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Submarines – The Cornerstone of Deterrence. Some Past, Current and Future Considerations

Submarine operations and capability have facilitated military – and consequent political - coercion since their introduction as naval assets in the early 20th century: they are a cornerstone of deterrence.

There is a general perception that the employment of submarines as a deterrent relates solely to the deployment of SSBNs carrying ICBMs. Such platforms are, of course, a primary strategic deterrent. All submarines however, by the nature of their stealth (undetected presence), offer highly flexible and effective capabilities of deterrence. The employment of their stealth facilitates the covert operation of submarines - with a high level of impunity - in areas where control of the air and maritime surface environment may be held by the adversary.

Even in their early primitive designs, their stealth offered a vastly different threat to other naval platforms – particularly after Germany pursued ‘unrestricted’ attacks on merchant vessels in WW1.

WW2 German ‘Wolf Pack’ operations very nearly succeeded in crippling supply lines to the UK, until advances in radio DF, message interception, code breaking and high-definition airborne radar, critically curtailed those (mainly by surfaced U Boats at night) ‘Wolf Pack’ operations. Since WW2, the capability development of submarine sensors and weapon systems, with the concurrent ability to remain dived and largely unexposed, has swung the tactical balance back in favour of the submarine (to the extent that the most capable Anti-Submarine platform is now another submarine).

The employment of ‘Stealth’ via submarine operations, results in confusing, and compounding, uncertainty on the part of the opponent. The declaration of a submarine presence (for example, an exclusion zone) in areas of strategic (and tactical) importance to an adversary, is a profound and highly disruptive strategy. It demands a concentrated and disproportionate response by the threatened adversary, to defend against a threat which may, or may not, be present.

As recently as the Falklands campaign, high speed Royal Navy SSN transits to the South Atlantic and subsequent RN submarine Falkland Island operations, presented a real threat to Argentinian maritime forces/units entering the declared exclusion zone, well ahead of the RN surface task force arrival.

Similarly, however, once the RN Task Force had arrived, significant restrictions were imposed on the operations of that Task Force due to the uncertain presence, but real threat, of Argentinian submarine operations.

Later in the campaign, the threat of military coercion via the exclusion zone(s) was given a powerful strategic deterrence boost via the sinking (by HMS CONQUEROR, using WW2 Mk

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8 torpedoes) of the GENERAL BELGRANO - the essential consequence of which was the cessation of Argentinian Navy surface force activity, for the remainder of the war.

In times short of hostilities, the availability of a submarine capability is, of itself, a significant strategic asset to the operating nation. Without any declaration of intent, the very nature of stealthy submarine capability, enables the host nation to undertake operations involving the collection of intelligence, together with reconnaissance and surveillance, in areas of interest to that nation. Should the strategic situation deteriorate, and the host nation consider an escalation to be in the national interest, the submarine can be tasked to increase the intensity of those operation even to the point of the host nation declaring a submarine presence (via, for example, designation of an exclusion zone) or commencing special forces and/or maritime strike operations.

A critical factor in the strategic employment of submarines is the selection of an area in which they are going to be most effective. Unless configured in the 'Land Strike' role with 'Tomahawk' (or similar), or design and constructed in the ballistic missile firing role, submarines are best directed to a maritime focal point to execute a mission. If that mission involves the interception of hostile maritime forces, then the focal point is the most achievable point of interception. If the mission is 'trailing' a threat nation's submarine, then the focal point is one at which a 'cued' joint force contact handover can be made to execute such a 'trailing' operation.

Conventional submarines are best tasked with operations suitable to their power and speed restrictions. Strategic advantage is best achieved by pre-positioning in the vicinity of focal/choke points - adjacent to which the submarines can conduct a covert patrol - through which, because of geographical limitations, vessels of interest must pass. An alternative might be a position close to the location of the adversary's home ports and operational training areas. The best tactical advantage is achieved via proximity to the target in circumstances where some geographical or strategic limitations prevail, before the target forces disperse into a geographically unrestricted open ocean.

The concept that allied submarines should randomly patrol the open ocean or set up patrol areas close to home waters, waiting for the adversary to arrive, is a flawed strategy with severely limited tactical options. The use of submarines to defend home waters, 'time limits' the opportunity for alternative tactical opportunities, should the primary objectives fail – the enemy has arrived!

As an overarching principle, a submarine at sea, represents a threatening presence. By dint of its stealth, its location is unknown which creates a significant problem for a potential adversary.

If the strategic objective is the ability to pre-position a number of submarines to execute a function of deterrence, close to the maritime hubs of a potential adversary, then overall number of submarines required requires consideration of the following:

- The 'Patrol Days' capability specification of the submarine design (fuel and provisions storage capacity).
- How many submarines required on patrol (without a gap).
- The length of time required on patrol.

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- The distance to/from the patrol areas.
- The speed /endurance of the submarine (ie nuclear or conventionally powered. Nuclear powered submarines can be pre-positioned more rapidly than conventional submarines and have no fuel restrictions. They do not compromise their stealth by running diesel engines to charge a battery).
- The operating cycle of the submarine (operational days available after allowing for maintenance/upkeep and pre-deployment training).

Essentially, the further away the area (or areas) of strategic interest, the greater the number of submarines required to maintain a continuous presence on task.

Propulsion determines how fast and far a submarine can go; overall power determines what it can accomplish in a given location. The density of seawater (around 805 times greater than air) imposes an unforgiving reality on these dynamics: the cubic relationship between power and speed. For a submarine to go two times faster, eight times the power is needed; three times faster requires 27 times the power. Long-submerged endurance requires considerable electrical power for heating/cooling, ventilation, and atmosphere control to keep the crew healthy—not to mention offering conditions favouring recruitment and retention. Lastly, advanced submarine tactical systems require high and growing amounts of power to operate and cool their associated sensors and combat systems.

These are enduring and profound arguments for nuclear power for submarine propulsion and the use of nuclear-powered submarines as a primary deterrent.

Some thoughts on the Importance of a Joint RAN/USN Submarine Relationship

- Overarching effect of USN/RAN collaboration in the most sensitive of military programs: submarine operations.
- Mutual respect for the systems capability of operational submarines and the professional competence of the crews.
- Joint development of latest version of Mk48 ADCAP (MOD 7) heavyweight torpedo.
- Joint training for prospective submarine commanding officers (including fire/counterfire; submarine versus submarine engagements).
- Assistance from USN submarine stealth capabilities in enhancing RAN submarine stealth facilities.
- Shared intelligence product from sensitive submarine operations by both nations.
- Sharing submarine base facilities for maintenance and operational support.
- Shared industrial materials, such as HY steel and the welding techniques associated with hull production.