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THIRD WORLD BALLISTIC MISSILE PROLIFERATION
AND THE CHALLENGE TO THE OPERATIONAL COMMANDER

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.

Signature: William E. Cook, Jr.

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<p>During the past two decades ballistic missile proliferation has raised a new threat for an operational commander to consider when preparing for and conducting operations in a potential or actual theater of war. Regional third world ballistic missile capable states and continuing improvements in missile system capabilities will threaten the security of rear areas as well as front line units. While today's third world missile systems are relatively ineffective in terms of military importance, Desert Storm demonstrated the enormous political and psychological leverage these weapons systems can create.</p> <p>The purpose of this paper is to examine the growing threat posed by third world ballistic missiles and their impact in possible future conflicts. The paper first covers present third world capabilities and then considers possible future development in the areas of missile inventories, missile accuracy, warhead development, targeting accuracy and access to space. The paper then looks at the possible responses to counter the threat.</p> <p style="text-align: right;">(continued on the back)</p>			
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The paper concludes that the current threat is capable of low levels of threat and harassment to military operations, particularly to fixed targets. Populated areas remain at most risk to ballistic missile attack as has been demonstrated by historical example. Finally, the threat is growing both because the number of missile capable countries is growing and because of pending technical advances. The result is that an operational commander will have to take greater care in preparing for and conducting ballistic missile defense than was previously the case.

ABSTRACT

During the past two decades ballistic missile proliferation has raised a new threat for an operational commander to consider when preparing for and conducting operations in a potential or actual theater of war. Regional third world ballistic missile capable states and continuing improvements in missile system capabilities will threaten the security of rear areas as well as front line units. While today's third world missile systems are relatively ineffective in terms of military importance, Desert Storm demonstrated the enormous political and psychological leverage these weapon systems can create.

The purpose of this paper is to examine the growing threat posed by third world ballistic missiles and their impact in possible future conflicts. The paper first covers present third world capabilities and then considers possible future developments in the areas of missile inventories, missile accuracy, targeting accuracy, warhead development and access to space. The paper then looks at the options available to an operational commander and possible responses to counter the threat.

The paper concludes that the current threat is capable of low levels of threat and harassment to military operations, particularly to fixed targets. Populated areas remain at most risk to ballistic missile attack as has been demonstrated by historical example. Finally, the threat is growing both because of pending technical advances and because the number of missile capable countries is growing. The result is that an operational commander will have to take greater care in preparing for and

conducting ballistic missile defense than was previously the practice.

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TABLE OF CONTENTS

ABSTRACT	ii
TABLE OF CONTENTS	iv
LIST OF ILLUSTRATIONS	v
INTRODUCTION	1
The Problem	1
THE CURRENT THREAT	2
THE PRESSURES FOR PROLIFERATION	2
CURRENT THIRD WORLD CAPABILITIES	5
The Middle East	5
The Korean Peninsula	7
South Asia	8
Latin America	9
South Africa	9
TRENDS FOR THE FUTURE	10
Missile Inventories	10
Missile Accuracy	10
Targeting Accuracy	11
Warhead Development	11
Access to Space	12
OPTIONS AND RESPONSES	13
Assessment of Military and Political Effectiveness	14
Options and Response	15
CONCLUSION	19
TABLE 1: Selected Ballistic and Space Launch Missile Capabilities of Third World Countries.	22
ENDNOTES	26
BIBLIOGRAPHY	28

LIST OF ILLUSTRATIONS

Figure 1. Middle Eastern Range Arcs 6
Figure 2. Korean Peninsula Range Arcs 7
Figure 3. South Asia Range Arcs 8

THIRD WORLD BALLISTIC MISSILE PROLIFERATION
AND THE CHALLENGE TO THEATER OPERATIONS

INTRODUCTION

"Israel not only has the deterrent power to face down the missiles held by Syria, Iraq and now Saudi Arabia ... we also have the ability to attack their populated areas to a degree that outstrips theirs many times over¹."

ITZHAK RABIN

"I swear to God, we will let our fire scorch half of Israel if it tries to wage anything against us²."

SADDAM HUSSEIN

The Problem. The quotations cited above demonstrate but one example of regional conflict in which ballistic missiles play an increasing role. The enormous potential of missiles was first demonstrated in World War II when Germany, unable to attack the UK with manned aircraft, was able to launch 1,200 V-1 cruise missiles and 3,500 V-2 ballistic missiles at cities in England and in Europe. These missiles caused much physical damage and killed 12,000 civilians³.

For most of the period following World War II, ballistic missiles were in the possession of only a few nations. The high cost, the high degree of technical skill and the complex infrastructure needed to support design and manufacture of missile systems ensured that the world's minor powers could not obtain them. Eventually, the US and the USSR were able to achieve a balance of power in which the ballistic missile role was one of strategic deterrence on an intercontinental scale.

Over the last two decades, the balance achieved by a relatively few major powers has been seriously degraded. Through receipt of missiles from allies, purchase, technology transfer or home grown efforts, there are now over twenty third world countries with some type of ballistic missile capability. The growing scientific, technical, engineering and manufacturing capabilities of developing countries almost guarantee continued proliferation of ballistic missiles.

The operational commander faces a growing challenge. As missile inventories, missile accuracy, targeting accuracy (through either better fire control systems or increased access to indigenous or commercially available space assets) and warhead efficiency increase, the greater will become the probability that an operational commander will face a hostile regional power capable of using an effective ballistic missile system in the near future. The goal of this paper is to examine the current third world ballistic missile threat, to speculate on likely future developments and to consider some potential responses that an operational commander may consider in countering the threat.

THE CURRENT THREAT

THE PRESSURES FOR PROLIFERATION

Why do so many countries seek to obtain a ballistic missile capability? There are a number of very strong military and

political reasons. Possession of missile technology confers a degree of prestige in terms of enhancing one's standing as a modern, autonomous and industrial nation. Beyond prestige there are also national security concerns that can make ballistic missiles and the ability to use them very attractive to a given nation. Many of the political, military and security concerns are regional in nature. With the demise of the bipolar world of the two super powers, these regional concerns will become more prominent and take on greater importance both locally and globally.

The "traditional" role of ballistic missiles has been one of strategic deterrence. In this respect any nation can justify the acquisition of ballistic for reasons of national security. As an example, North Korea, feeling abandoned by the former Soviet Union and viewing itself increasingly isolated may well be justifying its current missile development and nuclear efforts as a means to guarantee deterrence from attack by South Korea and the U. S.

Action often provokes reaction and thus a nation may seek a ballistic missile capability to counter the capability of a potential adversary. An example is that of India and Pakistan. When asked why Pakistan was pursuing ballistic missile development, the Pakistani Minister of Defense said that his country had "to have an antidote for what our enemy (India) next

door has⁴." The de-stabilizing effect of an arms race between India and Pakistan is further complicated by regional tensions arising from such issues as their respective relations with China, the dispute over Kashmir and domestic economic and political factors.

Prestige and gain in international status should not be overlooked as motivators for obtaining ballistic missile capability, regardless whether or not one could effectively employ it. One can argue that just *having* such missiles enables a nation to gain more influence and autonomy in its relations with its neighbors, in its ability to act independently of influence by global powers and in its participation in international arenas such as the United Nations. This is particularly true if the missile threat is linked with a nuclear weapons capability. In addition to the influence and prestige with which a nation may demonstrate the superiority its regime politically, economically and militarily, the implied power to persuade and intimidate can be politically useful as well.

Possession of missiles can also be seen in strictly terms as a means to enhance a nation's ability to fight a war. If a nation finds itself in conflict with an adversary who has a superior forces in terms of technology, number of men, better armament, more tanks, etc., then use of tactical ballistic missiles can help to even the odds. Missiles offer an all weather, fast

moving, difficult to stop weapon that can strike targets in the enemy's rear. If the missile systems are of relatively low technology with correspondingly low accuracy, a chemical or nuclear warhead can help make up for inaccuracies in either the targeting systems or the missiles themselves. While most third world missile systems employed today are not accurate enough to have real military use, attack against fixed, heavily populated targets offer tremendous psychological and political leverage. Future technological development will increase the ability to attack more mobile military targets as well.

The causes of missile proliferation listed above are not intended to be a complete list. However they serve to demonstrate some of the key reasons why more nations will seek to acquire missiles and why the capabilities of third world missile systems will continue to improve in the future.

CURRENT THIRD WORLD CAPABILITIES

As previously stated, over twenty third world countries have ballistic missile capabilities. Presently there are two areas of the world in which the United States is most likely to become involved in a regional conflict: the Middle East and the Korean Peninsula. These and other regions are discussed below.

The Middle East. The Middle East and the southern Mediterranean littoral have the greatest number of nations with

ballistic missile arsenals. These countries are: Algeria, Egypt, Iran, Iraq, Israel, Libya, Saudi Arabia, Syria, Turkey and Yemen. Most of these countries obtained Frog or Scud missile systems from the former Soviet Union (FSU). These systems are obsolescent and are not likely to remain useful because of age and because of lack of support from the FSU. However, a number of these countries are embarked in design and manufacture of indigenous missile systems either based on Soviet technology or with assistance from some other nation.

Israel has the most advanced program, possessing a long range missile capability and assessed to have a nuclear capability as well⁵. It

demonstrated a space launch capability in 1988⁶ and has collaborated with Iran, Taiwan and South Africa⁷. Although Iraq was to destroy all of its missiles capable of greater than 150 km range, it is easy to speculate that its expertise in missile design still

exists. Both Iraq and Iran

worked to create a number of indigenous missile systems and Iraq's nuclear program is well known. While Iran has acceded to

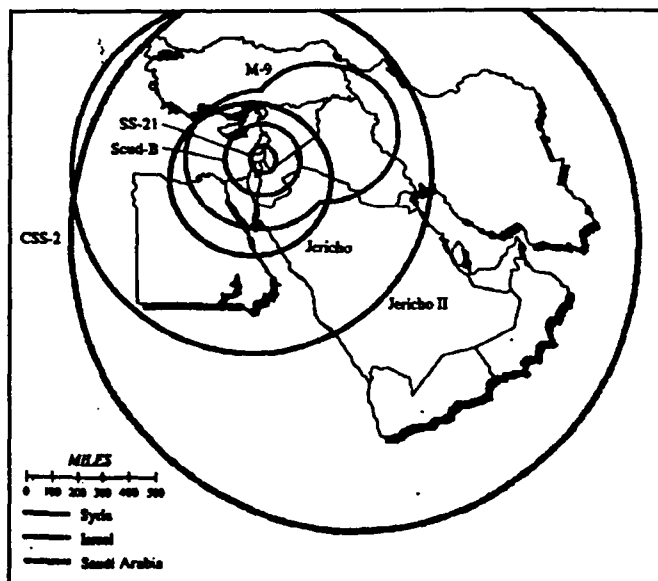


Figure 1 Middle Eastern Range Arcs

the Nuclear Non-Proliferation Treaty and has stated support for a nuclear weapon free zone, many have suspected it of pursuing a nuclear capability as well⁸. Syria is trying to obtain updated missiles from North Korea and China and has recently purchased M-9 missiles which have yet to be delivered⁹. Other countries in the region are engaged in programs and their efforts are summarized in Table 1. Range arcs for various missile systems are shown in Figure 1¹⁰.

The Korean Peninsula. North Korea is very secretive and outside observers encounter great difficulty in obtaining any relevant information. Besides manufacturing an improved version of the Scud missile, which it has sold to other third world countries, North Korea is also developing the indigenous No-Dong missile with an approximate 600 mile range. This missile would be able to threaten targets outside the Korean Peninsula and there are concerns about sale to other countries as well, specifically to Egypt and Iran¹¹. South Korea's operational

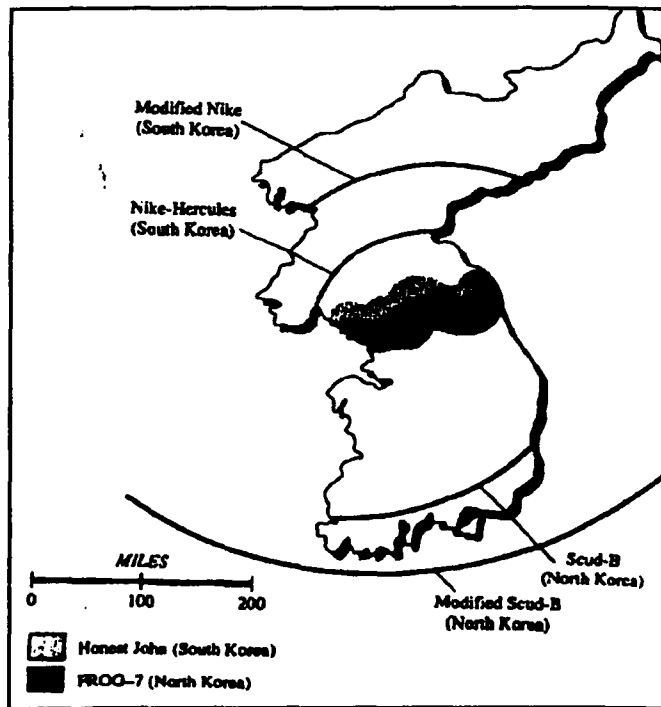


Figure 2 Korean Peninsula Range Arcs

missile inventory consists of Honest John and Nike technology from the U.S. but it is also working on developing an indigenous short range surface to surface missile system. Range arcs for the two countries are shown in Figure 2¹².

South Asia. India has both the resources and the technology to qualify as a nuclear state should it choose to do so. It confirmed its nuclear capability by detonating a nuclear device in 1974. (The government continues to deny that the technology has been used for military purposes.) In 1989, India demonstrated its missile technology with the launch of the two stage Agni missile on a flight of 1500 miles¹³. In addition to the Agni, India has several other missile systems in various stages of

development. These are intended to support an ambitious indigenous space program to give India an extensive satellite communication, reconnaissance and surveillance capability by the end of the decade¹⁴. Pakistan's operational missile inventory presently consists of short range missiles only¹⁵, however interest has been expressed in development of a space launch

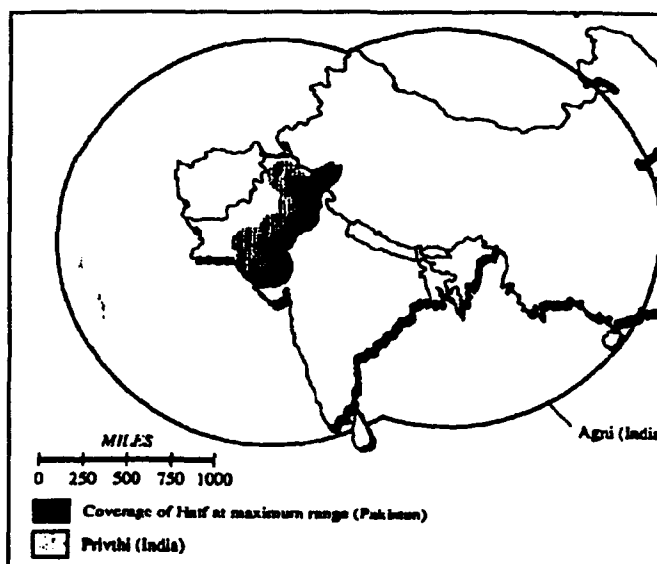


Figure 3 South Asia Range Arcs

vehicle which would add a significant capability if it is ever developed. It is also receiving assistance from China in developing its indigenous Haft missile series. Pakistan has repeated pledges not to make nuclear weapons and not to explode a nuclear device but has also admitted that it has the elements to make such a device if put together¹⁶. Range arcs for south Asia are shown in Figure 3¹⁷.

Latin America. Argentina and Brazil pursue missile development programs both for export and in competition as rival powers in South America. Argentina has exported its technology but has recently signed an agreement with the United States for transfer of technology to Argentina in exchange for controls over technology it both develops and receives from the United States¹⁸. Brazil is working on an intermediate range ballistic missile design and is also trying to improve its space launch capability with Russian assistance¹⁹.

South Africa. South Africa has tested a booster rocket believed to be a version of the Israeli Jericho II rocket and appears to be working on the development of its own space launch capability²⁰. The South African recently announced that it built six of seven planned nuclear weapons but dismantled them before signing the Nuclear Non-Proliferation Treaty in 1991²¹.

TRENDS FOR THE FUTURE

Having discussed the current capabilities of third world ballistic missile systems, let us consider what future capabilities may develop by examining the trends in the following areas: missile inventories; missile accuracy; targeting capability; warhead development; and access to space.

Missile Inventories. Based on the historical evidence of actual employment over the past twenty years, a number of third world countries have seen political and military advantages to having ballistic missiles in their armories. Egypt and Syria fired them against Israel in 1973, Iran and Iraq used them against each other in the war from 1980 to 1988, Libya unsuccessfully attacked a US military facility on the Italian island of Lampedusa in 1986, the Afghani government employed missiles against guerrilla forces in 1988 and finally, Iraq used missiles against Israel and Saudi Arabia during Desert Storm in 1991²². Precedent for employment of ballistic missiles is an established concept. Both conventional and chemical warheads have been used with significant effect on population centers. As a result, missile inventories are likely to be a part of a growing number of third world nations.

Missile Accuracy. The third world missile of today has a relatively large CEP and thus is of questionable military value.

A "good" third world missile with a 300 meter CEP and an equivalent 1000 kg unitary warhead (capable of damaging vehicles or standard buildings out to a radius of 60 meters) means that a given missile has only a few per cent chance of damaging its target²³. Thus it would take about twelve such missiles to achieve a 50% probability of cratering a highway and dozens of missiles to ensure damage to one of ten C-130 aircraft dispersed evenly on a 3000 foot runway²⁴. Clearly accuracy is an important factor in increasing the military effectiveness of a missile system. Improvements in missile propulsion and guidance systems are being actively pursued and upgrades of inertial design or access to Global Positioning System (GPS) technology have the potential to reduce CEP's in the near term to 100 meters or even as little as 50 meters with access to advanced technology²⁵.

Targeting Accuracy. Targeting accuracy is likely to remain a belligerent's biggest challenge. Without a long range sensor of some kind, accurate targeting is nearly impossible, particularly against dispersed and mobile military target. As a result, third world missiles will continue to be most effective against fixed targets and/or highly populated areas.

Warhead Development. To date warhead employment has been limited to either unitary explosive or chemical variants. However current technology may allow for deployment of cluster and fuel air munitions²⁶. Nuclear weapon production is expensive and

requires a high degree of technology to produce efficient warheads with correspondingly high yields. While several nations either have or could obtain working nuclear devices, final proof of design can be completed only by testing, which is subject to detection by various means. In addition, the nuclear weapons developed are likely to be of low yield. While a 1 to 5 kt warhead will make a 300 meter CEP missile much more effective, a number of missile systems employed today have CEP's of 1000 meters or larger. For some systems, yields of up to 20 kt may be needed to be militarily effective. Thus for the near future, nuclear weapons capability represents more of a threat to population centers and fixed targets than to mobile military targets.

Access to Space. As previously discussed, some countries are developing domestic space programs which could give them surveillance capability and thus increased reconnaissance, surveillance, targeting and damage assessment capabilities. In addition, commercially available communications and imagery are becoming easier and cheaper to obtain. While perhaps not a direct improvement of missile systems, this is one area in which a belligerent can improve the effectiveness of the missile system at hand.

In summary, technical advances and growing numbers make the ballistic missile threat a real and growing one. Although

technical improvements may require extensive testing to prove their worth, access to improved technology is growing easier and the results should become apparent in the near future. The many uncertainties in how quickly missile technology will proliferate and in how quickly highly capable ballistic missile systems will be developed requires, as always, that the operational commander will have to pay close attention to his prospective adversary's capabilities whatever develops.

OPTIONS AND RESPONSES

Ballistic missiles possess unique capabilities that make them particularly useful. They can travel a long distance in a short time and thus give little or no warning of their arrival. They are difficult to intercept once launched and many air defense systems are unable to detect, track and assign counter targeting to multiple launch or multiple axis attacks. Finally, as demonstrated by Iraq, it is possible to operate a missile force more easily than an air force and even possible to launch missile attacks without having air superiority in one's own air space.

What is the potential impact of ballistic missiles on theater operations? What options are available to the operational commander to defend his forces effectively? How should the commander respond to best counter the threat?

Assessment of Military and Political Effectiveness. During Desert Storm, the world was exposed to real time television coverage of Iraqi Scud missile attacks against targets in both Israel and Saudi Arabia. These attacks had little military significance but the psychological and political impact was enormous. The result was an intense effort to find and destroy weapons with little real military value.

The lesson learned is that the operational commander will have to consider the political impact as well as the military impact of a potential adversary's ballistic missile employment. As demonstrated in Desert Storm, the host nation must be made aware of the opponent's capabilities and the civilian population as well as the military forces engaged must be prepared to withstand such attacks. Until significant technical advances occur, the most effective use of short and medium range ballistic missiles will be civilian population centers. In its attacks on Israel, Iraq provided an additional political lesson. Clearly non-belligerent neighboring states within the theater of operations must also be part of the commander's contingency planning. The attempt to hold friendly forces hostage to an attack on a friendly non-belligerent or neutral third party will require diplomatic and political negotiations as well as military operations to effectively counter the threat. Each situation will be unique and will have to be addressed as circumstances warrant.

Operationally, the opponent's capability must be assessed by considering the missile system's range, payload and accuracy with additional considerations given to inventory and rate of fire. Most ballistic missile systems employed today have a relatively short range but even a missile capable of only a 50 mile range are still capable of threatening fixed bases in rear areas. Accuracy and payload are the next two items to consider in determining how much of a threat exists. Currently employed missile systems have a large CEP and warheads have been either of unitary explosive or chemical design. Technical upgrades may soon make missiles militarily effective by increasing accuracy and by adding better warheads with cluster, fuel air or even nuclear munitions. Finally, the number of missiles an opponent has on hand and how rapidly he can launch them are the remaining considerations to be given to assessing how militarily effective a given missile system will be. Low inventories and low rates of fire significantly reduce the military impact of a ballistic missile system. During Desert Storm, the low rate of fire and the poor accuracy of the missile system used reduced the military consequences of a Scud attack to random chance.

Options and Responses. After assessing the capabilities of the opponent's missile system(s), what options does the operational commander have to counter the threat and what actions should he take? Consider a general scenario in which a brigade sized unit must be deployed overseas to assist an ally in

responding to the hostile actions of a neighboring regional state.

Typically troops and some equipment will arrive by air and assemble in the vicinity of the airport before deploying into the combat area. Heavier equipment will arrive by sea and be placed in a staging area until moved to a forward location. The first steps in countering the missile threat is to take steps minimize possible damage to entry points, staging areas and logistic bases. Since air and port facilities are fixed targets in known locations, a viable missile threat means that resources will have to be allocated to defend these facilities and people, equipment and logistics must all be organized to spend as little time in these areas as possible. Security concerning troop and supply movements must be rigidly exercised.

A number of options are available to the commander to reduce or eliminate a ballistic missile threat. One option is preemption in which missiles are destroyed before they are launched. Unfortunately, as shown by Desert Storm experience locating and destroying a solid fueled missile deployed on a mobile launcher is a very difficult task, even with complete air superiority over the enemy's air space. The task is further compounded when the enemy uses fortified bunkers or underground storage facilities and engages in deception such as positioning dummy launchers. Frequently the launcher is most easily detected after the missile

is launched at which point the launcher immediately becomes greatly reduced in importance. While detection and destruction of missiles prior to launch should be pursued, the commander can probably be more effective in attacking the enemy's command and control systems and his targeting capability.

A second option is interception in which the missile is destroyed in flight. A Scud-B travels at Mach three²⁷ which means that a target 200 miles away will be struck five to seven minutes after launch. The lack of warning and short flight time means that extensive efforts by the operational commander will have to be made in establishing missile launch detection systems and in employing anti-ballistic missile (ABM) systems. This is an area over which the operational commander has little control since continued technical advances are needed before a truly effective ABM system is developed. The most effective action for the commander to take is to ensure that national as well as theater assets are directed to detecting missile launches and to giving as much warning time as possible.

Just as use of national and theater space based assets is an important operational tool for friendly forces, denial of space based assets to the adversary can limit his operational employment of his forces. Preventing the enemy from using space based communications and imaging satellites inhibits both command and control and surveillance. While military satellites may be

effectively jammed or otherwise neutralized, commercial satellites will require diplomatic negotiation to render them useless to enemy employment. The operational commander must evaluate his requirements and make them known to higher authority as soon as possible.

The next option is to consider hardening of military targets. In this area the operational commander can be very effective. Underground storage facilities and revetments may be tedious to construct but they are inexpensive and very effective. Critical equipment, communications sites, repair facilities and storage locations can easily be protected by earth or concrete. There will be some facilities that can not be protected in this manner but they should be kept to the minimum possible.

"Civil defense" in terms of constructing or providing bomb shelters, gas masks, pre-staged first aid supplies, and chemical defense gear will reduce the effects of a missile attack should one occur. The planning and estimate of civil defense related activities should be considered prior to arrival in theater and will most likely require coordination with the host nation and other allies as well.

One last area which an operational commander may consider is that of retaliation or reprisal. Use of chemical or nuclear weapons by friendly forces and/or attacks on purely political,

economic or cultural targets as a means to deter or retaliate for missile attacks will most certainly be subject to prior review and approval by the national command authority. While this course of action may well be effective in deterring missile attacks, the advantages can easily be negated. The price may be rapid escalation, stiffening of enemy resolve, censure and interference from other nations or aid and support to the enemy from sympathetic countries which were previously neutral. For all practical purposes, this course of action is of limited use because of the risks involved.

The operational commander thus has a number of possible actions he can take to defend his forces from ballistic missile attack by a third world nation. In many respects these actions are easily and even obviously derived. However the previous threat was very low and there was little reason to allocate resources when other threats were more important. As capabilities develop, the operational commander will find himself devoting more time and effort to offensive and defensive missile operations.

CONCLUSION

The third world ballistic missile threat of today presents a low level threat to military operations engaged in a regional

conflict. Short ranges, inaccurate targeting, inaccurate missiles, low inventories, low rates of fire, command and control difficulties and low technology all combine to make these missile systems more of a harassment problem than a serious military threat. As an example a single F-16 can carry a payload equivalent to that of four Scud-B missiles and deliver its weapons with precision accuracy²⁸. For now the operational commander is more likely to find himself more concerned with the political consequences of attacks on host or allied nation population centers and with the extensive allocation of resources to find and destroy the enemy's missile launch systems.

Nevertheless the threat is growing and by the year 2000, more nations will have missile systems that will have significantly more capability than the ones employed today. Technical improvements from foreign suppliers and from the growing scientific and engineering infrastructure of developing nations will mean that the operational commander will soon face more capable missiles in terms of range and accuracy. Improved warheads with cluster, fuel air, improved chemical and even nuclear munitions will also be available.

Planning and executing an effective missile defense will take on greater importance and nations will work to improve their defensive capabilities as well. How well the lessons of Desert Storm have been taken to heart may be shown by Israel's current

effort to develop a sophisticated anti-ballistic missile capable of achieving Mach 9²⁹.

The operation commander is facing a world in which more nations are acquiring more capable systems. In the next ten years, ballistic missile employment in a regional conflict will pose a serious military threat to the forces engaged. The planning for how to effectively counter this threat and how to fight and succeed in spite of it should begin now.

Table 1 (contd.): Selected Ballistic and Space Launch Missile Capabilities of Third World Countries.

Country	Missile/Type	Range(KM)	Status	Warhead
LATIN AMERICA				
Argentina	Alacran BM/SLV	200	D	
	Condor I BM	95	O (?)	
	Condor II BM	900	Canceled	HE
Brazil	SS-300 BM	300	D/T (1)	HE, CL (?)
	MB/EE-350 BM	350	D	HE, CL (?)
	MB/EE-600 BM	600	D	(series)
	MB/EE-1000 BM	1000	D	
	SS-1000 BM	1200	D (1)	
	IRBM BM	3000	P/D	N
	VLS SLV	10000	P/D	
Note: (1) For sale to Libya and Iraq. (?)				
Cuba	Frog-7 BM	65	O	HE
MIDDLE EAST/MEDITERRANEAN				
Algeria	Frog-7 BM	65	O	HE
Egypt	Frog-7 BM	65	O	HE
	Sakr-80, 365 BM	?	O	
	Scud-B BM	300	O	HE
	Project T BM	450	D	
	Vector BM	600	D (1)	HE, Fuel Air (?)
	Scud-100 BM	600	D (2)	
	Badr-200 BM	800	Canceled (1)	
Notes: (1) Developed with Argentine assistance based on Condor II.				
(2) Chinese assistance and British Aerospace Involved.				
Iran	Shahin-2 BM	60	O (1)	HE
	Iran-130 BM	130	O (1)	HE
	Mushak-120 BM	120	O	
	Mushak-160 BM	160	O (2)	
	Mushak-200 BM	200	D	
	Iran-200 BM	200	O	
	Scud-B BM	300	O (3)	HE
	Scud-C BM	600	O (3)	HE
	M-9 BM	600	P (4)	

Table 1 (contd.): Selected Ballistic and Space Launch Missile Capabilities of Third World Countries.

Country	Missile/Type	Range(KM)	Status	Warhead
Iran	Tondar-68 BM	1000	D	
	Notes: (1) Indigenous. (2) Chinese assistance. (3) Supplied by North Korea. (4) Attempting to acquire from China.			
Iraq	Frog-7 BM	65	O	HE
	Laith BM	90	O	
	Nissan BM	110	O (1)	HE
	Fahd-D BM	250-320	D (?) (2)	
	Scud-B BM	300	? (2)	HE
	Al-Husayn BM	600	? (2)	HE,C,B
	Al-Abbas BM	300	? (2)	HE,C,B
	Notes: (1) Indigenous. (2) Under UN security resolution, Iraq was to destroy all missiles with a range of greater than 150 km.			
Israel	Mar-290 BM	40	O (1)	
	Mar-350 BM	40-150	O (1)	
	Lance BM	130	O (2)	HE
	Jericho I BM	650	O (3)	HE,C,N
	Jericho II BM	1500	O (3)	HE,C,N
	Jericho IIB BM	1300	O (1)	HE,C,N
	Shavit SLV	2500	O (3)	
	Notes: (1) Indigenous. (2) U.S. import. (3) French assistance.			
Kuwait	Frog-7 inventory believed completely destroyed in Gulf War.			
Libya	Frog-7 BM	65	O	HE
	SS-21 (?) BM	120	O (?)	HE
	Scud-B BM	300	O	HE
	Otrac BM	480	D (1)	
	Al-Fateh BM	480-725	D (1)	
	Ittisalt BM	700	D (1)	
	Note: (1) Indigenous, initially designed with German assistance.			
Saudi Arabia	CSS-2 BM	2000	O (1)	
	Note: (1) Chinese import.			

Table 1 (contd.): Selected Ballistic and Space Launch Missile Capabilities of Third World Countries.

Country	Missile/Type	Range(KM)	Status	Warhead	
Syria	Frog-7	BM	65	O	HE
	SS-21	BM	120	O	HE
	Scud-B	BM	300	O	HE
	Scud-C	BM	600	O (?) (1)	HE
	M-9	BM	600	? (2)	HE

Notes: (1) North Korean Import.
(2) Purchased from China but not delivered.

Turkey	Honest John	BM	37	O	HE
	ASR-227	BM	<150	? (1)	

Note: (1) Indigenous.

Yemen	Frog-7	BM	65	O	HE
	SS-21	BM	120	O	HE
	Scud-B	BM	300	O	HE

OTHER COUNTRIES

Indonesia	GSLV	SLV	1500	P	
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South Africa	Arniston	BM	1500	T/D (1)	N (?)
	Jericho II	BM	1450	T (2)	

Notes: (1) Israeli assistance.
(2) Israeli design.

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