

Keep on keeping on: South America's navies strive to sustain submarine capabilities

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Faced with ageing submarine fleets – many fast approaching the end of their service lives – a number of South American navies have launched programmes to upgrade or replace them. *Tim Fish* reports

The navies of South America have a long history of conventional submarine (SSK) operations, and have over time developed the capability to maintain, overhaul, and upgrade boats in local facilities. This has allowed them to sustain submarines in indigenous shipyards, keeping them in service well beyond their original design life.



Riachuelo, Brazil's first SSK under the PROSUB programme, seen just prior to launch on 14 December 2018. The boat was later lowered into the water using a shiplift. (Naval Group)

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Yet it remains a fact that many navies in the region are still operating boats acquired in the late 1970s and early 1980s. Replacement programmes are getting under way, but budget problems remain a challenge. As a result, it is likely that many existing submarines will reach almost 50 years of active service before being retired.

Brazil

Brazil is pushing ahead with a programme for new boats under its Programa de Desenvolvimento de Submarinos (PROSUB) submarine development project. There are three components to the programme: the first has provided the Brazilian Navy (Marinha do Brasil: MB) with a new submarine construction facility and naval base in Itaguaí in Sepetiba Bay, west of Rio de Janeiro; the second provides for the in-country construction of four new Scorpène-derivative S-BR SSKs built to the design of French shipbuilder Naval Group (formerly DCNS) under a transfer of technology package; and the third will see the construction of the MB's first SN-BR nuclear-powered attack submarine (SSN).

Once in service, the four modern SSKs and a new SSN are intended to enable Brazil to realise its ambitions to protect and harness the resources of what it calls the 'Blue Amazon': its extensive exclusive economic zone and continental shelf. Brazil has 7,000 km of coastline and three million square kilometres of offshore waters to patrol.

Building on a strategic defence agreement worth EUR6.7 billion (USD9 billion) signed by the Brazilian and French governments in December 2008, French shipbuilder DCNS (now Naval Group) was contracted in September 2009 to deliver all three elements of the PROSUB programme. However, the agreement specifically excludes the transfer of nuclear propulsion technology, which is being developed indigenously by Brazil.

To deliver the programme, Naval Group has joined forces with local firm Odebrecht to form Itaguaí Construções Navais (ICN), which is 59% owned by Odebrecht and 41% by Naval Group. The first SSK, *Riachuelo* (S40), was launched in a ceremony on 14 December 2018.

Under current planning, *Riachuelo* will begin sea trials in the third quarter of 2019, with delivery to the navy planned for mid-2020. This is about three years later than originally planned. Brazil has experienced economic and political problems in recent years that have seen the majority of its other naval programmes for surface ships either frozen or cancelled. PROSUB has largely been spared from the budget cuts, and although it has slipped somewhat, the navy has been able to push ahead by giving it top priority at the expense of its other programmes.

Under current plans boat two, *Humaitá*, is expected to launch in 2020, followed by third boat *Tonelero* (S42) in late 2021, and fourth boat *Angostura* (S43) in 2022. All four are planned to be in service by 2023.

Displacing 1,870 tonnes, the S-BR design is longer than earlier Scorpène boats (71.6 m compared with 66.4 m) to meet MB requirements for increased range, extended endurance (up to 45 days), and a larger crew. The boats can reach a top submerged speed of 20 kt and achieve a diving depth of 350 m.

The submarines feature six 533 mm tubes firing either Naval Group F21 heavyweight torpedoes or MBDA Exocet SM39 Block 2 Mod 2 missiles. CANTO acoustic decoys launched from two Contralto-S countermeasures launchers will provide the S-BR boats with an anti-torpedo capability.

The SN-BR, to be named *Álvaro Alberto*, was initially expected to start construction in 2015 and enter service as early as 2021, but will now likely be delayed until at least the end of that decade. Naval Group has declined to comment on the construction schedule for the project, but Admiral Eduardo Bacellar Leal Ferreira, commander of the Brazilian Navy, said in late 2018 that the submarine should be ready “by the late 2020s”. Speaking at the Wilson Center in Washington, DC, on 25 September 2018, the admiral attributed the delays to budget issues as well as taking extra care in the construction of the reactor.

Even that date may be ambitious, however, with industry sources suggesting that construction is not now expected to start until 2022, with the build, outfit, assembly, test, and commissioning process expected to last about a decade.

The SN-BR initial design activity was completed in 2017. Displacing about 6,000 tonnes and with an overall length of 100 m, *Álvaro Alberto* has been designed to accommodate an indigenously developed 50 MW pressurised water reactor. In Iperó, Sorocaba, the Aramar Experimental Centre (CEA) will use the Nuclear Power Generation Laboratory (LABGENE) to develop and test all elements of the SN-BR’s nuclear propulsion plant.

With delivery of the SN-BR programme, Brazil would become the seventh nation – after China, France, India, Russia, the UK, and the US – to build and operate an SSN.

Meanwhile, the MB is upgrading its existing 1,520-tonne Tupi-class Type 209/1400 SSKs. First-of-class *Tupi* (S30) was built by Howaldtswerke-Deutsche Werft (HDW) – now ThyssenKrupp Marine Systems (TKMS) – in Kiel, Germany, and commissioned in 1989. The remainder of the fleet was built at the Arsenal de Marinha do Rio de Janeiro (AMRJ) in Brazil, with second boat *Tamoio* (S31) commissioning in 1995, followed by *Timbira* (S32) in 1996 and *Tapajó* (S33) in 1999. A further two Improved Tupi boats with an increased displacement of 1,550 tonnes were to be built but due to budget constraints just one, *Tikuna* (S34), was commissioned in 2005.

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