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NAVAL POSTGRADUATE SCHOOL
Monterey, California

AN OVERVIEW OF THE WORLD'S NAVIES, FUTURE ROLES OF THE US NAVY, AND IMPLICATIONS FOR NAVAL POSTGRADUATE SCHOOL INSTRUCTIONAL AND RESEARCH PROGRAMS

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The purpose of this report is to present a brief overview of the world's navies, to state some general conclusions concerning U.S. Navy shortcomings that the author draws from this overview, and to encourage the Naval Postgraduate School faculty to review both its academic and research programs to respond to these changes.

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1. Introduction.

The purpose of this paper is to present a brief overview of the world's navies, to state some general conclusions concerning US Navy shortcomings that the author draws from this overview, and encourage the Naval Postgraduate School (NPS) faculty to review both its academic and research programs to respond to these changes.

The new world order that will arise from the continuing changes in the Soviet Union will result in significant changes in the expected areas of operations for the US Navy. It is shown that, if one discounts the Soviet threat, there will be little challenge to US naval ships on the open oceans. But when the Navy must operate close to land, such as is the case for naval support of ground operations (Iraq), evacuation of US citizens in hostile situations (Liberia), amphibious operations (Lebanon) and drug interdiction, the threat is significant. This threat is often different from that expected on the open oceans. For example, battle space is greatly reduced, there can be confusion between enemy and non-belligerants, operations are in shallow water, and joint operations with other US services as well as allies will become more and more common. The continuing spread of first-world weapons to third-world countries that must be countered at close range in a confused environment with restrictive rules of engagement, will require new technologies and new techniques and tactics.

Emphasis in this report is on platforms and weapons. It is recognized that there are many other dimensions of a threat. Some of these are technology, equipment quality, logistics support,

deployment, training, doctrine, leadership, morale, strategic and tactical initiatives, political will etc. But these alone could not pose a threat to US naval forces in blue water. Potential adversaries would need platforms and weapons capable of sustained operations at sea in sufficient numbers to challenge the firepower of the US carrier battle group. It will be seen that the Soviet Union is the only country with significant numbers of ocean-capable forces. However, a closer look at the navies of other countries shows significant firepower that can be brought to bear on US naval ships operating close to shore. This has imporatant significance for determining where efforts need to be focussed in both new weapons and sensor systems as well as operational tactics.

Section 2 of this report shows in summary form the major platforms and weapons of the Soviet Union, the erstwhile Warsaw Pact, NATO, and the United States. Emphasis in this section is on ocean-going vessels. Sections 3 through 6 show similar data for subsaharan Africa, Latin America/Carribean, Asia/Australasia, and Mideast/North Africa. Emphasis in these sections is on their coastal capabilities, since as the reader will see, they have very limited ocean-capable navies. In each section, platforms and weapons are displaid by country and by submarine, ocean-going surface ships, coastal vessels, and missiles. All data in this report is taken from The Military Balance 1990-1991 (ref. [1]). That document contains far more detail than is shown in this report. The reader wishing to pursue a particular area in more detail should consult that document, or references [2] or [5] for more details available in the unclassified literature.

Section 7 contains the author's conclusions drawn from this overview, and suggests areas for R&D emphasis that will be required to meet the threats the Navy can be expected to face in the littoral areas of the world in which it will find itself increasingly operating.

2. The USA/USSR and Allied Navies.

This section contains a comparison of the major ocean-going platforms of the US Navy and its NATO allies with those of the USSR and its former Warsaw Pact allies. No attempt is made anywhere in this report to do detailed comparisons by platform or weapons capabilities. It is sufficient for the limited purposes of this report to show orders of magnitude in order to point out potential weaknesses in the US Navy capabilities where increased emphasis and study are required.

Table 2-1 shows the numbers of various classes of submarines[1] held by the USA, USSR and their allies. The reader will see that with the demise of the Warsaw Pact the USSR lost virtually none of its submarine capability (not surprising perhaps since a number of the Warsaw Pact counties are land-locked).

To be consistent with the data source (ref. [1]), the numbers in the various tables in this report have not been altered to reflect changing world situations. For example, the Warsaw Pact

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[1]For readers not familiar with the standard terminology for platforms and weapons, a list of the ones used in this report is included in Appendix A. A complete list can be found in ref. [4].

COUNTRY	SSBN	SSGN	SSN	SSG	SS
USA	34	13	77		1
USSR	63	46	68	14	114
NATO	10		12		115
W. PACT					8

Table 2-1. Submarines in the USA, USSR, NATO and Warsaw Pact.

was formally disestablished on 1 May, 1991, and the single US conventional submarine was decomissioned in late 1990. It is believed that that such changes will not invalidate the main conclusions of the report.

Table 2-2 shows the numbers of various classes of ocean-capable surface combatants. Again the reader can see that the USSR lost little naval capability when the Warsaw Pact went out of existence. The clear US superiority in naval air strike power is indicated by the first two columns.

What we see from Tables 2-1 and 2-2 is the fact that in terms of platforms the Soviet Navy continues to be a formidable force. Since their ship building apparently continues unabated, this will probably continue for some time. But in terms of a likely threat to the US Fleet one must ask what purpose an attack on US naval forces would serve if it is not part of some overall expansionist goal in Europe, or other area contiguous to the USSR. It is not the purpose of this report to try to evaluate this threat. Rather the purpose is to illustrate that the US Navy, in addition to being continually ready to counter this force, must also be prepared for hostile activities instigated by far less capable countries when US interests result in naval operations close to their shores.

COUNTRY	CVN/CV	CVV	BB/CGN/CG/CC	DDG/DD	FFG/FF
USA	14		45	59	100
USSR		5	43	31	148
NATO		4	4	60	206
WARSAW PACT				2	7

Table 2-2. Surface Ships in the USA, USSR, NATO and Warsaw Pact.

The next sections show the the overall size and structure of the world's navies broken out by sovereign countries within geographic areas as is done in reference [1]. No attempt has been made to eliminate landlocked countries that can have no navy. The reader will see that the ocean-going capabilities of most of the navies is extremely limited, and in many cases are non-existent. But when one looks at their coastal waters capability, especially the proliferation of missiles and ever more capable conventional submarines, it can be seen that some of these countries could pose a significant threat to US naval operations that will require new sensors, weapons, platforms and tactics.

3. Sub-Saharan Africa.

The submarine and ocean-going surface ships of the many countries that constitute sub-Saharan Africa are shown in Table 3-1. The only submarines are three French Dauphines belonging to South Africa.

Table 3-2 shows the numbers and classes of coastal vessels of the various countries in this region, and Table 3-3 shows the existence of the four classes of missiles (surface-to-surface, air-to-surface, air-to-air, and surface-to-air). Since specific numbers of these weapons are difficult to verify, asterisks show which countries are in possession of which type.

Recent events have resulted in US naval operations off the African coast at Liberia in the removal of US nationals. More will be said later in this report about this type of limited obective use of naval forces and the implications it has for new systems.

COUNTRY	SS	FF
ANGOLA		
BENIN		
BOTSWANA		
BURKINA FASO		
BURUNDI		
CAMEROON		
CAPE VERDE		
CENT. AFR. REP.		
CHAD		
CONGO		
IVORY COAST		
EQUAT. GUINEA		
ETHIOPIA		2
GABON		
GAMBIA		
GHANA		
GUINEA		
GUINEA-BISSAU		
KENYA		
LESOTHO		
LIBERIA		
MADAGASCAR		
MALAWI		
MALI		
MOZAMBIQUE		
NIGER		
NIGERIA		2
RWANDA		
SENEGAL		
SEYCHELLES		
SIERRA LEONE		
SOUTH AFRICA	3	
TANZANIA		
TOGO		
UGANDA		
ZAIRE		
ZAMBIA		
ZIMBABWE		

Table 3-1. Submarines and Surface Ships in Sub-Saharan Africa.

COUNTRY	CORVETTES	MISSILE CRAFT	TORPEDO CRAFT	PATROL CRAFT	MINE C/M
ANGOLA		6		5	
BENIN				2	
BOTSWANA					
BURKINA FASO					
BURUNDI					
CAMEROON		1			
CAPE VERDE				2	
CENT. AFR. REP.					
CHAD					
CONGO					
IVORY COAST		2		2	
EQUAT. GUINEA					
ETHIOPIA		8		6	
GABON		1		1	
GAMBIA					
GHANA				2	
GUINEA					
GUINEA-BISSAU					
KENYA		6			
LESOTHO					
LIBERIA				1	
MADAGASCAR				1	
MALAWI					
MALI					
MOZAMBIQUE					
NIGER					
NIGERIA	3	6			2
RWANDA					
SENEGAL				2	
SEYCHELLES					
SIERRA LEONE				2	
SOUTH AFRICA		9			9
TANZANIA				4	
TOGO					
UGANDA					
ZAIRE					
ZAMBIA					
ZIMBABWE					

Table 3-2. Coastal Vessels in Sub-Saharan Africa.

COUNTRY	SSM	ASM	AAM	SAM
ANGOLA	*	*	*	*
BENIN				
BOTSWANA				*
BURKINA FASO				*
BURUNDI				
CAMEROON	*	*		
CAPE VERDE				
CENT. AFR. REP.				
CHAD				*
CONGO				
IVORY COAST	*			
EQUAT. GUINEA				
ETHIOPIA	*			*
GABON	*			
GAMBIA				
GHANA				
GUINEA				*
GUINEA-BISSAU				*
KENYA	*	*	*	*
LESOTHO				
LIBERIA				
MADAGASCAR	*			
MALAWI				*
MALI				*
MOZAMBIQUE				
NIGER				
NIGERIA	*		*	*
RWANDA				
SENEGAL				
SEYCHELLES				*
SIERRA LEONE				*
SOUTH AFRICA	*	*	*	*
TANZANIA				*
TOGO				
UGANDA				*
ZAIRE				
ZAMBIA		*		*
ZIMBABWE				*

Table 3-3. Missiles in Sub-Saharan Africa.

4. Latin America and the Caribbean.

Table 4-1 shows the submarines in Latin America[2] by class.

COUNTRY	TR-1700	T-209	OBERON	GUPPY	SK-506	FOXTROT	MACKEREL
ARGENTINA	2	2					
BAHAMAS							
BELIZE							
BOLIVIA							
BRAZIL		1	3	2			
CHILE		2	2				
COLOMBIA		2			2		
COSTA RICA							
CUBA						3	
DOM. REP.							
ECUADOR		2					
EL SALVADOR							
GUATEMALA							
GUYANA							
HAITI							
HONDURAS							
JAMAICA							
MEXICO							
NICARAGUA							
PANAMA							
PARAGUAY							
PERU		6		1			4
SURINAME							
TRINIDAD							
URAGUAY							
VENEZUELA		2					

4-1. Latin American Submarines.

Although the conventional submarines in this part of the world pose a limited threat far from shore, they can form a serious threat close to shore as was demonstrated in the Falklands conflict. This table illustrates an important point made in this report. By scanning the columns one can see that many coutries possess the same class of submarine. Modern conventional

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[2] In this section we use the term Latin America to include all countries in South and Central America.

submarines are not only difficult to detect with current methods, but will cause a serious classification problem. If you detect a 209 class, to which country does it belong? The tables showing these conventional submarines may well be out of date when this report comes out. As is reported in reference [3], the sale of modern highly capable conventional submarines is a worldwide growth industry.

COUNTRY	CVV	CC	DD	FF
ARGENTINA	1		6	7
BAHAMAS				
BELIZE				
BOLIVIA				
BRAZIL	1		6	11
CHILE		1	8	2
COLOMBIA				4
COSTA RICA				
CUBA				3
DOM. REP.				
ECUADOR			1	
EL SALVADOR				
GUATEMALA				
GUYANA				
HAITI				
HONDURAS				
JAMAICA				
MEXICO			3	
NICARAGUA				
PANAMA				
PARAGUAY				
PERU		2	8	4
SURINAME				
TRINIDAD				
URAGUAY				2
VENEZUELA				6

4-2. Latin America Surface Ships.

Table 4-2 shows the ocean-capable surface ships in this area of the world. Both Argentina and Brazil possess small carriers that can provide limited air support.

Table 4-3 shows the coastal vessels. National shoreline protection is clearly the emphasis for countries' naval operations in this part of the world.

COUNTRY	CORVETTES	MISSILE CRAFT	TORPEDO CRAFT	PATROL	MINE C/M
ARGENTINA			2	7	6
BAHAMAS					
BELIZE					
BOLIVIA					
BRAZIL				15	6
CHILE		4	4	3	
COLOMBIA					
COSTA RICA					
CUBA		18			14
DOM. REP.				4	
ECUADOR	6	6			
EL SALVADOR					
GUATEMALA					
GUYANA					
HAITI					
HONDURAS					
JAMAICA					
MEXICO				41	
NICARAGUA					8
PANAMA					
PARAGUAY				6	
PERU		6			
SURINAME					
TRINIDAD					
URAGUAY				2	1
VENEZUELA		3			

Table 4-3. Latin American Coastal Vessels.

Table 4-4 shows the types of missiles possessed by the various countries. Again one can see a proliferation of modern weapons that could pose a serious threat to naval vessels close to shore.

COUNTRY	SSM	ASM	AAM	SAM
ARGENTINA	*	*	*	*
BAHAMAS				
BELIZE				
BOLIVIA				
BRAZIL	*		*	*
CHILE	*	*	*	*
COLOMBIA	*		*	
COSTA RICA				
CUBA	*	*	*	*
DOM. REP.				
ECUADOR	*		*	*
EL SALVADOR				
GUATEMALA				
GUYANA				*
HAITI				
HONDURAS				
JAMAICA				
MEXICO				
NICARAGUA		*		*
PANAMA				
PARAGUAY				
PERU	*	*	*	*
SURINAME				
TRINIDAD				
URAGUAY				
VENEZUELA	*		*	*

Table 4-4. Latin Amercan Missiles.

The conclusion one can draw from the tables in this section is that, although the Latin American countries have some ocean-capable vessels, they would pose little threat to the US Navy far from shore. But a US Navy presence projecting power close to the shore of many Latin American countries could find a significant threat, especially in an environment where the sinking or disabling of a single US warship could have serious political ramifications.

5. Asia and Australasia.

Table 5-1 shows the very signiicant numbers of submarines in the Asian countries (less the USSR). These include one strategic and four attack nuclear submarines belonging to China, and one

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guided missile nuclear submarine (a Soviet Charlie-I) operated by India.

COUNTRY	SSBN	SSN	SSGN	SSG	SS
AFGHANISTAN					
BANGLADESH					
BRUNEI					
BURMA					
CAMBODIA					
CHINA	1	4		1	87
INDIA			1		18
INDONESIA					2
JAPAN					14
N.KOREA					24
S.KOREA					3
LAOS					
MALAYSIA					
MONGOLIA					
NEPAL					
PAKISTAN					6
PAPUA N.GUINEA					
PHILLIPINES					
SINGAPORE					
SRI LANKA					
TAIWAN					4
THAILAND					
VIETNAM					
AUSTRALIA					6
NEW ZEALAND					

Table 5.1. Asian Submarines

It should be noted that 84 of the 87 Chinese conventional submarines are Romeos, many of which are believed to be non-operational.

Table 5.2 shows the surface vessels. The reader can see that the overwhelming majority of platforms are frigates, with significant numbers in Japan, China, South Korea, India, and Taiwan. A comparison of North and South Koreas shows the heavy emphasis on submarines in the North (24 to 3), and the heavy emphasis on surface ships in the South (3 to 34).

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COUNTRY	CVV	DDG	DD	FF
AFGHANISTAN				
BANGLADESH				4
BRUNEI				
BURMA				
CAMBODIA				
CHINA			18	37
INDIA	2	5		20
INDONESIA				16
JAPAN		6		58
N.KOREA				3
S.KOREA		7	2	25
LAOS				
MALAYSIA				4
MONGOLIA				
NEPAL				
PAKISTAN			3	10
PAPUA N.GUINEA				2
PHILLIPINES				2
SINGAPORE				
SRI LANKA				
TAIWAN			6	18
THAILAND				5
VIETNAM				7
AUSTRALIA		3		9
FIJI				
NEW ZEALAND				4

Table 5.2. Asia Surface Ships.

Table 5.3 shows the coastal vessels of the various Asian countries. China and North Korea both have large numbers of patrol, torpedo, and missile craft. These three coutries and Japan have large numbers of mine and mine countermeasure craft.

COUNTRY	MISSILE CRAFT	TORPEDO CRAFT	PATROL CRAFT	MINE C/M	CORVETTES
AFGHANISTAN					
BANGLADESH	8	8	1		
BRUNEI	3		3		
BURMA			37		
CAMBODIA			11		
CHINA	215	160	110	52	
INDIA	12		2	20	10
INDONESIA	4	2	21	2	
JAPAN		5	9	48	
N.KOREA	34	173	154	20	3
S.KOREA	11			9	4
LAOS					
MALAYSIA	8		2	5	
MONGOLIA					
NEPAL					
PAKISTAN	8	4	4	3	
PAPUA N.GUINEA			4		
PHILLIPINES			12		
SINGAPORE	6			2	3
SRI LANKA			2		
TAIWAN	52		3	8	
THAILAND	6		14	7	2
VIETNAM	8	23	2	5	
AUSTRALIA	22			3	
FIJI				5	
NEW ZEALAND				4	

Table 5.3. Asia Coastal Vessels.

Table 5.4 shows the proliferation of missiles in the Asian countries. Some 8 countries have air-to-surface capability, and 16 have surface-to-surface. Almost all countties have air-to-air and/or surface-to-air missiles.

COUNTRY	SSM	ASM	AAM	SAM
AFGHANISTAN	*		*	*
BANGLADESH	*			
BRUNEI	*			*
BURMA				
CAMBODIA				*
CHINA	*	*	*	*
INDIA	*	*	*	*
INDONESIA	*			*
JAPAN	*	*	*	*
N.KOREA	*		*	*
S.KOREA	*	*	*	*
LAOS			*	*
MALAYSIA	*		*	*
MONGOLIA				*
NEPAL				
PAKISTAN	*	*	*	*
PAPUA N.GUINEA				
PHILLIPINES			*	
SINGAPORE	*		*	*
SRI LANKA				
TAIWAN	*	*	*	*
THAILAND	*		*	*
VIETNAM	*		*	*
AUSTRALIA	*	*	*	*
FIJI				
NEW ZEALAND		*	*	*

Table 5.4. Asia Missiles.

It is clear that the naval capabilities in many Asian countries exceed those of most in Latin America and all those in sub-saharan Africa. The US Navy could face signicant resistance off the shores of these countries, although it is still difficult to see any deep ocean, blue water threat that could not be defended against with the current US forces.

6. Mideast and North Africa.

We now turn to the final and one of the most troubled areas of the world involving vital US interests, the countries bordering on the Mediterranean and the oil states. Table 6.1 shows the

submarines in this part of the world broken out by class (all Soviet). Notice that neither Iraq nor Iran has a submarine. It is the author's contention that had either one had an operable undetected conventional submarine, especially of the modern type such as a German 209, the role of the US Navy in Desert Shield and Desert Storm would have been significantly different. Operating carriers in areas as restricted as the Persian Gulf in support of limited objectives would probably be considered to have an unacceptably high risk in the presence of enemy submarines.

COUNTRY	KILO	ROMEO	FOXTROT	TOTAL SS
ALGERIA	2	2		4
BAHRAIN				
EGYPT		10		10
IRAN				
IRAQ				
ISRAEL				3
JORDAN				
KUWAIT				
LEBANON				
LIBYA			6	6
MORROCO				
OMAN				
QATAR				
SAUDI ARABIA				
SOMALI				
SUDAN				
SYRIA		3		3
TUNISIA				
UAE				
YEMEN				

Table 6.1. Mid-East and North Africa Submarines.

Table 6.2 shows the surface ships in the mid-east and north African countries. Although ocean capable, they are mostly operated close to their home base. Table 6.3 shows the coastal

vessels in this part of the world. Notice the numbers of missile craft.

COUNTRY	DD	FF
ALGERIA		3
BAHRAIN		
EGYPT	1	4
IRAN	3	5
IRAQ		5
ISRAEL		
JORDAN		
KUWAIT		
LEBANON		
LIBYA		3
MORROCO		1
OMAN		
QATAR		
SAUDI ARABIA		8
SOMALI		
SUDAN		
SYRIA		2
TUNISIA		1
UAE		
YEMEN		

Table 6.2. Mid-East and North African Surface Ships.

Table 6.4 shows that virtually all countries in this region possess all four classes of missiles. Table 6.5 shows a breakout of the surface-to-surface missiles by make or classification. Not only are missiles of all types available in most countries, many countries are armed with the same or similar models. One can see that the surface-surface version of the French Exocet is present in seven countries, the Soviet Styx in seven, US Harpoons in four etc. Many of these countries are either direct neighbors or in close proximity. With short reaction time due to missile speeds and sizes of countries in the area, there is a critical need for new thinking about rapid methods of identification and classification.

COUNTRY	MISSILE CRAFT	TORPEDO CRAFT	PATROL CRAFT	MINE C/M	CORVETTES
ALGERIA	11		1	1	3
BAHRAIN	4		2		2
EGYPT	21		18	9	
IRAN	10			3	
IRAQ	8	6		2	6
ISRAEL	26				
JORDAN			1		
KUWAIT	8				
LEBANON					
LIBYA	24			8	7
MORROCO	4		9		
OMAN	4		8		
QATAR	3				
SAUDI ARABIA	9	3		5	
SOMALI	2	4			
SUDAN					
SYRIA	12			9	
TUNISIA	6				
UAE	6				2
YEMEN				3	

Table 6.3. Mid-East and North Africa Coastal Vessels.

Table 6.6 shows selected types of fighter/ground attack (FGA's) aircraft in the various countries in the region. These numbers were current prior to the Desert Storm conflict. Again one can see the proliferation of given makes and models. In Desert Storm, the allied French airforce flew only about one percent of the combat missions against Iraq. This was in large part due to the identification problem and the concern to avoid blue casualties caused by blue fire.

COUNTRY	SSM	ASM	AAM	SAM
ALGERIA	*		*	*
BAHRAIN	*	*	*	*
EGYPT	*	*	*	*
IRAN	*	*	*	*
IRAQ	*	*	*	*
ISRAEL	*	*	*	*
JORDAN		*	*	*
KUWAIT	*	*	*	*
LEBANON		*		*
LIBYA	*	*	*	*
MORROCO	*	*	*	*
OMAN	*	*	*	*
QATAR	*	*		*
SAUDI ARABIA	*	*	*	*
SOMALI	*		*	*
SUDAN			*	*
SYRIA	*	*	*	*
TUNISIA	*		*	*
UAE	*	*	*	*
YEMEN	*	*	*	*

Table 6.4. Mid-East and North Africa Missiles.

Table 6.7 shows selected air-to-surface missiles in this region. Again one can see the proliferation of a given make among different countries.

COUNTRY	EXOCET	GABRIEL	OTOMAT	HARPOON	STYX	SCUD	FROG	SM-1	SS-21
ALGERIA									
BAHRAIN	*				*				
EGYPT			*	*	*	*	*		
IRAN			*	*	*	*	*	*	
IRAQ									
ISRAEL		*		*					
JORDAN									
KUWAIT	*						*		
LEBANON									
LIBYA			*		*	*	*		
MORROCO	*								
OMAN	*								
QATAR	*								
SAUDI ARABIA				*					
SOMALI					*				
SUDAN									
SYRIA					*	*	*		*
TUNISIA	*								
UAE	*								
YEMEN					*	*	*		*

Table 6.5. Surface-to-Surface Missiles in the Mid-East/North Africa Region.

COUNTRY	MIG-17	MIG-23	SU-20	F-5	MIRAGE
ALGERIA	30	17			
BAHRAIN				12	
EGYPT					16
IRAN				60	
IRAQ		90	70		64
ISRAEL					
JORDAN				72	
KUWAIT					23
LEBANON					
LIBYA		28	90		72
MORROCO					14
OMAN					
QATAR					
SAUDI ARABIA				53	
SOMALI	10				
SUDAN				9	
SYRIA	38	60	35		
TUNISIA				19	
UAE					14
YEMEN	35		25	11	

Table 6.6. Selected FGA's in the Mid-East/North Africa Region.

COUNTRY	AS-11	AS-12	EXOCET	HOT	MAVERICK
ALGERIA					
BAHRAIN	*	*			
EGYPT		*	*	*	*
IRAN					*
IRAQ	*	*	*		
ISRAEL					*
JORDAN					*
KUWAIT	*	*	*	*	
LEBANON					
LIBYA					
MORROCO				*	*
OMAN			*		
QATAR			*	*	
SAUDI ARABIA					*
SOMALI					
SUDAN					
SYRIA		*		*	
TUNISIA					
UAE	*	*	*		
YEMEN					

Table 6.7. Air-to Surface Missiles in the Mid-East/North Africa Region

7. Future US Naval Operational Problems

Although it is not possible to predict with any certainty the future locations and situations in which the US Navy will be required to operate, it is possible to draw some conclusions from the above overview and the current world situation. With the decline of the stable bipolar world we are seeing ever increasing local conflicts as traditional ethnic and religious rivalries are unleashed. As long as the Soviet Navy continues to operate its strategic forces it will remain a major concern to our Navy. But we can expect that the well publicised problems internal to the USSR, including its continual existence, will be a major preoccupation for them for the foreseeable future. While our Navy must continue to be able to counter any threat that they can mount, it must also be better prepared to respond in support of US national interests wherever a threat occurs. The question is, what if anything can we learn from the above overview of the world's navies?

The first observation to make is that there is currently a very low level of threat to our surface fleet and sea lanes of communication (SLOCS) from non-soviet forces on the open oceans. This could change if the proliferation of highly capable conventional submarines continues as Benedict points out in refence [3]. But future conflicts are far more likely to occur off the coasts of certain countries; recent examples include Lebanon, Liberia, Libya, and the Persian Gulf/Red Sea. The major common characteristics of such operations are i) limited and often difficult rules of engagement, ii) shallow water operations, iii) non-belligerent parties and vessels present,

iv) the opponent will possess high technology weapons, v) their will be little domestic tolerance for even small numbers of US casualties, vi) engagements are likely to be at close range with very limited battle space, and vii) more amphibious support operations as well as joint service operations. The implications of each of these are discussed below.

i) <u>Rules of Engagement</u>. In the type of naval operation envisaged, it is highly unlikely that war will have been declared against the USA. We can expect more "incidents" like the USS Stark attack, or the perceived threat to the Vincennes. We need to review technologies, strategies and tactics that can be of more help than we have in the fleet today. It is unlikely that we will be in a position to instigate offensive operations; it is much more likely that we will be in a responding mode, and then only when a serious threat is already under way.

ii) <u>Shallow Water Operations</u>. The Navy's concentration of effort has clearly been on combat in deep water. Our navy is structured as a "blue water" navy. But the littoral areas pose significantly different threats. Mine warfare clearly becomes far more important. So does the threat from land-based air and missiles. As was seen in earlier sections, many countries off which US ships are likely to be called to operate possess significant numbers of missile and/or torpedo boats. Some possess highly capable conventional submarines. While these may not be a significant threat to our fleet in the oceans because of their limited speed and endurance, they could cause serious problems in shallow water. Our own submarine force would rather avoid shallow water. Not only is their room to maneuver limited, their acoustic detection methods

are seriously degraded.   So are the acoustic systems on surface ships.   Couple this with the quietness of modern conventional submarines possessed by third world countries and we see a vital need for improved ASW methods in shallow water. We need also to put much greater effort into mining and mine countermeasures. With increasing likelihood of the Navy Marine Corps undertaking amphibious operations, the priority for being able to counter sophisticated modern mines has increased substantially.

iii)   <u>Presence   of   Non-belligerents</u>.   We   have   developed classification systems and weapons systems for ocean operations that will either be of little help in coastal regions or highly inappropriate. For example, while the land-attack version of the Tomahawk missile was extemely successful in Desert Storm, the sea-attack version was found to be of limited use.   The political consequences of sinking or seriously damaging a third party warship (a Soviet, French, British, Egyptian, ..?) vessel in the gulf by a US missile could be destabilising rather than just embarrassing. The consequences of causing serious casualties aboard a non-warship could be even worse.   Because of the rules of engagement it is highly unlikely that a zone of belligerency could be declared to help alleviate the problem.

iv) <u>High Technology Weapons</u>.   Whereas our navy faces high tech weapons on the ocean, they have room to operate with a layered defense over long ranges.   But close in to shore the long range systems will be of limited use. The exocets that hit the USS Stark are an example. We have shown that the majority of countries now possess these weapons, and it is highly unlikely, given the profits to be made, the instability in the world, and the difficulty of

monitoring arms shipments, that proliferation will be curtailed or even kept at its current level. Better and faster classification and response systems are called for to counter such weapons as well as to obtain better timely intelligence through scouting.

v) <u>Little Tolerence for Casualties</u>. The US public may have considerable tolerence for US casualties when its independence is threatened by a global power such as the USSR. But the Navy must be prepared for a world in which public opinion will often side with the perceived underdog, and that even modest damage to a US warship could be heralded as a victory by them, and at the same time seen as an unacceptable embarrassment by the US government.

vi) <u>Close-in Hostile Engagements</u>. The ranges over which conflicts will occur will be much shorter than those for which our weapons systems and platforms are designed and for which our people are trained. This has already been alluded to above. We will probably have to rethink the configuration of systems and our training programs and tactics. At the same time we need to re-emphasise work that can lead to improved close-in systems. Sea Sparrow and Phalanx may have been adequate as a third and final level of defense to stop small numbers of leakers. They were never intended to be the whole answer to short range attacks.

vii) <u>Amphibious and Joint Operations</u>. Naval actions close to shore may be shows of force, but are much more likely to be part of some Marine amphibious operation (such as the recent extraction of US nationals from Liberia) or limited objective joint-service operation (such as Grenada and Panama). There will be a much greater need for interservice communication and operation.

When one considers the above seven characteristics as a whole, one can see some reasonably clear directions for further research and development to respond to the future Navy roles. There is a clear need for better technologies for identification and classification, mine countermeasures, close-in missile defense, non-acoustic ASW to mention just a few. It is hoped that the contents of this report will stir interest and debate at NPS as to how our academic and research programs can be changed to better support the changing roles of the Navy.

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APPENDIX: ACRONYMS FOR PLATFFORMS AND WEAPONS

SUBMARINES.

           SSBN Ballistic Missile Nuclear Powered Submarine
            SSN Nuclear Powered Attack Submarine
           SSGN Guided Missile Firing SSN
             SS Attack Submarine
            SSG Guided Missile Firing SS

SURFACE SHIPS.

             CV Aircraft Carrier
            CVN Nuclear Powered Aircraft Carrier
            CVV VSTOL and Helicopter Carrier
             BB Battle Ship
             CC Cruiser
             CG Guided Missile Firing CC
            CGN Nuclear Powered CG
             DD Destroyer
            DDG Guided Missile Firing DD
             FF Frigate
            FFG Guided Missile Firing FF

MISSILES.

            SSM Surface-to-Surface Missile
            ASM Air-to-Surface Missile
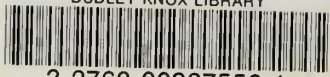   AAM Air-to-Air Missile
            SAM Surface-to-Air Missile

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