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ANTI-SHIP CRUISE MISSILE PROLIFERATION
IN THE PERSIAN GULF AND THE
IMPACT ON U.S. MARITIME OPERATIONS

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

22 February 1993

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ABSTRACT

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This analysis combines the current and future ASCM inventory, Persian Gulf geopolitical situation and potential for U.S. involvement in future regional crises as background information. Military options are discussed in detail within the framework of the background provided and the Joint Force Sequencing model: Stability, Crisis Response, Forcible Entry, and Sustained Operations. Actions available to CINCCENT include: presence, combined/joint exercises, military to military exchanges, intelligence collection, rules of engagement, and use of military force.

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INTRODUCTION

The anti-ship cruise missile (ASCM) is probably the greatest single threat to navies of today. Together with mines, the ASCM is seen as a "great equalizer" by smaller, less developed navies, and as such, are sought out by many nations. The numerous weapons systems available through the international arms market from both western and eastern sources continues to expand. With such wide availability, proliferation of ASCMs into third world navies has steadily increased over the past two decades.

With ranges of 20 nautical miles and greater, ASCMs significantly augment coastal defense and offensive operations of small states, making larger navies, such as the United States Navy, more susceptible to attack and damage as maritime operations center more and more on littoral areas as outlined in the 1992 Navy/Marine Corps white paper, "From the Sea." Deployed in either coastal sites, small and/or intermediate sized surface ships or on aircraft, such weapons give small states unparalleled capacity to reduce naval access by larger powers¹. Nowhere is this more evident than the waters of the Persian Gulf and its confined entrance, the Strait of Hormuz.

This paper examines the threat of ASCMs in the context of the Persian Gulf and suggests options to the Commander in Chief, Central Command (CINCCENT) to counter this threat to U.S. maritime operations. The options are discussed within the framework of joint force sequencing: stability, crisis response, forcible entry and sustained operations.

THE THREAT

The threat of ASCMs, and their inherent advantages, lies in their basic design. Most missiles are characterized by low radar cross sections making detection difficult. Combined with their relatively high speed and low flight profiles, this drastically decreases reaction time by the intended target. The reaction time available to a ship's crew to respond to a small, fast low flying missile which has suddenly appeared from over the horizon is very limited. Timely reaction is further compounded in relatively confined waters where a ship's maneuverability is restricted, as is the case in the Strait of Hormuz.

Another advantage to many of these weapons is their effective warhead in relation to the overall size of the missile. Most Former Soviet Union (FSU) and Republic of China (PRC) built missiles are characterized by massive warheads and the result of being hit by one of these weapons can be catastrophic. The Israeli destroyer, ELATH, became the first victim of ASCMs, sunk by Soviet SSN-2 Styx missiles fired from an Egyptian Komar-class patrol boat during the 1967 Arab-Israeli war.

Anti-ship cruise missiles produced in the west, carry smaller warheads in comparison to those made in the east. The damage caused by the explosion of a western warhead may not sink a medium or large target but will most likely cause a mission kill; that is, eliminating the target as an effective fighting unit. Such was the case with USS STARK when it was hit by two French Exocet missiles in 1987. The ship was put out of action and required extensive repair before it returned to service over fifteen months later². When employed against smaller targets, however, the

results can be devastating, as in the case of the two Libyan units, TARIQ IBN ZIYAD, a Nanunchka class corvette, and WAHEED, a Combattante-II class missile boat, both sunk by U.S. Navy Harpoon missiles in March 1986.

A hit by most ASCMs can be disastrous even if the warhead fails to detonate. This was the case with HMS SHEFFIELD during the Falklands/Malvinas War and USS STARK in 1987. In both instances, the missiles' remaining liquid fuel caused extensive fires which, in the case of SHEFFIELD, caused the loss of the ship.

An added advantage of ASCMs is the variety of launch platforms available. Many current missiles in production have variants that can be launched from surface, submarine, airborne or shore-based platforms. The McDonnell Douglas Harpoon missile can be launched from all the above platforms³. With just modest ingenuity, any nation can install a limited ASCM system on practically any platform. The Exocet missiles that the Argentines removed from their ships and placed on flatbed trailers during the Falklands/Malvinas War is a good example of the creative employment of this type of missile system. The Argentines successfully employed this imaginative method in an attack on the British destroyer HMS GLAMORGAN during the war⁴.

A limiting factor of these weapons is the indirect cost. The range of many ASCMs exceeds the launch platform targeting sensor capabilities. To effectively employ ASCMs at their maximum ranges, a secondary platform, such as an aircraft, may be required to provide the launch site with accurate targeting information. Radar and Electronic Support Measures (ESM) systems are generally required to support targeting efforts as well. These additional systems require considerable capital investment as well as trained operating and maintenance personnel. While

many third world nations may not be able to afford the entire cruise missile package, most of the petro-dollar rich Gulf states have sufficient budget resources to acquire the necessary weapons and support hardware.

THE CURRENT INVENTORY

Currently there are no indigenous ASCM programs in the Persian Gulf region, however, several Western and Eastern built ASCMs are in the inventories of Persian Gulf nations. Additionally, there are numerous additional ASCMs on the international arms market that are available to Persian Gulf nations now or soon will be. The PRC continues to expand its inventory of exportable weapons and the FSU appears willing to sell any of its weapon system to any buyer with cash. Table 1 outlines the basic capabilities of these missiles in order of Chinese, French, Italian, United States, and FSU manufacturers.

ANTI-SHIP CRUISE MISSILES¹

PRODUCER	NAME	RANGE (nm)	SPEED (mach)	HOMER	LAUNCH PLATFORM
China (PRC)	HY-1	25	0.9	Active	Shore/Surface
	HY-2 (Silkworm)	54	0.9	Active	Shore/Surface
	HY-2A	54	0.9	IR	Shore/Surface
	HY-2G	54	0.9	Active	Shore/Surface
	C601	60	0.9	Active (or IR)	Air [B-6 (Chinese version of TU-16 Badger)]
	C801	25	1.0+	Active	Shore, Surface, Air
France	AM39 (Exocet)	42	0.9	Active	Air (Mirage F-1, Mirage 50, Super Entendard, Atlantique ATL2, Super Frelon, Super Puma, Sea King)
	MM40 (Exocet)	40	0.9	Active	Shore/Surface
	AS.15TT	9	0.9	Command	Air (Super Puma)
	MM.15	9	0.9	Command	Surface
France/Germany	ANS2	65	2.0+	Probably Active	Surface/Air
Italy	Otomat	48	0.9	Active	Shore/Surface
	Teseo	90	0.9	Active	Surface
United States	Harpoon	80	0.85	Active	Shore, Surface, Air, Sub
Former Soviet Union (FSU)	SSN-2A/B (Styx)	25	0.9	Active	Surface
	SSN-2C (Styx)	45	0.9	Active or IR	Surface
	SSN-9 (Siren)	65	0.9	Active or IR	Surface
	SSN-19 (Shipwreck)	100+	1.0+	Active	Surface
	SSN-22 (sunburn)	60	2.5	Active	Surface
	SSN-25X ³				Surface
	SSC-1B (Sepal)	100+	1.2	Active	Shore
	AS-4 (Kitchen)	250	2.5+	Active or IR	Air (Backfire B, Bear B/C, Blinder)
	AS-6 (Kingfish)	250	2.5+	Active	Air (Badger C/G)
	AS-16 (Kickback)	7	5.0	Active	Air (Backfire C)
AS-174				Air	
	KH-35 ⁵	80	?	Active	Shore, Surface, Air (fixed wing/helo)
<p>Note 1: Although there are numerous other missiles being produced by other countries, this table is limited to those missiles that are currently in the inventory of Persian Gulf nations and those missiles which may become available for import in the near future.</p> <p>Note 2: Missile under development</p> <p>Note 3: Missile under development, expected to be installed in new Russian Frigate</p> <p>Note 4: Air launched version of SSN-25X, under development</p> <p>Note 5: Recently introduced on international arms market. May possibly be a new designation of the SSN-25X/AS-17</p>					

Compiled from the following sources:

- Anti-Ship Missiles, Defense & Foreign Affairs, February 1992
- Combat Fleets of the World 1990/1991: Their Ships, Aircraft, and Armaments
- Guide to the Soviet Navy, Third Edition
- The Ships and Aircraft of the U.S. Fleet, Fourteenth Edition
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- Iraq - Anti-Ship Capability, Jane's Soviet Intelligence Review, October 1990
- China's Naval Missiles, Asian Defense Journal, October 1990
- Dossier, Naval Forces, Vol No. VI 1992
- Moscow Air Show Advertisement (Aug 92) FAX provided by Ken Parys of NMIC

Table 1

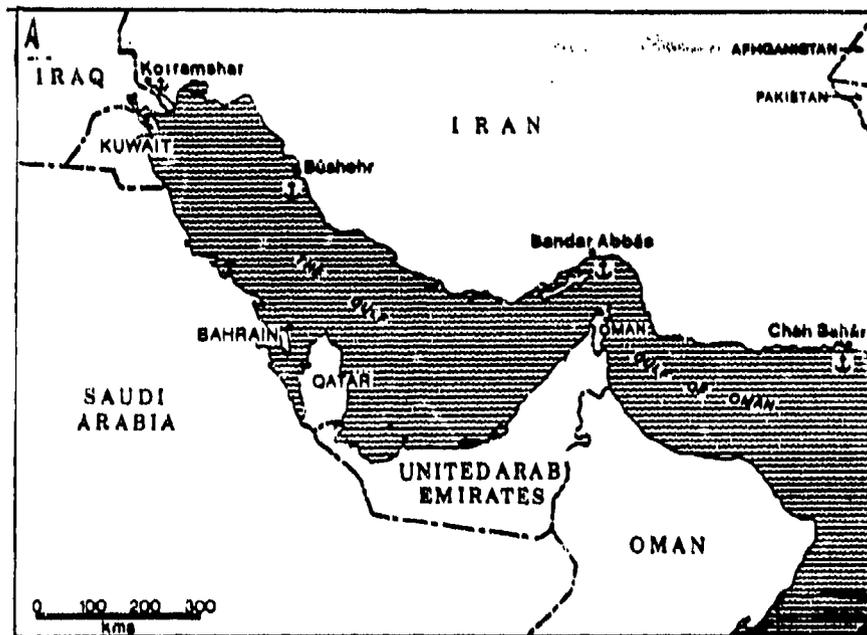
GEO-POLITICAL SITUATION

U.S. PERSIAN GULF POLICY: For the latter half of this century United States policy in the Persian Gulf has centered around the free access to oil. Since Harry Truman, presidents have sought to ensure the stability and security of friendly states and moderate regimes of the region as well as the maintenance of open sea lanes for transporting oil. More recently, the United States has desired to control weapons proliferation (especially weapons of mass destruction), develop political and economic cooperation with the Arab world and to limit conflicts, such as the Iran-Iraq war, that might affect other interests⁵.

The Bush administration's stated policy for the Persian Gulf lists four specific goals which encompass the above general policy. President Bush's policy was one of maintaining stability in the region, preventing either Iran or Iraq from dominating the region, halting the spread of radical Islamic fundamentalism, and reducing the threat of terrorism from and in the region⁶. It appears that President Clinton will maintain the same policy.

The presence of United States naval forces has been the cornerstone of the execution of U.S. policy in the Persian Gulf since 1947. Since that time, the US Navy has maintained a physical presence within the Gulf in the form of the Middle East Force. This naval presence remains crucial to the implementation of United States policy as executed by CINCCENT. It has developed America's influence in the area by demonstrating U.S. long term interest, investment and commitment in the region. Increased U.S. influence in the region is a direct result of the rapport developed between the Gulf states and U.S. maritime forces following many years of naval presence.

The reflagged Kuwaiti tanker escort operation which began in 1987, Operation Earnest Will, is an example of CINCCENT employing naval forces in carrying out the U.S. policy of ensuring free flow of oil out of the Persian Gulf. An operation such as this not only demonstrates United States resolve to protect its vital interests, but also increases U.S. influence in the region. A more recent example of the utility and effectiveness of keeping maritime forces in and near the Gulf was CINCCENT ability to rapidly respond to Iraq's invasion of Kuwait by moving already deployed naval forces directly to the scene within hours of the invasion. The ability to respond so rapidly may very well have prevented Saddam Hussein from continuing his invasion south into Saudi Arabia.



Source: John Jordan, "The Iranian Navy," *Jane's Intelligence Review*, May 1992, p. 213.

The Persian Gulf Region

An analysis of individual Gulf state relations with the United States, in the context of that nation's potential ASCM threat to U.S. maritime operations, is outlined below.

IRAN: Iran is the most likely threat to U.S. naval forces in the Gulf region for the foreseeable future. Despite the passing of the Ayatollah Khomeini, Iran's policy and attitude toward the United States remains one of antagonism and hatred. This stems from the U.S. support of the former Shah of Iran, the hostage crisis of 1979-1981 and more recently, the U.S. initiated arms embargo designed to force Iran to renounce terrorism as a state policy. There is little prospect that the adversarial relations between the two countries will improve any time soon. As a result, the United States has little direct influence on Iran⁷.

Following the lengthy war with Iraq, Iran was in shambles; its infrastructure overtaxed and collapsing, its military exhausted and lacking major hardware in significant numbers. A major part of President Rafsanjani's strategy for rebuilding Iran is the modernization of the country's armed forces. This necessity was reinforced by the recent 1991 Gulf War which demonstrated the political resolve and military capabilities of the West⁸. Rearmament and modernization will allow Iran to increase its ability to project power out into the waters of the Gulf as well as the northern Arabian Sea. The anti-ship cruise missile is a readily available weapon for Iran to achieve this goal.

The Iranian Navy received U.S. Harpoon missiles under the Shah's regime, however, it is unlikely that any of these remain operational due to age and lack of maintenance⁹. New acquisitions of western missiles by Tehran are unlikely because of the ongoing arms embargo.

The PRC, a regular arms supplier to Iran, will more than likely continue to make ASCMs available for the foreseeable future. The coastal based HY-2 Silkworm, of which the Iranians have many, is employed in two fixed sites near the Straits of Hormuz with an additional four mobile launchers¹⁰. Additionally, there are reports

that Silkworms have been tested aboard a surface unit following an innovative Iranian installation¹¹. Although less sophisticated than the Harpoon, the relative ease of acquisition of the Silkworm missile could prove attractive to the Iranian Navy¹². A contract with the PRC for two hundred of the more modern C-801 missiles was signed in 1992. This missile is comparable to the French AM39 Exocet but has a less sophisticated seeker¹³. Other possible acquisitions from the PRC include the air launched C601 and the Chinese-built version of the TU-16 Badger, the missile's associated launch platform. This weapons package would give Iran a truly long-range punch anywhere in the Gulf and well south into the Arabian Sea.

A more recent and rather unnerving development is the purchase of military equipment from the FSU. A Russian built Kilo-class submarine was recently delivered to Iran, reportedly the first of either two or three Kilos ordered¹⁴. If Iran continues to develop military ties with the cash starved FSU, acquisition of several types of ASCMs could be in Iran's future. Iran recently purchased Backfire-C (Tu-22M) bombers from Russia¹⁵. The SSN-9, SSN-19, SSN-22, SSN-25X, AS-16 and AS-17 are all possible future candidates to be added to the Iranian inventory. Missile launch platforms in the form of Tarantul or Nanunchka class patrol craft may also be made available. If Iran is successful in acquiring any of the above missiles, their ability to directly control access to the Persian Gulf, as well as the surrounding waters, will greatly increase. This could pose major threats to maritime operations of the United States as well as the surrounding nations.

IRAQ: The next most credible threat to U.S. naval forces is Iraq. Relations between the United States and Iraq could not be worse. Saddam Hussein continues

to challenge the United States led coalition which defeated his country in 1991. The chance of improved relations between the two nations is unlikely.

Although it's naval forces were eliminated and the majority of coastal based ASCMs were destroyed as a result of the 1991 Gulf War, Iraq still possesses Mirage F-1 and Super Frelon aircraft, both capable of launching the French made AM-39 Exocet. The quantity of AM-39's still in the Iraqi inventory is unknown, however, reliable sources indicate there may be as many as 400 Exocets remaining from the over 800 purchased from France during the 1980's¹⁶.

Hussein's military arsenal is composed of large quantities of FSU equipment. The FSU, which is in dire need for cash, could be anticipated to sell arms to Iraq in the future. These arms would most likely include ASCMs, possibly including launch platforms such as Tarantul or Nanunchka-class patrol craft. These craft can be outfitted with SSN-2 series, SSN-9 and even SSN-22 missiles. If a mutual deal could be worked out between Baghdad and Moscow that included any of these systems, Iraq would pose a significant ASCM threat to any maritime forces in the Gulf.

Additionally, the PRC will most likely remain one of Iraq's primary sources for arms in the future. They have provided the HY-2 Silkworm to Baghdad as well as Chinese built B-6 Badger aircraft and their accompanying C601 missiles¹⁷.

Future arms sale agreements with the West, however unlikely, are also a possibility. The French Exocet and Italian Teseo are the most likely candidates in any such agreement. France sold Exocets to Iraq prior to the Gulf War, and Italy had arranged a large naval sale which included several frigates and missile patrol craft. In the ever growing competitive arms market, a future arms deal between Iraq and either France or Italy is possible. A revitalized and rearmed Iraq under Saddam Hussein could continue to pose problems for Persian Gulf security and challenge U.S.

interests throughout the region. However, Iraq's current economic condition as well as the ongoing arms embargo will most likely retard any military build-up by Hussein.

SAUDI ARABIA: Saudi Arabia maintains close and rather long standing friendly ties with the United States and as such poses little or no direct threat to U.S. interests. The house of Saud, although not as secure as the United States would like, represents the greatest stability in the Gulf region. CINCCENT, however, could find himself employing forces to defend Saudi Arabia in the future should Iraq rebuild its military and threaten Saudi Arabia and its oil fields.

Saudi Arabia's extensive wealth and resultant large military forces serve to balance the power of Iran. The Saudi Arabian Navy is professional, extremely modern, and well balanced. It's ASCM firing platform inventory consists of four frigates armed with Teseo (Otomat Mk2), thirteen Harpoon equipped missile craft, and several French AS.15TT armed Dauphin helicopters.

The United States regularly conducts combined exercises with the Saudi navy. This demonstrates interoperability between U.S. and Saudi naval forces and has served as a deterrent to potential adversaries such as Iran and Iraq.

OTHER FRIENDLY GULF STATES: The United States has extremely close bilateral ties with the island nation of Bahrain. The most western of all the Gulf States, Bahrain has served as host to Commander, Middle East Force (COMIDEASTFOR), who has maintained a support base in the country since 1971. The United States relations with the United Arab Emirates (UAE), Kuwait, Oman, and Qatar continue to improve and expand.

Although posing little or no direct threat, these smaller Gulf states do pose a limited threat to the United States under three possible scenarios. The first involves the capture of one of these nation's military equipment by another state as was the case when Iraq invaded Kuwait. The second scenario would involve a revolutionary change in the government caused, for example by the spread of radical Islamic fundamentalism. Finally, the United States could become involved in territorial disputes over oil drilling rights between the Gulf States. There are many such disputes ongoing between Iran, the UAE, Qatar, Bahrain and Saudi Arabia.

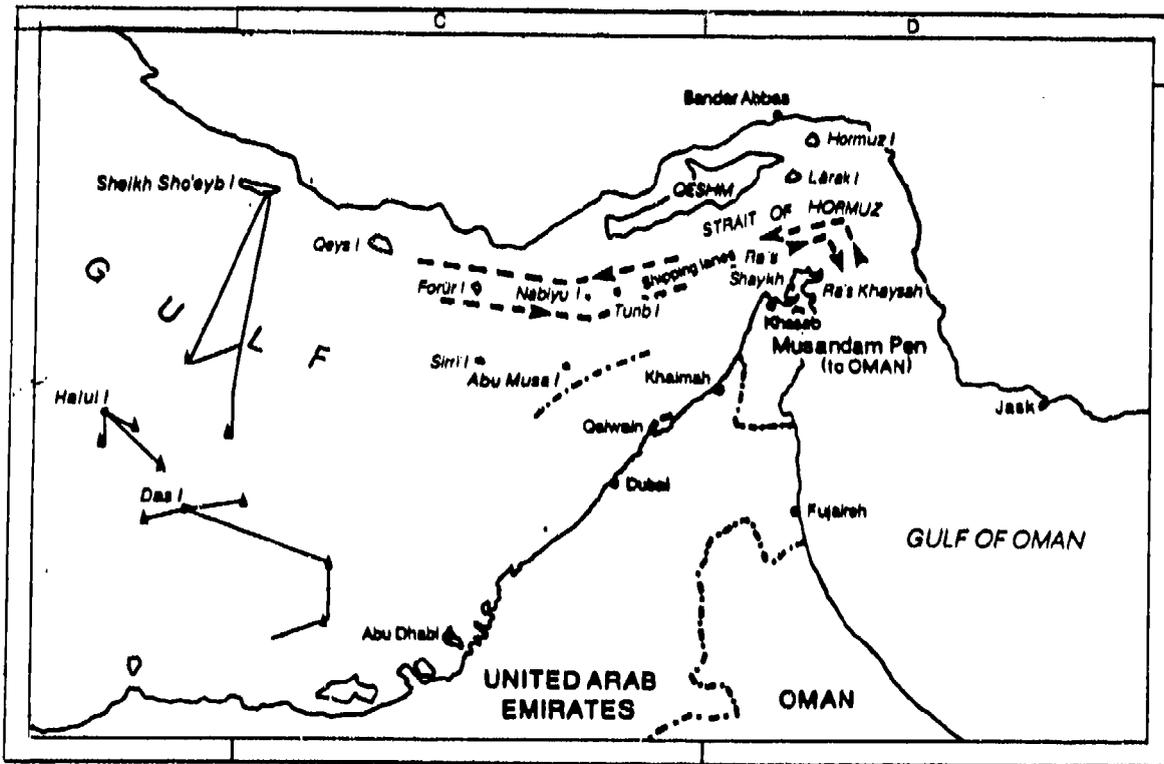
Exocet is the primary ASCM in use by all the above states. These missiles are mounted on fast attack craft which are all based on the French Combattante-class design.

THE GULF'S IMPACT ON US MARITIME OPERATIONS

The geographic limitations on maritime operations in the Persian Gulf and its entrance, the Strait of Hormuz, are easily defined. The Gulf is small in relation to the surrounding bodies of water, i.e. the Gulf of Oman, Arabian Sea and Indian Ocean. The confined waters of the Strait of Hormuz, about 30 nautical miles wide at its northern point, is even more restrictive. These limited waters greatly reduce reaction time to any hostile attack, but particularly to the employment of countermeasures against an incoming missile. This would be especially so if launched from ashore against a transiting target in the Strait of Hormuz itself.

The narrow Strait of Hormuz is the only entrance to the Persian Gulf available to sealift. Maritime traffic can be easily interdicted in this highly restrictive body of water. It would have been nearly impossible for the U.S. led coalition to maintain the extensive logistic tail to support coalition forces against Iraq during Desert

Shield/Storm had Iran chosen to interfere and interdict maritime forces transiting the Strait of Hormuz. The threat of Iranian interdiction alone would have forced CINCCENT to divert significant forces to the south and away from Kuwait to protect maritime traffic in through the Strait. As it was, Iran's intentions throughout the 1991 Iraq war were always of deep concern to the CINC. Iran's prime capability to carry out such actions, or threats, lie in their ability to employ ship, airborne and shore based ASCMs from their commanding geographic position along the eastern and northern boundary of the strait.



Source: Tom Hartman, John Mitchell, *A World Atlas of Military History, 1945-1984*, (London: Secker & Warburg, 1984), p. 28.

The Strait of Hormuz

A further environmental limitation to Gulf region operations is caused by unique environmental anomalies unique to the Gulf region. These include severe refraction and ducting of electromagnetic radiation, such as radar, which can reduce detection of inbound missiles and thereby further reduce missile threat reaction time.

FUTURE CONFLICTS

Considering U.S. policy in the region and the relative threat by each of the Gulf states, what are likely scenarios in which the United States could be drawn into a conflict? What would bring U.S. maritime forces into direct threat to the use of ASCMs in this region? If history is any judge, the Gulf will continue to be a volatile area which will continually challenge the CINC's planning and operations. The Persian Gulf and its surrounding states will continue to be of major concern to U.S. policy makers for as long as oil remains a powerful strategic raw material.

Any regional conflict, such as the Iran-Iraq War, can threaten the free flow of oil from the Gulf. The reduced flow of oil from the Persian Gulf during the hostilities between Iran and Iraq in the 1980's, the so called Tanker War, is a good example. The United States, in executing its regional policy, would certainly take action to limit and control the extent and escalation of such a regional war. Economic and diplomatic isolation, arms embargoes and similar restrictions are examples of actions the United States can take at the strategic level. Additionally the CINC can be tasked to carry out military operations which could include protection of friendly nation's assets, escort operations and/or direct military action to defend the vital interests of the United States. U.S. maritime forces, in turn, would most likely be employed to ensure that merchant traffic continues to move freely in and out of the Gulf. In Operation Earnest Will during the Iran-Iraq War, U.S. naval forces were used to escort

oil tankers through the war zone to and from Kuwait in the final stages of the war. Similar operations in any future regional war would most likely take place.

As noted earlier, there are currently several claims disputes between Gulf states, mostly over oil resources. These include Iran-Qatar, Iran-UAE, Saudi Arabia-Yemen, and Qatar-Bahrain¹⁸. The Qatar-Bahrain dispute is probably the most precarious for the United States because of Washington's close ties with Bahrain and emerging ties with Qatar. Should any of these disputes break out into armed conflict, free flow of oil could be affected. The United States will do everything it can to help the parties resolve these disputes peaceably, however if armed force is used, CINCCENT would most likely be tasked to employ his forces to limit the scope of the conflict.

Other potential conflicts that could eventually involve U.S. maritime forces include Iraqi military reconstitution and expansion and revolutionary subversion and overthrows of friendly states through radical Islamic fundamentalism on the Iranian model. The CINC could be tasked to take active steps to defend any nation threatened in any of the above situations. Actions could include military defense of a state's borders, punitive strikes against the offending nation, and numerous others.

THE CINC'S OPTIONS

The regional CINC has a number of options available to him in dealing with the threat of ASCMs in the Persian Gulf region. Any course of action must be tempered with minimal risk to U.S. forces while demonstrating firm United States' resolve and commitment to the region. Each increase in tension from peacetime stability through sustained military operations, the risk to U.S. military forces and political interests must be weighed against the expected gain. The following discussion follows the four

stages of the joint force sequencing in order of Stability, Crisis Response, Forcible Entry and finally Sustained Operations.

STABILITY: The majority of the CINC's operations will occur during the 'Stability' phase. The main effort should be to demonstrate not only support for friendly states within the region but to also display a clear resolve to potential enemies that the United States will decisively act to protect its interests in the Gulf. The four specific actions to carry out the stability mission include: (1) Presence, (2) Combined/Joint Exercises, (3) Military to Military Exchanges, and (4) Intelligence Collection. All of these actions have minimal risk with potentially high gain.

Presence: The most significant asset available to the CINC is the long standing U.S. naval presence in the Persian Gulf. The U.S. Navy has been a welcome sight by those friendly with the United States because it is unobtrusive. Unlike ground forces, and to a large extent land based air forces, maritime forces remain, for the most part, out of sight. Therefore the local governments are not seen as 'puppets' of the United States by their wary populace. At the same time, this long term naval presence has demonstrated to all, friends and enemies alike, that the United States is in the Gulf to stay and will support its allies. Consequently, there is less likelihood that the United States' potential enemies will employ ASCMs.

Naval presence also facilitates deployment of additional forces when needed, such as the Earnest Will operations associated with the Iran-Iraq War and the military build-up of Desert Shield. Such major expansion of operations would have been much more difficult and onerous to accept by all the Gulf states had the United States not maintained a continual presence for nearly 50 years.

However, there is a degree of risk involved in maintaining a presence in the Persian Gulf. Unlike most other areas of U.S. naval operations, the ASCM threat remains relatively constant to naval forces operating in the Gulf due to the explosive nature of the region. Therefore, even when carrying out the basic role of presence, U.S. maritime forces must remain especially vigilant and crews must man a 'real' condition III (wartime steaming) watch. The challenge and warning regime in use today is in response to this fact. Rules of engagement notwithstanding, the requirement and right of self defense gives unit commander's weapons release authority and tends to raise the overall tension in the Gulf.

Combined/Joint Military Exercises: Combined and Joint military exercises with friendly Gulf states offer another effective method of helping to maintain stability in the region. In certain instances where highly visible U.S. presence is not desired, naval and air exercises become the most readily acceptable type of operation to all parties. Combined exercises increase not only US expertise in the region, but also improve local force capabilities through training and force multiplication. Improved readiness and proficiency of friendly government armed forces helps deter potential enemies from taking offensive action against U.S. allies. Interoperability issues, such as communication procedures and weapons employment are also raised and solved. Demonstrating that U.S. forces have the ability to operate in a combined environment in the Persian Gulf has also had a deterrent effect on otherwise unfriendly nations.

Military to Military Exchanges: Another highly effective method of developing cooperation between the U.S. military and the Gulf States is the ongoing military to military personnel exchanges. Through this type of activity, both countries benefit as they gain a better appreciation for one another's culture and methodology. By operating in each other's respective service, individual officers develop a personal

rapport with their counterparts. This increased understanding and mutual respect demonstrates the United States dedication to the region and increases military interoperability among nations.

Intelligence Collection: The intelligence arena has applicability throughout the spectrum of joint force sequencing. In the case of the ASCM threat, intelligence is critical in providing information regarding type and quantity of missiles, their location, methods of employment, and a nation's ability to target U.S. and allied maritime forces. Further intelligence gathering is more difficult in the closed societies of the principal adversaries, Iran and Iraq, as well as some of the less than open communities of states friendly to the United States.

Specific intelligence subjects of concern to the CENTCOM include arms agreements and imports, non-conventional employment of weapons, indications and warnings (I & W) of ASCM employment, and regional government's intentions.

In the case of arms agreements and imports, special intelligence efforts need to be directed toward the ASCMs coming from the PRC and FSU. Both countries have either long standing or expanding trade relations with Iran and Iraq. The PRC has provided, and will probably continue to provide, technical assistance in developing indigenous weapon systems as well as actual missile transfers to both Iran and Iraq¹⁹.

Non-conventional employment of weapons, in the terms of this paper, consists of the significant modification of an imported missile system by a nation to fit the requirements of that nation's military. Two examples of non-conventional weapons employment include the Argentinean conversion of surface ship launched Exocet missiles to shore based mobile batteries and the reverse being the Iranian modification of shore based HY-2 Silkworm missiles to surface ship use.

Indications and Warning provided by communication (COMINT), electronic (ELINT), and imagery (IMINT) systems intelligence contribute vital information to take defensive actions against ASCM attack. Communication and electronic intercept systems normally provide timely intercept data with the drawback that both systems depend on a radiating target for best results. Imagery systems provide data on location and physical arrangement of ASCM systems. However, poor weather conditions can reduce the effectiveness of these systems.

The most difficult information to obtain, however, concerns national intentions. Iran and Iraq in particular have been unpredictable. Although I & W systems are helpful, no system can extract the actual thought process of the political and military leadership.

The most valuable benefits the CINC can derive from carrying out all the above actions is one of perception. All these efforts help the commander determine what weaponry each nation has, how they can be expected to employ their forces, and how effective they will be at carrying it all out.

CRISIS RESPONSE: Despite all efforts to maintain stability, crises are still expected in this volatile region. Since the U.S. interest in the free flow of oil will most likely be an issue in any of these crises, the CINC is likely to be involved. This includes more narrowly focused crises such as the 1987 incident when ASCM's were launched at USS STARK as well as broader regional conflicts. Consequently, issues of Rules of Engagement (ROE) and specific military response must be addressed.

ROE: The principal ROE aspects for the CINC to consider are the specific rules desired and the level of delegation to subordinate commanders. In countering the ASCM threat, two particular ROE items govern the discussion. First, what level in

the chain of command has the authority to declare a force "hostile," and second, considerations for the use of strikes.

Power to declare a force "hostile" can impact not only the operation at hand but have higher level political ramifications as well. The dilemma for the CINC is to determine the command level at which to invest this critical authority as well as the time or phase of the operation. He may also choose to retain this authority himself and control the crisis at the highest level. The CINC must balance both the risk to U.S. forces operating in the vicinity of the threat and the potential gains of maintaining control at higher or lower levels.

In the case of an ASCM threat, it is probable that the best defense is a strong offense. From a shipboard defense prospective, it is far more effective to eliminate the missile before launch than to counter it as an inbound threat. Therefore, the use of preemptive strikes to destroy ASCMs before launch becomes a major ROE consideration. Granting ROE which allows the commander the freedom of action to destroy other threatening targets and not just those actually involved in an attack is critical. Roughly translated this means a hostile act by one equals hostile intent by all. An example of this occurred in March 1986 when one Libyan surface to air missile (SAM) battery attacked a U.S. military aircraft and all other Libyan military units operating in the area of U.S. maritime forces were determined to have hostile intent. This led to attacks on several Libyan SAM sites as well as three Libyan naval vessels carrying ASCMs. However, the CINC must always balance risk to U.S. forces against containing and directing the course of the crisis.

Use of Military Force: If CINCCENT chooses to take direct military action in a regional crisis, he has considerable resources available which allow several response options. A response may be non-lethal, such as electronic countermeasures or

deception. The response may also start at a lower level of the spectrum of severity and only increase if lesser methods prove ineffective at controlling the crisis and deterring an adversary.

In the specific case of ASCM threat, there are a wide variety of non-lethal actions available to the CINC in disrupting opposing operations. These include, but are not limited to, the disruption of the nation's political and/or military Command, Control and Communications (C³) systems, denying the enemy accurate targeting information, conducting electronic warfare against radar and other targeting systems, psychological operations, and execution of a theater wide misinformation campaign through media releases and public statements.

Should the CINC decide on stepped up action to control and resolve a crisis, several levels of military operations are available including reinforcement of in-theater forces, threatening direct military action, direct use of military force, and the threat of continued military operations against the adversary. Many military force components capable of destroying the ASCM threat are available to the CINC. Naval assets include Tomahawk missile carrying destroyers, cruisers and submarines, and strike aircraft from a carrier battle group (CVBG) the highly responsive Marine Expeditionary Unit (MEU), which can be reinforced to nearly any size up to a division strength Marine Expeditionary Force (MEF). In and out-of-theater Air Force assets include airborne early warning E-3A's, fighter aircraft and CONUS based bombers. Although less likely to be retained in-theater, army rapid response light forces can be quickly deployed to the region, and finally, special operation forces are also available.

Reinforcing existing in-theater forces sends a signal to the opponent that the United States is committed to controlling the crisis. A show of strength without actually employing force can be successful in deterring a nation from continuing with a

course of action that is counter to U.S. interests. Reinforcement of personnel can occur rather quickly, but sustainability of light forces can become critically shortly after arrival. Long term reinforcement of personnel and heavy equipment takes time and considerable effort and cost in the face of ever shrinking defense budgets. Unlike the Desert Shield operation, the crisis may not offer the CINC the luxury of a lengthy build-up of forces. Reinforcement as a show of force represents low risk with moderate gain.

The next level of military operations is threatening to use force. A critical element of any threat is that it must be credible. The CINC must have the forces on hand and have the necessary national political support to carry out the threat if the opponent fails to take the desired action. Without credibility, the threat becomes hollow and the deterrent effect lost. Use of threats possesses increased risk to U.S. forces, should force actually be required. Gains can be high, especially if the threat alone successfully deters the enemy.

Should deterrence through intimidation fail to get the desired results, direct use of military force may be required. The CINC may choose to attack and destroy specific targets in a 'tit for tat' style operation or employ his forces in a punitive raid, attacking a broader range of targets. Both methods can be effective in both controlling and resolving the crisis. Targets in the first case include ASCM platforms/sites that attacked U.S. maritime or allied forces as well as their associated targeting systems, either shore station, surface or subsurface platform or aircraft. An example of *specific target selection* occurred in March 1986 when U.S. naval forces attacked a Libyan SA-5 missile site that had launched missiles against U.S. aircraft operating in international air space. The broader *punitive strike* may include a mixture of the specific targets listed above as well as C³ facilities, naval bases and air bases.

The U.S. Navy and Air Force strike against Libya in April 1986 is a good example of the use punitive strikes. Terrorist camps, military air fields and C3 facilities were attacked following Libya's use of state sponsored terrorism against the United States and Europe. In both cases of direct military force employment, the risk to U.S. forces increase along with potential gain.

Finally, the threat of continued military operations against the offending nation can be effective in ensuring at least short term, if not long term, compliance with U.S. wishes.

Table 2 compares U.S. forces available to CENTCOM to carry out direct military action with the potential risk level and associated possible gains.

DIRECT FORCE OPTIONS VS RISKS & GAINS

FORCE	RISK	GAIN	
TOMAHAWK (TLAM)	LOW	HIGH	Note 1 and 2
USAF/USN ATTACK A/C	HIGH	HIGH	Notes 1 and 3
USAF BOMBERS	MOD	MOD	Note 4
SPECIAL OPERATIONS	HIGH	HIGH	Notes 1 and 5
NAVAL BOMBARDMENT	HIGH	MOD	Note 6

Note 1: High target selectivity.
 Note 2: There are limited assets available in theater as well as a long term targeting problem if the target is not already planned prior to the crisis.
 Note 3: All potential adversaries within the Gulf possess considerable anti-aircraft forces, both in anti-aircraft artillery (AAA) and surface to air missiles (SAMs). Aircraft loss as well as pilot loss and/or capture must be considered.
 Note 4: Risk to aircraft is lessened due to altitude of attack. Target selectivity may be reduced and thus civilian casualties increased because of weapons used by bomber aircraft. There is a risk of undesired collateral damage.
 Note 5: Extremely high risk should the operation be exposed and/or forces captured. Use of special operations may not be acceptable to National Command Authority because of sovereignty issues. Very high target selectivity possible.
 Note 6: Distance required of the coast to carry out shore bombardment places the firing ship at extremely high risk. Limited range of 5 inch gun limits target selection. There is a risk of undesired collateral damage.

(This table represents the author's subjective analysis and views)

TABLE 2

FORCIBLE ENTRY & SUSTAINED OPERATIONS: At the high end of the joint force sequencing spectrum are operations to carry out a Forcible Entry and Sustained Military Operations against an enemy. These two sequences are discussed together as options available to the CINC in countering an ASCM threat under these operations are very similar. The desired end result is the same; elimination of the missile threat to maritime forces. All actions outlined under Stability and Crisis Response remain available when executing a forcible entry or carrying out sustained operations. However, actions under these two sequences tend to include a higher level of violence. When these operations require the support of naval forces, it is essential that sea control be established in the area of operations and the threat of ASCMs must be eliminated as a pre-requisite of gaining sea control. Therefore all ASCM platforms as well as the associated targeting and C³ systems become immediate targets for attack and destruction.

Additionally, action must be taken to prevent the adversary from obtaining further weapons to replace those expended or destroyed. At an operational level the CINC can interdict the enemy's land, sea and air logistical routes. At the strategic level diplomatic, political, and economic measures may be taken to isolate the enemy as well as pressure appropriate arms exporters to prevent the resupply of the opponent. The United States and coalition political leadership effectively isolated Iraq during Desert Shield/Storm by use of diplomatic means and the ongoing Maritime Interdiction Force (MIF) operations to control goods being delivered to Iraq by sea is a current example of an interdiction operations.

CONCLUSION

The threat of ASCMs to U.S. maritime operations in CENTCOM's area of responsibility is real and growing. Because of U.S. vital interests in the Persian Gulf the option of withdrawing forces clear of the threat is not available. The United States, and the U.S. Navy in particular, is in the Gulf to stay, and as such, operations within the region's littoral cannot be ignored. If the United States is to maintain the capability to project power in and around the Persian Gulf, maritime forces must be able to operate effectively in peace or war in the littoral.

As discussed in this paper, CINCCENT has numerous options available to counter the threat of ASCMs throughout the wide ranging spectrum of joint force sequencing. However, most of these same courses of action are available to regional CINC's in other areas containing emerging nations which possess ASCMs at present or will in the future. They too, will find themselves having to plan for and possibly execute similar operations as CINCCENT.

No one can predict the future in these turbulent times. One thing is for sure, however, and that is that U.S. naval operations in the Persian Gulf will become more and more dangerous as the proliferation of anti-ship cruise missiles continues throughout the region.

ENDNOTES

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3 Norman Friedman, "Modern Antiship Missiles - The Great Equalizers," Armed Forces Journal, June 1992, p. 38.

4 Max Hastings, Simon Jenkins, The Battle for the Falklands, (New York: W.W. Norton & Company, 1983), p. 296.

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7 ibid. p. 257.

8 Anoushiravan Ehteshami, "Iranian Rearmament Strategy under President Rafsanjani," Jane's Intelligence Review, July 1992, p. 312.

9 John Jordan, "The Iranian Navy," Jane's Intelligence Review, May 1992, p. 216.

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13 Jacobs, p. 560.

14 Joris Janssen Lok, "Russia Delivers First 'Kilo' to Iran," Jane's Defence Weekly, 21 November 1991, p. 9.

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