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CHINA'S SEA BASED DETERRENCE: STILL EVOLVING

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A new visual of a Chinese SSBN suggests that China has come out with a new variant of the Type 094. The Type 094 is currently China's only SSBN variant that is built to carry the JL-2 SLBM which is reported to have a range of around 8000 km. The new variant Type 094A appears to have various improvements to make it more effective.[1] China's sea based deterrent is still believed to be in a nascent stage mostly because of technological bottlenecks. China had, a year ago, decommissioned its previous SSBN – the Xia class submarine after years of development struggle.

China appears to be committed to No First Use and credible minimum deterrence policy at least for the near future. This is the reason why China is putting in a lot of efforts to put in place a credible sea based nuclear deterrence force. China has been working to put in place an efficient sea based deterrent for a very long time. However, even after pouring in billions of dollars for the projects, the effort has not yet paid off. China's first generation SSBN- the Xia class with the JL-1 Submarine Launched Ballistic Missile (SLBM) - is believed to have never left port for a deterrence patrol. There is not even proof of any successful submerged test firing of the JL-1 from the boat. The design of the submarine was based on a Soviet SSN, but modified for carrying and operating with the SLBM. The boat was, for symbolic reasons, commissioned and decommissioned a couple of years ago.

The second generation SSBN – the Jin class boat (currently operational) is reported to be, by design, marginally better than the Xia class. However, the boat development reportedly still faces technological bottlenecks. As far as the JL-2 missile is concerned, there were some reports in the past of successful test firing of the missile from the boat. However, the extent of readiness is doubtful given the absence of any fresh information on the boat. The Type 094, as is evident from the images, has 12 vertical ballistic

missile launch tubes.[2] Each tube can accommodate a unitary warhead ballistic missile.

The latest modifications noticed are a redesigned sail that supports a rounded top over the navigation window. The new rounded off sail is similar to the Type 093B boat's sail shape.[3] Two more modifications noticed were smooth slope in the front top and a small fillet at the front base of the sail.[4] All modifications done appear to improve the hydrodynamic performance of the boat. But the main purpose here is to lower the acoustic profile of the SSBN. All rounded and smoothened surface would reduce any turbulence in the water flow around the boat that might create any noise. Some Chinese language media reports speculate that the raised lid housing the missile launch tubes are higher than the previous design,[5] thereby implying greater range for the JL-2 SLBM. But this appears to be too speculative to be true as any increase in range above 20 percent would require testing and no news of the JL-2 test firing were reported in the recent past.

For SSBNs, stealth is of paramount importance, which is what makes the platform the most survivable and the most reliable nuclear deterrence arm. During deterrence patrols most of the SSBNs operate at four knots to reduce the noise profile and always sail alone without any external support. The Type 094A is believed to be the fourth SSBN to be built in that series. Also, the background in the picture suggests that the boat is based in the Sanya base in Hainan Island.[6] The Sanya base was specifically built for basing China's SSBNs and has underground tunnels that enable the boat from sailing in and out of the port without surfacing to prevent detection by enemy satellites and other surveillance platforms. The port is also equipped with demagnetisation facility to enable the boat evade enemy magnetic anomaly detectors.

In 2009, the US Naval Intelligence released a chart which contained comparisons of the acoustic profile of the Chinese and Russian Submarines. According to the chart, the Type 094 is noisier than the 1970s Soviet Submarine. The recent improvements done would contribute to the noise reduction in the boat. These design optimisations are akin to fine tuning the systems. However, the boat design itself is based on a double hulled Soviet submarine design and moreover Chinese solid fuel missile booster technology is not as efficient as the US technology. The burn rate performance of the solid fuel is comparatively low leading to longer missile length which necessitated the raising of the lid in the missile tube area,[7] which also contributes to some acoustic signature. Nevertheless, Russian analysts opine that the noise signature has been reduced significantly.[8] It is known that China has been using rubber tiles to absorb the internal noise, similar to the ones used in the Russian Kilo class submarines.

Another major problem with the Chinese submarines related to acoustics is the twin reactor and twin turbine. In a submarine the highest source of narrow band acoustic signature is the reactor and turbine. With twin power systems the Chinese submarines produce more narrowband acoustic signature. The problem with this power system was the major technological bottleneck the Xia (Type 092) class submarine also faced. There is no recent information on any improvements to the Type 094 propulsion system.

The recent redesign points to the fact that China is still experimenting with its SSBN design and that presently it is not yet deployment ready, despite speculations that it might undertake deterrence patrols. Though better than the Xia class SSBN, the Type 094 can be said to be still evolving in design and development. Evidently, China is striving hard to lower the acoustic profile of the submarine. Another issue would most probably be the underwater firing of the JL-2 missile. The past couple of years have seen vibrant nuclear signalling by China. In light of this, the high restriction on any information on the SSBN capability - particularly relating to the JL-2 - might be a strong indication that the capability is not yet mature. The Chinese sea based deterrence has a long way to go technologically as well as in terms of training and experience which would take even longer from the time the systems are put in place. China, being a communist country like Russia, the command and control for its sea based nuclear deterrence force can also be expected to be on similar lines.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

Notes

[1] "敏感时刻再现身 最新 094A 核潜艇出海试航" http://military.dwnews.com/news/2016-07-12/59752912.html , 12 July 2016

[2] "Design Change Observed on Latest 094A Strategic nuclear submarine", http://military.dwnews.com/news/2016-07-05/59751203.html , 05 July 2015

[3] "094 strategic nuclear submarines appeared in the South China Sea may be equipped with JL-2 can cover the whole territory of the United States

",http://news.ifeng.com/a/20160713/49347370_0.shtml, 13 July 2016

[4] "Image show possible new variant of China's Type 094 SSBN", http://www.janes.com/article/62282/images-show-possible-new-variant-of-china-s-type-094-ssbn, 15 July 2016

[5] "Latest Strategic Nuclear Submarine appeared in South China Sea There are a number of improvements compared to the earlier Type 094"http://war.163.com/16/0714/08/BRU0I87V00014OMD.html , 4 July 2016

[6] "Image show possible new variant of China's Type 094 SSBN", http://www.janes.com/article/62282/images-show-possible-new-variant-of-china-s-type-094-ssbn, 15 July 2016

[7] "094 strategic nuclear submarines appeared in the South China Sea may be equipped with JL-2 can cover the whole territory of the United States

",http://news.ifeng.com/a/20160713/49347370_0.shtml, 13 July 2016

[8] "敏感时刻再现身 最新 094A 核潜艇出海试航" http://military.dwnews.com/news/2016-07-12/59752912.html , 12 July 2016