point of naval programmes

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## WHAT PEOPLE ARE SAYING ABOUT DEFENCE IQ'S NAVAL EVENT PORTFOLIO...

"Defence IQPC OPV Conferences provide a veritable platform and ample opportunity for intellectual exchange and networking by leaders of world navies, maritime operators and other stakeholders with the ultimate objective of developing requisite architecture for enhanced security."

*Vice Admiral OS Ibrahim, Chief of the Naval Staff, Nigerian Navy*



"The annual Offshore Patrol Vessels Conference organized by IQPC has become an important reference world forum concerning the growing use of these naval assets, when senior representatives from different Navies can present and discuss the solutions they have found to reconcile technical issues with operational tasks and budget constraints so as to better accomplish their missions. ..."

*Rear Admiral Francisco Deiana, Director of Naval Engineering, Brazilian Navy*



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