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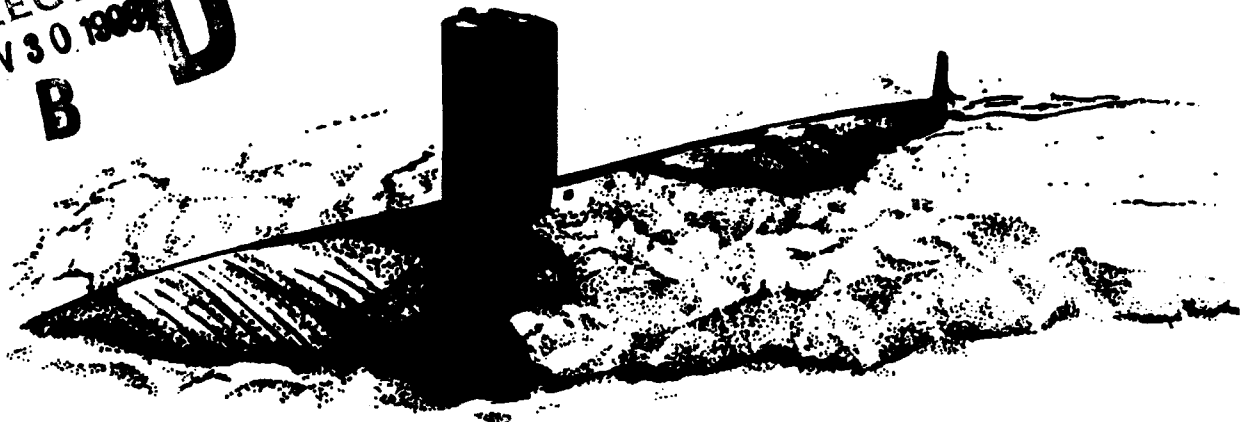


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SUBMARINE ROLES IN THE 1990's AND BEYOND

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EXECUTIVE SUMMARY

ABSTRACT

With the Cold War ended, roles for submarines in support of national security objectives are examined under the assumption that the successors to the Soviet Union will not pose a future threat. The enduring characteristics of the submarine - stealth, endurance, and agility - are used to develop roles and missions for submarines in the context of the President's defense agenda for the new world order. Future submarine roles are Peacetime Engagement, Surveillance, Deterrence, Regional Sea Denial, Precision Strike, Task Group Support, and Ground Warfare Support. Likely missions in each of these roles are identified. The basic assumption regarding the threat is then reviewed to determine if additional submarine roles and missions are appropriate.

CONTEXT

Given the unpredictability of future scenarios for crises and the certainty that conflict will occur, only a general context can be used to define the future roles and missions of the submarine. The context used is the defense agenda that contains four elements: deterrence, forward presence, crisis response, and reconstitution.

ENDURING SUBMARINE CHARACTERISTICS

The submarine has demonstrated several characteristics that provide critical advantages and are unlikely to change with time:

Stealth - This most basic and important characteristic derives from the fundamental ability of the submarine to submerge and become invisible and virtually undetectable. With nuclear propulsion, submarine stealth exists 24 hours a day. Submarine stealth should not decline since all past efforts to overcome it have been unsuccessful. The advantages that stealth provides the submarine include: covertness, surprise, survivability, freedom of movement, self-defense, and uncertainty.

Endurance - Nuclear submarines have virtually unlimited submerged endurance conditioned only by onboard food supplies or weapons expenditure. Submarines do not require forward bases, extended logistic trains, or prepositioned supplies. Endurance provides the submarine with the advantages of continuity and independence.

Agility - The submarine can proceed quickly where needed, often in advance of other forces, and can act promptly in response to a broad range of situations. Agility is much more than mobility. Agility of the submarine results from: (1) nuclear propulsion, which provides high speed for an unlimited time; (2) multiple mission capability provided by the ship design, weapons, sensors, and crew training; (3) a proven readiness posture; and (4) reliable shore or tender based submarine command, control, and communications systems. Agility provides advantages of mobility, flexibility, readiness, and responsiveness.

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SEA POWER

The modern nuclear submarine is the only military unit that combines stealth, endurance, and agility in a single unit. These qualities enable the submarine to perform a variety of missions which are vital elements of American sea power. Effective mission execution by a submarine with cruise missiles is unique in that it does not place American forces at an appreciable risk.

A submarine can threaten the application of or actually apply force through activities such as surgical strike, port closure, and selective vessel elimination. Precision weaponry minimizes collateral damage and can serve as an important force multiplier.

SUBMARINE ROLES AND MISSIONS

In the defense agenda of the new world order, the enduring characteristics and the advantages they provide result in the following critical roles for the submarine:

Peacetime Engagement - In this role, the submarine will support the defense agenda of Forward Presence through a spectrum of activities such as deployments, combined exercises and operations, port visits, and military-to-military relations. Although this is not a new role for the submarine, greater visibility will enhance the image of global presence and commitment, despite declining force levels. The presence of a capital asset also complements the more limited navies and military forces of many friends and allies. The presence of a submarine will demonstrate U.S. engagement, thus promoting regional stability and cooperation.

Surveillance - The unique combination of stealth, endurance, and agility makes the submarine an exceptional maritime surveillance platform. The covert submarine can transmit real-time information to the National Command Authorities in time to avert or mitigate crises, and to task force commanders in time to thwart an attack. The submarine can also collect intelligence of long-term value because the adversary cannot tell when or if a submarine is present. The value of information obtained before, during, and after conflict and crises is increasing. The Surveillance role can be executed across the spectrum of levels of violence.

Deterrence - The submarine will play a critical role in deterrence of both nuclear and conventional conflict. The peacetime role of the ballistic missile submarine will continue to be nuclear deterrence. Stealth makes this component the most survivable element of the nuclear deterrent triad. The attack submarine will continue its important role in conventional deterrence while simultaneously maintaining its contribution toward nuclear deterrence. As a conventional deterrent, the attack submarine is a ubiquitous threat that can exert sustained pressure on nearly any trouble spot. It can do so with minimal provocation, risk of casualties, or events that might adversely affect the American national will.

In its role of nuclear deterrence, the attack submarine can hold threat SSBNs at risk and can serve as one of several national technical means used to verify arms control agreements.

Regional Sea Denial - In areas where unacceptably high risks to friendly surface and air forces exist, the submarine can interdict threat surface and subsurface forces, as well as merchant shipping, thereby denying access to the region. To conduct all naval operations (except submarine operations) local sea superiority must be established. Sea denial is a prerequisite to sea superiority and, in contested areas, is most readily established by submarines because of their enduring characteristics. In the Regional Sea Denial role, the submarine may operate independently or in coordination with other forces. The Regional Sea Denial role allows the submarine to exercise its preeminent capability for antisurface and antisubmarine warfare to help clear the battle space in a

regional conflict. This role may also entail the conduct of covert offensive mining operations by submarines to enforce blockades or other sanctions.

Precision Strike - Precision Strike is a relatively new role for the submarine. Submarines can strike targets ashore within 650 miles of the coast using cruise missiles. This encompasses about 75 percent of the earth's landmass and includes most of the potentially important targets. The submarine can be positioned without prealertment or provocation of the adversary, and its stealth allows the submarine to exploit surprise. The transition from covert posture to military attack can be done instantaneously from the adversary's perspective without any external indications. Precision weapons allow the submarine to strike the designated target while minimizing any collateral damage, without risk to the launching platform. As the vanguard element of a coordinated strike, submarine-launched cruise missiles can attack air defense, early warning, and communications facilities to reduce the threat against follow-on aircraft. A coordinated cruise missile attack using ten to twenty submarines could provide substantial land-attack capability.

Task Group Support - The submarine can operate in the Task Group Support role either as an integrated component or independently. The stealth of the submarine allows it to be the unseen eyes and ears of the task group. Submarines can operate with relative impunity in waters controlled by hostile forces, allowing U.S. surface ships to stay out of range of hostile fire. Endurance allows the submarine to arrive on the scene before the task group, remain on station throughout the crisis, and depart well after the task group departs, if necessary. If the task group moves, the submarine can also move as desired. The agility of the submarine allows it to perform a wide variety of missions as required by the task group commander. The submarine enables the task group to conduct its operations more effectively while minimizing the risk of being attacked.

Ground Warfare Support - The ability of the submarine to operate covertly, close to enemy coastlines, allows it to support ground warfare operations in ways that other platforms cannot. A key mission of submarines in Ground Warfare Support will be to insert small groups of forces for which surprise or secrecy is essential. Other Ground Warfare Support missions include collection of tactical intelligence for forces ashore or reconnoitering coastal areas in advance of amphibious operations.

Submarine Roles Summarized - Future submarine roles will be significant elements in establishing and maintaining a stable world order. These roles will complement those of other military forces in achieving national objectives, yet the inherent combination of stealth, endurance, and agility allows the submarine to perform missions that no other force can accomplish. Versatility allows the submarine to perform more than one role simultaneously, if tasked.

COST EFFECTIVENESS

When the fiscal costs of submarines are analyzed and weighed against the benefit these ships provide, the submarine is a bargain. In the Fiscal Year 1992 budget, while accounting for over 30 percent of the combatant ships in the U.S. Navy, submarines use only 17 percent of the operating funds and 18 percent of the research and development funds. Submarines only require 7 percent of the personnel in the Navy and 11 percent if tender/support personnel are included. At the same time, submarines have unequaled readiness and maintain a consistently high tempo of forward-deployed operations. Submarines have low manning requirements, low life cycle operating costs, and low annual operating costs. They utilize proven technology and capabilities.

In the foreseeable future, control of the seas in support of national security objectives will remain paramount. As the availability of forward bases decreases, the value of forces that can operate without reliance on these bases increases. The less well-defined threat that will exist in the post Cold War world will require forces with endurance and agility so that they can go wherever

needed and stay as long as necessary. Submarines, deployed from bases in the United States, are a cost-effective way to project power "Around the World, Around the Clock." In the world of a smaller Navy, the value of submarines will increase.

CAVEAT - THE SOVIET ASSUMPTION

At this time, the successors to the Soviet Union demonstrate little malicious intent toward the United States, but still retain formidable military and naval capabilities. This capability represents a potential 'hazard' to our national security but not a malicious 'threat.' Until these military capabilities diminish significantly, it is prudent to continue to plan for the primary attack submarine role that evolved during the Cold War--antisubmarine warfare-- while shifting our emphasis to account for regional conflicts.

CONCLUSION

Changes in the world order suggest that future military threats may be less well defined and more broadly based than in the past. Advance warning of impending crises may be only a few days, if any warning is available at all. With foreign basing rights being curtailed, and U.S. military forces being downsized, highly mobile deployed platforms capable of independently responding to a crisis without logistical buildup will play a more significant part in protecting our national interests. For decades, submarines have consistently been ready to respond to a crisis by engaging in a variety of roles which are described in this paper. These roles and missions are not necessarily new -- the submarine force has been conducting many of them for years. What is new is the change in emphasis brought about by the changes in the world.

U.S. naval forces have historically been able and must continue to be able to achieve local sea superiority to ensure support of national objectives. With the exception of the former Soviet Navy, no nation's forces now or in the foreseeable future can challenge our global sea supremacy -- the cost of developing such a navy is too great. Keeping this cost high by having a capable navy is a major argument for strong, balanced naval forces. Maintaining a strong U.S. Navy serves as valuable insurance for the future in an uncertain world. The submarine with its stealth, endurance, and agility operating either alone or in coordination with other naval and military forces, is a highly cost-effective component of the forces needed to ensure sea superiority. In fact, the submarine is typically at the leading edge of U.S. sea superiority.

The enduring characteristics of the submarine enable it to serve in critical roles that provide military strength and options for action necessary in the new world order.

INTRODUCTION

PERSPECTIVE

The purpose of U.S. military forces is to preserve the independence, freedom of action, and territorial integrity of the United States; to support American and allied vital interests abroad; and to encourage an international order in which our freedoms and democratic institutions can prosper. The statutory mission of the U.S. Navy is to conduct prompt and sustained operations at sea in support of all aspects of the national military strategy and related naval policies. Traditionally, sea power has been essential in maintaining freedom of the seas and protecting sea lines of communications to the United States. In the future, as the level of imports of raw materials and energy resources and the level of exports of agricultural and manufactured products continue to rise, the strength of American and world economies will become more reliant on the sea lines of communications. Because of this, the ability of U.S. naval forces to maintain sea supremacy becomes even more important.

"The necessity of a Navy springs from the existence of peaceful shipping."

Alfred Thayer Mahan, 1840-1919

Through technology, naval forces have expanded their core missions to include projection of power over land.

"The seas are no longer a self-contained battlefield. Today, they are a medium from which warfare is conducted. The oceans of the world are the base of operations from which navies project power onto land areas and targets. . . . The mission of protecting sea lanes continues in being, but the Navy's central missions have become to maximize its ability to project power from the sea over land and to prevent the enemy from doing the same."

Timothy Shea
Project Poseidon
February 1961

Submarines are essential to the successful conduct of these central missions, but their employment in support of American interests is not widely understood.

Historically, the effectiveness of the submarine in combat has often been underestimated, and submarines have repeatedly achieved significant wartime success in roles not envisioned in the pre-war plans. In World War II, the Germans intended to use submarines to attack enemy warships. Instead, the German U-boat was almost successful in defeating England by interdiction of merchant shipping along the strategic sea lines of communication. Between World Wars I and II, the United States submarine force was planned to be used primarily as a scout for the battleship fleets. Nevertheless, the U.S. submarine was instrumental in the defeat of Japan by interdiction of the shipping required to supply the Japanese war machine.

Following World War II, the self-contained nature of our major potential adversary, the Soviet Union, diminished the requirement for interdiction of sea lines of communication and the potential for victory through attrition. The large Soviet submarine fleet and the recognition that the submarine was the best defense against another submarine led to a new assignment for the U.S. submarine force -- antisubmarine warfare (ASW). The emergence of the killer submarine began a lengthy process of enhancing submarine capabilities so that the ASW task could be effectively

accomplished. The Cold War evolution of nuclear weaponry resulted in Soviet fleet ballistic missile submarines operating within layered defenses of mines, surface ships, and submarines, and under a powerful air-defense umbrella. Submarines were the only force capable of operating in this threat environment; therefore, the primary U.S. submarine assignment became forward area operations, at the van of the Maritime Strategy. In addition, for the past four decades, attack submarines have maintained a continuous watch in their early warning and reconnaissance roles **around the world, around the clock, and always ready**. These roles have been the central element in the design, operation, and sizing of the U.S. attack submarine force.

Now that the Cold War has ended, it is appropriate to reexamine the nation's military requirements. This study provides an element of that reassessment by examining future roles and missions of the U.S. submarine force under the basic assumption that the successors to the Soviet Union will pose no significant threat in the future. The enduring characteristics inherent in the submarine will be used as the basis for defining future roles and missions in support of national security objectives.

CONTEXT

No one predicted that the Cold War would end in the dissolution of the Soviet Union into its constituent republics. Similarly, it is not possible to accurately predict the geopolitical or military context in which the submarine will be called upon to perform its roles in shaping future world events. History suggests that in the future there will be frequent crises and conflicts. The global economic interdependence of nations coupled with nearly instantaneous communications implies that many of these crises and conflicts will have consequences for the security of the United States. Given the unpredictability of future scenarios for conflict and the certainty that conflict will occur, what context should be used to define the roles and missions of the submarine in future conflict?

The President has defined the context of a new world order, which identifies the following national interests and objectives in the 1990s:

- The survival of the United States as a free and independent nation, with its fundamental values intact and its institutions and people secure;
- A healthy and growing U.S. economy to ensure opportunity for individual prosperity and resources for national endeavors at home and abroad;
- Healthy, cooperative, and politically vigorous relations with allies and friendly nations; and
- A stable and secure world, where political and economic freedom, human rights, and democratic institutions flourish.

To achieve these basic objectives, the President defined a defense agenda for the 1990s. The essential demand on U.S. military forces will be to deter conflict wherever possible, but to prevail in conflicts that do arise. In fulfilling this demand, the President defines four elements for the defense agenda:

Deterrence - Deterrence forms the central concept guiding U.S. military strategy. As long as substantial nuclear strike capability against the United States exists, deterrence of nuclear attack will be the highest defense priority. Deterrence also encompasses inhibiting conflicts that involve conventional weapons. Conventional deterrence relies upon our capabilities to sustain credible forward presence in important regions and to defeat or reverse an adversary's attacks.

Forward Presence - The goal of forward presence is to maintain a positive influence in distant regions. The military contribution to this influence is the demonstration of U.S. engagement in those regions. U.S. forces deployed throughout the world promote American influence and access, show our commitment, lend credibility to our alliances, enhance regional stability, and provide a capability to respond to crises.

Crisis Response - Regional conflicts fueled by ethnic, cultural, or economic differences, or control of resources may increase in numbers and intensity. In any event, regional crises will occur. The range and scope of such contingencies can be many and varied. However, when U.S. interests are threatened, the goal will be constant -- where possible prevent conflict, and, where not possible to prevent it, resolve the conflict in consonance with U.S. national security objectives. American forces must be able to respond rapidly to deter and, if necessary, to fight unilaterally or as part of a combined effort with other nations.

Reconstitution - Reconstitution is the generation of forces to meet contingencies that require forces beyond those available from active and reserve components. Implicit in the concept of reconstitution are the assumptions that any military threat beyond a regional crisis will also have to be built or reconstituted, and that there will be sufficient warning of the developing threat that our own forces can be built or reconstituted in adequate time to counter that threat.

These national objectives and the defense agenda are basic and are likely to endure beyond the 1990s. To meet the demands of the National Security Strategy, the U.S. requires well-balanced naval forces with capabilities ranging from sea-based strategic nuclear forces for deterrence to forward-deployed forces capable of responding quickly and operating anywhere.

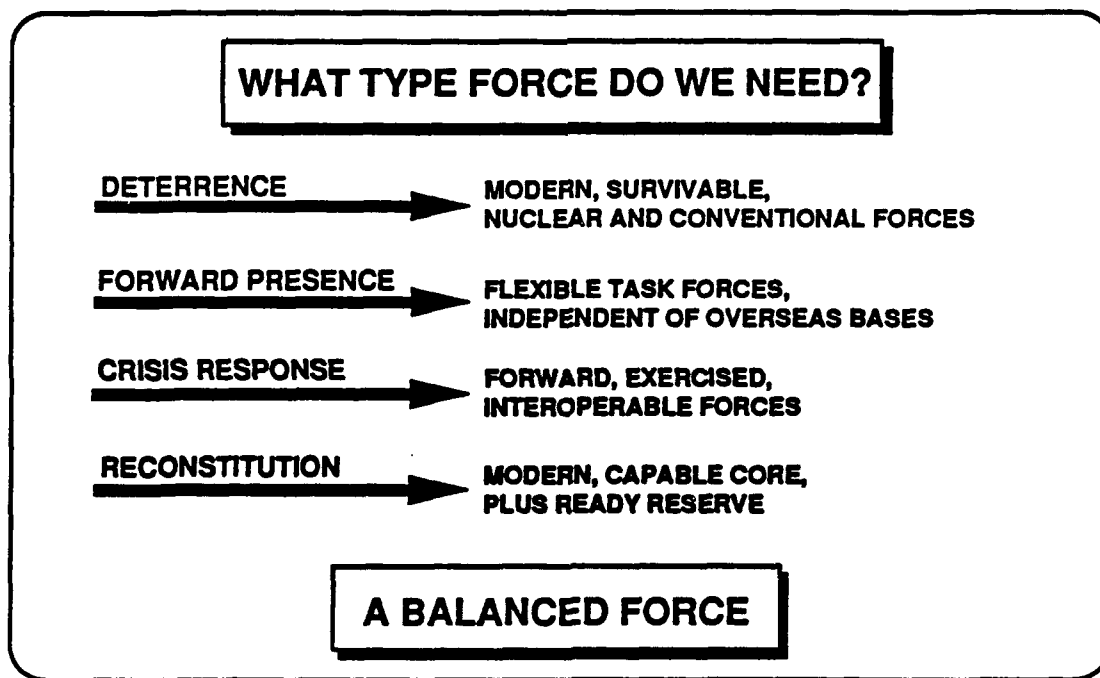


Figure 1. Balanced Naval Forces to Support the Defense Agenda

ENDURING SUBMARINE CHARACTERISTICS

Over the years, the submarine has demonstrated a number of enduring characteristics -- some unique to submarines and some common with other naval and military forces. The most significant of these characteristics are **stealth, endurance, and agility.**

STEALTH

Stealth is the most basic and important characteristic of a submarine. It derives from the fundamental nature of the submarine that it can submerge below the surface of the ocean and become virtually invisible from threat sensors. The simple act of submerging when coupled with prudent operation to control detectable emissions, such as sonar and radio transmissions, provides the submarine with unequalled stealth. Advanced sonar and electronic sensors ensure that our submarines detect potential adversaries well before their forces can detect us. In addition, because of nuclear propulsion, submarine stealth exists 24 hours a day.

Over the last 40 years, billions of dollars have been spent on antisubmarine warfare without significantly reducing the stealth of the nuclear submarine. No other nation can afford to spend similar sums of money in pursuit of the elusive goal of detecting a submarine. For the foreseeable future, no nation will be able to produce a naval capability that will put submerged American submarines at significant risk. Moreover, the modern and capable U.S. submarine discourages other countries from spending their limited economic resources on antisubmarine warfare.

Notably, significant efforts are currently being expended to provide aircraft and surface ships with defensive measures and a mere fraction of the stealth that the submarine can achieve by simply submerging.

The following advantages result from submarine stealth:

Coverttness - Coverttness allows the submarine to conduct assignments without any indication that American forces are present, let alone involved. Coverttness is important in the collection of intelligence. A potential adversary can be reasonably certain that American satellites are monitoring his activities, but does not know if, when, or where submarines may be operating. Coverttness provides a wide range of options in dealing with crises.

Surprise - Stealth allows the submarine to retain the initiative and to conduct missions or to engage threats on the submarine's own terms. This engagement may occur when the adversary is not prepared. The utility of surprise in warfare is well known.

Survivability - The submarine cannot be readily attacked because it cannot be readily detected. Even in those rare situations in which the submarine is detected, experience has shown that adversaries cannot easily classify, localize, and bring weapons to bear on the submarine. Stealth allows the submarine to select the conditions of battle so that it will survive the engagement. Thus the submarine can fight when outnumbered, prevail, and live to fight again. A submarine can be depended on by its operational commander to continue its assignment, even when sailing in harm's way. Because of its survivability, a submarine is not likely to become a debilitating loss in some regional conflict, a loss which could undermine the will of the American public to prevail in that conflict.

Freedom of Movement - Its inherent stealth allows the submarine to operate almost anywhere, including areas that are denied to other forces. Movement into these areas may be the first step in establishing sea superiority, well in advance of other forces.

Self-defense - The submarine's primary self-defense mechanism is its stealth. The submarine does not need other ships or aircraft to aid in its defense, thereby eliminating the need for command and control to coordinate defense. Further, all weapons in a submarine's inventory can be used for offensive attack.

Uncertainty - Stealth can create uncertainty in the minds of any adversary because the adversary does not have the ability to determine where or how many submarines are in opposition. Stealth allows the national leadership to exploit uncertainty while selecting options in pursuit of national objectives.

Non-Provocation - The movement of a submarine anywhere in international waters (because it can be done unannounced and invisibly) is not necessarily a provocative act that might cause a crisis to escalate or might cause an adverse response. The use of submarines does not have to be an ostentatious display of American power. While a submarine will not replace a carrier battle group, this advantage provides the United States a great deal of flexibility in responding to a crisis. It provides the National Command Authorities with the option of being provocative or nonprovocative. Submarines can be moved into position, remain on station, and be withdrawn without political implications.

In the past, the United States has routinely moved carrier battle groups into position to attempt to influence events ashore in many regions. In some cases, this activity was not well received by people in the region.¹

ENDURANCE

The characteristic of endurance is derived primarily from the nuclear propulsion plant that essentially eliminates the endurance limitations of nonnuclear powered submarines and other conventionally powered naval platforms. The submarine is designed to operate independently for extended periods of time without support. Limited only by onboard food supplies or by weapons expenditure, the nuclear submarine can remain covertly on station for several months. In peacetime, American submarines have routinely operated submerged on station for up to 75 days. Longer periods on station are possible. Nuclear submarines have virtually unlimited submerged endurance.

The characteristic of endurance provides the following advantages:

Continuity - The submarine can remain on station carrying out its assignments for long periods of time. If necessary, the submarine can be covertly relieved on station by another submarine without interruption of tasking. This continuity can be critical to operational effectiveness. Submarines can be on station before the crisis peaks, during the crisis, and after the crisis until stability is restored, all during the course of a normal deployment.

Independence - Endurance allows the submarine to operate largely unencumbered by requirements to resupply, relocate, or rendezvous to remain ready. The manner in which submarines are constructed, maintained, and operated eliminates the need for forward-positioned bases or support facilities. In a period when available facilities outside the United States are

¹ Examples include Indian response to U.S. naval operations in the Bay of Bengal in 1971 and Philippine response to operations during the December 1989 coup attempt.

rapidly disappearing, the value of this aspect of endurance increases. American submarines routinely deploy from the United States to the Mediterranean Sea or Western Pacific Ocean for periods of 5 to 6 months. While these submarines visit selected ports, most port calls are for crew morale, display of commitment, and alliance building, and not for logistical support. Submarines do not rely on forward bases, logistics trains, or prepositioned supplies and, therefore, do not "tax" the theater commander for their use.

AGILITY

Agility means that the submarine can proceed quickly where needed and act promptly as directed in response to a broad range of situations. Agility is much more than mobility. Agility of the submarine results from four considerations: (1) from its nuclear propulsion plant, which provides high speed for an unlimited time; (2) from the multiple mission capability provided by the design, weapons, and sensors of the submarine, and training of its crew; (3) from the proven readiness posture of the U.S. submarine force, a result of the excellent infrastructure, including maintenance activities and training facilities; and (4) from the proven U. S. submarine command, control, and communications facilities, which allow the submarine to receive directives rapidly and to make timely reports from anywhere in the world.

Agility provides the following advantages:

Mobility - The nuclear submarine can operate for nearly unlimited time at its maximum speed. In addition, unlike most other naval vessels, the periods of high-speed operation are not limited by sea conditions and in no way affect the period of on-station endurance. A submarine can arrive promptly in any area that it is needed and be quickly repositioned in response to an evolving situation. This provides the National Command Authorities a flexible capability with which to influence an adversary's thinking. The mobility of the submarine has been demonstrated in many of the international crises since World War II. With a number of them forward deployed, U.S. nuclear-powered submarines could be almost anywhere in the world within 48 hours, ready to support our national objectives.

Flexibility - A submarine has the capability to meet a variety of requirements, independently or jointly with other forces, singly or in numbers, so that the response can be tailored to the situation. Submarines provide the National Command Authorities with a wide range of options in selecting a course of action to achieve national objectives. The submarine can be where it is needed to monitor events, establish a presence, or apply force, to influence events. The submarine is the only naval platform that can operate in an unrestricted manner in the most inhospitable ocean environments, such as the Arctic Ocean. Submarines are multimission capable. Today and for the foreseeable future, attack submarines with typical loadouts can fill the roles and conduct many of their missions anywhere in the world without any change in personnel, weapons, or equipment.

Readiness - Submarines maintain the highest readiness posture except during infrequent shipyard maintenance periods. Crew training, food and supplies, and weapons are routinely maintained at levels that allow deployment on short notice. Results of exercises and responses to real-world crises have shown that typically the first submarines can sail in 1 to 2 hours, and over 80 percent of the operational SSNs can be at sea within 48 hours of being ordered to do so.

Responsiveness - The capability to communicate to and from a submarine permits it to respond promptly to any directive, limited only by the available sensors and weapons. Submarines have access to robust worldwide communication links that provide reliable connectivity with their operational commanders, including the National Command Authorities.

SEA POWER

Stealth, endurance, and agility each provide significant capabilities to the submarine; the combination of all three in a single unit provides exceptional value. The submarine is the only platform that combines these three characteristics in a single unit. Submarines can perform missions wherever needed maintaining positive, precise control over the tactical situation. The submarine is exposed to risk only when warranted by the gain in mission execution. The submarine can attack wherever and whenever it selects or is directed. Submarines play an especially important role in fighting forward in regional crises because of their ability to operate unsupported, their immunity to missile attack, and their striking power.

All submarine weapons are precision-guided munitions, allowing effective attack on specific targets with high reliability and precision. This is a proven submarine capability with proven technology. Precision weapons allow the submarine to threaten the application of or actually apply force through activities such as precision strike with cruise missiles, port closure with submarine-launched mines, and selective vessel elimination with torpedoes and antiship cruise missiles. Precision application of force also ensures that collateral damage is minimized. Precision weaponry delivered from a covert platform can be an enormous force multiplier.

Precision mission execution with cruise missiles by a submarine does not place American forces at appreciable risk. This minimizes the potential for American casualties and avoids the nightmare of viewing American prisoners-of-war on television.

The attack on Libya in 1986 was an unquestionable success. However, this operation resulted in loss of aircraft and American lives. The use of TOMAHAWK missiles as part of a similar attack would avoid or at least reduce these casualties.

Although the value of precision mission execution derived from the combination of stealth, endurance, and agility has historically been underestimated, the submarine has always exploited these characteristics to achieve exceptional results in every role assigned. Future roles and missions for submarines must focus on the effective use of these enduring characteristics.

SUBMARINE ROLES AND MISSIONS

The distinction between tasks, missions, and roles is sometimes blurred. For consistency in this discussion pertaining to the submarine, the following definitions and examples are provided:

Task - A task is simply a job to be done. The currently defined Fundamental Naval Warfare Tasks are:

- Anti-Air Warfare
- Antisubmarine Warfare
- Antisurface Warfare (ASUW)
- Strike Warfare
- Amphibious Warfare
- Mine Warfare

The Supporting Naval Warfare Tasks are:

- Special Warfare
- Ocean Surveillance
- Intelligence
- Command, Control, and Communications
- Electronic Warfare
- Logistics

Mission: A mission is a task, together with its purpose. A mission for a submarine might be to conduct strike operations to degrade enemy air defenses in advance of aircraft operations. Another mission might be to conduct surveillance of merchant vessels suspected of arms smuggling to identify smuggling patterns.

Role: Literally, a role is a part played by an actor. In the context of this discussion, a role is a part played by a force. A role might encompass a number of missions, each of which could include one or more fundamental or supporting naval warfare tasks. A role is the part that a unit or force performs in achieving objectives. It is emphasized that a role is a part. Military operations generally require that multiple forces, each with distinct characteristics, accomplish their parts in order to achieve objectives. Roles assume that forces are complementary and enhance each other. Roles are assigned in consideration of both strategic objectives and the capabilities of a force to contribute to the achievement of those objectives.

Within the Navy, each naval warfare force -- submarine, surface, and air -- has unique characteristics, roles, and missions. The capability of each force complements, enhances, and enables the capabilities of the others. In a broader sense, the capabilities of naval forces complement, enhance, and enable the capabilities of the other services in joint operations.

In the national defense agenda, the characteristics of the submarine and the advantages submarines provide result in critical roles for the submarine force. These roles are listed in

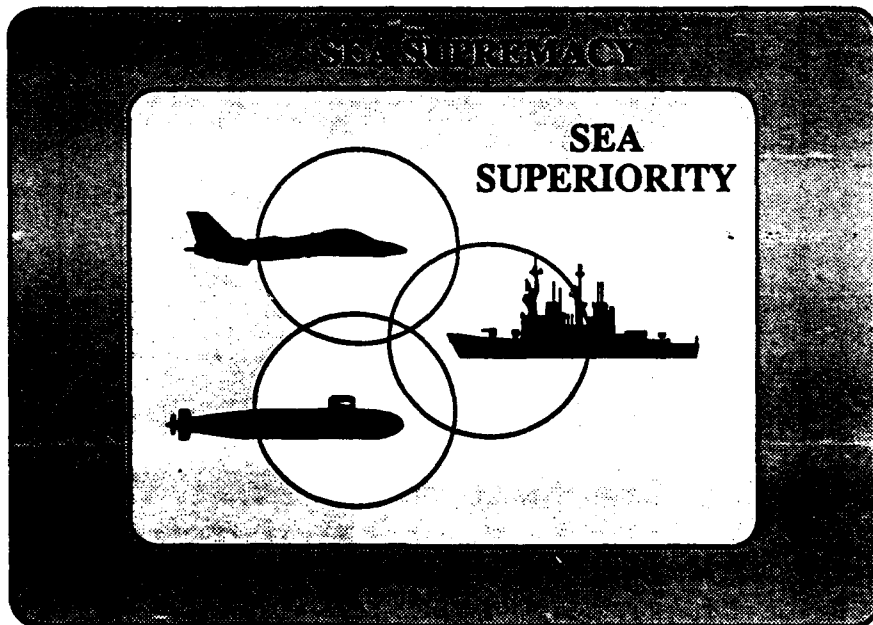
generally increasing levels of violence and all are needed to implement the defense agenda of the new world order:

- Peacetime Engagement
- Surveillance
- Deterrence
- Regional Sea Denial
- Precision Strike
- Task Group Support
- Ground Warfare Support

The above roles will not necessarily be performed exclusively by the submarine. For example, nuclear deterrence will continue to be performed by bombers, land-based intercontinental ballistic missiles, and SSBNs. Similarly, submarine operations and potential missions in each of these roles complement those of other forces as part of a balanced fleet structure.

However, the unique combination of characteristics allows the submarine to perform elements of each role that cannot be accomplished by any other force. The circumstances in which these roles are likely to be required of the submarine, the nature of operations conducted in each role, and the potential missions assigned are discussed in the following paragraphs.

NAVAL WARFARE ROLES



CHARACTERISTICS, ROLES, AND MISSIONS
which are
COMPLEMENTARY, ENABLING AND ENHANCING

Figure 2. Balanced Fleet Structure

PEACETIME ENGAGEMENT

Peacetime Engagement is a set of peacetime measures, such as port visits and joint naval exercises, used to help build alliances, influence events, and foster regional stability. It involves the full range of diplomatic, economic, and military relations with other nations in order to build confidence in other nations that the United States is a strong ally of democratic states. The specific purpose of Peacetime Engagement is to positively influence the behavior of other nations toward each other, as well as toward the United States. The March 1991 Joint Chiefs of Staff Joint Military Net Assessment states that Peacetime Engagement is "an essential supporting concept for our national military objectives" and is a critical part of Forward Presence in the defense agenda for the 1990s. Peacetime Engagement differs from Deterrence because the latter implies the much narrower negative concept of preventing aggression through the threat of force. Peacetime Engagement can help prevent the need for military force, but can also enhance the effectiveness of force should it become necessary.

The submarine has not traditionally been a particularly visible participant in the Peacetime Engagement role; however, it has been active in this role for the past forty years. Employment of submarines more overtly in the Peacetime Engagement role will be necessary to counter the image of American global withdrawal as force reductions occur and fewer forces are forward deployed. As the number of available forces decrease, the importance of every component and unit in Peacetime Engagement increases.

Peacetime Engagement will be a normal peacetime role of the submarine. It includes a spectrum of activities such as deployments, combined exercises and operations, port visits, and military-to-military relations. The submarine complements other forces in execution of the Peacetime Engagement role. This U.S. capital asset is also a powerful complement to the more limited navies and military forces of many friends and allies. The submarine's endurance allows it to perform this role without forward bases or logistic support. Stealth and agility can be used to promote the image of the omnipresence of U.S. forces.

The visible presence of submarines in the Peacetime Engagement role is an unmistakable symbol of American commitment to regional peace and stability. The invisible potential presence of submarines can multiply the effect of this commitment.

Missions for a submarine in the Peacetime Engagement role, just like those of other naval forces, include:

- Combined naval exercises to foster military-to-military relations; and
- Port visits as part of friendship building and as a demonstration of regional commitment.

USS SAM HOUSTON (SSBN 611) interrupted a deterrent patrol and visited Turkey to demonstrate the continuing American commitment to the southern flank of NATO following the withdrawal of U.S. JUPITER missiles from Italy and Turkey in 1963. In the past year, submarines have conducted port visits in over 200 foreign cities around the world. For example, in November, 1991, USS SAND LANCE (SSN 660) completed a routine deployment to South America during which the ship operated with naval forces from and visited ports in nine nations. Elsewhere other submarines conducted port visits in Southeast Asia, Northern Europe, and around the Mediterranean Sea. These and other visits clearly demonstrated American commitment to and interest in various regions of the world.

SURVEILLANCE

The unique combination of stealth, endurance, and agility makes the submarine an exceptional maritime surveillance platform. The submarine has proven its capability to transmit real-time information to the National Command Authorities in time to avert or mitigate crises. The value of information obtained during surveillance before, during, and after conflict and crises continues to increase as available warning time decreases. The submarine also has a capability for the collection of intelligence of long-term value because the adversary cannot tell when or if a submarine is present. Stealth allows the collection of information without affecting the observation. The target platform or forces do not modify their behavior because they do not know that the submarine is present. In some circumstances, the submarine can covertly surveil surface vessels, such as the tracking of vessels suspected of carrying illegal arms or terrorists. Only the submarine can conduct covert surveillance of other submarines.

The Surveillance role could be executed in crisis response situations across the spectrum of levels of violence. In addition, a submarine would probably be assigned missions in the peacetime Surveillance role when not engaged in training or other operations.

Missions for a submarine in the Surveillance role include:

- Area surveillance operations to transmit real-time early warning of threatening activities by potential adversaries;
- Maritime intelligence collection operations in support of national requirements;
- Ocean surveillance operations to detect, track, and report vessels potentially involved in activity such as illegal arms shipping or transporting terrorists; and
- Surveillance of air or naval forces that could conduct hostile acts against the United States.

During the Falklands War, the British positioned HMS SPARTAN and HMS SPLENDID just outside Argentine territorial waters. Here "the SSNs began a new and critical function: lying off Argentina's air bases and using electronic equipment, sonar and visual sighting to report the takeoff of aircraft sorties towards the Falklands [Islands]."² These submarines operated in waters that were not safe for other British surveillance assets due to lack of air superiority.

DETERRENCE

The normal peacetime role of the ballistic missile submarine will continue to be nuclear deterrence. Stealth makes the submarine component of the nuclear-deterrent triad the most survivable element against any eventuality. Endurance and responsiveness, coupled with the submarine's survivability, will provide a pervasive threat to any nation considering the employment of nuclear, chemical, or biological weapons against the United States or its allies.

In the near term, ballistic missile submarine nuclear deterrent patrols are not likely to change in nature or scope. However, if nuclear, chemical, or biological weapon proliferation

² Throughout this paper examples of Royal Navy experience in the Falklands War are used to illustrate selected points. Similar examples of U.S. experience are available at a classified level. Max Hastings and Simon Jenkins, The Battle for the Falklands (London: W.W. Norton, Co., 1983) p. 157.

continues and adversaries other than the successors to the Soviet Union develop a capability to strike the United States or a close ally, patrol patterns, targeting packages, and command control procedures can be easily revised to account for these changes.

Meanwhile, the attack submarine will continue its contribution to nuclear deterrence and its important role in conventional deterrence. In its role of nuclear deterrence, the attack submarine holds threat SSBNs at risk, thereby creating additional uncertainty in a potential enemy's perception of the viability of its nuclear forces. The attack submarine is also one of several national technical means used to verify arms control agreements.

Just as nuclear deterrence has been reliably performed by the triad of bombers, land-based ballistic missiles, and SSBNs, in the future conventional deterrence will rely on a variety of military and naval forces, including the attack submarine. The long-range bomber can contribute to deterrence by its potential to rapidly deliver conventional weapons. The carrier battle group will contribute to conventional deterrence by an imposing physical presence and the capability for sustained combat without requirements for forward basing. The attack submarine will contribute by being a ubiquitous threat. Any potential adversary will be uncertain about the location of American submarines, but will be certain that a submarine can deny use of the seas or conduct precision strikes ashore in any region.

The stealth of the submarine allows it the freedom of movement to get where deterrence is required and to apply direct pressure anywhere needed. Because the submarine is relatively invulnerable and invisible, it can be employed so that potential aggressors are not provoked to respond to its presence. The forward-deployed submarine applies the deterrent pressure of presence analogous to deterring speeding along a highway patrolled by unmarked police cars. In this analogy, battle groups are the police cruisers.

Submarine stealth can also create uncertainty in potential adversaries. The ability of the submarine to choose to reveal itself, coupled with its mobility, can evoke the appearance of a large force. The submarine's stealth could potentially be used to create deterrent pressure without any forces actually being present.

The presence of a torpedo-firing submarine off a coast might not evoke the fear that is the cornerstone of deterrence; however, the capability of the submarine to launch surprise precision cruise missile attacks, perhaps decapitating command and control, adds another element to be considered by potential aggressors.

When used to increase deterrent pressure in an escalating crisis, the submarine's relative invulnerability can be vital in avoiding undesirable events that might occur if more vulnerable forces are present. In addition, the absence of a visible American presence precludes inciting foreign domestic opinion against "gunboat diplomacy."

In summary, the submarine has great value as a perceived, but nonprovocative global presence. While the submarine alone may not cover the full spectrum of conventional deterrence sought through presence, its unique combination of capabilities provides significant support of this element of the defense agenda.

Missions for a submarine in the Deterrent role include:

- Ballistic missile nuclear deterrent patrols as part of the Single Integrated Operational Plan, remaining undetected and ready to execute nuclear missile strikes when directed by the National Command Authorities;
- Operations to hold threat ballistic missile submarines at risk;
- Ocean surveillance operations to hold at risk threat submarines that could launch cruise missiles at the United States;
- Surveillance operations to verify arms control agreements; and
- Regional contingency patrols to place any potential adversary's seagoing and land-based targets at risk.

Over the past four decades, U.S. submarines have been at sea contributing to deterrence of both nuclear and conventional attacks on the United States.

REGIONAL SEA DENIAL

In this role, submarines will be a lead force in establishing local sea superiority which is necessary to conduct all naval operations, except submarine operations. The first step is to deny access to the area of interest by threat surface and subsurface forces. In contested regions, sea denial is most readily accomplished by submarines because of their stealth, endurance and agility.

Stealth enables submarines to operate in areas of interest where risks to friendly surface and air forces are unacceptable. In crisis response situations that have escalated to conflict, the preeminent capability of the submarine in antisurface and antisubmarine warfare would be exercised to clear the area of threat maritime forces. Key forces to be defeated are likely to be diesel submarines, and surface ships equipped with surface-to-surface or surface-to-air missiles. Further, access to the contested area would be denied by interdiction of maritime forces departing port or maintaining a barrier around the area. In addition, submarines could interdict merchant shipping to curtail logistic support to an adversary. The continuity of such offensive operations would be enhanced by the submarine's endurance.

Submarines could also use their important offensive mine warfare capability in the Regional Sea Denial role. The actual planting of mines (or even the intimation that mines have been sown) is usually sufficient to stop maritime traffic at a port. One or two submarines with a nominal loadout of submarine-launched mines can covertly close virtually any port in the world. Covert mining provides the option of closing ports in support of either blockade or conflict.

Execution of the Regional Sea Denial role by submarines will most likely be applied in areas close to an adversary's coast, in which other friendly forces are at risk. Sea denial operations by submarines in these areas would not only reduce the potential for damage to high-value surface ships, but also conserve tactical aircraft for power projection strikes without their being subjected to the risks involved in attacking enemy surface ships.

The use of submarines to deny maritime operations in broader ocean areas is also important. Again, submarines would enter the region first, interdicting any enemy forces encountered, softening the battle space prior to the arrival of friendly surface forces. The submarine would also be employed when there are insufficient carrier battle groups or surface

combatants to cover large regions, or when logistics requirements limit other force capabilities to operate in distant regions. If a regional conflict requires concentration of air power and supporting surface ships in a particular area, submarines would complement remaining forces in protecting the flanks. Such protection could include denial of access to the area in which U.S. surface forces are concentrated, denial of adventuresome maritime operations in remote locations where other regional conflicts might occur, and denial of access to friendly strategic sea lines of communications.

In the Regional Sea Denial role, the submarine force will function as the offensive line clearing the way for and protecting more vulnerable forces.

Missions for a submarine in the Regional Sea Denial role include:

- ASUW and ASW operations in assigned areas to destroy enemy surface ships and submarines;
- ASUW operations in assigned areas to interdict enemy shipping attempting to enter or depart specified ports;
- ASUW and ASW operations in straits or open-ocean areas to protect sea lines of communications from threat forces;
- ASUW operations in assigned areas to enforce blockade restrictions imposed on specified adversaries; and
- Offensive mining operations in specified port approaches or other areas to curtail the transit of enemy shipping in that area.

At the start of the Falklands War, the exclusion zone established around the Falklands Islands was initially enforced by the Royal Navy submarines that were deployed to cover the approaches to Port Stanley and the entrances to Falkland Sound.³ The sinking of the GENERAL BELGRANO by HMS CONQUEROR was sufficient to deny the use of the seas by the Argentine Navy, essentially establishing Royal Navy sea superiority.

PRECISION STRIKE

Precision strike is a relatively new role for the submarine. Submarines carry land-attack cruise missiles as part of the normal weapon loadout, and they can reload these missiles from forward-deployed tenders. The accuracy and effectiveness of TOMAHAWK missiles were graphically demonstrated in Operation DESERT STORM. Although limitations on the number of missiles carried by a single submarine preclude the use of the submarine to conduct saturation bombing, a submarine can put a number of warheads on any target as effectively as any other force. Ten or more submarines operating as a cruise missile strike force can provide a substantial land-attack capability.

The submarine provides a nonprovocative, low vulnerability, politically flexible method for conducting precision strike. The principal utility of submarine-launched precision strikes is to destroy fixed targets of significance, such as command and control facilities; to destroy targets that

³ John Fieldhouse, "Despatch by Admiral Sir John Fieldhouse, G.C.B., G.B.E., Commander of the Task Force Operations in the South Atlantic: April to June 1982," *The London Gazette*, 13 December 1982, p. 16112.

pose significant threats to other attacking forces, such as enemy air defense installations; or to destroy targets for which surprise is essential, such as offensive missile facilities. As a result, the submarine using precision strike provides the capability to make a measured response to a threat.

As an element of a coordinated strike, submarine-launched cruise missiles would be the vanguard element that attacks air defense, early warning, and communications facilities to reduce the threat against follow-on American aircraft. The submarine enhances the performance of tactical air forces by suppressing air defenses, allowing more tactical air assets to conduct missions other than the suppression of those air defenses.

The stealth of the submarine allows it to get into position without prealerting or provoking the intended adversary. Just as important, stealth allows the submarine to exploit the element of surprise and to launch the attack without risk to the launching platform. The transition from covert posture to military attack can be done instantaneously from the adversary's perspective without any external indications. The submarine can quickly revert to a covert posture after the attack. The endurance of the submarine allows it to be on station ready to conduct strikes for an extended period of time. Agility allows the submarine to get on station promptly and to respond quickly to launch directives and targeting changes. The precision weapons carried onboard allow the submarine to strike the designated target while minimizing the possibility and extent of any collateral damage.

Using the capability to conduct direct precision strikes, the submarine provides the National Command Authorities the ability to exert influence and project power over a large portion of the globe. Figure 3 depicts those portions of the earth's surface that can be reached by a submarine-launched TOMAHAWK missile. Over 75 percent of the land can be attacked. Much of the land areas that are outside the range of TOMAHAWK missile are dense jungle, frozen steppes, rugged mountains, or uninhabitable desert.

Missions for a submarine in the Precision Strike role include:

- Small-scale strikes to demonstrate American resolve, to deter enemy action, or to divert enemy attention from other activity;
- Offensive strikes (small scale of 1 to 5 submarines or large scale of 10 to 20 submarines) to destroy selected high priority targets such as command and control facilities, electrical power generation stations, or threat nuclear, biological, or chemical warfare facilities;
- Offensive strikes when other strike assets are occupied with other tasking; and
- Strikes in support of or in coordination with other military and naval forces.

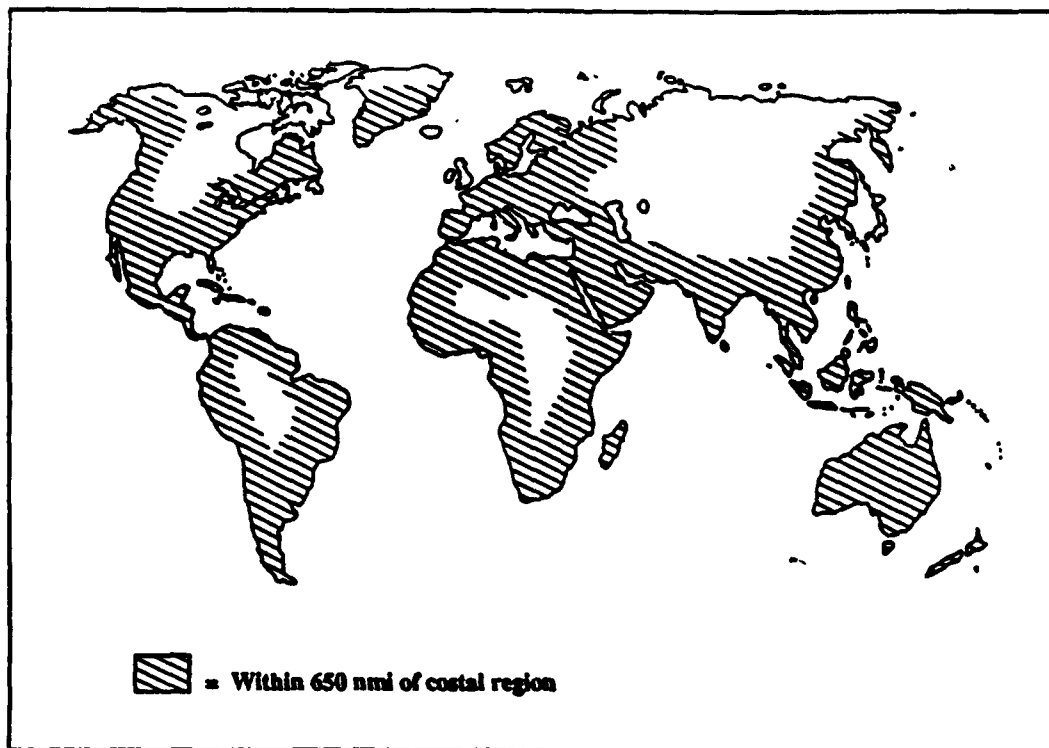


Figure 3. The Global Reach of Submarine-Launched TOMAHAWK Land Attack Missiles

TASK GROUP SUPPORT

This role would utilize the multimission capability of the submarine to enhance the effectiveness of surface task force operations. The task group might typically be a carrier battle group, but it could also be an amphibious force or underway replenishment group. The stealth, endurance, and agility of the submarine make it a valuable asset for any task group as a means of complementing and enhancing the capabilities of other platforms in the task group. In the past, the primary means of projecting power or establishing sea superiority was a large carrier battle group. The carrier battle groups of the future are likely to be fewer in number and smaller in size.⁴ In some cases, smaller task groups comprised of two or three cruisers, destroyers or frigates, and one or more submarines may be tasked to establish local sea superiority, provide forward presence, or project power in smaller regional conflicts or crises.

The submarine can operate in the Task Group Support role either independently or as an integrated component. Stealth allows the submarine to be the unseen eyes and ears of the task group. Properly positioned, the submarine can provide early warning and targeting information to the task group, allowing the ships of the task group to limit detectable emissions. The submarine can operate with relative impunity in waters controlled by hostile forces, allowing U.S. surface ships to stay out of range of hostile fire. Its endurance allows the submarine to arrive on the scene before the task group, remain on station throughout the crisis, and depart well after the task group departs, if necessary. If the task group moves, the submarine can also move as desired. The agility of the submarine allows it to perform a number of missions as required by the task group

⁴ Secretary of the Navy H. Lawrence Garrett, III summarized future task forces by stating that "... with a smaller fleet -- we will not always have a traditional carrier battle group to MODLOC in every potential trouble spot. . . It simply won't be possible or necessary, in a new world of isolated, regional flash points, for us to lumber around everywhere in our Cold War armor of dozen-ship carrier battle groups." CHINFO, Washington, DC. message 082104Z NOV 91.

commander. For example, while conducting surveillance, the submarine could simultaneously conduct ASUW to sink an anti-air capable surface ship, eliminating that threat to friendly air forces and allowing tactical air assets and surface ships to conduct other missions. The submarine can provide friendly surface ships with over-the-horizon targeting for antiship missiles, intelligence reports on hostile force movements, and combat search and rescue. **The submarine enables the task group to conduct operations more effectively while minimizing the risk of being attacked.**

While acting in the Task Group Support role, the submarine can perform many of the same missions it performs in the Regional Sea Denial and Surveillance roles. The submarine can prepare an area for future task group operations. For example, in areas where hostile submarines are expected, submarines as the preeminent ASW platform can be used to counter the threat from nuclear or diesel submarines. Once submarines have cleared an area of threat surface and subsurface forces and the task group is ready to enter that area, the submarines could be reassigned to flanking positions to conduct barrier operations that will prevent threat forces from entering the area. The flanking areas may be close to or distant from the crisis area. For example, a submarine might be used to provide early warning and protection from surface and submarine threats for logistics or repair ships located on the periphery of the crisis area.

Even the perception that submarines are present significantly hinders an enemy's naval activities because of the need to apply so much effort to ASW. In the presence of American submarines, the enemy also suffers from a lack of freedom of action that can be exploited to the advantage of U.S. forces.

Task Group Support by submarines might also involve specialized tasks during situations of imminent conflict. These might include covert tactical intelligence collection, electronic warfare, or early warning of threat operations, such as aircraft sorties or ship departures from port. In the pre-conflict stages of a crisis, the submarine would also be useful in enforcing a quarantine or an embargo by providing locating information on shipping in areas in which task group surface ships might be provocative or vulnerable to surprise attack.

Missions for a submarine in the Task Group Support role include:

- Operations in assigned areas to provide early warning, tactical intelligence, and electronic warfare to a task group;
- ASW and ASUW area clearance operations in assigned areas to destroy threat forces present prior to the arrival of a task group;
- ASW and ASUW barrier operations in assigned areas to deny threat forces entry into task group areas;
- Over-the-horizon targeting for antiship missile attacks so the launching surface ship can remain outside the range of enemy weapons;
- Surveillance operations in specified areas to collect information for a task group as part of embargo or quarantine enforcement; and
- Strike rescue operations in areas inaccessible to friendly surface ships or aircraft.

During the Falklands War, the location and shadowing of the principal vessels of the Argentine Navy was " the most vital preoccupation of the British command." HMS CONQUEROR and HMS SPLENDID were placed along the Argentine coast specifically to detect, shadow and report the movements of the Argentine cruisers, carrier and submarines to protect the flank of the British task force. Both submarines did their missions superbly and with impunity.⁵

GROUND WARFARE SUPPORT

The ability of the submarine to operate covertly close to enemy coastlines allows it to play a role in Ground Warfare Support that other platforms cannot; however, this role is limited by the inability of the submarine to carry large numbers of forces and weapons. A key mission of the submarine in Ground Warfare Support will be to insert small groups of forces for which surprise or secrecy is essential. These small groups can include the spectrum of Special Operations Forces such as Navy SEALs, Army Special Forces, Marine Corps Force Reconnaissance, and Air Force Special Operations personnel. The submarine could also perform missions such as collection of tactical intelligence for forces ashore or reconnoitering of coastal areas in advance of amphibious operations.

The Ground Warfare Support role may overlap with the Precision Strike role, allowing the submarine to complement other available forces in conducting strikes ashore in support of ground combat. A single submarine could launch cruise missiles to destroy particularly difficult targets such as anti-air defenses, thereby enhancing tactical air force performance.

The Ground Warfare Support role of the submarine is essentially offensive in nature and is likely conducted in crises that have escalated to conflict or in those in which conflict is imminent.

Missions for a submarine in the Ground Warfare Support role include:

- Special Warfare operations to covertly insert/extract Special Operations Forces;
- Coastal reconnaissance of specified areas in preparation for amphibious assault;
- Special Warfare operations to covertly insert/extract personnel at specified locations or conduct noncombatant evacuation operations;
- Deployments of SEALs in minisubmarines (swimmer delivery vehicles) to attack high-value targets in restricted waters; and
- Gathering tactical intelligence for ground warfare operations.

In October 1942, U.S. Major General M. W. Clark, Deputy Allied Force Commander, went to Algeria to advise the Vichy French of the plans for the Allied invasion of Africa and to obtain vital intelligence. He was inserted and extracted by submarine.⁶

⁵ Hastings, pp. 147-149.

⁶ John S. D. Eisenhower, *Allies - Pearl Harbor to D-Day*, (New York: Doubleday, 1982), pp. 136-142.

SUBMARINE ROLES SUMMARIZED

The future submarine roles will be significant contributors to establishing and maintaining the new world order. These roles will complement other military forces in achieving national objectives, yet the inherent combination of stealth, endurance, and agility allows the submarine to execute missions that no other force can accomplish. It is important to note that the versatility of the submarine allows it to carry out more than one of these roles at the same time if tasked to do so. For example, submarines can conduct Regional Sea Denial while simultaneously performing Surveillance or Task Group Support. During Operation DESERT STORM, submarines routinely conducted Surveillance and Precision Strike at the same time.

Figure 4 depicts the operational continuum covering increasing levels of violence from peace through crisis and regional conflict to global war. For most of the past 40 years, the U.S. national security strategy and resulting military strategy have been focused on the worst case -- global war and unrestricted submarine warfare. As a result of the monumental changes in the world political situation in the past two years, planning for operations at levels of violence below global war has become a more realistic approach. Figure 4 also reemphasizes that the submarine can execute vital roles and missions across the spectrum of violence.



Figure 4. Submarine Roles in the Operational Continuum

COST-EFFECTIVENESS

When the fiscal costs of submarines are analyzed in comparison to the benefits these ships provide, the submarine is a bargain. In the Fiscal Year 1992 budget, while accounting for over 30 percent of the combatant ships in the U.S. Navy, submarines use only 17 percent of the operating funds and 18 percent of the research and development funds. Submarine manning requires only 7 percent of the naval personnel and only 11 percent if tender/support personnel are included. At the same time, submarines have unequaled readiness and maintain a consistently high tempo of forward-deployed operations.

Low Manning - The day-to-day manning and associated fiscal costs of submarines is low. A typical submarine requires about 140 people. A single DD-963 class destroyer requires about 300 people.

Low Life Cycle Operating Costs - Typical submarines are built for a 30-year life and are manned by relatively small crews. The submarine is built to operate at sea with a 15-year or longer supply of fuel. Operating costs represent only a small percent of the total life cycle cost of an attack submarine.

Low Annual Operating Costs - The annual operating cost of an attack submarine is about one-half that of a destroyer or frigate and only one-third that of a cruiser.

Proven Technology and Capabilities - Existing submarines, which will make up the bulk of the submarine force for the next 20 to 30 years, are a proven entity, use proven technology, and have already been paid for. The existing equipment, weapons, and capabilities have been proven under a variety of conditions.

In the foreseeable future, the need to control the seas in support of national security objectives will become more vital than today. As the availability of forward bases decreases, the value of forces that can operate without reliance on these bases increases. The new world order will require even more far-ranging maritime operations than previously required because the threat will be less well defined geographically, and crises are likely to arise in many regions. Sufficient larger forces may not be available to maintain the desired level of forward presence. The submarine is capable of action in regional crises in areas that are not under the carrier's umbrella. A cost-effective way to project power "Around the World, Around the Clock" is with submarines forward deployed from bases in the United States. In the world of a smaller Navy, the value of submarines increases.

The submarine, with its enduring characteristics and precision weapons, provides an exceptionally valuable means to support our national interests. The attack on Libya in April 1986 presented an awesome display of measured force, proved national resolve, and demonstrated the complementary nature of a joint operation. Occasions may arise when it is desirable to achieve similar strike objectives without employing such a large and diverse force. On such occasions, the submarine with its precision weapons, singly or in coordination with a small group of surface forces, provides a cost-effective alternative, particularly for conducting localized joint suppression of enemy air defenses. For example, two submarines equipped with vertical launch systems, in consort with surface ships equipped with land-attack TOMAHAWK missiles, could have conducted the initial defense suppression attack on Libya (see figure 5). This strike could have been accomplished at a small fraction of the cost and with no casualties. Use of submarines might eliminate the need for Air Force assets to fly extended ranges to arrive in the attack area. Use of submarines might also shorten the time required to muster a force with which to conduct a strike.

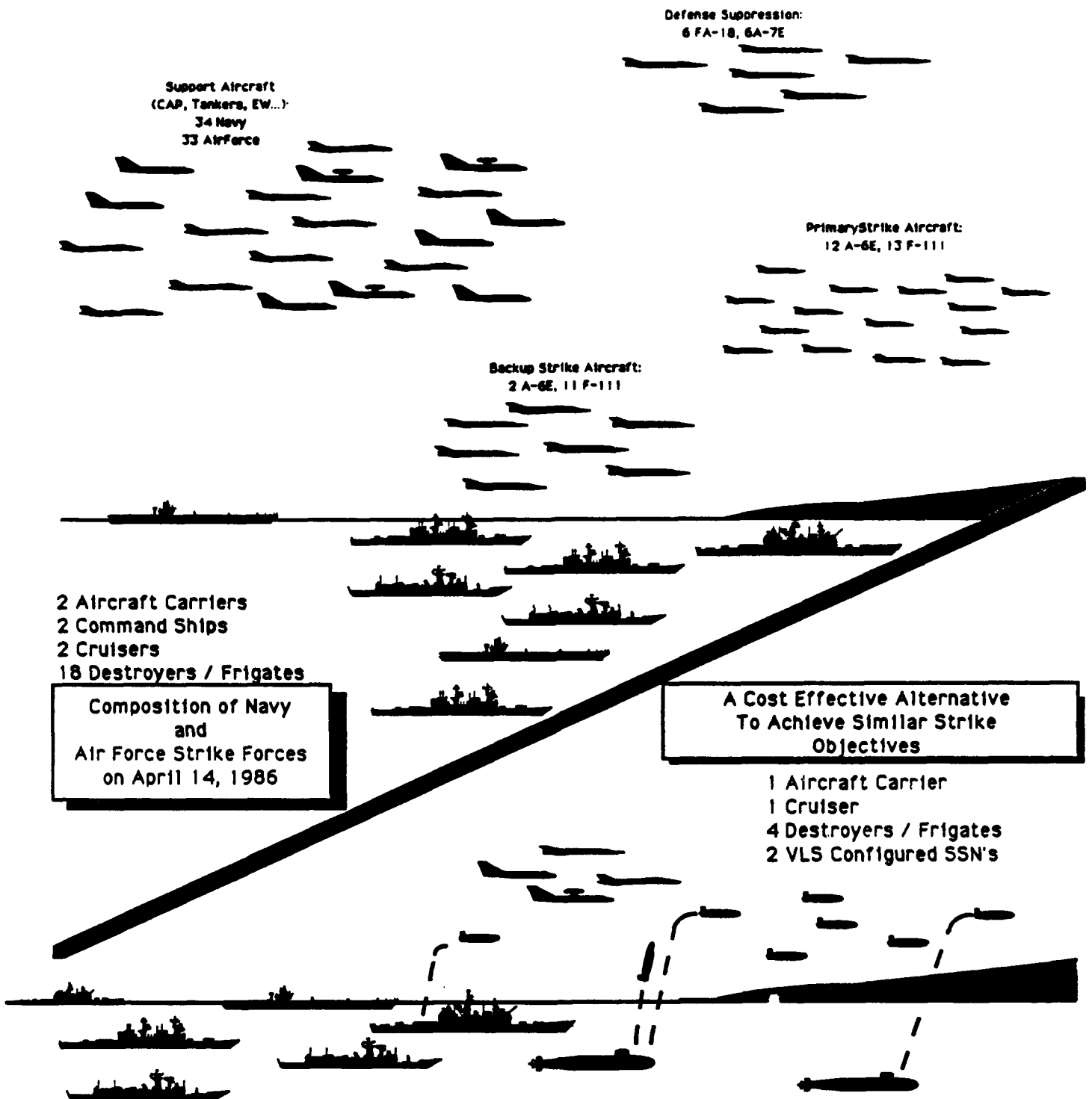


Figure 5. A Comparison of Strike Methods for Libyan Strike

CAVEAT - THE SOVIET ASSUMPTION

It is appropriate to return to the basic assumption of the preceding discussion that the successors of the Soviet Union will pose no threat to United States interests. The word "threat" implies some degree of malicious intent. At this time these successors demonstrate little malicious intent, but still retain formidable military and naval capabilities that continue to improve. This capability represents a potential "hazard" to our national security. Although conflict with former members of the Soviet Union is considered more and more unlikely as our mutual understandings and agreements develop, the potential to wield these military forces in future situations cannot be discounted and must be a consideration in any review of future U.S. defense policy and forces. The dissolution of the Soviet Union was not predicted; therefore, it is difficult to foretell the progression of events and the future intentions of those who control the former Soviet military. The United States may choose to change its defensive posture somewhat as the old 'threat' subsides, but should not forsake its insurance as long as 'hazards' exist.

Until the ultimate course of events in the former Soviet Union is more easily discernible and its residual military capabilities diminish significantly, it is prudent to maintain the ability to carry out the primary attack submarine roles that evolved during the Cold War. Primarily, the conduct of forward area ASW should be considered because no other force is capable of performing it. To be effective in this task, the United States must maintain a technological advantage with respect to Russian submarines. If their military capability declines and Russian-American relations continue to improve, submarine roles in the new world order will evolve as previously discussed. In these roles, the submarine force will carry out its missions and tasks as depicted in figure 6.

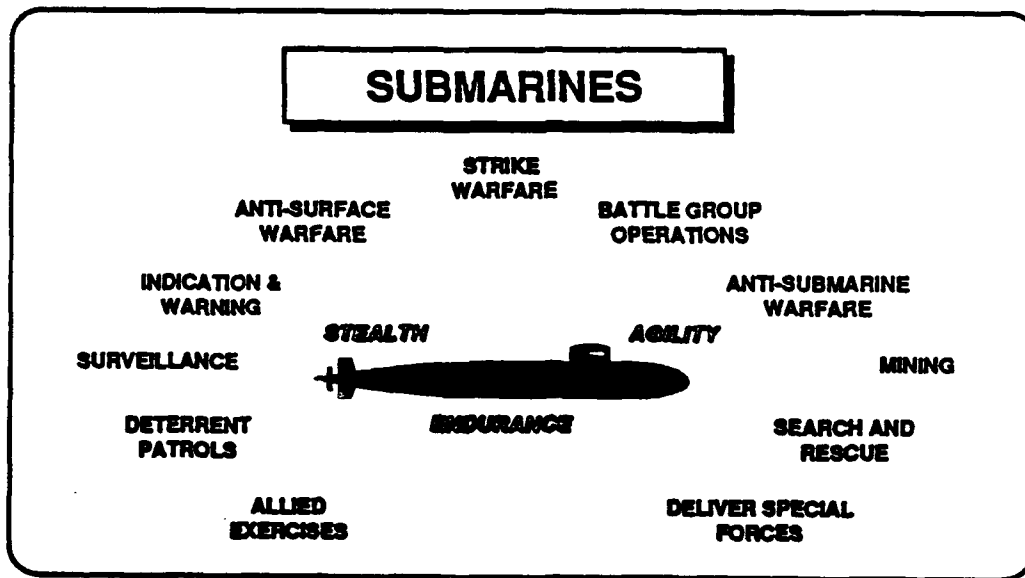


Figure 6. Submarine Tasks and Missions

CONCLUSION

Recent events have left the world with only one true superpower -- the United States. The demise of the otherwise stabilizing bipolar world order has, to a great extent, "made the world safe for regional conflict." With the spectrum of potential threats so much less well defined and more broadly based, advance warning of an impending crisis may be only two or three days as compared to Cold War scenarios that typically assumed two to three weeks advance warning. With foreign basing rights being dramatically curtailed, most military and naval forces needed to respond to a crisis will be physically located in the United States. Highly mobile and stealthy platforms such as nuclear submarines are the only major weapons system that can deploy and engage an opponent immediately without requiring a "critical mass" of other mutually dependent supporting forces. Submarines have consistently been on station, ready to carry out a variety of missions, for many major crises of the past 40 years. The roles and missions discussed in this paper are not necessarily new -- the submarine force has been conducting many of them for years. What is new is the change in emphasis brought about by the changes in the world.

U.S. naval forces have historically been able and must continue to be able to achieve local sea superiority to ensure support of political and military objectives. With the exception of the former Soviet Navy, no nation's forces now or in the foreseeable future can challenge our global sea supremacy -- the cost of developing such a navy is too great. Keeping this cost high by having a capable navy is a major argument for strong, balanced naval forces. Maintaining a strong U.S. Navy serves as valuable insurance for the future in an uncertain world. In regional conflicts, specific nations may be able to interfere to various degrees with our exercise of local sea superiority, but the effect will be temporary because of the maritime power available to the United States. The submarine with its stealth, endurance, and agility operating either alone or in coordination with other naval and military forces is a highly cost-effective component of the forces needed to ensure sea superiority. The submarine allows the National Command Authorities to select a variety of actions with positive control that can promote influence, deter crisis development, tamp down a smoldering conflict, contain conflicts that do occur, and quickly prevail if conflicts encompass U.S. forces. Because of the options for action that can be executed using a submarine, the submarine force provides a large number of arrows for the quiver needed to achieve our national objectives.

It should not be forgotten that the Cold War was won through strength -- political strength, economic strength, military strength, and strength of resolve. Weakness in any of these areas at many points along the way might have resulted in a far different outcome. These same strengths will surely be required to establish and maintain our national security in the future. The characteristics of the submarine enable it to serve in critical roles needed to provide the military strength and options for action that will be necessary in the new world order. In addition, the submarine force provides the United States with a hedge against uncertainty during the transition period from the Cold War to the clearly defined new world order.

