Fleet regeneration: Portugal shapes up a modern, balanced fleet

The Portuguese Navy is in the middle of a modernisation effort aimed at building a credible and versatile fleet within the constraints of its size that will enable it continue to operate across a full spectrum of missions beyond the 2020s. Kate Tringham reports

Over the past decade, the Portuguese Navy (Marinha Portuguesa) has been in a process of regeneration that will see the majority of its assets renewed and upgraded by the mid-2020s. Much of the fleet was acquired very quickly during the 1960s and insufficient funding in the years since meant that by the early 2000s the navy was facing block obsolescence - with some 15 major vessels functioning way past their 30-year lifespan, and another five with a 20-year lifespan fast approaching 30 themselves.

The Portuguese Navy's Bartolomeu Dias-class (Karel Doorman) M-frigates were acquired from the Royal Netherlands Navy in 2006 and now form the backbone of Portugal's surface fleet. (Marinha Portuguesa) 1704664

Efforts to address this have resulted in a number of acquisitions over the past 10 years, including the introduction into service of two new Type 209PN (Tridente-class) submarines, two Bartolomeu Dias (ex-Royal Netherlands Navy Karel Doorman)-class M frigates, two indigenous Viana do Castelo-class offshore patrol vessels (OPVs), and a modernised Tejo-class (ex-Danish StanFlex 300) patrol ship so far.
Within Portugal's military planning programme for 2015-26 additional funds totalling EUR1 billion (USD1.1 billion) have been allocated to the navy to continue its fleet regeneration into the 2020s. This will include the commissioning of at least two more OPVs and four more modernised StanFlex 300 patrols ships, the acquisition of a replenishment tanker, a comprehensive upgrade for the service's five Super Lynx Mk 95 helicopters, and mid-life-upgrades (MLUs) for the navy's two frigate classes and submarines.

"It's a very heavy schedule," Vice Admiral António Maria Mendes Calado, the Portuguese Navy's vice-chief of naval staff, told Jane's. "Right now, we have a lot of programmes going on for a small navy, and it's a high pressure on our naval budget. Over the next six-to-ten years we're going to see the service in a very high period of activity in terms of modernising our assets and structuring our way of doing things in order to get the most out of the resources we have."

The ambition is to build a modern, balanced fleet that is capable of conducting operations across the full spectrum of missions, he said.

"What we are doing is decreasing the number of old-style ships in the fleet in order to prepare the navy for a new era of technology. Everything that is old will disappear from the suite by the 2020s. All that's currently left of those very old assets are two small patrol boats and three old corvettes," Vice Adm Mendes Calado said.

"From the beginning of the 2020s we will have no more corvettes, we'll have only OPVs and five StanFlex coastal patrol vessels, two submarines, five frigates, and five helicopters - all of which will have been updated. We also have a very small number of small rapid ships that are still in
good condition in terms of technology. Across this spectrum I could say that we are building a navy for the 20s that maintains a credible number of assets to comply with a full spectrum of missions."

The Portuguese Navy has both a military and non-military role, functioning as both a typical blue-water navy as well as the nation's coastguard. On the military side it is responsible for the maritime aspects of national defence and support of foreign policy, which includes supporting international commitments to collective defence, naval diplomacy, and protection of national interests abroad. Many of those international commitments take place within the context of NATO and EU missions.

Meanwhile, in its non-military role the navy conducts traditional coastguard tasks to provide security and safety at sea, as well as supporting economic interests through maritime resource protection and pollution control, scientific research, and cultural development.

"The Portuguese Navy has more than a century of experience doing both tasks - for us, it's a natural way of doing things," Vice Adm Mendes Calado said. "We work from the beach to the deep sea. Recently, the National Maritime Authority left the navy to become part of the defence department structure, but the navy still supports all its activities, providing education, personnel, and materiel. As such, people can come and go between the navy and the maritime authority structure as there is the same training, the same chain of command and logistic support, the same culture, and the same mindset. The chief of the navy also heads the maritime authority and coordinates both organisations in order to act efficiently in their missions and offer mutual support."

While operating a relatively small fleet, the navy’s range of commitments and responsibilities are vast: it has a 2,148 km coastline (including the Azores and Madeira archipelagos) to protect; however, the navy routinely projects power beyond its national area of responsibility to include West Africa, the Horn of Africa, the North Atlantic, and the Mediterranean and Baltic seas.

Flexibility is a key operational characteristic of the navy, Vice Adm Mendes Calado said. "This characteristic allows us to be prepared to act either in conflict or peacetime, covering a wide range of missions, using different configurations, permanently adapting to changing environments. It also helps to preserve our credibility in terms of international relations."

As such, the navy remains capable of contributing to collective security missions, which is a primary element of the country's national security posture.

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Recruitment woes

The major challenge facing the Portuguese Navy today is a lack of personnel, Vice Adm Mendes Calado said. "Recruitment and retention of the armed forces and of the navy in particular is becoming very, very challenging. This is giving us an incentive to try and change our approach to how we try to attract people to the navy and also retain them."

As of late 2016 personnel strength totalled 7,944 (including 1,116 marines), of which 6,928 are professional and 1,016 are on short-term contract. This number is about 600 personnel short of what the navy requires. "Over the past 10 years we have lost about 22% of our personnel," Vice Adm Mendes Calado noted, crediting this in part to continual defence cuts that resulted in wage reductions as a result of the recession, and a recruitment freeze during the period 2011-15.

"We are expecting things to improve over the next year, but we have been struggling to fill the gaps in military personnel," he said. "Navies are a hard place to live. The sea is not comfortable for
much of the time, and being away from friends and family for long periods isn't attractive to the younger generation. And what we're feeling right now is that all our attempts to attract new recruits are less than successful."

The navy is taking steps to address this issue, including adjusting the recruitment process in order to reach the whole of the country's territory.

"Most Portuguese Navy personnel are from the coastline. Interest from people who live far from the coastline is very low, so we are now preparing a campaign to go deep into the country to say to them, 'Hey - there is a navy here, it's a very interesting possibility for your lives'." As part of this effort, Portuguese Navy Day, which is held on 20 May, will this year be held in the north of Portugal instead of Lisbon and the main centres as usual.

**Recapitalising the fleet**

The Portuguese Navy's fleet of large surface combatants is made up of two Bartolomeu Dias (Karel Doorman/M)-class and three Vasco da Gama (MEKO 200)-class frigates which, despite being small in number and with some capability limitations, enable Portugal to contribute to collective security missions.

Both frigate classes will be modernised in the near future, but while the Bartolomeu Dias class will undertake a major refit for future NATO operations, the Vasco Da Gama class will receive a more limited modernisation that will necessitate repurposing the frigates for low-intensity missions only.

Portugal ordered the two ex-RNLN Karel Doorman M frigates when they became surplus to requirements in the Netherlands to replace its four 1960s-vintage Joao Belo-class frigates.

The frigates are fitted with two quad launchers for Harpoon Block 1C missiles, a Mk 48 vertical launch system for 16 SeaSparrow missiles, one Oto Melara 76 mm/62 compact as a primary gun, one Goalkeeper close-in weapon system, and two Mk 46 Mod 5 torpedoes, and they can embark the navy's Super Lynx helicopters.

The navy was originally planning to procure second-hand Oliver Hazard Perry-class frigates from the United States, but instead opted for the Karel Doormans on the basis that they were newer, better equipped, and had more commonality with the navy's Vasco da Gama-class frigates.

"We've been using the M-frigates in a very intensive way and they're proving themselves very well," said Vice Adm Mendes Calado. "I think the decision to buy them was a very clever decision in terms of technology, and the ship is more compatible with our Vasco da Gama class. They are the same technological age. We started our programme for the Vasco da Gama class in 1991 and the M-class frigates are from 1994 - so we can say they are sister ships in terms of technology," he said. "In addition, the Oliver Hazard Perry class are very old ships that need large crews, and with the Karel Doorman class, one of the big advantages is that it can be operated and fully explored in terms of capability with less people. And for us, personnel is the main resource challenge; if we have ships needing less human resources, it's better for us."

Work will include installing new combat management and electronic-warfare (EW) systems, and upgrading the sonar, Goalkeeper weapon and Harpoon missile fire-control systems. The frigates'
Mk 46 lightweight torpedoes launching system will be upgraded to the Mk 54 standard, which performs better in littoral waters, while the SeaSparrow point defence missile system will be replaced with the Evolved SeaSparrow Missile (ESSM).

Vice Adm Mendes Calado said that Bartolomeu Dias will enter its MLU next year, with work to be carried out over 15 months. Dom Francisco de Almeida will follow in 2019, with the aim that work on both is completed by or before 2020.

After the M-frigates have completed their MLU the navy will then turn to modernising its three Vasco Da Gama-class ships, he said.

Built in Germany to the Blohm + Voss MEKO200PN design, the Vasco Da Gama-class frigates were commissioned into service in 1991. Their equipment fit includes a single 100 mm gun, an Mk 29 octuple launcher for RIM-7P NATO SeaSparrow missiles, eight Harpoon anti-ship missiles, Mk 46 Mod 5 lightweight torpedoes, and a Phalanx Block 1B close-in weapon system. The ships have also received modifications to enable them to serve as NATO flagships.

The planned upgrade has been scaled back due to budgetary constraints. According to Vice Adm Mendes Calado, work will include a new integrated communication system and a new integrated platform management system. The modernisation of the combat system and sensors is still under discussion, but the ships will not receive ESSMs or Harpoon Block II missiles. "The combat system won't be as capable as the one we're going to install in the M-frigates," the admiral noted.

In light of the reduced modernisation plans the Vasco Da Gama frigates will be mainly engaged in low- and medium-intensity operations and will therefore be restricted to smaller-scale contingency
operations and deployments. In spite of this, Vice Adm Mendes Calado said his aim was to keep the frigates "as high-intensity as possible" under the circumstances. "My aim is to keep those ships as respected combat ships," he said.

Portugal is planning to retire its remaining corvettes, comprised of the 1970s-vintage Baptista de Andrade and Joao Coutinho classes, by 2020. (Marinha Portuguesa)

The Portuguese Navy maintains a fleet of three 1970s-era corvettes, two OPVs and a number of smaller coastal patrol vessels to carry out patrol tasks in its coastguard capacity across the entire Portugal-Madeira-Azores triangle. The three corvettes (two Joao Coutinho class and one Baptista de Andrade class) are all that remain of a fleet of 10, seven having been progressively decommissioned from 1999 to 2016. The remaining three are scheduled for retirement by 2020. OPV procurement over the past decade has failed to keep pace with the desired level to replace the corvettes, but the navy continues to push ahead with efforts to renew its coastal patrol capability.

After years of delays, the Portuguese Navy finally took delivery of two new Viana do Castelo-class OPVs in 2010 and 2013. The vessels were built by the formerly state-owned Estaleiros Navais de Viana do Castelo shipyard under a contract signed in 2002.

Plans to procure four more OPVs to progressively replace its remaining João Coutinho and Baptista de Andrade-class corvettes and a further two to be used as auxiliaries were cancelled in 2012 because of budget constraints. However, in May 2015 approval was granted for two more vessels and in July 2015 a contract for an additional two OPVs, worth around EUR77 million, was awarded to the CWSE-NPO consortium (comprising West Sea and EDISOFT: a Portuguese subsidiary of Thales).
Construction is moving forward at a much faster pace than the earlier vessels, with West Sea - Estaleiros Navais launching the third OPV on 3 May 2017. Both OPVs are on track for delivery in 2018.

The Viana do Castelo-class design features a displacement of 1,850 tonnes, length of 83.1 m, a top speed of 21 kt, a range of 5,000 n miles, and a crew of 42. Fittings include Wärtsilä propulsion and EID integrated communications systems. The OPVs are armed with the Oto Melara Modular Advanced Remotely controlled Lightweight Naval Weapon Station. The vessels are designed to perform a range of missions such as search and rescue (SAR), patrol, surveillance, disaster relief, pollution control, and combat.

Portugal received its first two Viana do Castelo-class OPVs in 2010 and 2013. Two more are on track for delivery in 2018. (Victor Barreira)

"This is the kind of ship that can operate in high seas. It's a ship with very good autonomy, it is very stable, and it has good seakeeping conditions; it can stay at sea for long periods in comfortable conditions. There is a very high quality of living on board these ships, and they have large spaces where, in humanitarian missions in the Mediterranean, they received a very large number of refugees on board offering easy conditions to accommodate them," Vice-Adm Mendes Calado said.

Outlined in the 2015-29 military planning programme is a requirement for up to 10 OPVs, and Vice Adm Mendes Calado is hopeful of this ambition being realised in the timeframe.

Another programme that is now gaining traction is the modernisation of five StanFlex 300 patrol vessels, which the Portuguese Navy procured from the Danish Navy in 2014. The first 54-m long
vessel was commissioned into service in May 2016, three more are planned to join the fleet during 2017, while the fifth is scheduled to commission in 2018.

The patrol vessels - known as the Tejo-class in Portuguese service - were acquired to replace the navy's three remaining Cacine-class large patrol craft (one of which retired this year at 47 years old) and the patrol/auxiliary ship NRP Schultz Xavier. They will be used to conduct patrol, search and rescue, surveillance, fisheries protection, and other tasks with Portugal's EEZ.

The Portuguese Navy's first StanFex 300 patrol boat, NRP Tejo, was commissioned into service in May 2016. (Portuguese Navy)

Modernisation work is being carried out by Portuguese state-owned shipyard Arsenal do Alfeite, and includes structural modifications and the fitting of navigation and communication systems and a protected mount armed with a 12.7 mm machine gun.

"In operations, the platform is proving itself very well," Vice Adm Mendes Calado said.

"These ships have been operated by the Danish Navy in Lebanon - they were used as combat ships. We've changed that profile so that now it's more of a ship to patrol the domestic seas in Portugal to protect our resources, fisheries control, and so on, while giving the crew of those ships very good conditions to undertake this mission profile," Vice Adm Mendes Calado said.
The introduction into service of two new Trident-class (Type 209 PN) submarines in 2010 has provided a major boost to the Portuguese Navy's subsurface capabilities. Credit: Marinha Portuguesa (Marinha Portuguesa)

In terms of fleet recapitalisation, the entry into service of two new Trideante-class (Type 209PN) attack submarines in June and December 2010 has represented a major boost in the Portuguese Navy's capability.

The Type 209PNs were ordered under a contract worth around EUR800 million awarded to the now-defunct German Submarine Consortium, which consisted of Howaldtswerke Deutsche Wett (HDW), Nordseewerke, and trading house MAN Ferrostaal, in 2004. The submarines replace the navy’s 1960s-vintage Albacora (Daphne)-class submarines, just one of which remained operational from late 2005 until its decommissioning in December 2009.

The two new submarines combine proven design principles from the original German Type 209 submarine with innovative features of the later Type 212A and 214, including a hydrodynamic hull form, an air-independent propulsion (AIP) system, and flank sonar arrays. They have an overall length of 67.9 m, a submerged displacement of 2,020 tons, a crew of 33, and accommodation for 14 additional personnel. Maximum speed is over 20 kt (submerged), with a range of more than 10,000 n miles. Each submarine has eight 533 mm tubes and 16 WASS Black Shark heavyweight torpedoes can be carried on board.

The Albacora-class boats they replace had significant endurance limitations and poor habitability (the 54-strong crew had to hot bunk across three watches) that resulted in low morale and issues with recruiting submariners. By contrast, the Trideante class provides much better crew conditions and the boats have an endurance of around 60 days. However, the most significant capability enhancement is the AIP system, which enables to boats to stay submerged for longer, increasing their time on station and providing greater stealth by virtue of their lack of need for a snorkel. The
boats also have a variety of features that reduce their acoustic, electromagnetic, and thermal signatures.

"Looking at the present, our submarine squadron is in very high morale," Vice Adm Mendes Calado said. "The new submarines are excellent pieces of equipment and the navy has been using them intensively in different missions. The capabilities of these ships are incredible to us in terms of combat capability, survivability and sensitivity. The range of the Albacora-class submarines was too small to cover our national interests, whereas the Type 209s are covering all the Atlantic, all the interests of Portugal. We're very happy with the result."

**Logistics and support**

Alongside the continuation of the OPV project, the Portuguese Navy's other top priority is the acquisition of a new auxiliary replenishment oiler (AOR) to replace its in-service AOR, NRP Berrio. The AOR was originally commissioned into service with the UK Royal Navy (RN) in 1970 and then purchased from the UK's Royal Fleet Auxiliary (RFA) in March 1993.

"We have begun studies regarding the new tanker, with the possibility of replacing Berrio in the 2021/2022 timeframe," Vice Adm Mendes Calado said.

The Portuguese Navy is planning to replace its ageing AOR, NRP Berrio, which was originally commissioned into service with the UK Royal Navy in 1970 and then purchased from the UK's Royal Fleet Auxiliary in March 1993. (Victor Barreira)

With various European navies currently replacing AORs under fleet renewal programmes, the Portuguese Navy is also looking for opportunities to join a construction programme, "which could give us gains of scale and synergies in terms of future support of those ships", Vice Adm Mendes Calado said. With this in mind, the navy has been in discussions with the RN, as well as the German, Dutch, and Spanish navies. "We've been speaking with each other, trying to find out
which programmes they will carry on in the future, and we'll look for opportunities to join one of those programmes."

The acquisition of a second-hand ship is also an option, "although our aspiration is really for a new tanker," he said. "The procurement law will be reviewed next year and we will try to increase the funding for this programme to facilitate the decision-making around the tanker acquisition."

Requirements will be broadly based around a ship displacing around 15,000-16,000 tonnes, with a small crew, a helicopter deck, and some support to enable the projection of marines for special operations.

"We're also looking at the possibility of [providing facilities] to support humanitarian and disaster relief operations," Vice Adm Mendes Calado said. "I've seen an example of a good ship with space to install a containerised hospital to support disaster operations. Possibly the Portuguese Navy will try to do something similar."

For well over a decade Portugal has been considering the procurement of a new amphibious landing platform dock (LPD) that would significantly boost the navy's force projection, C2, and expeditionary capabilities, as well as its ability to support HADR operations.

Attempts to procure such an asset have to date proved unsuccessful, however. In 2005 the Portuguese Ministry of National Defence signed a declaration of intent with former state-owned shipyard ENVC for the design and delivery of a ship by 2010, with cooperation from HDW. The programme suffered numerous delays owing to financial constraints, however, and the agreement expired in 2011.

Another consideration explored was the purchase of the French Navy's LPD, FS Siroco, but this was also decided against in mid-2015. Incompatibility of FS Siroco with military hardware in use by Portugal, including the air force's AgustaWestland AW101 Merlin helicopters, dictated the decision.

Portugal will continue to seek another solution to meet the country's amphibious requirements, although the programme has been put on hold for the time being.

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**Naval aviation**

The Navy Helicopters Squadron (Esquadrilha de Helicópteros da Marinha) fields a fleet of five AgustaWestland Super Lynx Mk 95 shipborne helicopters that it operates from the Vasco da Gama- and Bartolomeu Dias-class frigates, and other surface ships when required. The fleet comprise three new-build aircraft and two updated HAS3 airframes. The platforms are optimised for anti-submarine warfare, having an AQS-18V dipping sonar and carrying two Mk 46 torpedoes, however they routinely undertake other roles such as maritime surveillance, SAR, special operations transport, and utility transport.

The original plans called for the purchase of an additional two to three platforms, but funding was never made available and as a result, the platforms are used intensively.

The fleet will shortly begin a comprehensive modernisation programme. Work on all five units will be completed under a EUR69 million modernisation package awarded to Leonardo Helicopters in July 2016. The upgrade includes the replacement of the original Rolls-Royce Gem 42 engines with...
more powerful LHTEC CTS800-4N turboshfts. Other improvements include a new 'glass' cockpit utilising three 10x8-inch multifunction displays, new navigation systems, and a new electrically powered rescue hoist. The upgrade will also extend the fleet's service life, deal with airworthiness obsolescence, and allow it to meet new European flight standards due to come into effect in 2018.

The first Super Lynx will be delivered to Leonardo Helicopters' Yeovil facility in the United Kingdom to start its upgrade in June. Under the terms of the contract the aircraft will be redelivered between 2019 and 2021.

"We're aiming to extend the lives of our five helos in parallel with the extension of the MLU of the frigates. We will try to operate the Super Lynx until the 2030s," said Vice Adm Mendes Calado.

While the platforms are used intensively, very experienced pilots and technicians meant that the ratio of availability of air assets for such a small fleet was very good, he added.

"At the beginning of this year we had periods where four helos were operational; so in a five-helicopter squadron we had four ready during some weeks. The average of 2.8 is the standard. The high level of availability is based on very experienced technicians who stay for long periods of time in the squadron. The same goes for our pilots - retention is very high, so they are very experienced."

The vice admiral noted that the helicopters have been in operation for 26 years without a single accident, "which, for us, is a medal of glory".

The UK RN is the Portuguese Navy's reference point in terms of the qualification and certification of personnel. "For us, it's very important to keep this kind of relationship with the RN as a condition to keeping our level and performance high."