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North Korea's bodged nuclear-missile submarine will be very dangerous – to its crew



North Korea's new nuclear-missile submarine is launched. The vessel is likely to have limited capabilities - KCNA/Reuters

Opinion by Tom Sharpe – The Telegraph
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The news that North Korea has [modified an ageing Russian diesel submarine to fire nuclear weapons](#) has been met with some mirth amongst the underwater community. The boat's hull form now resembles a child's drawing of a submarine, and it "will handle like a pig, dived or surfaced" according to my submariner friends.

So is this just a PR stunt by the North Korean regime or a viable platform for carrying nuclear weapons?

Let's start with the Romeo class diesel-electric submarine on which it's based. Romeos were built in the Soviet Union between 1957 and 1961 and in China between 1962 and 1984. Even back then, the Romeos were considered 'noisy' – relatively easy to detect and track. The whole point of a submarine is that its enemies don't know where it is, so this is not a desirable characteristic.

North Korea imported seven Chinese-built Romeos between 1973 and 1975 and built a further 13 domestically. There isn't any firm information on their operational state but 'not very' seems to be the consensus.

'Diesel-electric' is a commonly used power train in submarines, much the same as you would find in U-boats or Allied subs of the World Wars. You get batteries and electric motors for running when fully submerged, and diesel engines which can drive the sub faster and recharge the batteries. Diesel-electric remains the most common propulsion type in the world due to its relative simplicity and low cost.

Diesel-electric submarines have an Achilles heel, and it's huge; more like an Achilles leg. Batteries cannot hold very much energy, so when fully submerged the submarine cannot move at all fast (except perhaps for a brief battery-draining sprint) and it has limited range.

To recharge its batteries or travel at speed the boat has to start up its diesel engines. Not only does this make a racket in its own right, but because diesels require air to work, the sub has to either surface or come to periscope depth and put a dustbin-sized snort mast above the surface that can be detected by radar or even seen. So for the entire period of the recharge, often many hours, the submarine's acoustic, visual and radar signatures are all increased. This vulnerability is what drove the world's better-funded navies to develop and build nuclear submarines, which can go fast and far while fully submerged, staying down for months on end if need be.

There are other options. If you want a submarine that doesn't cost billions of pounds per hull but with greater submerged endurance than a traditional diesel-electric, there are various so-called 'air independent' types, which generally work by storing oxygen or oxidiser aboard the sub so as to run a conventional engine or fuel cells without air. The Germans are building one of these for the Israelis with a likely nuclear missile capability and the South Koreans are going down the same route. Such subs are nowhere near as capable as nuclear-propelled boats, but they aren't as cripplingly limited as diesel-electrics: especially 1950s-vintage Soviet diesel-electrics.

So we know that the Romeo class sub was not a powerful platform to begin with. The next issue is what the bolt-on housing aft of the fin is for. Imagery of the launch shows ten missile tubes; four large and six small. Expert analysts believe the large four could take the Pukguksong family of submarine-launched ballistic missiles and that the smaller ones could house a cruise missile variant such as the Hwasal-2. [All are nuclear capable.](#) But these are big missiles and the Romeo is a small submarine. The work that must have been done inside the boat to make it all fit is likely to make the shed welded to the casing look elegant. And as if that wasn't enough of a cut-and-shunt job, images also suggest that the boat lost its torpedo tubes as part of the conversion.

It is also worth pausing to discuss how difficult it is to add new weapon systems to old ships. The notion of plug-and-play could not be further from the truth. To work effectively the new system has to be integrated into the ship's existing sensors and

equipment which is a challenge at the best of times but if you're talking about merging relatively modern microchip technology with Cold War valve-based equipment then it's even harder.

Assuming it all fits and everything is integrated as it should be, then the stability required from the platform to launch heavy ballistic missiles will be hard to achieve. A modern nuclear-powered ballistic missile submarine such as the Royal Navy's Vanguard Class can hover with a precision measured in inches – you're not going to get that from this boat given its age, small size and ungainly shape. It might well have to fire from the surface which will give it weather limitations and increase its vulnerability. As one friend said to me, 'it has nuclear weapons – it doesn't need to be accurate'. That's true, but it does need to be able to get the missiles away without toppling them during launch or wrecking itself.

Then we come to the final problem: for a deterrent to work it has to be credible and for that it must be survivable in war. A well-run nuclear submarine is extremely survivable and this is the reason the UK housed its deterrent in submarines in the mid 60s and never looked back. Finding a proper nuclear missile boat is nigh on impossible – it's like a 17,000 ton hole in the ocean. Don't believe reports that periodically emerge saying that a new technology is about to render the oceans transparent and submarines therefore obsolete. One day that might happen, but it hasn't yet.

By contrast, the North Koreans' new boat will sound like it's hosting a drummers' convention. It is supposed to deliver Armageddon but will probably end up just sounding like it.

Noisy submarines like this are an absolute joy to hunt. When I was captain of a specialist sub-hunting warship, we came across a few. One was a diesel submarine whose radar mast had been bent in bad weather and wouldn't retract properly and so made a banging noise so loud you could almost hear it on the upper deck. Another country had a nuclear submarine that emitted a distinct frequency on its starboard quarter we could hear from, well, I won't give ranges, but it was a lot. Good times.

Conversely, there was a brilliant German U-boat that was like chasing a phantom and going up against any UK or US nuclear submarine means that you need a whole web of assets to be in play and all on their A-game if tactical advantage is to be achieved.

Somewhere between the two extremes are the Russian nuclear submarines [snooping around our undersea infrastructure in the North Atlantic](#). Don't be fooled by the unimpressive performance of the Black Sea Fleet; the Russians' Northern Fleet – the Red Banner Northern Fleet, in the old days – are competent and finding them isn't easy, but we manage it.

The newly-modified North Korean boat will be easy to track by any serious anti-submarine operator in the region. South Korean 214 submarines will have no difficulty at all tracking and destroying it if needed. Likewise the Japanese Soryu class are excellent

and their lithium-ion batteries give them much better dived endurance than most diesel-electrics. A US Navy Virginia class boat would scarcely need to make an effort.

Submariners are a cautious bunch and generally shy away from saying that hunting other submarines is easy, but in this case, it really would be.

Submarines, like all warships, only have three jobs to do: reassure allies, deter would-be adversaries and be ready to defeat them should that fail. Submarines are unique in that they achieve all three whilst remaining invisible. The fact that their enemies do not know where they are is their superpower – take it away and they become vulnerable and immediately unable to deliver on any of the three tasks.

Given how long this project has been in development – construction images can be found from September 2016 – and how fast North Korea has developed its land-based missiles in the meantime, it feels unlikely that this boat will form a serious part of the regime’s nuclear deterrent. In this case, their [land-based options remain a more survivable and cost-effective option](#).

Nevertheless, no matter how wonky, it is still an emerging nuclear capability and should therefore be closely monitored. It will be interesting to see how this project progresses from here. Sea trials will last at least a year (assuming they go well) and be accompanied by various ejection tests where inert missiles are fired to prove the various launch systems. By then, every capable submarine operator in the region will have tracked this boat at close range and its capabilities and vulnerabilities will be intimately known.

In the meantime, its ability to deliver Armageddon remains reassuringly remote. For now, the only risk this submarine poses is to the luckless sailors who have to go to sea aboard her.

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