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STATEMENT OF

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Chairwoman Snowe, Members of the Seapower Subcommittee, thank you for the opportunity to discuss the role submarines will play in the 21<sup>st</sup> Century. Today, U.S. and allied forces face increasingly complex foreign capabilities in the form of submarines and their associated weapons systems. In some cases, because of stealth, lethality, and affordability, submarines are becoming the platform of choice for countries looking for an asymmetric counter to superior naval forces.

#### **PLATFORMS**

The number of submarines worldwide has decreased over the last ten years as nations retire older, less capable platforms and concentrate resources on new, more capable submarines. These new submarine designs have improved war fighting capabilities and are multi-mission capable, harder to locate, and have increased submerged endurance, all of which will improve their combat potential. Additionally, the improved capability of each platform reduces the number of submarines required to fulfill overall mission requirements.

## **Components of Mission Success**

Countries operating submarines have greater access to sophisticated technologies, many of which are increasingly of dual-use nature.

Diesel submarines currently in orders of battle are severely limited in submerged endurance based on their battery capacity. **Air Independent Propulsion** (AIP) technology is available as an option for conventionally powered submarines. The AIP system acts as a low capacity battery charger or provides limited power in parallel with the batteries, thereby extending the submarine's submerged endurance. AIP submarines are able to remain submerged for 2 to 3 weeks. This is a dramatic improvement over the 3 to 4 day submerged endurance of today's diesel-electric submarines.

Locating and neutralizing submarines depends on acoustic detection of these platforms. Submarines of all sizes are becoming quieter. **Quieting technologies** continue to improve and are increasingly available for backfit into older designs. Among the methods used are sound-isolating mounts for submarine machinery, low acoustic signature propellers,

active vibration suppression equipment, pumpjet propulsion and sound-absorbent coatings. Submarines incorporate these measures to varying degrees based on available space and cost considerations, but even the smallest and most widely available submarines are designed for reduced acoustic signatures.

## **WEAPONS**

The trend in naval weaponry is toward **better guidance and greater destructive power**. Modern submarine-launched heavyweight torpedoes can home on acoustic signatures, a ship's wake, or be guided by wire, and can literally break a ship in half. Even relatively unsophisticated mines can cause extensive damage and are difficult to detect and remove.

Improved **torpedo** systems and technologies significantly boost a submarine's combat capabilities. An example is the wake homing torpedoes which are exported with all Russian KILo Class diesel submarines. Wake-homing torpedoes are much easier to employ than other types of torpedoes because they are much less dependent upon an accurate targeting solution. Success is dependent on firing into the target's

wake rather than at the target itself. This greatly reduces the amount of training and tactical proficiency required to effectively conduct torpedo attacks against surface ships.

Submarine-laid **mines** range in sophistication from inexpensive WWII-vintage mines to costly, advanced self propelled-warhead models equipped with encapsulated torpedoes. Medium- to low-technology mines are prevalent throughout the world. Used properly, they are extremely effective and the threat they pose is serious. The numbers and types of the more sophisticated mines are growing.

Submarine-launched **anti-ship cruise missiles** are an emerging concern. The French EXOCET and the Russian NOVATOR ALFA, currently under development, are available for export, potentially increasing ASCM threat in volatile regions. China is developing submerged-launch missile systems, eventually adding a greater degree of complexity to the future security environment.

## **SYSTEMS**

Increasing sophistication also extends to on-board systems. Modern submarine **combat systems** combine sensor, weapons control, and data management functions. This trend has been driven by the need to keep pace with the reduced manning complements on newer submarines, emerging technologies and optimization of submarine capabilities. Integrated combat systems provide automated assistance to every phase of a combat mission, including mission planning, contact detection, target classification, target tracking, and weapons launch.

Submarine **sonar** systems have become more capable in recent years through extensive use of state-of-the-art digital electronics. These advances increase the proficiency in the detection and tracking of targets. With future submarine acquisitions limited by costs, new technologies and subsystems can be acquired to backfit into existing submarines. Signal processing upgrades and new sonar arrays are also cost effective ways to enhance a submarine's capabilities and performance.

## **NATIONS**

**Russia** continues to produce a wide range of leading edge undersea warfare technologies, for their use and for export. Sophisticated propulsion, quieting, and weapon systems are at sea now and are being incorporated into new construction submarine programs such as the SEVERODVINSK SSN. The SEVERODVINSK SSN will be Russia's first true multi-purpose submarine. Equipped with vertical launch tubes aft of the sail, this platform will be able to put to sea with a myriad of weapons to include land attack cruise missiles, ASW missiles, and ASUW missiles. This number and variety of weapons will allow the SEVERODVINSK SSN to replace both the OSCAR SSGN and the AKULA SSN in Russia's future order of battle. The first SEVERODVINSK SSN was laid down in a well-publicized ceremony at Severodvinsk Shipyard in late 1993. Construction has been delayed due to funding problems. Russia also continues planning for the DOLGORUKIY SSBN, which will be the future centerpiece of the Russian sea-based nuclear deterrent force. Russia has started construction of the first two hulls of the fourth generation SS, the Russian Navy's PETERSBURG (formerly LADA SS) and its export version, the AMUR. Despite different customers, PETERSBURG and LADA are reported to be nearly identical. These submarines are advertised to be built in configurations reflecting

customer's requirements, to include the option of an air independent propulsion system. Operations by OSCAR SSGN's and AKULA SSN's continue, as the Russian Navy employs these units to their advantage in both barrier and open ocean operations. Russia continues limited SSBN patrols; the majority of these operations are conducted by newer DELTA III/DELTA IV SSBN's.

Nuclear submarines are an important symbol of **China's** status as a regional power. The Chinese are designing a new SSN for construction in the next century. This TYPE 093 SSN will be a multipurpose nuclear attack submarine with quieting, weapons, and sensors systems improved over those currently deployed on HAN SSN's. In addition to torpedoes, the TYPE 093 is expected to carry a submerged-launch anti-ship cruise missile.

China continues to incorporate submarine technologies imported from Russia and other nations into its indigenously produced diesel-electric and nuclear-powered submarines. The last two diesel submarines ordered from Russia were upgraded variants of the KILO design. This variant is one of the quietest diesel submarines in the world and was previously only seen in service with the

Russian Navy. China has also developed significant designs of its own. Both the MING SS and SONG SS are being produced. In addition, its sole SSBN, the XIA, has recently undergone extensive overhaul. The XIA is expected to provide a bridge to a more sophisticated follow-on class of SSBN's. This combination of submarine classes provides China with a layered defense capability for operations out to the first island chain, and contributes to an overall area denial strategy centered on the area surrounding Taiwan.

While the **North Korean** submarine force reflects dated technology by Western standards, North Korean submarines during wartime would present significant challenges, particularly in coastal areas. North Korea has placed high priority on submarine construction programs which are ongoing despite its economic hardships. An example of this is the SANGO SSC, a simple submarine constructed in two variants, for use in the covert insertion of Special Operations Forces (SOF), mining or antisurface warfare.

The **Indian** Navy is pursuing a nuclear submarine program. They have started developing their own infrastructure based on a CHARLIE I SSGN previously leased from Russia. They

also continue to operate and maintain KILO SS's obtained from Russia, reflecting their status as a balanced navy fully supporting India's goals as a regional power in South Asia. India is turning to Russia to overhaul their KILO's; in addition to one unit currently in Russia; additional KILO's are expected to depart India this Spring for overhaul there.

To achieve a publicly stated intent to control the Strait of Hormuz and to consolidate naval superiority in the Persian Gulf, **Iran** has acquired three KILO diesel-electric submarines from Russia. These submarines play an important role in any Iranian plan to interdict surface ship traffic in the Strait or defending their coastline from seaborne attack. KILO submarines carry both acoustic and wake homing torpedoes, and can lay mines. Iran has overcome initial shortfalls with KILO batteries, operating these units vigorously in exercises, including simultaneous operations by all three KILO's during an exercise last year.

#### **AREA DENIAL**

Some foreign nations are developing area denial strategies and are combining a wide variety of naval capabilities into layered defense. As an example, Iran, making maximum use of the advantages afforded by geography, has developed a sophisticated, layered defense plan for the southern Gulf and Strait of Hormuz designed to deny access to this critical area in time of crisis. The three KIL0-class diesel submarines can fire wake-homing or wire-guided acoustic torpedoes at ships attempting to enter or depart the Gulf, or can be used to lay mines. These submarines and their associated weapons are integrated into a layered defense which includes mine fields, anti-ship cruise missiles and swarming small craft.

The increasing sophistication of the world's submarine forces and the weapons carried by these platforms is an important factor in planning for military operations and U.S. force employment. The U.S. submarine force remains the best and most effective tool in countering these growing foreign capabilities.

Chairwoman Snowe and members of the Seapower Subcommittee, thank you for the honor of testifying today. I stand ready to answer your questions.