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Submarines and Peacekeeping

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Introduction

Submarines[1] are not generally regarded as peacekeepers, given their long and forbidding history.[2] There has always been a certain furtive air to submarine operations, encouraged by the unrestricted policies of all the powers during World War II.[3] This is further influenced by their stealthy nature. Often painted black, these foreboding vessels project an air of menace even if they are simply sitting in harbour. This image is often instigated by their own crews; upon returning from its famous patrol in the Falklands, the crew of *HMS Conqueror* sailed into port flying a jolly roger, reviving an old war time custom. Combat between these vessels is commonly referred to as a "knife fight", and the cloak of secrecy that surrounds all their operations adds to their aura of mystery.

Even if the utility of submarines in peacekeeping operations is not immediately apparent, they are, nonetheless, critical factors in the planning of peacekeeping operations. Currently, there are more than 600 submarines around the world operated by 46 different countries (see Table One).[4] Over half of these are found in navies outside the United States and Russia. While many of them are in a run-down state, a growing number of these submarines are increasingly modern.[5] Many are found in highly strategic waters, crisscrossed by important sea lanes and areas of important marine resources. In short, submarines represent a growth industry in naval weapons. As such, they occupy an important niche in maritime operational planning.

This article examines the role of submarines in multinational peacekeeping operations from two different perspectives. First, it looks at the role of the submarine as a threat to peacekeeping operations. In many cases, the submarine will figure prominently among the threats to maritime and possibly land peacekeeping operations in the next century. They may also be the cause of the biggest disasters in the future.

The article then looks at the positive roles that submarines can play in multinational peacekeeping operations. In future operations, peacekeepers will be increasingly deployed into intrastate conflict as well as situations where the shield of the UN will not be respected. The typical "Chapter Six" type operation has, in recent years, been increasingly replaced by Chapter Seven and "Chapter Six and Half" operations. Cases in point for the latter have been both Somalia and Bosnia.[6] Submarines will provide unique capabilities to embattled peacekeeping forces that will allow them to complete their missions more effectively, *especially* in these types of operations.

	NATIONS	*NATO RIMPAC*	*US*	*USSR RUSSIA*	*WARSAW PACT*	*NON ALIGNED*[a]	*TOTAL*
1980/81	*39*	*173*	*130*	*335*	*14*	*197*	*869*
1985/86	*40*	*173*	*102*	*435*	*12*	*257*	*979*
1990/91	*44*	*173*[b]	*130*	*329*	*na*	*302*	*934*
1995/96	*46*	*155*[b]	*99*	*160*	*na*	*249*	*663*
BUILDING[c]	*+1*[d]	*+20*	*+9*	*+7*	*na*	*+24*	*+60*

Source: Jane's Fighting Ships, 1980/81 - 1995/96, Richard Sharpe (ed.), (Houndswell: Jane's Information Group).
- a: Non-aligned includes such Western states as Sweden, ASEAN, and after 1985/86 Warsaw Pact states excluding Poland, together with those states traditionally termed "non-aligned".
- b: This figure includes Polish submarines as part of the Visegrad group of nations.
- c: This figure represents submarines that are actually building rather than simply proposed. Numbers would be even higher if the latter were included.
- d: Singapore

The End of ASW? The New Security Environment and Submarines

At the close of the Cold War,[7] submarine forces in most Western states came under attack for their perceived irrelevance. While this was true even for a major naval power like the United States,[8] it was especially true in Canada which had very limited submarine resources to begin with. As the Canada 21 Council concluded:

In the new strategic context, there is no obvious need to maintain the wide range of air, ground, *and ASW* conventional forces needed to repel an attack because it is difficult to conceive of any military power with the desire or ability to attack Canada.[9]

Freed of the burdens of the Cold War, submarines were portrayed in many circles as Cold War relics for which there was no justifiable need in the post-Cold War era. The *Globe and Mail* editorialised "[e]ven if we could afford the $800 million [cabinet] knows that nothing is a bargain if they are not necessary." We could rely on our allies to protect Canada from undersea threats.[10] More surprisingly, even some naval officers spoke out against the purchase of nearly new British *Upholder* submarines by the Canadian Navy:

Britain has every right to reap the so-called "peace dividend" by taking *Upholder* submarines out of service; but Canada should not consider adding to the British dividend by purchasing submarines for which there is no demonstrable need.[11]

To laymen and professionals alike, the Cold War fixation on the sea lanes seemed to carry over into the post-Cold War era; that is, the only conceivable external threat to Canada was to its sea lanes. The evaporation of the threat to the sea lanes seemed to suggest that the Navy could dispense with submarines, and all the better too, given their sinister reputation. Canadians would not countenance the offensive use of submarines against anyone's trade. The collapse of naval

rivalry and the unchallengeable supremacy of the United States Navy (USN) also suggested that it was extremely unlikely that Canada would be forced to fight a naval battle on the high seas, thus it was also unlikely that we would face any form of undersea threat. Secure in our fortress, we could, as the *Globe and Mail* suggested, cede our sovereign undersea responsibilities to foreign governments as it was inconceivable that we would ever be forced to call for help in those areas.[12]

This strategic rationalisation is essentially a revival of the old "fireproof house" concept. As first stated by Senator Raoul Dandurand in 1927, the argument suggests that Canada benefits from a happy coincidence of geographic features which protects it from the vagaries and violence of world politics. Our location next to a benign great power, and expanses of oceans and ice on our other three boundaries ensures that Canada is effectively isolated from the security dilemma which afflicts all other nations. "We are a fireproof house, far removed from flammable materials." Thus, Canada need do little in its own defence given that there is nothing we could do to stave off military attack from the south and, in the unlikely event of invasion from outside the continent, America's interests would automatically be engaged. This geopolitical relationship was given official endorsement, first by Roosevelt's 1939 Ogdensburg declaration, and later by the series of bilateral agreements concluded between Canada and the United States for continental defence.

Submarines, Multinational Operations and Canada 21

The Canada 21 report is interesting in this respect. Arguably one of the most influential documents produced during the 1994 defence debate, it rejected an isolationist stance at the strategic level, while embracing it wholeheartedly at the tactical level. Canada could not avoid committing itself in world politics; however, the military would not play an important role in Canadian foreign relations. Thus, Canada could shed many of its explicit overseas military commitments as well as foregoing most new ones, especially those that might involve violence. While the report sparked controversy for its seeming idealistic logic, [13] at its heart, it is coldly realist in content.

The growing interdependence of world trade, environmental matters, demographics and cultural shifts meant that geographic isolation was increasingly irrelevant.[14] As such, policies of economic and political isolation were no longer practicable. The world was already at Canada's doorstep - we could ignore it only at our peril. Furthermore, it accepted traditional Canadian strategic thinking which placed our faith in a multilateral approach to our own security. Canada could not hope to compete militarily with anyone given its limited fiscal resources. Furthermore, the sparsity of the Canadian population and the vastness of country meant that threats to Canadian security were dealt with more effectively first, through diplomatic efforts, and then second, by keeping these threats as far away from Canadian borders as necessary.[15] As Canada lacked the political, economic, and military resources to carry out such a policy alone, it necessitated a multilateral approach to security.

The Canada 21 Council did adopt a decidedly radical approach to defence. The council calculated that Canada could virtually abandon all its security commitments on the assumption that the United States and other Western partners would essentially pick up the slack that was

generated by this development, and that the cutbacks would fail to generate any serious international ramifications for the country.[16] On top of this, the Council also recommended that plans to upgrade or maintain capabilities dependent "upon the use of heavy armoured formations, heavy artillery, air-to-ground fighter support, and *anti-submarine warfare techniques*" be abandoned. It also recommended that the *City* class frigates abandon their anti-submarine role and eventually be replaced by smaller ships.[17]

Post Cold War Peacekeeping and Warfare

Since the issuance of the Canada 21 report, many of its findings have proven true. The international arena did not evolve into a "new world order" as was hoped by many in the heady days of 1989. The military budget is under increasing pressure from rising personnel and capital costs as well as pressure from domestic groups to reduce its size in order to protect social programmes as was also suggested by the report.[18] Nevertheless, in a very important way, the findings of the Council have not been borne out by the experience of the Canadian Forces since 1994. Canada has not been able to pick and choose the missions with an eye on keeping its forces out of harm's way. In the new security environment, there is no safe area to retire behind: the front line is everywhere. While it may be possible to specialise in light forces, leaving heavy armoured warfare and carrier air power to the great powers, it has not been possible to place forces where "high intensity conflict is not a significant risk".[19]

Of course, this oversight depends on what "high intensity" is defined as. The Council failed to provide any definition as to what they consider to be high intensity operations. One recent Navy study defined high intensity as "global warfare".[20] Nevertheless, there presumably would be numerous situations which the Council would not deem appropriate for Canadian military operations as they would not be encompassed by this definition. The Gulf War operations conducted by Canadian Forces would surely have been included, as perhaps would operations in Bosnia and Somalia.[21] While the Haitian operations have been comparatively peaceful, these too could have easily erupted into violence between rival factions and peacekeepers. While it may be possible to leave heavy armour and attack helicopters to the larger powers, the disappearance of front and rear areas seen in both the Gulf as well as in Bosnia and Somalia mean that light forces will still require combat skills. While the *Globe and Mail* would remark that we were beyond seeing Canadian troops ever engage in full scale combat, much less hand to hand combat[22] just three months previously, Canadian troops had just taken part in their largest action since the Korean War, earning one of the few unit commendations during the UNPROFOR mission.[23]

At sea, the situation is even worse. While modern land and sea warfare is marked equally by the intensity and immediacy of violence, sea warfare is distinguished from the former by the consequences of that violence. Individual troops may be killed or wounded by a sudden firefight, but rarely do sporadic events immediately jeopardize the pursuit and realization of the mission. At sea, a successful strike places the entire ship at risk. Further, the political and symbolic capital that is invested in warships means that damage to even one of these vessels can bring an entire operation into question. The loss of a single vessel in the Adriatic would have precipitated a political crisis within NATO. At the same time, over a hundred troops were lost throughout UNPROFOR, which is equivalent to the loss of a frigate in terms of personnel. The ability of sea

warfare to transition rapidly between completely peaceful operations to high intensity operations, together with the immediacy of the consequences of loss,[24] means that warships must have as full a range of combat capabilities as possible if they are to enter war zones or areas marked by maritime conflict.[25]

ASW is Not Dead: Hostile Submarines and Multinational Peacekeeping Operations

The shift from open ocean to littoral operations, presaged by the United States' Navy's "...From the Sea" doctrine, suggests a new area of operations for navies. In reality, it is the re-discovery of the traditional operating area of navies. During the Cold War, aside from NATO exercises, most naval operations took place in the littoral area.[26] The naval aspects of the Korean War, Arab-Israeli Wars, the US/Libyan confrontations, and even the Falklands War were all conducted in the littoral area. However, this change in doctrinal emphasis has revealed a number of concerns that were downplayed during the Cold War. While these issues are many, the problem posed by conventionally powered submarines are of concern in this article, especially those operating in the littoral area. During the Cold War, diesel/electric submarines were downplayed because of the important role that nuclear submarines would have played in a contest for the Atlantic sea lanes. Diesel/electric submarines were simply "lesser included cases".[27] However, the problems that these submarines present, particularly to littoral operations, have raised the importance of operational planning.

The Utility of Submarines for Small Naval Powers

In littoral operations, submarines operated by small naval powers are well suited to achieving political objectives. States faced with an American-led multinational coalition in a peacekeeping or peacemaking operation are unlikely to have the naval resources to conduct an effective offensive war at sea. They are less likely to possess surface ships capable of surviving long in a high intensity naval conflict, whereas submarines pose a threat that is not easily eliminated. Thus, submarines are likely to continue to be the weapon of choice for those states fearful that their interests and sovereignty will be challenged on their maritime frontiers. Still, most states will be unable to afford a large number of these expensive vessels. The most that can be hoped for is that a submarine can score a decisive hit on a critical coalition asset. As one naval officer writes:

Their goal will not be to overwhelm US military might or to defeat in set piece engagements the assembled power of coalitions battle groups. Their mission will be to disrupt and sting, to slash and feint, to use their stealth as a mugger might use the shadows.[28]

This is not a forlorn hope. ASW in littoral waters is one of the most challenging of all naval operations. Operating areas are not likely to be as familiar to coalition forces as they are to opposing forces. Compounding this are general characteristics of littoral waters - poor sonar conditions due to radical variations in the water column's thermal structure, high reverberation, varying tides and currents, and highly directional ambient noise levels.[29] Even with nearby allied airbases from which to operate, air surveillance may be limited. Opposing submarine forces may blend in with local shipping traffic making it difficult to differentiate their acoustic signatures from local noise. Worse still, unlike nuclear submarines, diesel/electric submarines

can "bottom out" or rest on the ocean floor. Once motionless, they present an extremely difficult sonar target.[30] Even if detected, most torpedoes have been designed for deep water ASW, rather than for shallow water targets.

The experience of the Royal Navy during the Falklands War provides ample evidence of the difficulty that diesel/electric submarines present to anti-submarine operations. In 1982, Argentina possessed four submarines of varying capability. However, they effectively possessed a single submarine with which they could conduct offensive operations against the British task force. Facing that single submarine were parts of NATO's North Atlantic ASW group, the ASGRU2, arguably one of the most experienced ASW forces in the world at the time.[31] Despite the ASGRU2's depth of experience, the Argentinians were able to conduct two attacks on the British task force, both of which failed due to technical malfunctions.[32] Local acoustic conditions rendered British forces helpless: over 150 weapons were released with no hits scored.[33] According to the Argentinian Captain of the *San Luis*: "There was no effective counter attack. I don't think that they knew we were there until they heard our torpedoes running." The implication is that every weapon expended in the British ASW effort was against a false target.[34]

Thus, the diesel/electric submarine will figure prominently amongst the threats to maritime operations in the next century. Submarines using their inherently stealthy nature can operate even in areas where there is overwhelming opposing naval superiority, given the difficulty of locating them in a highly noisy environment. Finally, states with limited resources to invest in naval forces can maximise the effect of their defence dollars by investing in submarines, for the above reasons, as well as for the flexibility of these weapon systems.[35]

> A state finding itself at odds with its neighbours or with the international community, can also calculate that the prevailing emphasis upon expeditionary forces, presents it with a commensurately greater seaborne threat. Therefore it too looks to the submarine's potential to complicate the planning considerations of would be assailants or interventionists.[36]

Offensive Submarine Operations

The danger posed by submarines is enhanced not only by their stealth, but also by the versatility of their weapon systems. During World War II, submarines were limited in the range and direction of their attacks, given their submerged speeds and the speed of their weapons. Modern submarines can draw on a growing arsenal of sophisticated weapons including mines, missiles and torpedoes, many of which greatly extend the distance between the intended targets and the submarine.

Many modern submarines have the ability to lay minefields while submerged. Maritime mines represent a significant risk to naval operations. Geoffrey Till notes that during the Korean War, for example, "the most powerful navy in the world was held for weeks in its planned invasion of Wonsan by a few ancient mines laid by the North Koreans." More recently, amphibious operations were cancelled during the Gulf War due to the presence of maritime mines off the coast of Kuwait.[37] Mines are cheap weapons that are enormously expensive and dangerous to

counter. They can be effectively used to deny critical areas to opposing naval forces, to delay operations, or to impede the ability of naval forces to transit certain areas. As with submarines, damage resulting from mines can be used to foment political complications within coalitions. While the submarine may not be the most effective platform with which to mine an area, it is however the only one that can do so covertly. Submarine-laid mines will be a complete "surprise".

Mines are not the only system that can extend the diesel/electric submarine's reach. Many submarines have the ability to fire cruise missiles. For example, Greek *Type 209* submarines are equipped to fire SubHarpoon missiles which have a reach of 70 nautical miles. Although the Royal Australian Navy has yet to procure Tomahawk land attack missiles, the *Collins* class submarines have been fitted to fire these missiles which have a reach of 250 nautical miles. While Russia does not export its SS-N-15 cruise missile, the increasingly competitive arms market and the hard currency generated by such sales may weaken its policy.[38] New, small-scale missiles, such as the Sea Ferret, may provide all submarines with a cheap land attack and sea-to-air missile.[39]

Though submarines are potent weapons for striking at warships, they are even more effective against merchant shipping targets. This concern is amplified by the fact that most peacekeeping expeditionary forces have extremely long supply tails. In littoral operations, and many others as well, the overwhelming majority of those forces' supplies will have a maritime component. Submarines have the almost unique capability to target "the arteries" of expeditionary operations: logistic ships.

The days of mass convoys are effectively over. The sizes of convoys in World War II were generated by the carrying capacities of contemporary shipping. Merchant vessels were commonly 400 to 500 feet long and between 10,000 to 16, 000 tons. Modern merchant vessels are between 200,000 and 400,000 tons and capable of carrying:

> the equivalent of a WW II 30 ship convoy, or a Brigade's worth of weapons, vehicles, ammo, stores, rations, field hospitals, spares, maintenance workshops, command and control, communications, etc. Enough for 30 days combat except for personnel and (fuel).[40]

During urgent situations, the loss of even a single container ship may be a strategic blow from which it may be difficult to recover. One need only think of the implications of the loss of one or two of these ships in the Persian Gulf. The loss of the *Atlantic Conveyor* in the Falklands War denied all but one heavy lift helicopter to the British, nearly ruining their amphibious operations. The Royal Marines were forced to make an arduous cross-country march carrying nearly all their supplies on back due to the lack of air logistical support.[41] A similar loss in the Gulf may have delayed operations by a month or more, giving Iraq an opportunity to continue to manipulate divisions within the coalition as well as to maintain its psychological campaign against uncertain Western democracies.[42]

Many developing states possess submarines of marginal capability and modernity. Taiwan is currently experiencing great difficulty in updating its World War II era *Guppy* class submarines

given China's opposition to such arms sales. Many such states are similarly equipped with elderly systems. Once again the Falklands serves as an important example. The Argentinian submarine *Santiago del Estero*, was inoperable during the conflict due to the inability to submerge. Nevertheless, the Argentinians regularly moved it about to give the impression that it was capable of conducting operations.[43] By making a number of operationally useless boats "disappear", a littoral state can create a potent deterrent effect in the minds of the opposing naval commanders'. Technology does not have to be the most sophisticated to accomplish its mission: the *General Belgrano* was sunk using World War II era technology - steam driven torpedoes.[44]

In sum, submarines continue to pose a distinct threat to naval operations. They are inordinately flexible weapons systems that can survive in enemy controlled waters to conduct a variety of missions. The difficulty of conducting ASW in littoral waters enhances this ability. They are capable of laying minefields and attacking land and sea targets using standoff missiles. Their torpedoes and missiles pose an enormous threat to merchant shipping, particularly those supplying coalition forces in littoral operations. Perhaps most importantly, they are capable of creating political and military effects that are out of proportion to the effort invested in their operations. This can occur simply by disappearing from the view of the opposing maritime commander, and can also include conducting attacks on opposing forces, especially those whose commitment or capabilities may be less than complete.

Thus, the proposition that ASW is no longer necessary in the new security environment simply cannot be maintained in the face of this evidence: the requirement for ASW is alive and well. Naval forces lacking ASW capabilities will be unable to conduct virtually anything but the simplest peacekeeping operations. This is especially true for those states, such as Canada, which rely on multilateral diplomacy and military operations as a keystone to their security policies. Without an effective ASW skill set, Canadian ships would have been endangered in both the Gulf and Adriatic operations. Given the proliferation of submarines worldwide, losing ASW capability may greatly restrict the areas in which Canadian ships can safely operate, as well as the types of operations in which they can participate.[45] Relying on allies to protect us in future operations will only further lower our usefulness, and thus, our value as partners in multinational operations.

The Submarine as Peacekeeper in Multinational Operations

While it is true that submarines will present distinct problems for operational planning in maritime peacekeeping, they can also complement peacekeeping operations thereby making them a desired partner. In particular, conventional submarines offer specific capabilities that may make them more desirable platforms than nuclear submarines.

Diesel Versus Nuclear Submarines

Diesel/electric submarines are primarily limited in two critical ways in comparison to their nuclear counterparts: endurance and speed. Resources of power, air and water aboard a SSN can be generated by the submarine's nuclear power system. Therefore, the only limiting factor in SSN operations is the crew's endurance and stores. Nuclear submarines commonly only surface as they leave and enter home ports while on patrol. Diesel/electric submarines must periodically

resurface to replenish the air, as well as to run their engines to recharge their batteries. Although these submarines can do this when submerged by raising a "snorkel" mast, this act exposes them to possible detection by the enemy's radar and sonar.

Because a SSN essentially has unlimited power, its underwater speed is a factor of hull design and safe (that is, silent) operating speeds. Thus, SSNs are capable of sustained cruising speeds of 25 knots or higher, if the circumstances require it, for the duration of their patrols. A diesel/electric submarine's speed is a function of the strength of the charge in its battery and the energy management strategy of its captain. While SSKs are capable of moderately high speeds underwater, they can do so only for a very limited time, before being forced to surface or snorkel to recharge their batteries. Most modern SSKs are capable of remaining submerged for up to five days (and considerably more if an air-independent propulsion system is used) at a speed of 4-5 knots.

Nevertheless, despite these crucial operational limitations, diesel submarines may be preferable to SSNs. SSKs, if properly maintained, are generally much quieter than SSNs. The nuclear reactor aboard the SSN must be kept cool at all times which necessitates the constant running of pumps and operation of valves. Efforts to quiet these systems depend on the vigilant efforts of the crew, the boat construction company, and the ongoing maintenance schedule, any part of which can foil the best efforts to keep a submarine silent.[46] By virtue of their battery powered motors, SSKs avoid many of the noise problems that challenge SSNs. In the noisy littoral environment, the minimization of self-generated noise will also improve a submarine's own sonar performance.

The limitations imposed by the need to regularly resurface or snorkel may not be as critical as they might have been in a general world war. In many peacekeeping operations, coalition forces will have near complete control of the sea and probably of the air as well. Thus, SSKs may recharge their batteries with little fear of being detected by hostile forces.[47] Where this may not be the case, most SSKs are capable of "gulping" or snorkelling intermittently.[48] While this may mean that the submarine operates without fully recharged batteries, the infrequent radar signatures produced by the snorkel mast will make identification and tracking difficult.

In littoral operations, one of the principal tasks for submarines will be to sweep the area clean of opposing submarines or to establish a positive contact with them. In order to do this, submarines will have to be capable of going everywhere in the operating theatre, including shallow water. Shallow water operations by SSNs are particularly tricky. SSNs tend to be appreciably larger than their conventional counterparts. This is due to a combination of a number of factors including the reactor system, hull shape and weapon capacity. The large hull size of SSNs increases the difficulty of operating these vessels in shallow water. SSNs, especially those operating at high speeds, have considerable residual momentum.[49] As such, SSNs must have significantly more depth beneath them in order to safeguard against jammed diving planes.[50] Given that SSNs often have more draft depth than an aircraft carrier, they require far deeper water to operate safely at periscope depth.[51] Manoeuvring in shallow water may present the SSN commander with the unpalatable choice of running into an underwater obstacle or broaching the surface, whereas the smaller and lighter diesel/electric submarine might be better able to cruise over it without broaching.[52]

Because of their stealthy nature, submarines are extremely effective vessels for implementing and enforcing peacekeeping/making operations. They can:

- operate in a state's backyard, unsupported and in the face of opposing sea control efforts;
- conduct non-politically intrusive operations in forward areas;
- be inserted for a wide range of operational tasks (intelligence indication and warning, special operations;
- conduct a wide range of operations once there with a high degree of survivability.[53]

Given these inherent features, submarines can play three crucial roles in future peacekeeping operations: Strategic Conventional Deterrence, Intelligence Collection, and Support.[54]

Strategic Conventional Deterrence

Just as the presence of a submarine complicates the planning of a task force commander in any naval operation, the presence of submarines complicates the tasks of those that would oppose coalition forces as well. As demonstrated by the experience of the British during the Falklands War, ASW is a costly form of naval operation both in terms of the numbers of platforms required to successfully carry it out, as well as in the amount of time required. Further, opposition naval forces may be limited in their freedom of movement by coalition forces, thus complicating their ASW attempts. It almost goes without saying that the lack of any effective ASW skills will multiply the complications imposed on opposition forces.

Just as the *Santiago del Estero* imposed a psychological penalty on British operations during the Falklands War, submarine operations can be used to manipulate perceptions, thus enhancing deterrence. One study of military leaks to the press during the Falklands War identified a distinct effort to manipulate Argentinian perceptions with implied submarine operations.[55] Canada, too, has used its submarines to manipulate foreign perceptions off its coasts. In 1993, *HMCS Okanagan* tracked and arrested American fishing boats which were fishing illegally in Canadian waters, while the previous year, *HMCS Ojibwa* tracked fishing violators, providing information passed on to maritime patrol aircraft.[56] The Navy reported that the submarine operations had the effect of reducing American fishing violations for several weeks following these incidents.[57]

Similarly, advertising the participation of a submarine could have this effect on opposing forces, especially those not capable of detecting submarines. The submarine's ability to operate in waters where surface ships might have difficulty, such as near contested shore lines, enables them to detect violations that might go unnoticed by naval forces positioned farther out. Relying on passive systems alone to detect and track their targets complicates the effort to conceal illegal activity. A "submarine surfacing out of nowhere to intercept ... would leave great questions with the enemy regarding where such blockades could be broken."[58] Further, because of their covert nature, these types of submarine operations may have an effect out of proportion to the effort invested in them. The British sinking of the *General Belgrano* in 1982 led directly to the withdrawal of the Argentinian fleet from the South Atlantic, all but sealing the fate of the isolated garrison on the Falklands Islands. As Ditzler notes:

> If *Conqueror's* attack had been carried out by Royal Navy Harriers or Exocet missiles, it would not have had the same deterrent effect. As it was the Argentinian navy was coerced into believing it lacked the equipment, confidence, and perhaps the competence to meet the SSN threat.[59]

Intelligence Collection

The same features which enhance conventional deterrence also play an important role in intelligence collection. The ability to cruise undetected close to hostile shores demonstrates the utility of these vessels. During the height of the Cold War, American submarines were able to penetrate the ports of some of the Soviet Union's most sensitive naval installations, conducting signals and electronic intelligence, as well as photographing the undersides of Soviet submarines.[60] Submarines would be able to perform similar missions in a peacekeeping context, complementing the intelligence resources available to a naval or a ground force commander.[61] Further, such missions might be able to collect intelligence unavailable by other means. Satellite overflights can be planned for as long as the orbital periods are known. High altitude aircraft, such as the TR-1 and SR-71 are highly scarce resources which may not be available on short notice. Further, these and other aircraft may be detected, thereby warning the opposition that they are being watched. A submarine's stealth avoids these problems. No other platform has the ability to covertly track, identify, and monitor vessels in fog conditions.[62] Bottomed out submarines could conduct long range and long term intelligence operations in strategic waterways with little likelihood of being detected.

Submarines can also be used to insert special forces teams ashore to conduct intelligence gathering activities. Such capabilities are not just restricted to larger SSNs. Before they were retired, British *O class* boats were routinely used to deploy Special Boat Service troops. Similarly, Israel uses its small *Type 206* submarines to deploy units of its special forces.[63]

Support Operations

There are a wide variety of other tasks that can be effectively performed by submarines that would serve to free up other resources, allow for the more efficient use of those resources, or perform tasks that would place them at risk. The sensors aboard a submarine enable it to scrutinise a far larger area than is possible with a surface ship. Under good sonar conditions and equipped with a towed array, submarines are capable of covering 125,000 km^2 over a forty to fifty day patrol, whereas a surface task group of five to six ships, with a combined helicopter capacity of eight craft, has a continuous surveillance coverage of 192,000 km^2 in a 30 day patrol. Thus, considerable resource savings can be had with submarines, especially given that most SSKs are crewed by as few as 30 personnel.[64]

Operating in conjunction with maritime patrol aircraft (MPA), submarines are able to assist in controlling enormous areas. Again, the sensors on board these vessels provide useful long range information, however, the submarine's ability to respond to that information may be limited by speed and safety considerations. Submarines operating with MPA can pass on their target information, allowing the aircraft to conduct more detailed investigations of contacts that are far

removed from the submarine's position. This also has the benefit of allowing the submarine to remain covert.[65]

Finally, submarines may be extremely useful in the covert detection and, possibly, the clearance of minefields. Until opposing defences are either neutralised or pose no further threat, submarines can covertly map minefields using remotely controlled vehicles equipped with a minehunting sonar, such as is operated by Canada's new *Kingston* class vehicles. Although mine clearance was a common practice of American submarines in World War II , no submarine is currently capable of such operations. However, developments in remotely operated vehicles may yet make such operations feasible.[66]

Operational Challenges to Submarine Peacekeeping

Despite the apparent utility of peacekeeping with submarines, several challenges revolving around the issue of secrecy must be resolved. Because a submarine generally is only effective as long as its stealthy nature is protected, every nation which operates submarines guards its operational characteristics as one of its most sensitive secrets. Thus, issues such as communication and control may pose significant problems. In operations involving NATO forces alone, this need not be a problem. NATO has extensive experience and a doctrine capable of dealing with these sensitive issues, although it is a subject of one of NATO's most recent tactical publications.[67]

Nevertheless, solutions to these problems are already being addressed. The United States Navy's Naval Doctrine Command is currently developing doctrine for multinational maritime operations.[68] This complements a series of internationally released naval operational manuals to assist in the planning and execution of multinational operations developed by the Naval Tactical Support Activity in Washington, D.C. Known as the "Extac 1000 Series" (for experimental tactics), they cover a wide variety of operations. NATO submarine safety procedures are being examined in this process at a very elementary level for release to Partnership for Peace nations.[69]

More problematic is the dissemination of intelligence collected by submarines. In multinational operations, problems can occur where intelligence received by one nation cannot be shared with another. Even in NATO operations, different levels of intelligence sharing exist amongst the sixteen member nations.[70] Occasionally, because of these security restrictions, individuals from one nation may be party to intelligence that cannot be shared with their commanding officers who are from another nation. These problems can be addressed through close attention to the organizational structure of any operation to ensure that information flows smoothly from one level to another.

The most troublesome aspect facing submarine operations is the question of inter-operability and the degree of connectivity desired. Even in wholly national operations, submarines can be difficult to operate with.[71] The problem stems from two different but related sources: the need to avoid "blue on blue" - friendly fire - encounters, and the difficulty communicating with submarines.

Friendly fire is avoided between invisible submarines and friendly ships by establishing tightly controlled "havens", transit routes, and "weapons free" zones. Havens may be fixed operating areas, or they may be moving areas of water space (similar to the boxes placed around aircraft by air traffic controllers to avoid in-flight collisions). However, which ever they are, submarines detected in these areas may not be attacked by surface ships. An operational plan may also establish "safe havens" along deployment routes where submarines can pause in the event of operational difficulties elsewhere. As Hervey notes:

> Moving a large number of slow, diesel powered SSs to and from fixed patrol areas, with no mutual interference, nor cramping of surface and air operations, is a tricky water space management problem. It can be controlled ... but only if a comprehensive initial deployment plan is drawn up, which will swing into action with minimal chatter.[72]

Given that this often involves the sacrifice of some task force assets in specific areas in order to allow the submarine operational space, naval commanders are usually less than enthusiastic about working with submarines in their midst.[73]

These water space management problems can become particularly complex in a dynamic littoral scenario,[74] and even more so when multinational units are involved. As with questions of intelligence, nations are loath to give up the locations of their submarines on operations, even when they are cooperating with trusted allies. More particularly, most nations do not wish other ships to get too near to a submarine for fear of the acoustic intelligence that may be collected from it. The situation can be dealt with through a liaison officer attached to the task group's headquarters. After reviewing the operational plan, the submarine HQ will usually issue "no-go" areas where friendly forces should not venture. In operations involving navies which generally do not cooperate together, these arrangements may be resisted by the submarine service. Submariners, fearful of becoming inadvertent targets for its partners above, may not trust the competency of the naval crews it operates with. The simplest solution is the establishment of geographic separation between operating forces to ensure that they never cross paths.

For the multinational force, this operability problem is complicated by the fact that no direct communication will likely be possible with the submarine. At the most basic level, even if the submarine was willing to talk, the level of compatibility between the communication and cryptographical systems is likely to be non-existent. For safety reasons alone, most task force commanders will want to talk directly to a submarine commander (even if the submarine's national authority does not want him to). Secure voice circuits may have to be installed using commercially available equipment. However, if there is a basic incompatibility with the equipment installed onboard, as there is with much of the former Eastern bloc equipment, other organizational arrangements may have to be made, including the operation on less secure frequencies and communication through shore authorities. Obviously, these problems are fundamental ones that may preclude some nations from contributing submarines, or may preclude their operation in certain missions or areas.

Conclusion

The submarine has a much maligned reputation. Its "scourge of the seas" reputation is an unfortunate holdover from the World Wars that often make it difficult to sell submarine operations to the sceptical public. This is made all the more unfortunate given the growing utility of submarines in the post-Cold War strategic environment. As shown above, submarines are an extremely attractive weapons system, especially for weak naval powers keen on denying their waters to larger naval forces that they may have to confront. Given that the overwhelming majority of peacekeeping operations that will be conducted in the future will likely have a significant maritime component, hostile submarines will figure prominently in the success or failure of those missions. Submarines will not just play a negative role in future operations, however. Their enormously versatile capabilities make them useful for a whole range of operations within a naval peacekeeping task force, reducing the difficulty of collecting maritime intelligence, and deterring opposing forces from sortieing out of their harbours. While considerable imagination, cooperation, and political willpower will be demanded from the politicians and naval staffs of the nations that operate submarines if the problems of secrecy and interoperability are to be surmounted, these in and of themselves need not be fundamental objections to the inclusion of these ships into a multinational operation.[75] The benefits that can be realized in peacekeeping operations are simply too great to be ignored for long. Indeed, the submarine is due for a much needed revision of its image.

Endnotes

1. The author wishes to thank the following individuals for their assistance in the preparation of this paper: Cdr. Bob Davidson, D. "Griff" Griffiths, Peter Haydon, Cdr. Larry Hickey, LCdr. Doug McLean, and Cdr. Dan Fitzgerald. Special thanks to Griff, LCdr. McLean, and Cdr. Davidson for reviewing the paper. All omissions and errors are solely the responsibility of the author.

2. LCdr. D.N. Griffiths (RCN), "The Maritime Face of Peacekeeping," *Canadian Defence Quarterly* (September 1995), p. 14.

3. Peter T. Haydon. "Submarines: The Issues, Some Facts, and Some Myths," *Strategic Datalink*, vol. 50, (Toronto: CISS, July 1995).

4. Richard Sharpe (ed.), *Jane's Fighting Ships 1995-96* (Houndswell: Jane's Information Group, 1995).

5. *Worldwide Submarine Challenges* (Washington, DC:, Office of Naval Intelligence, 1996).

6. Although both were mounted under Chapter Seven authorization. On the blurring between Chapter Seven and Chapter Six operations, see, Christopher Brady; Sam Dawes, "UN Operations: The Political Military Interface," *International Peacekeeping*, vol. 1, no. 1 (Spring 1994); Lt. Col. Ken Watkins, "Naval Operations in the 1990s: A Legal Sea Change?" in Peter Haydon and Anne Griffiths, eds., *Multinational Naval Operations* (Halifax: Centre for Foreign Policy Studies, 1996).

7. As early as 1983, some reports were questioning the utility of submarines. The Senate Subcommittee on National Defence in its report *Canada's Maritime Defence* noted "[Submarine's] major disadvantage is that they are quintessentially weapons of war and would be able to contribute little to the accomplishment of the ancillary duties assigned to MARCOM in peacetime." *Canada's Maritime Defence* (Ottawa: Supply and Services, 1983), p. 49.

8. Ronald O'Rourke, "Submarines as an Important Part of a Dynamic New Navy," *The Submarine Review* (July 1993), p. 35.

9. *Canada 21,* p. 62. Emphasis added.

10. "The Question of Submarines," *Globe and Mail* (August 3, 1995), p. A. 17.

11. Ed Gigg. "Don't Waste Money on Conventional Submarines," *Globe and Mail* (March 29,1993), p. A. It should be noted that Gigg did not advocate against all submarines, simply diesel electric ones. He noted that if Canada could not acquire nuclear submarines, then it should abandon its submarine service. One naval officer that did question the utility of submarines for Canada is Capt. (N) R. Thomas. Thomas noted "In a time of changing focus for the fleet, increasing complications for funding and emphasis on versatility and flexibility, there is no justification for acquiring new submarines," in Capt. (N) R Thomas, "The Canadian Navy: Options for the Future," *Working Paper #4* (Ottawa: CIIPS, 1992), p. 56.

12. "The Question of Submarines," p. A. 17.

13. Edna and LCdr. (CF) Roy Keeble, "The Canadian Navy in the Post-Cold War Era: Theoretical Inclinations and Practical Implications," *Maritime Security Working* Papers, no. 4 (August 1996); *Minutes of Proceedings and Evidence of the Special Joint Committee of the Senate and of the House of Commons on Canadian Defence Policy, Issue #*2 (1994), pp. 8-11, 70.

14. *Canada 21,* pp. 17-21.

15. *Ibid,* pp. 11-12.

16. *Ibid,* p. 67.

17. *Ibid,* p. 64. Emphasis added.

18. *Ibid,* p. 62.

19. *Ibid,* p. 63.

20. *Adjusting Course: A Naval Strategy for Canada* (Ottawa: Dept. Of National Defence, 1997), p. 41.

21. Operations in Somalia were similarly "high intensity" as evidenced by the ferocious firefights that erupted between American and Somali forces there.

22. Margaret Wendte.

23. David Pugliese, "The Army's Secret Battle," *Ottawa Citizen* (Monday, October 7, 1996), pp/ A6-A7.

24. James Tritten. "Is Naval Warfare Unique," *Journal of Strategic Studies*, vol. 12, no. 4 (December 1989); James Tritten, Roger Barnett, "Are Naval Operations Unique," *Naval Forces*, vol. 5, no. 7 (1986).

25. Thomas, "The Canadian Navy", p. 95.

26. The littoral area is defined as the region bounded by the outer limits of the continental shelf. Essentially, littoral operations are those that occur within the sight of or adjacent to the coast.

27. Ronald O'Rourke, "Submarines as an Important Part of a Dynamic New Navy," p. 35; Capt. J.M. Martin (USNR Ret.d), "We Still Haven't Learned," *Proceedings* (July 1991), pp. 64-68.

28. Capt. Bruce Lindner (USN), "ASW as Practised in Birnham Wood," *Proceedings* (May 1996), p. 63.

29. Brian Longworth, "Changes and Challenges in Underwater Warfare," *Naval Forces*, vol. 15, no. 3, p. 10.

30. Nuclear submarines have intakes on their bottoms that supply water to their reactor cooling systems. These intakes must be kept open at all times to prevent the reactor from overheating. Motionless SSKs present no doppler shift for sonar to detect. Further, with few systems running they present almost no acoustic signal whatsoever. Active sonar is likely to be similarly limited. Without a recent ocean floor map, even side scanning sonars may be hard pressed to locate a bottomed out submarine. Further, local submarines can take advantage of bottom features to hide from these sorts of capabilities. Norman Friedman, "Littoral ASW: Not as Easy as it Sounds," *International Defence Review*, vol. 28, no. 6 (1995), p. 54.

31. George Krause, "World Submarine Proliferation and US Sea Control," *The Submarine Review* (April 1993), p. 63.

32. The Argentinian German designed Type 209 submarine's fire control computer failed and their torpedo's wire guidance broke during both attacks. John Benedict, "Third World Submarine Developments," *The Submarine Review* (October 1990), p. 53.

33. Krause, "World Submarine Proliferation and US Sea Control," p. 62.

34. Capt. Charles H. Wilbur (USN Ret.d), "Remember the San Luis," *Proceedings*, vol. 102 (March 1996), p. 88. Friedman reports that the San Luis bottomed out during the British counter

attack. Further, the frigates could not wait until the submarines air supply ran out given its responsibilities as a radar picket. Friedman, "Littoral ASW: Not as Easy as it Sounds," p. 57.

35. Krause, "World Submarine Proliferation and US Sea Control," p. 62.

36. Rupert Pengally, "Grappling for Submarine Supremacy," *International Defence Review*, vol. 29 (July 1996), p. 48.

37. Geoffrey Till, *Modern Sea Power* (London: Brassey's, 1987), p. 153; Anthony Cordesman, Abraham Wagener, *The Lessons of Modern Warfare Vol. VI: The Gulf War*, pp. 820-821.

38. "The Silent Menace: Diesel/Electric Submarines in 1993," *International Defence Review*, vol. 26, (August 1993), p. 613; Richard Sharpe (Capt.), ed., *Jane's Fighting Ships 1991-1992*, 94th Edition (London: Butler and Tanner Ltd., 1991), p. 720.

39. "Sea Ferret Mini-missile for Littoral Warfare," *International Defence Review* (February 1997), p. 14.

40. *Shipping Protection in the 1990s* (Halifax: Maritime Command Headquarters, February 1996), p. 4-2.

41. Martin Middlebrook, *The Fight For the Malvinas* (London: Viking, 1989), p. 198.

42. Lindner, "ASW as Practised in Birnham Wood," p. 63.

43. Middlebrook, *The Fight For the Malvinas*, p. 74.

44. Wilbur, "Remember the San Luis," p. 86.

45. Noted naval weapons analyst Norman Friedman has concluded that naval area defences are becoming less practical in the current political environment due to the restrictive rules of engagement prohibiting some area wide fire control solutions. Thus, as area defence is increasingly unavailable, ships will be forced to rely on their own resources to provide local defence, placing a premium on their skills and technology. Norman Friedman "Ship Self Defense", paper presented in Ottawa, Ontario, April 24, 1995, pp. 2-3.

46. RAdm. John Hervey (RN Ret.d), *Submarines* (London: Brassey's Defence Publishers, 1994), pp. 191-197.

47. Cdr. Paul Murdoch (USN), "SSNs Aren't Enough," *Proceedings*, vol. 122 (February 1996), p. 50.

48. Hervey, *Submarines*, p. 56.

49. *Ibid*, p. 41.

50. In particular, the loss of an SSN in a shallow water littoral operation, especially if the hull were recovered by the opposing state, would be an intelligence disaster for the United States.

51. For example, if a periscope extends twenty feet above the conning tower of a submarine, then the total height of the submarine from keel to the top of the periscope may be as much as seventy feet. In order to have enough depth under the submarine to safely operate it, a submarine may be restricted to waters of one hundred feet or more. SSKs tend to draw far less draught than their nuclear counterparts, enabling them to go in shallower water.

52. Murdoch, "SSNs Aren't Enough," pp. 49-50; Hervey, *Submarines*, pp. 36-38.

53. Richard Chapman, "Submarines in a New Security Environment," *The Submarine Review*, p. 66.

54. Robert K. Donovan, "Roles and Missions for a Post Cold War US Submarine Force," *The Submarine Review* (January 1993), pp. 13-14.

55. Lt. Brent Ditzler (USN), "British Submarine Diplomacy," *The Submarine Review* (April 1993), p. 53.

56. Allan Jock, *The Potential of a Submarine in Fishery Surveillance and Enforcement* (Ottawa: CFN Consultants, May 14,1993) (A)96/0648.

57. *Halifax Chronicle Herald* (March 19, 1993), p. A24.

58. Donovan, "Roles and Missions for a Post Cold War US Submarine Force," p. 13.

59. Ditzler, "British Submarine Diplomacy," p. 54.

60. Jeffrey T. Richelson, *The US Intelligence Community*, 3rd ed. (Boulder: Westview, 1995), pp. 195 - 196.

61. Some may object to the use of intelligence operations in a peacekeeping context given their warlike connotations, and especially since they would have to be performed without consent. Nevertheless, there is some evidence to suggest that they did in fact occur throughout UNPROFOR's mission in Bosnia, especially during the failed airdrops to isolated pockets of Bosnian Muslims.

62. Jock, *The Potential of a Submarine in Fishery Surveillance and Enforcement*, p. 38.

63. "The Silent Menace," p. 613.

64. Fred W Crickard and Peter T. Haydon, *Why Canada Needs Maritime Forces* (Nepean, 1993), pp. 22-23.

65. *Ibid*, p. 23.

66. Murdoch, "SSNs Aren't Enough," p. 48.

67. NATO's AXB-5B covering tactics, and AXB-1C which covers safety procedures were developed in the 1980s, whereas, other naval doctrine stems from the 1950s.

68. *Multinational Maritime Operations* (Norfolk: Naval Doctrine Command, September, 1996).

69. The most important issue in operations with submarines is that of safety - how to get the submarine to periscope depth without it hitting a friendly vessel. Where a common operating language, communication frequencies and operating procedures are lacking, only extremely basic operations can be undertaken. Nevertheless, NATO is working with Poland in particular through a series of Baltic operations under the aegis of PFP to develop experience in these matters.

70. Generally, the closest intelligence relationships exist between the AUSCANUKUS nations, or Australia, Canada, United Kingdom, and the United States. Record, *Op Cit*, pp. 272-282.

71. Lt. Mike Dulas (USN), "The Battle Group's Most Unused Asset: The Submarine," *The Submarine Review* (October 1995), p. 99.

72. Hervey, *Submarines*, p. 162.

73. Cdr. Ken Hart (USN), "Battle Group Employment of Submarines," *The Submarine Review* (April 1996), p. 101.

74. Hart, "Battle Group Employment of Submarines," p. 101; Dulas, "The Battle Group's Most Unused Asset: The Submarine," p. 102.

75. Even in NATO, submarine operational doctrine is the newest of all the tactical publications (AXP-1). Only in recent history has it been possible to get the NATO partners to agree on a common doctrine for these ships, highlighting the concern over secrecy shared by all submarine operating nations. Still, the lack of a common doctrine did not prevent submarines from taking part in NATO operations prior to the publication of AXP-1.