US-CHINA RELATIONS: A STUDY OF MISSILE ISSUES

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CERTIFICATE

Certified that the dissertation entitled **"US-CHINA RELATIONS: A STUDY OF MISSILE ISSUES"** submitted by me in partial fulfillment of the requirements for the award of the degree of **MASTER OF PHILOSOPHY** has not been previously submitted for the award of any other degree of this university or of any other university and is my original work.

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Dedicated

to

my parents

CONTENTS

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PREFACE

The nature of inter-state relations is determined by a number of factors: strategic-security, economic-commercial, military-technological and political. These factors have common significance for states and their behavior is determined by their particular understanding and perception of these. Missiles, over the last few decades have become central to the strategic and security thinking of states. As such, the missile related issues have been crucial for the bilateral relations between the US and China, as these directly affect the security and strategic concerns of both the states. These have led to much confrontation between the two during the last two decades. It would be of much interest to have an analytical look on this issue, which had influenced the trajectory of the Sino-US relation during most of the recent past.

The 'Introduction' part of this research deals with a general observation of the Sino-US relations and the bearing of missile issues on them. Missile issue has created tension between the two countries. The chapter also deals with the nature and role of missiles and their significance for strategic and security planning. Missiles, today, constitute an important part of a country's weapon delivery system. Due to their greater effectiveness and low-cost affordability, missiles are probably most sought after weapon systems. Missiles hold great security as well as strategic implications. Armed with Weapons of Mass Destruction, these can generate terror among enemies. Acquiring more and more

missile capabilities means strengthening the deterrence value of countries's forces.

'Chapter Two' deals with the missile programmes of both the US and China. Both the countries possess a number of missiles targeted at each other although the US missile capabilities have an enormous edge over those of the Chinese. Both the US and China perceive mutual threat from each other's nuclear-tipped missiles.

In 'Chapter Three', the focus of analysis is centered around the much talked about missile defense systems of the US. China feels threatened due to the US plans for missile defense system. The proposed US National Missile Defense System (NMD), if deployed, will neutralize the Chinese deterrence. Moreover, the inclusion of Chinese neighbouring countries such as Taiwan and Japan, in the Theatre Missile Defense Systems (TMD) are viewed by China as an attempt to encircle or contain it. China, therefore, protested against such US plans. China threatens to respond by taking counter measures and building up a robust missile forces to counter the US defenses.

Another major source of tension between the US and China is related to the issue of proliferation of missile technology. This has been discussed elaborately in 'Chapter Four'. China has resorted to arms and missiles technology sales to other countries in order to earn much-needed foreign currency, enhance its diplomatic weight and obtain political support from the recipient countries. Interestingly, the US contends that China transferred missile technologies to the states, most of whom cause serious security threat for the US. China, on the other hand, accuses the US of its hypocritical behaviour on this

issue and it has been non-committal with regard to its promises on non-proliferation of missile and nuclear technology.

The nuclear espionage episode sprang a surprise for those advocating a close Sino-US cooperation. The hard liners, who subscribed to the Cox Report conclusions, revived the "China threat" theory by alleging that China was involved in a wide-ranging theft of sensitive US missile and nuclear technology. This would pose, as they claim, a great security threat to the US in future. Thus seen from the prism of missile issues, the Sino- US relations make an interesting subject for research. In the following chapters an attempt has been made to probe into the Sino-US relations focusing particularly on the missile issues.

CHAPTER ONE

INTRODUCTION

Since the US President Richard Nixon's path-breaking visit to the People's Republic of China, relations between Washington and Beijing have had something of a roller coaster trajectory. China and the US have gone through various phases of friendship and tension, conflict and cooperation. Indeed, the realization on the part of both the countries that greater engagement between them would serve the interest of both compels them to cooperate. At the same time, there are certain contentious issues which have created considerable tension and the relations have occasionally turned sour. From amongst a large number of tension generating factors, we can judiciously select some of these and club them under what we can call missile issues.

Missiles are not just delivery systems to be seen from a pure military point of view. Since their inception into security structures of the states, missiles have revolutionized the strategic-security thinking and planning. In bilateral relations, missiles and related issues serve as a defining factor. In Sino-US relations missiles do play important role as a major source of tension and conflict. The policies adopted by both the US and China regarding missile related issues have contributed to mutual suspicion and resulted in mutual accusations. Be it, the development and deployment of missile forces in their own arsenal or export of missile technology and related systems and equipments or theft of missile or nuclear technology - each

of such issues have had a damaging impact on bilateral relations and probably would continue to do so in future. There is hardly any concrete and workable cooperation with regard to finding solutions for missile disputes. Thus, seen from the angle of missile issues, the bilateral relations between the US and China present a gloomy picture. One can say that missile issues have contributed towards derailing the relationship to a great extent in recent years. It has exacerbated certain persistent areas of conflict.

Today, the US has become China's principal external security concern. After the collapse of the Soviet Union, the US remained the "only foreign power capable of directly threatening China's security, blocking the PRC's projection of power, and preventing unification with Taiwan."[1] It stands in the way of China's rise to the paramount status in Asia. Beijing is fearful of the fact that the US has a network of forward-deployed military forces, alliances, and strategic partners in East Asia to contain China. Since the late 1980s, Beijing has come to see the US not as a strategic partner but as the chief obstacle to its own strategic ambitions.[2]

There has been a great debate within the US over the last several years on the issue of dealing with China. The range of views extends from hardliner advocacy of 'containing' China to the moderate view of comprehensive 'engagement'. The Clinton administration had tough time in balancing between these two policy approaches

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[1] Mel Gurtov and Byong-Moo Hwang, *China's Security: The New Roles of the Military*, (Boulder, Lynne Rienner Publishers, 1998), p.70.

[2] Richard Bernstein and Ross H. Munro, "The Coming Conflict with America", *Foreign Affairs*, March/April, 1997, vol.76, no.2, p.18.

before it could implement a China policy of closer cooperation and greater economic and commercial engagement. However, Clinton's successor George W. Bush Jr. reinvented the old rhetoric of 'China threat', proclaiming China a 'strategic competitor'. The Pentagon quickly become active and formulated its own policy to enhance US relations with Taiwan. "Within months after Bush took office, an ugly incident of a US spy plane, a sizeable arms sale to Taiwan, and aggressive talk of US missile defense increased tension markedly."[3] Interestingly, however, over the last three years, especially after the September eleven attacks on America, a lot has improved as far as the bilateral relations are concerned. It is still unclear what definite shape the bilateral Sino-US relations would take in future. The scope of the present thesis revolves around the issues related to missiles and their bearing on the bilateral relations. Before we go into specific issues related to missiles, it would be of great use to discuss the nature of missiles and their impact on strategic planning and security thinking.

Role of Missiles in Strategic Thinking

From the earliest days of its development, missile has been ascribed an almost supernatural power to generate terror.[4] Missiles were first used in large numbers in the Second World-War. The German V-1 and V-2 missile campaigns against the UK exerted a powerful psychological force and also caused much

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[3] Elizabeth Economy, "Changing Course on China", *Current History*, vol.102, no.665, September 2003, p.243.

[4] Mark Smith, "On Thin Ice: First Steps for the Ballistic Missile Code of Conduct", *Arms Control Today*, vol.32, no.6, July/August 2002, p.9.

destruction at a very low cost. Since then the development of missile technology has come a long way and today the world is full of a vast range of missiles.

R.V. Jones, a British scientist once noted that "no weapon yet produced has a comparable romantic appeal"[5] as he emphasized the kind of psychological impact left by such weapon. The idea is as relevant today as it was then. The outcome of a war is determined by a complex combination of factors that include numbers, politics, strategy, tactics, training, leadership, organization, logistics and, of course, weapons. A slight superiority in most of these categories or a great superiority in one, can account for victory.[6] It is obvious that the country possessing better weapons increases its chances of victory. Missiles are today considered to be deadly weapons and are probably the most sought after weapon system in the world.

While weapons come and go in the military, history provides examples of classes of weapons having both a dramatic and enduring impact upon the conduct or prevention of warfare. A number of technological developments have fundamentally changed the airpower during its short history. Some of the more salient examples are jet engines, nuclear warheads, radio, radar and missiles (ballistic and cruise: surface-to-surface, air-to-air, air-to-ground and surface-to-air).[7]

Ballistic missiles possess unique capabilities due to which they are considered very important for military use. First, they are capable of traveling long distances in

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[5] Ibid.

[6] Kenneth P.Werrel, *The Evolution of the Cruise Missile*, (Alabama, Air University Press, 1985), p.2.

[7] Ibid, p.2.

relatively short periods of time. Second, existing air defenses are unable to intercept ballistic missiles (though US has proposed to put in place a missile defense system and is currently working on it), so that missiles are assured of penetrating the intended target. Third, it may be easier for a country to operate a missile force than an air force. In some cases, ballistic missiles might be the only practical means of attacking targets at long ranges.[8]

Missiles and Weapons of Mass Destruction

Missiles can carry both conventional and nuclear/chemical (weapons of mass destruction) warheads. Today, they are supposed to be much more effective, especially in their deterrent value, if the carry weapons of mass destruction. The poor accuracy and small payload of most long range ballistic missiles discourage countries from arming them with conventional explosives. Therefore, missiles, in particular the long-range ballistic missiles are considered to be cost-effective delivery systems which can send WMDs over great distances. The link between ballistic missiles and weapons of mass destruction underpins the psychological impact, which the missiles are known to have. Consequently, missile development and WMD are now intertwined, and rhetoric on WMD proliferation almost always includes concern over delivery systems.

Although some scholars have pointed out the drawbacks of missiles as an effective delivery system compared to strike aircrafts, most states today want to acquire missiles, for various reasons. A state may acquire missiles in order to

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[8] Carus W. Seth, *Ballistic Missiles in Modern Conflict*, (New York, Praeger, 1991), p.27.

diversify its delivery capabilities so as to overcome the vulnerability of one system. In other cases, a state might want ballistic missiles, if it were unable to afford the acquisition, infrastructure, training, and maintenance costs of advanced strike aircraft; if it did not have a sufficient pool of trained pilots; or if military leaders believed that strike aircraft could not penetrate defenses; and of course, if it is not able to buy advanced combat aircraft and support system. Finally, states turn to missiles for a perceived psychological value of conventional missile strike in disrupting morale and causing panic among civilian populace of the enemy country even if missiles are relatively ineffective in producing heavy casualties.[9]

There are a number of issues related to the role of missiles in strategic and security matters which are currently debated and accounted for:

First, the most important aspect of missile is its uniquely threatening nature, which exerts strategic effect of a qualitatively different nature than other delivery systems. An intermediate range or strategic ballistic missile can reach its target in a matter of minutes, compared to hours in case of a strategic bomber. The great speed at which they fly and their travel mainly through space make it extraordinarily difficult to defend against them, the US missile defense plans notwithstanding. No other delivery system can provide all those elements of range, speed, and time, relative immunity to defenses and of course, cost-effectiveness. For a state without a

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[9] John R. Harvey and Uzi Rubin, "Controlling Ballistic Missiles: How Important? How to Do It?" *Arms Control Today*, vol. 22, no.2, March 1992, p.14.

force-projection capability but whose aim is to generate long-range strategic effects, ballistic missiles are the delivery system of choice.[10]

Second issue relates to concerns over missile proliferation or the spread of missiles all over the world. Some states, today, possess large number of ballistic missiles with great range, accuracy and sophistication, while others, mainly, in the developing world are actively seeking to acquire missiles, especially the ballistic missiles. Most of these appear to have purchased missiles from the global missile market. For example, Pakistan, Iran, Iraq, Taiwan, Israel, North Korea and Syria have acquired missiles through purchase. The kind of impact missile proliferation can have on regional and global security is a cause of concern for many. "Ballistic missiles may affect regional confrontations, if they undermine crisis stability, give their owners greater strike capabilities than are available by other means, stimulate arms races, or worsen regional tensions. Missile proliferation may also create a new means by which regional states can threaten the major powers."[11]

In controlling proliferation of missiles, the states have come up with global as well as individual efforts. While on the one hand, a set of guidelines embodied in Missile Technology Control Regime (MTCR) has been put in place, some states on the other hand, mainly the US, have intensified efforts to develop adequate defenses against ballistic missiles. There is currently no multilateral treaty or agreement regulating the production, possession, or trade in missiles. The MTCR, established

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[10] Mark Smith, n.4, p.10.

[11] John R. Harvey and Uzi Rubin, n. 9, p.15.

in 1987, is an informal and voluntary export control regime that seeks to limit the proliferation of missile systems and related technology that can deliver a payload of 500 kg or greater to a range of at least 300 km.[12] Thus, one can see how missiles leave an impact on the military, security and strategic aspects of bilateral relations as well as on regional and global security and give rise to a host of debatable issues among states. In this view, we will proceed to underscore the role and impact of missile issues in Sino-US bilateral relations.

Missile Defense and China

Over the last several years, the US plan for ballistic missile defense systems, both versions of it - theatre and national, has been a growing source of tension in Sino-US relations. A missile defense involves the deployment of defensive weapons in order to protect a territory from incoming missiles by shooting them down. The two main categories of such missiles defenses are - Theatre Missile Defense (TMD) and National Missile Defense (NMD). Today, the US is perhaps the only country which is pursuing an active programme of missile defense, although the former USSR is believed to be the first country to have deployed some kind of a missile defense. The US perceives growing threat to its national security from the so-called 'rogue' states which are hostile to it. There has been considerable debate, both within and outside the US over the missile defense programme. Those who support it, argue that in order to protect the US and her allies from missile attacks carrying

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[12] Jayantha Dhanapala, "Introduction "in "missile Development and Its impact on global Security," *DDA Occasional Papers*, 2000, no.2, September 1999, pp.1-3.

weapons of mass destruction (WMDs), the US must pursue a missile defense deployment plan at whatever price. Those who oppose it, argue that it would spark the deadly arms race.

The discussion and debate over the feasibility and effectiveness of the proposed missile defense is currently going on in the US. But there are very significant implications of a TMD/NMD deployment for the Chinese. China has become increasingly apprehensive about such developments which have direct bearing on her national security. Until recently, the Chinese leadership had been focused on theatre missile defenses (TMD) as a perceived threat to China's key national interest in preventing Taiwan's independence. Chinese have opposed provision of any TMD system to Taiwan while their greatest concern is that Washington will provide Taiwan with advance TMD that is operationally linked to the US military.[13] They argue that such linkages would mean a "de facto restoration of the US- Taiwanese military alliance which was abandoned with the normalization of Sino-US relations in 1979."[14] Chinese fear that this would ultimately lead to extension of the US political support for Taiwan's independence. In the meanwhile, the issue of National Missile Defense (NMD) emerged as another source of tension. Chinese regard it to be a potentially more serious threat to Chinese security as it poses a "direct military threat" to China's national security, and raises several other political and military-strategic challenges.

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[13] Banning Garrett, "Facing the China Factor", *Arms Control Today*, vol.30, no.8, October 2000, p.14.

[14] Ibid.

The Chinese fear that a US NMD would negate the credibility of China's nuclear deterrent force which has brought China the great power status and helped her assert independence in world affairs. While the hardliners in the US have not hesitated in declaring that missile defense is intended for China, the moderates have taken a more cautious approach. For example, the Clinton administration clearly stated that "the US needs an NMD system to defend against so-called 'rogue' nations, such as North Korea, Iran and Iraq, and to shoot down a handful of missiles from the accidental launch" and it did not explicitly mention China as one of the driving forces behind NMD.[15] It appears, however, that current US NMD plans are designed to counter the small Chinese ICBM force.

Indeed, the US NMD plans are significantly influencing the internal Chinese debate regarding its plans for nuclear and missile modernization. It is being seen as a provocative and destabilizing step that may force China to alter its current nuclear posture, which is considerably weaker than that of the US. Chinese view missile defense as undermining global strategic stability by making all other nations insecure. Beijing, therefore, will be forced to buildup the nuclear and missile arsenals to counter the proposed US shield, which will in turn spark arms races.[16] Very few Chinese believe in the US assurances that the missile defense system is not

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[15] Charles Ferguson, "Sparkling a Build-up: U.S. Missile Defense and China's Nuclear Arsenal", *Arms Control Today*, vol.30, no.2, March 2000, p.13.

[16] Joanne, Tompkins, "How U.S. Strategic Policy is Changing China's Nuclear Plans", *Arms Control Today*, vol.33, no.1, January/February., 2003, p.13.

aimed at China, since the capability of missile defence to intercept Chinese missiles will be inherent in any deployed system.

The above concerns have set off a debate in China on how to respond to missile defense. There are three major sets of ideas in this regard.[17] The first argue that, because missile defense is merely a tricky ploy, China need not alter its nuclear posture whatsoever and should not divert valuable resources to counter a missile defense system that will never work. The second view advocates a robust response as it believes that the Chinese economy can absorb a buildup to as many as 1,000 ICBMs, which can be used to saturate the missile defense. The third one, which also reflects the majority view, holds that a moderate response to the US missile defense programme is required. The advocates of this view hold that missile defense will not pose a serious threat until at least 2008, and China will have enough time to wait and see before pursuing a more aggressive response. They argue that a moderate buildup would suffice for now. In addition, they advocate China's pursuit of Multiple Independently Targetable Reentry Vehicle (MIRVs), which would be more effective at penetrating a ballistic missile shield.[18] Moreover, counter measures are gaining spotlight among Chinese analysts as several of them believe that these can be successfully employed against a US missile defense.

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[17] Ibid, p.14.

[18] Ibid, p.15.

Missile Technology, Non-Proliferation and Related Issues

The history of Sino-US tension over the issue of military technology exports has been one of confrontation and a lack of mutual concern. Although both the US and China have actively endeavoured to find common ground on the arms control and missile proliferation issues, the confrontational and reactive nature of their interaction has prevented them from doing so.

A lot of suspicion has been generated in the US over the reported illegal transfer of Chinese arms and military technology to other states. The US sees such transfers as encouraging proliferation of weapons of mass destruction and accuses China of causing regional instability. China, on the other hand, finds the current arms control regime to be detrimental to its interests. Moreover, Chinese complaints against the US also emerge from the US military supplies to some countries, which China regards to be its strategic competitors such as Taiwan, Japan and South Korea. Arms sale to Taiwan by the US is regarded as the most objectionable by the Chinese.

The US had agreed in the 1982 Sino-US communiqué that it would not increase the level of arms sales to Taiwan, either quantitative or qualitative and would rather reduce it gradually. Beijing pledged, on its part, to the US in 1992 and once again in 1994 to abide by the parameters of the MTCR, the international regime designed to prevent the proliferation of ballistic missiles and related technology.[19]

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[19] Bates Gill and Matthew Stephenson, "Search for Common Ground: Breaking the Sino-U.S. Non-Proliferation Stalemate", *Arms control Today*, vol.26, no.7, September 1996, p.15.

Nevertheless, both governments often accuse each other of violating its pledge. The US officials categorize China's non-proliferation record as mixed. They acknowledge a slight improvement over the years but at the same time have shown continued concerns over Beijing's arms export policies. The US has pursued a non-proliferation policy targeting North Korea, Iran, Iraq, Libya and Syria and especially Pakistan. China has a record of military related trade with all of these countries, and this relationship continues even today with Pakistan, Iran and possibly North Korea.

China, on the other hand, believes that international arms control regimes often impose major costs on Beijing and are invoked selectively by western countries, especially the US.[20] The Chinese contention is that it is accused of violating imprecise standards, which they were not involved in negotiating. It accuses the US of flouting its own arms control commitments, most importantly, by large scale sale of advanced weapons to Taiwan.

The positions of both the US and China on military technology transfer issues are shaped by their respective worldviews and foreign policy agenda. China accuses the US of hypocritical behaviour in this regard; pointing out that the US is world's largest arms exporter. China's perception of its standing in the world differs fundamentally from that of the US. Washington tends to pursue policies that support and help in preserving a stable world order. It opposes whatever it perceives to be destabilizing for the existing order and it sees the Chinese arms exports policies as a

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[20] Jennifer Weeks, "Sino-U.S. Nuclear Cooperation at a Crossroads", *Arms Control Today*, vol.27, no.4, June/July, 1997, p.11.

destabilizing factor. At the same time, the US regards its own arms exports to certain countries as stabilizing and therefore justifies it.[21]

On the other hand, China remains greatly dissatisfied with the existing order, branding it as western dominated. China seems less concerned with the US objections and fears regarding Chinese transfer of arms to countries, which the US sees as hostile. It views military technology transfers as a means to achieve strategic goals and earn foreign currency. The monetary gains from the arms exports are seemingly the primary goal for China. The idea is to direct this money to finance defense and economic modernization, which would ultimately serve China's national goal that is, gaining a rightful place it deserves in the new world order.[22]

Moreover, China has been vacillating in the eyes of the US on the promises it made to abide by the international arms control regime. Most notably, Beijing pledged to honour the MTCR; but it is not a member of the regime and its behaviour suggests that it does not regard MTCR guidelines as binding. China has been critical of MTCR on two counts - first, Chinese officials resent being pressured into arrangements such as MTCR, for it was not a party to the negotiations; Secondly, they point out that limiting China's missile sales puts China at a disadvantage in the market of long-range delivery systems, because there is no such ban on aircraft sale.

The US decision to withdraw from the ABM Treaty was opposed by China, albeit mildly. The Chinese analysts argued that in doing so, "the US has taken a

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[21] Bates Gill and Matthew Stephenson, n.19, p.17.
[22] Ibid.

destabilizing action," which would fuel regional arms races. However, China's reaction to the official withdrawal was unexpectedly soft.

Another source of great tension between the two countries in recent years is based on the US accusations that the Chinese government has been involved in a comprehensive espionage program to acquire information on nuclear weapons designs and missile technology. A Congressional panel called Cox Committee, in its report, made sweeping charges about China having illegally obtained sensitive and critical technological information from the US laboratories over the past several years. According to the report, this will greatly help China in its defense modernization program which would ultimately turn into a greater threat to the US security. The nuclear espionage episode created considerable tension and the bilateral relation between the US and China turned unpleasant.

CHAPTER TWO

THE CHINESE AND THE US MISSILE PROGRAMMES

I. Evolution of the Chinese Missile Programme

China's missile force is currently estimated to comprise of more than 140 warheads on around 40 intercontinental ballistic missiles (ICBMs), some 88 medium-range ballistic Missiles (MRBMs) and 12 submarine launched ballistic missiles (SLBMs) and one Xia class submarine.[1] There are also short-range ballistic missiles (SRBMs) for tactical operations, such as the M-9s which were test-fired toward Taiwan during 1995 and 1996. The first-generation nuclear armed missiles were developed and deployed by the Chinese military industry during the period from 1956 to 1981. After that, the second artillery of the People's Liberation Army (PLA) fielded two types of intermediate-range ballistic missiles (IRBM) and one intercontinental ballistic missile (ICBM). These were liquid-fueled missiles and were designed to carry heavy warheads against cities and other "soft" targets.[2] Chinese also experimented with smaller, mobile missile with the same liquid propellants, but finally they turned to solid-propulsion system after the successful flight of a submarine-launched ballistic missile (SLBM) in 1982. By 1986, the more survivable solid-propellant missiles, both submarine launched and ground mobile, began to replace the first-generation

[1] 'Chinese Nuclear Force', *Bulletin of Atomic Scientists*, Vol 57, no.5, September-October 2001, pp. 71.
[2] John W. Lewis and Hua Di, "China's Ballistic Missiles Programs: Technologies, Strategies, Goals", *International Security*, Fall 1992, vol., 17, no.2, p.7.

strategic forces and this process was scheduled for completion before 2010. The obvious goal has been to create a less vulnerable, reliable and flexible strategic force.

The development of Chinese missiles has been divided into four phases by Shirley Kan and Robert Shuey in a CRS report prepared by them.[3] After developing land based MRBMs and limited-range ICBMs in the first phase, China decided on diversity and reliability. Therefore in the second phase, China inducted long-range ICBMs, SLBMs and SRBMs in its missile force, while improving upon mobility and the shift to solid fuel. In the third phase, China has supposedly planned to deploy by 2000-2005, a new set of missiles including a new MRBM with a large conventional warhead for tactical operations, (though there are doubts about the continuance of this particular programme), a new land-mobile, solid-fuel ICBM with a lighter warhead, and a new, longer range SLBM on a next-generation submarine. In the fourth phase, China is believed to have planned for the deployment of a land-mobile, long-range, lighter warhead ICBM for the 21st century.[4]

In addition, China has developed and deployed a number of conventionally-armed anti-ship, air-launched, and ground-based, coastal defense cruise missiles. It may develop more cruise missile which would be of the land-attack category. The purchase of Russian supersonic Sunburn anti-ship cruise missiles indicates that the PLA is now choosing to modernize more rapidly through selective foreign acquisitions rather than relying solely on the deficient

[3] Shirley A. Kan and Robert D. Shuey, "China: Ballistic and Cruise Missiles", *CRS Report for the Congress*, The Library of Congress, 1998, p.2.
[4] Ibid, p.2.

domestic defence industries.[5] Since the early 90s China has embarked upon a military modernization programme largely with the help of technologies obtained from foreign countries. The modernization programme among other things includes, increasing the accuracy and survivability of its missile force and enhance the offensive capability by using Multiple Independently Targetable Reentry Vehicle (MIRV) technology.

We will now undertake a detailed periodic analysis of the Chinese missile programme starting from the early efforts in this area till recent modernization programme. This would help us better understand the real nature and role of Chinese missile programme.

Early Efforts and the Rationale for Missile Development

During the Cold War major strategic objective of China was to deter the nuclear superpowers, first, the US and then the Soviet Union, especially since the late 1960s. John W. Lewis and Hua Di categorically point out that there is no evidence that any "overarching strategic doctrine" informed the Chinese leadership and its decision to proceed with the strategic missile programme in the mid 1950s. In the early years these programmes were "essentially technology driven" and it was only in the early 1980s that China developed relevant strategic and tactical doctrines for its missile forces. Beijing regarded the US as its enemy and a nation that had repeatedly threatened China with nuclear attack i.e., nuclear blackmail. It was understood by the Chinese leadership that only long-range ballistic missiles could strike the homeland of the US and therefore the Missile

[5] Ibid, p.2.

Research and Development Organization was assigned the task of building the missiles. China did not consider building tactical ballistic missiles (TBMs) despite having capability to do so. Conventional TBMs were not judged cost-effective for battlefield use. Not until 1984, the Chinese became aware of the potential market in the third world, that they began developing TBMs for export.

The Soviet Assistance

The missile programme of China was initiated with the much needed help extended by the Soviet Union. In mid-50s Soviet advisers suggested the Chinese government that 'missile technology' be included in the PRC's Twelve Year Plan for the Development of Science and technology (1956-67). On May 26, 1956, the Central Military Commission of the Communist Party of China created the missile research and development (R&D) organization. On October 15, 1957, the Sino-Soviet New Defense Technical Accord was signed and it was under this agreement that two R-2 missiles were transferred to Beijing and marked the beginning of the Chinese ballistic missile programme.[6]

In the second half of 1958, the blueprints and technical documents of manufacturing, testing, and launching the R-2 were delivered to the PLA. The launch of R-2s (Chinese name 1059) was delayed until September 1960 due to the sheer magnitude of the task and their own version of the R-2, the1059 was not fired until November 5, the same year. A year later, a few conventionally armed 1059s were assigned to the PLA for training purposes. Their production continued until February 1964. Throughout the period between 1958 and 1964,

[6] John W. Lewis and Hua Di, no.2, p.7.

Beijing was also pursuing the development of nuclear weapons. As the progress in nuclear programme culminated in the first weapon test on October 16, 1964, the Chinese focused attention to the development of a missile that could carry the nuclear bomb.

The range of the R-2 missile provided by the Soviets was merely 590 kms which was too short to reach even the American military bases in Japan. Moreover, the atomic warhead under development exceeded the R-2's payload carrying capacity of 950 kg.[7] Thus in addition to its work on the R-2, the missile research and development organization (the Defense Ministry's Fifth Academy), on September 19, 1958, directed the development of a Dong Feng (DF or East Wind) series of land based ballistic missiles.

Dong Feng Series

The first in the DF series, the single-stage DF-1, was intended to have a "range of 2,000 km, enough to hit all of Japan with a payload of 1,5,00 kg".[8] The work on the development of the missile was to complete by 1962. The idea of DF-1 originated from Soviet missile R-12, which Moscow had refused to sell to China. In 1960, when the Chinese and the Soviets began to drift apart, the China's missile engineers realized that they were to carry on without any further Soviet assistance. Recognizing that Dong Feng programme would have to begin by modifying the 1059, they set their aim on what they named as DF-2, the new

[7] Ibid, p.13.
[8] Ibid, p.13.

version. With a range of 1,200 km comparable to the Soviet R-5, the DF-2 would have to be based near the Sino-North Korean border to strike all of Japan.

Having perceived the US nuclear threat to their homeland the Chinese sought to counter it by building a missile that could reach the continental United States. On November 14, 1961, a group of engineers, with Qian Xuesen, the US returned rocket specialist, as the head, was assigned the task to develop a 10,000 km ICBM, which would use liquid oxygen and kerosene as propellants (similar to those used in the Soviet R-7, and the US Atlas). This missile was called DF-3. Qian Xuesen, a Chinese born scientist who migrated to the US during the Japanese occupation, worked on advanced US missile programme including the Titan ICBM and was forced to leave the US in 1955 under suspicion of spying, returned to become the "father of the Chinese ballistic missile force".[9] Due to adverse circumstances, however, the ICBM version of DF-3 was cancelled. In 1964, after a major redesign in the earlier version tested, the DF-2 test was successfully conducted. China's first strategic missile system had become operational only when DF-2A, a modified version of DF-2, was launched from Shuangchengzi test base in Gansu province on October. 27, 1966. It carried a nuclear device which weighted 1,290 kg and had a yield of 12 kilotons.[10]

Probably as early as April 1964, the Central Military Commission redefined the strategic requirements for the Dong Feng programme, leading to changes in the yet-to-be finalized DF-1. The range requirements for the launch was raised to 2,500 km, sufficient to hit US bases at Clark field and Subic Bay in

[9] A.K.Sachdeva, "Chinese Missile: winning a Limited War", www.idsa-india.org/an-jun-600.html.
[10] John W. Lewis and Hua Di, no.2, p.15.

the Philippines, and the payload requirement was raised to 2,000 kg, [the planned maximum weight of the hydrogen bomb then under development]. The new designation given to DF-1 was DF-3. To meet the added requirements, the DF-3 was redesigned to have four engines in a cluster providing 96-tonne lift-off thrust.[11] DF-3 project was assigned an urgent priority over DF-2A by the Premier Zhou Enlai himself and as a result the missile was successfully launched on December 26, 1966. The DF-3, capable of carrying a 2,150kg warhead over 2,650km, was deployed in May 1971. The engineers continued to work on DF-3 and an improved version of it with the range of 2,800 km was commissioned in 1986 with the designation DF-3A. The outmoded DF-3 was sold to Saudi Arabia in 1988.

In 1965, Premier Zhou Enlai came forth with his initiative and set in motion plans under which the missile units would finish R&D on the DF-2A MRBM and the DF-3 IRBM in 1968, complete R&D on a long-range missile between 1969 & 1972 and try to flight-test an ICBM before 1975.

In early 1963, on behalf of the Fifteen-Member special commission, Zhau Erlu, whose background was in defense production, visited the missile organ, the Fifth Academy and proposed a plan called banian sidan, i.e., to build "four types of missiles in eight years." The plan envisaged a gradual move toward an ICBM that would include completion of the Dong Feng series, DF-2 through DF-5, each with a different range based on specific imaginary targets. The imaginary targets in the draft plan as originally formulated in 1964 were Japan (DF-2), the

[11] Ibid, p.15.

Philippines (DF-3), Guam (DF-4), and the Continental United States.[12] The Eight-Year Plan for the Development of Rocket Technology (1965-72) was adopted in March 1965, and it set the guidelines for the full-scale pursuit of the Dong Feng missile programme, as well as other missile technologies. The first two of the four missiles as endorsed by banian sidan plan, the DF-2A and DF-3 were already in an advanced stage. The remaining two missiles, DF-4 and DF-5, outlined by the plan were to have range of 4,000 km (long range missiles) and 12,000 km (ICBM) respectively. The first was intended to hit the B-52 base on the US Island of Guam and the Second (DF-5) was projected to cover the continental US from China. These two missiles could be built by 1970 and 1972, respectively, R&D on the DF-4 started in March 1965 but preceded rather slowly, partly because of the higher priority accorded the DF-5. Later another proposal extended the scope of DF series by adding a programme to develop a three-stage DF-6.

Despite many delays caused by the political turmoil, the work on both the DF-4 and DF-5 continued. However after the successful test of a thermonuclear device in 1967, the first Academy argued that work of the DF-4 should give way to the DF-5 due to constraints of limited resources. The DF-5 was capable of carrying a 3,000 kg payload, while the DF-4 would carry only 2,200 kg. As such the thermonuclear device was too heavy for the DF-4.[13] But in January 1968, the Central leadership reiterated the importance of the DF-4 programme and directed that its progress should not be impeded. The first Academy, while complying,

[12] John W. Lewis and Xue Litai, *China Builds the Bomb*, (Stanford, Stanford University Press, 1988), p.212.
[13] John W. Lewis and Hua Di, no.2, p. 18.

also insisted on accelerating the DF-5's R&D. The deployment of the DF-5 was necessitated by the pressure of the Sino-Soviet conflict. On May 18 and 21, 1980, the ICBM, DF-5, was tested in first too full-range test flights into the pacific and it was consequently delivered to the second Artillery for "operational training", and in December for "trial operational deployment" in an experimental silo.[14]

The international events during the late 70s caused great worries in Beijing. The Soviet Union seemed to be on the offensive and winning, while the US was retreating and loosing. The crisis intensified following the Soviet invasion of Afghanistan in December 1979, and Beijing decided to deploy all available strategic weapon systems. The DF-5 could become truly operational only in August 1981. On November 10, 1983, the first Academy began to improve the DF-5's range, operability, and reliability. Therefore the work began on a variant of DF-5 with the name DF-5A. Its development involved overcoming technical challenges before the first full-range launch of the missile. It can each carry a 3,200 kg warhead to 13,000 km. The missile is two-stage missile, which uses storable liquid fuel and gyroplatform inertial guidance with on-board computers.[15] It was confirmed by the US officials in September 1998 that China has deployed about 20 DF-5A (CSS-4) ICBMs, most of them targeted at the United States. As far as DF-6 missile is concerned, by October 30, 1973, an endless number of technical problems forced its cancellation. At this time, Sino-US relation had begun to improve, while Beijing's confrontation with Moscow had further aggravated.

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[14] Ibid,p.18.
[15] Shirley A. Kan and Robert D. Shuey, no.3, p.6.

In 1966, Qian Xuesen advocated the development of an advanced DF-5 warhead with penetration capability. The concept of penetrability became an important word in Chinese strategic planning. The First Academy prepared the design of the missile reentry vehicle, which included electronic countermeasures and light exo-atmoshperic decoys. Owing to the information about US deployment of multiple reentry vehicles (MRVs) and development of multiple independently targetable reentry vehicles (MIRVs), the First Academy also planned the deployment of multiple warheads on the DF-6. But, since the Chinese lacked the technology related to the miniaturization of the warhead, the missile designers could not proceed with the plan. After a decade, in 1980, the MIRV project was given a backseat and was restarted only in November 1983, when the first Academy included them in the DF-5 modification programme.

On 20th September, 1981, the Chinese sent three satellites to the orbits using one carrier rocket and this was mistaken by many western experts to be a successful test of MIRV technology by PRC.[16] But the fact was that the rocket launch did not test any MRV or MIRV.

Unable to achieve breakthrough in the penetration capability of the missiles, the Chinese began to focus on the improvement in survivability of missiles. The advent of satellite reconnaissance technology and advanced missile accuracy after the late 1960s by foreign countries had made the PLA's retaliatory forces more vulnerable than ever. The Strategic Arms Limitation Treaty (SALT-I) accords of 1972 also shifted the emphasis towards a more qualitative arms race

[16] John W. Lewis and Hua Di, no.2, p.22.

between superpowers. This sense of vulnerability compelled the Chinese to pay greater attention to survivability. For this they emphasized two aspects: pre-launch survivability and base survivability. Simultaneously, they tried to reduce the time for pre-launch preparations and to find less vulnerable base modes. At this time the pre-launch preparations would account on average for no less than four hours, in addition to the time of transport from storage to the launch site.[17] First of all, they focused on efforts to reduce the propellant loading time and on Oct. 23, 1978, they test-fired a DF-3 after 2 hours and 32 minutes of pre-launch exposure.[18] As far as the two-stage DF-4 was concerned, it was decided to improve its survivability by basing it in silo, the land basing mode in the Soviet Union and the US in the 1960s. However, when the vulnerability of the hardened silos was exposed by the western strategists, a report was approved by Mao Zedong on May25, 1975. It recommended that the DF-4 basing mode be changed from silos to caves under high mountains and along with it the feasibility studies be made on rail mobile and other basing modes.

In late 1975, the Chinese conducted DF-4 rail mobile test over 8,000 km in ten provinces. On December 19, 1975, the Defense Science and Technology Commission (DSTC) approved the cave-basing mode but did not rule out other modes and ordered the experiments to continue. On August 2, 1980, the cave basing mode was operationally confirmed by a full-range test flight and the DF-4 was soon deployed in this mode.[19] In order to address the problem of survivability in basing the DF-5 missiles, the Chinese decided to go for silos

[17] Ibid, p.22.
[18] Ibid, p.23.
[19] Ibid, p.24.

because of the missile's size and also because the DF-5's US "twin", the Titan II, had been silo-based. A static test-firing was conducted in the silo in mid–1976, and on January 7, 1979, a successful silo launch confirmed the basing mode for the DF-5. In order to make them more survivable, the Chinese decided to build a large number of bogus silos.

Second Generation Missiles

With the first successful DF-5 flight test in 1971, the *banian sidan* goals for the first generation missiles had been met. The question of survivability, however, remained a crucial question and in their plan for the development of new generation of missiles, the designers decided to shift from fixed–based to mobile systems. It coincided with the accomplishment of two technological feats by the Chinese: the miniaturization of nuclear warheads as part of the SLBM system and computerization of the DF-5's missile control system. This helped in developing mobile systems for liquid- propelled missiles till the advent of solid rocketry.

The year in which DF-6 programme was abandoned (1973) the Chinese began to work on a program with code name DF-14. The aim was to assemble a liquid fueled missile with two-staged configuration having a payload capacity of 700 kg over 8, 000 km. It would be road-mobile (enabled due to relatively small payload) and it would incorporate a computerized control system enabling rapid targeting. The major significance of this missile was in its drastically reduced pre-launch exposure time. The DF-14 project, however, was delayed and could be resumed only in 1978 after a long interruption. It was then renamed as DF-

22.[20] The interruption was due to resource constraint caused by higher priority given to DF-4 and DF-5 programs which were in their trial stage of development. Resumption of work on DF-22 on a priority basis took place only in April 1980, one month before the DF-5's test flight to the pacific. It was named project 202. However, few years later, the Central Military Commission ordered a shift from liquid to solid rocketry and it resulted in a slowdown of project 202.

Arrival of Solid Rocketry and Commencement of Modernization Programme

The successful test firing of Julang 1, a submarine-launched ballistic missile (SLBM) marked a significant technological improvement for PLA. It was on October 12, 1982, that an SLBM with a range of 1,700 km, carrying a 600 kg payload was launched to record a fundamental achievement in developing solid propellant ballistic missiles. Being a solid-fuel missile, JL-1, provided grater safety and more rapid response time.[21] Very soon, the work began on DF-21, the land version modification of JL-1. Apart from this, Chinese also planned to develop another road-mobile solid-fuel rocket, an Intermediate range ballistic missile (IRBM), DF-23. Originally, the JL-1 was considered China's first generation SLBM, but with the shift in emphasis to mobility it was designated the pioneer second generation strategic missile. It became operational in August 1983.

The road-mobile DF-21 was successfully tested first in May, 1985 from a transporter-erector-launcher triple purpose truck. The second Artillery's first DF-

[20] Ibid, p.25.
[21] Shirley A. Kan and Robert D. Shuey, no.3, p.6.

21 regiment was established the same year. The missile was characterized by an automatic command-control-firing system, the first of its kind in the PLA's strategic missile forces. This was the first modern Chinese strategic missile in full sense. Attempts to further extend the range of DF-21 were made. The land-mobile DF-21 was favoured over its sea-based variant and its modification programme called DF-21A, began in July 1986. The missile designers were subsequently successful in reducing the DF-21's structural weight, add propellant, and boost the thrust of the second stage in comparison to the JL-1.[22] The JL-2 as well as its land version, the DF-23, received significance with the first test-firing of a 2m-diameter solid rocket engine at the end of 1983. This success in solid rocketry combined with the ever greater improvement of the PRC's security environment, encouraged Beijing to shift totally to solid-propellant missiles and to cancel the liquid propellant DF-22. On December 26, 1984, the Ministry of Space Industry issued a directive stressing four fundamental changes in future missile programme:

1. From liquid to solid propellant
2. From strategic to tactical missiles
3. From first to second generation strategic launchers
4. From experimental to utilitarian satellite missions[23]

[22] John W. Lewis and Hua Di, no.2, p. 7.
[23] Ibid, p.28.

In January 1985, a unified programme for the development of the second generation strategic weapons was outlined by the State Council and the Central Military Commission. It followed certain changes in the designations of the missile, for example, the DF-23 was renamed the DF-31 which was to follow the solid fueled DF-21, rather than abandoned liquid-fueled DF-22. Similar to the JL-1/DF-21 combination, the DF-31 and JL-2 are land-based and sea-based variants, respectively, of a largely identical missile. The Chinese have adopted concepts of yidan liangyong, luhai jiangu, jishu gongyong (one missile for two uses, considering both land and sea, and sharing a common technology).[24]

DF-31 would be China's next generation ICBM. It is a three-stage, solid fueled, mobile ballistic missile with an estimated range of 8,000 km and an accuracy, or circular error probability (CEP) of 1,000-2,000 feet.[25] DF-31 is believed to be in the final stages of development and the initial deployment might have already begun probably in late 2001 or 2002. Garrison deployments are expected between 2005 and 2010. It is viewed that the China may develop MIRVs for deployment on the DF-31 ICBM.[26] China is believed to have the technical capability to develop multiple reentry vehicles (MRV). A MRV system releases two or more reentry vehicles (RVs) along the missile's flight path at a single target. The more sophisticated and flexible multiple independently targetable reentry vehicle (MIRV) system releases two or more RVs to independent targets over a wider area and at different times. In CIA's speculation, if China needed an immediate MRV capability, is would take only a

[24] Ibid, p.29.
[25] "Chinese Nuclear Force", n. 1, p. 72.
[26] Shirley A. Kan and Robert D. Shuey, no.3, p.8.

few years to develop and deploy a simple MRV or MIRV on the DF-5 using DF-31 type RV. But MIRVing a future mobile missile would take several years.[27] Many expect that US deployment of a missile defense system would precipitate Chinese efforts to deploy multiple warhead system to ensure the effectiveness of its nuclear deterrent.

JL-2 SLBM would be the submarine-launched version of the DF-31 ICBM. China has faced difficulties getting its ballistic missile submarine programme on track. China's "fleet" consists of one Xia-class submarine built at Huludao Naval Base and shipyard and commissioned in April 1981. JL-1 SLBM was test-launched from a Golf-class diesel submarine in late 1982. However a full-scale launch of JL-1 from Xia took place in 1988. In 1989, the Xia was deployed to Jiang gezhuang submarine base. However the Xia is not thought to have ever sailed beyond China's regional waters.[28] The Pentagon believes that it is not operational and designates its missile experimental. China has begun work on a new ballistic missile submarine programme (SSBN) called project 094.[29] The new SSBNs, of which four to six will likely be built, are expected to carry 16 three-stage JL-2 SLBMs, the sea-based variant of DF-31.

Since July 1986, plans proceeded for the development of an even more advanced system, the DF-41. This three-stage solid propellant mobile ICBM with a range of 12,000 km was planned to be deployed in the first decade of the 21st century. However this programme is believed to have been cancelled. A new mobile, solid-propellant ICBM is in development instead. The CIA estimates that

[27] "Chinese Nuclear Force", n.1, p.72.
[28] Ibid, p.72.
[29] Ibid.

it will be targeted against the US and may be tested "within the next several years", although deployment is at least a decade away.

Tactical Missiles

The Chinese Planners in 1984 began to think of using mobile solid-fueled missiles to carry conventional warhead. In April-May that year, the First Academy submitted proposals to the military leadership for developing such ballistic missiles with short and long ranges, later named DF-15, and DF-25. Equipped with a 2,000 kg conventional warhead, the two-stage DF-25 has maximum range of 1,700 km and is considered strategic. Its conventional warhead, however, makes it a tactical weapon.

In the early stage of the evolution of its missile programme, China received R-1, R-2 along with the 162 km. R-11, and an SLBM capable of carrying a 950 kg payload. Not able to get further help due to Sino-Soviet rift, the Chinese began reverse engineering on R-11 and learned a great deal about the guidance system and gyroscopic integrator.[30] The interest in tactical missile was lost, however, until 1975, except for an attempt to develop them in 1966 at the onset of the Cultural Revolution. In 1975, the central Military Commission authorized an R&D programme named DF-61 with the task to build a missile for both military assistance to some countries and domestic use. What formed the basis for this was North Korean desire to buy missiles from China and the particular requirement of PLA for these missiles to counter the Soviet threat.[31] The Chinese hoped that the DF-61 would exceed the feat of the somewhat

[30] John W. Lewis and Hua Di, no.2, p.32.
[31] Ibid, p.32.

comparable American Lance and Soviet Scud-C. However, the DF-61 programme collapsed in 1978.

Chinese Cruise Missiles

China has developed and deployed a number of anti-ship, air-launched, and ground-based, coastal defense cruise missiles. C-802 anti-ship missiles have been sold to Iran. Following are the important cruise missiles currently deployed in service by China:[32]

- HY-2 (HY stands for Hai Ying, or Sea Eagle) anti-ship cruise missile (US designation CSS-C-2 Silkworm), can deliver a 400 kg warhead to 85 km and is deployed with the Chinese navy's coastal defense forces. In the 1980s, China sold HY-2 missiles to both Iran and Iraq.
- HY-2A/C-201 is anti-ship missile (US designation is CSS-C-3 Seer-Sucker) an improved version of HY-2 with a range of 95 km and a payload capacity of 513 kg. It is deployed on Luda-class destroyer and Jianghu-class frigates.
- C-601 is the air launched version of the C-201. It can deliver a warhead of 513 kg up to 110 km and is currently deployed on H-6D bombers in the naval air force.
- HY-3/C-301 is an anti-ship cruise missile (the US designation is CSS-C-6 Saw Horse). This is China's only reported supersonic cruise missile with a range

  of over 80 km.

[32] Shirley A. Kan and Robert D. Shuey, n.3, p.8.

- HY-4/C-201W anti-ship cruise missile was a result of improved HY-2 series of missiles with an extended range (the US designation of this missile is CSS-C-7 Sadsack). It has a range of 135 km with a 500 kg warhead and has been deployed with the PLA Navy's coastal defense forces.
- YJ-2/C-802 (YJ stands for Ying Ji, or Eagle Strike), designated as CSS-C-8 saccade by the US, this anti-ship cruise missile can deliver a more compact, 165 kg warhead to 120 km. It has been deployed on Luhu-class destroyer and Jiangwei-class and Jianghu-class frigates. In 1995, China transferred C-802 to Iran for use on Chinese and French supplied patrol boats.

China is reportedly developing a ground launched, land attack version of the C-802 to more accurately hit targets in Taiwan.

Cruise Missiles under Development[33]

- C-611: An improved version of the C-601 with an increased range of 200 km and improved propulsion, electronics, and terminal guidance.
- XW-41: It is being developed by improving upon HY-4 missiles with a longer range of 300 km.

Besides these, China is reported to have purchased from Russia two destroyers equipped with SS-N-22 Sunburn anti-ship cruise missiles, which are designed to counter US naval warships equipped with the Aegis system. The sea-skimming Sunburns can carry a nuclear or higher-explosive warhead weighing 300 kg to a range of 160 km. According to another report Israel is developing a

[33] Ibid, p.13.

cruise missile with a hard-target penetrating warhead for China. The missile is said to have a range of 397 km, with guidance that uses GPS and inertial navigation. [34]

Missiles for Market

In 1979, the Central Committee of the Communist Party of China directed the defense industries to follow certain guidelines.[35] It stipulated the following:

1. Combine military with civilian products
2. Combine peacetime with wartime production
3. Give priority to military products, and
4. Use civilian sales to foster military R&D

Later a new element was added to these guidelines emphasizing on the utilization of the military sales to foster the military R&D. The defense industries looked to the international arms market for selling weapons. Unlike the past, when politics or ideology and not money had guided the arms transfers, this time the Chinese began selling conventional weapons to gain hard currency. In 1979 itself country's first arms trade organization called China North Industries Corporation (NORINCO) was established and the next year the entire defense established was engaged in arms exports. A detailed discussion on China's Arms export policy will be under taken in a separate chapter.

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[34] Ibid, p.14.
[35] John W. Lewis and Hua Di, n.2, p.33.

M Series of Missiles

The First Academy decided to manufacture tactical surface-to-surface ballistic missiles for export. In April, 1984, the First Academy initiated work on the missile, the M-9 ('M' stands for Missiles – the implication was that the weapons of this class were being developed for export) The M-9 is a 600 km – range single stage solid propellant road-mobile ballistic missile. The missile was displayed at the first Asian Defense Exhibition (ASIANDEX) in Beijing in November 1986. At ASIANDEX, the Chinese disclosed the existence of an entire class of M-family tactical ballistic missiles. In 1985, the work on a ballistic missile for export called M-11 had started. China reportedly exported the M-11 to Pakistan in early 1991. The Second Academy developed yet another tactical ballistic missile for sale, this one a variant of a surface-to-air missile (SAM).

The Current Modernization Programme

The Chinese have been concerned for long about the pitfalls in their credible deterrent and are believed to have concluded that their nuclear capabilities are not enough to deter an enemy. Therefore quantitative and qualitative improvement of nuclear weapons is required. The current modernization programme focuses on solid fuel propellant technology, in order to enhance operational flexibility (reduced launch preparation time) and safety. Ongoing development and production programme aim at improving land-based and submarine-launched missiles, as well as the bomber force. The objectives are to improve the survivability of the strategic forces, develop less vulnerable basing

modes, and make general improvements in accuracy, range, guidance, and control.[36]

Apart from the indigenous efforts, China is heavily relying on the import of foreign technology for its modernization programme. China is striving to modernize its missile forces in the belief that missiles will constitute one of the most effective weapon systems for the next century. China is investing heavily in advanced guidance systems and satellites to improve missile accuracy.[37] In the future, Chinese ballistic missiles can be expected to include longer-range SLBMs, and land-mobile, solid-fuel ICBMs with smaller nuclear warheads, improved accuracy, MIRV capability, and improved penetrability. Moreover, Chinese cruise missiles can be expected to have extended ranges and greater accuracy and include land-attack cruise missiles.

II. The Evolution of the US Missile Programme

The development of missiles and their role in US military strategy can be understood with the help of an analysis of US nuclear and security strategy which was adjusted and readjusted during the last half century. The nature of the international security environment and its dynamics combined with the advancement in weapon technology has been largely responsible in determining the US security planning over the years. The utility of nuclear weapons as deterrence is effective only with the availability of equally effective and accurate

[36] Mel Gurtov and Byong-Moo Hwang, *China's Security: The New Roles of the Military*, (Boulder, Lynne Rienner Publishers, 1998), p.131.
[37] James R. Lilley and David Shambaugh, *China's Military Faces the Future*, (Washington D.C., American Enterprise Institute, 1999), p.10.

delivery systems. Missiles in this context acquire the most prominent position as a superb delivery mechanism. It is hard to imagine nuclear weaponry without missiles as delivery vehicles. The advent of missiles and in particular ICBMs, drastically affected the nature of nuclear doctrines.

Since the 1950s, American nuclear doctrine has been based on two central objectives:

1. Using the threat of nuclear retaliation to deter Soviet aggression against US territory and against US allies; and
2. Limiting damage to the American homeland, if possible, should war occur.[38]

In general, the US nuclear strategy has incorporated and omitted a number of elements ranging from rigid plans for massive strikes against the Soviet Union to greater targeting flexibility.[39] The nuclear strategy has been guided by technical limits and opportunities apart from the nature and perception of the external threat. In this context, the availability of an effective and secure delivery system for nuclear weapons played important role in the security posture of US in the Atomic age.

In the beginning, however, despite the availability of a variety of cruise and ballistic missiles put forward by the US services during the 1950s, primary US attention was focused on strategic bombers. The missile age was yet to begin. The US missile development received enormous attention as a result of Soviet

[38] Peter D. Feaver, "The Evolution of American Nuclear Doctrine" in Graham T. Allison and others (eds.), *A Primer for Nuclear Age*, CSIA Occasional Paper No.6, (Boston Way, Lanham, University Press of America Inc., 1990), p.49.
[39] Ibid, p.49.

advancement in this field. The geo-political compulsions of the period i.e., cold war alignments in the 40s & 50s rendered the Soviet security greatly jeopardized and the inability of Soviet Air Force to unleash a matching aggression against the American homeland led to a Soviet emphasis on the development of ICBMs. Whereas US strategic bombers could strike the Soviet Union from bases in Europe, North Africa, Guam, and Okinawa, Soviet bombers would have to take a long polar flight across the Arctic regions and Canada before they could reach the US.[40] Soviets allocated bigger resources to R&D work based on the German V-2 missile which culminated, on August 3, 1957, in the launch of an ICBM called SS-6 covering a range of several thousand miles. Sixteen months later the US tested its ICBM called Atlas over its full range.

Sputnik and the Missile Gap

In October 1957, the Soviets successfully launched the world's first long-range ballistic missile with a "peaceful" artificial satellite (SPUTNIK -1) and this eliminated the Soviet vulnerability by making it capable of delivering a nuclear weapon to the US.[41] The launch of sputnik in the orbit was considered a greater blow to American sense of security than the 1953 test of the Soviet thermonuclear bomb. Now it seemed the Soviets had overtaken the US in developing a revolutionary technology in rocketry.[42] The fear of vulnerability and

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[40] Norman Polmar, *Strategic Weapons: An Introduction*, (New York, Crane, Russak and Company Inc. 1982), p.30.

[41] "Development of Deliver Systems: Bombers, Missiles and Submarines" in *Nuclear Weapons and Non-Proliferation* by Sarah J. Diehl and James Clay Moltz, *Contemporary World Issues*, (Santa Barbara, ABC – CLIO, Inc., 2002), p. 9.

[42] Peter J. Roman, *Eisenhower and the Missile Gap*, (New York, Cornell University Press, 1995), pp.1- 2.

a general lag in missile technology eventually became a major political issue in the US in the late 1950s and is famously known as 'missile gap debate'.

This so called "missile gap" became a defining moment and it marked a critical stage in the evolution of US strategic and nuclear policy. The then US administration under Eisenhower reviewed the nation's strategic nuclear policies and developed new policies which were followed by new weapons and procedures in order to decrease the vulnerability of US nuclear forces. After long drawn out debates within the US administration and the pressure from public, by the end of 1958, the strategic missile force for the following decade was beginning to come into force.[43] On the other hand, in the Soviet Union, the development of true operational ICBMs, such as the SS-7 and SS-8 had begun at the same time and it became clear very soon that one day the happy period of assumed US ascendancy would come to an end. It carried wider implications both for the US security and that of her allies. With the US itself vulnerable, the concept of 'massive retaliation' as a response to a conventional challenge in Europe or Asia was no longer credible.[44]

Early Cruise Missiles

Although the real impetus to US missile programme came from the perception of 'missile gap' by the US, some kind of missile systems existed even before that. Given the primacy of bombers in the early years of cold war, the missiles were relegated to a secondary position as effective means of delivery

[43] Ibid, p.180.

[44] 'Massive retaliation' refers to a concept which informed the security strategy adopted by the US in the beginning of the Cold War during 50s. It had to be abandoned as a result of the new security challenges posed by the advent of the missile age.

system. In a significant development, the advent of small nuclear warheads meant that the delivery of weapons of mass destruction would become feasible with unmanned missiles. In the US, this potential was partially fulfilled with the development and limited deployment of low-attitude, air-breathing "cruise" or guided missiles.[45] The concept was borrowed from the German V-1, with the missiles following a preset flight path to a fixed target, "the lack of terminal accuracy in these weapons was compensated for by the high destructive force of the nuclear warhead".[46]

These cruise missiles included the Air Force's Matador with a 600 nautical miles[47] range (renamed as Mace), which was later increased up to 1,200 nautical miles (Mace-B), and Snark, with a 5,000 nautical miles range; and the Navy's submarine-launched Regulus-I missile, with a range of 500 nautical miles.[48] The matador/Mace were deployed in forward bases in Europe and the western pacific and snark missiles were based briefly at Presque Isle, Maine. The Navy operated two submarines carrying two Regulus-I missiles each and then built three additional submarines, one of which was nuclear-powered, to carry four or five missiles. It was in 1954, that the USS Nautilus, the world's first nuclear powered submarine was developed by the US.

The arrival of small nuclear warheads also permitted the US Army to deploy tactical nuclear weapons, which included the Honest John and Redstone battlefield missiles. Another missile called Jupiter, an Intermediate Range

[45] Norman Polmar, n.39, p. 21.
[46] Ibid, p.21.
[47] One nautical mile is unit of distance at sea which is equal to 1.852 km.
[48] Norman Polmar, n.39, p. 21.

Ballistic missile (IRBM), was a true strategic missile with a range of 1,500 miles. It was intended for basing in NATO nations for strikes against the Soviet Union. At the same time, the US Air Force showed interest in ballistic missiles, and initiated the Thor IRBM (1,500 miles) and the Atlas and Titan ICBMs, with initial ranges of 5,500 and 6,300 miles, respectively.

Inter-Continental Ballistic Missiles

While Thor and Jupiter, the first post war ballistic missiles, had ranges of just a few hundred miles, it was Atlas which became the first US Inter-Continental Ballistic Missile (ICBM). It was flight tested in 1958. It used liquid oxygen as fuel and therefore suffered the problem of extended pre-launch preparation time. The problem was solved with the development of storable liquid propellants, which were first tested in the giant US Titan missiles in 1962.[49] The first six Atlas ICBMS became operational in 1959 in the US, while the Thor IRBMs were installed in Great Britain under joint UK-US control, and subsequently the Jupiter IRBMs were planned for deployment in Greece and Turkey.

The fears generated by the specter of missile gap in late 50s dissipated during the next decade as Soviet management and production capabilities were unable to keep pace with the new weapons technologies. The Soviets suffered major operational and personnel problems. However the Kennedy Administration, which was inaugurated in January 1961 amid the "missile gap" debate, undertook an acceleration of both strategic and conventional warfare

[49] Ivan Oelrich, "Technology and the Evolution of Nuclear Weapons and Forces" in Graham T. Allison et al. (ed.), n. 3, p. 41.

programme. The new administration's first budget dramatically accelerated the missile programme.

A greater emphasis was placed on maintaining greater number of missiles as strategic weapons while reliability on the bomber was to be less. The efforts were directed to an unprecedented degree to develop the optimum "mix" of strategic forces. The nature of the future strategic mix was described by Kennedy's Secretary of Defense, Robert S. McNamara:

"The introduction of ballistic missiles is already exerting a major impact on the size, composition and deployment of the manned bomber force and this impact will become greater in the years ahead. As the number of...ballistic missiles increases, requirement for strategic aircraft will be gradually reduced. Simultaneously, the growing enemy missile capability will make grounded aircraft more vulnerable to sudden attack."[50]

Thus the incorporation of a new doctrine by the US administration necessitated the production and deployment of missiles on a larges scale so as to achieve numerical superiority over Soviet missiles. In this way, the US embarked upon the production and deployment of its second generation of missiles.

Second-Generation US Missiles

During the early 1960s, the remaining first generation ICBMs became operational: the Atlas-E in 1960, the Titan-I in 1962, and the Atlas-F in 1962, all with storable liquid propellants and capable of reaching the Soviet Union from launching pads in the United States. Among new missile were the Minuteman-I

[50] Quoted in Norman Polmar, n.39, p. 45.

and the Titan-II. The Minuteman-I had a solid propellant and could deliver a one-megaton warhead against targets 6,300 the nautical miles away.[51] This was first solid fuel ICBM of the US. It was installed in underground launch silos to provide protection against preemptive enemy missile or bomber attacks on the US deterrent force. The next missile, the Titan-II, the largest US ICBM ever developed, used storable liquid fuel and was capable of carrying a warhead of about nine megatons for a distance of 6,300 nautical miles.[52]

The proponents of the missile programme now advocated deployment on a large scale in order to outnumber Soviet Strategic forces. The Air Force leaders pushed for deployment about up to 2,500 Minutemen missiles. However the actual force levels were eventually fixed at 1,000 Minutemen and 54 Titan missiles. At the same time the earlier strategic missiles were being phased out in a speedy manner. By mid 1960s, all of the US first-generation ICBMs were phased out and finally a stabilized ICBM force at 1,000 Minutemen and 54 Titan missiles was deployed which would remain unchanged for the next two decade in the SAC (Strategic Air Command) inventory. Though the numbers remained the same, these weapons underwent significant qualitative improvements.

Another important element of the US strategic forces consisted of Polaris submarine-launched ballistic missiles fleet. It was also developed during 1960s. By the early 1960s, the US Navy was planning a 45 submarine force. Defence secretary McNamara however agreed for 41 submarines with 656 missiles, and

[51] Ibid, p.45.
[52] Ibid, p.49.

the last Polaris submarine went to sea in April 1967, seven and a half years after the first.[53]

The Strategic TRIAD

The components of the US strategic offensive force developed during the 1960s became linked together by the term TRIAD[54]. The structure of TRIAD evolved over last five decades, since the beginning of strategic nuclear planning in the late 1940s, when the Strategic Air Command (SAC) first acquired the capability of intercontinental delivery of nuclear weapons. Among the three legs of the TRIAD, two are constituted of a large number of strategic missiles namely- ICBMs which are land-based and SLBMs which are submarine-launched. Hence missiles formed a major component of US strategic TRIAD and they still have the same role to play. The third leg is composed of long range strategic bombers.

Multiple Warheads

During the 1960s, two aspects of strategic weapons began to dominate the arms race: ballistic missile defense and multiple warheads. Both these issues were closely related to each other.

With the large scale production and deployment of ICBMs by the US and former Soviet Union in 1960s, the magnitude of destruction that each side could

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[53] Ibid.

[54] The concept of TRIAD is based on three separate and distinct types of weapons, each of which is credited with being able to inflict "unacceptable" damage on the enemy after the US suffers a surprise nuclear attack. The term TRIAD was conceived in the late 1960s to describe the existence of the land-based strategic bomber and ICBM forces, and the sea-based SLBM submarine force. It is interesting to note that TRIAD did not come about through rational planning, but through the development of separate strategic weapon program.

now inflict on the other was supposed to be enormous. Both had large proportions of their population and industrial infrastructure concentrated in cities, which had become hostage to each other's devastating nuclear arsenals. At the same time, new technological breakthroughs opened the possibility of an active ballistic missile defense whereby incoming ICBM warheads could be intercepted with an Anti-Ballistic Missile (ABM) system. Both the US and the Soviet Union pursued the development and deployment of ABM systems. While in US, only the research in this area was undertaken the Soviet ABM efforts went ahead and got materialized into a programme. Soviets deployed Galosh missile launchers and associated radars around Moscow during mid-60s.[55]

As the evidence of a Soviet ABM deployment became clear, the US initiated countermeasures to overcome such ballistic missile defenses. What emerged was the idea that the most effective means to counter an ABM system was to saturate the ABM's radar and associated electronic equipment used to track incoming reentry vehicles, or else to exhaust the ABM interceptor missiles. The US Planners decided to follow a technological approach to saturating ABM interceptors, and thus began the programme on a type of weapons which would be considered most formidable in the years to come, i.e., the multiple warhead missiles.

With multiple warheads, a single missile carries aloft several Reentry Vehicles (RVs) which are released in flight to come down separately against one or more targets. The US began deployment of the first multiple warheads on the

[55] Norman Polmar, n.39, p. 52.

Polaris submarine-launched missile. In 1964, the Polaris A-3 became operational which carried a multiple Reentry Vehicle (MRV) payload.[56] As each Polaris A-3 missile would streak aloft, the warhead separates into three separate RVs or "bomblets"that can strike a single target. Most of the Navy's 41 ballistic missile submarines were rearmed with the A-3 missiles; the others were rearmed with the more advanced Poseidon.

Further advancement in technological aspect of missile programme led to the development of Multiple Independently Targeted Reentry Vehicle (MIRV), warheads that could send RVs against separate targets. The first US tests of an operational MIRV system began in 1968 with the Minuteman-III, an ICBM with a nominal range of 7,000 nautical miles. Whereas the earlier Minuteman-I and II missiles carried a single warhead of about one megaton, the warhead of the Minuteman-III has three RVs with a yield estimated at from 170 kiloton to 200 kiloton each. Between 1970 and mid-1973, 550 of the earlier Minuteman ICBMs in the SAC arsenal were replaced by Minuteman-III missiles with MIRV warheads.[57]

In 1970, the first submarine firings were conducted with the Poseidon C-3 missiles, an MIRV weapon. It could deliver up to 14 RVs to a range of 2,000 nautical miles, each with a yield of about 50 kiloton. Between 1970 and 1978, the US Navy restructured 31 of its Polaris submarines thereby enabling each to fire 16 of the Poseidon MIRV missiles[58]

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[56] Ibid, p.53.
[57] Ibid, p.54.
[58] Ibid.

The Minuteman and Poseidon MIRV programme increased the total number of reentry vehicles in the US strategic offensive forces by more than four times. By the 1978 the number of total warheads with multiple reentry vehicles went up to 7,274 as compared to a total of 1,710 pre-MIRV warheads. The MIRVing of its missile provided US with the capability to effectively counter any foreseeable Soviet ABM system and still destroy at least 400 Soviet Cities.

However, the US-Soviet agreements resulting from the Strategic Arms Limitation Talks (SALT) in 1972 restricted ABM deployments. Apprehensions about refueled arms race and worsening of the crisis led the US and the Soviet Union to sign the Anti-Ballistic Missile (ABM) Treaty in 1972. The treaty prohibited all forms of national missile defense that could provide territorial defense for the US or Soviet Union against long-range missile attack. However, it allowed both the parties to operate two small missile defense systems- one around the national capital and the other around an ICBM site, each equipped with no more than one hundred interceptors designed for local defense.[59] In 1974, the US and the Soviet Union agreed to end the number of permitted sites and interceptors to one each.

We will separately undertake a detailed discussion of the ABM Treaty under the issues related of US National Missile Defense and Theatre Missile Defense programme. These have very important implications for China. In a nutshell the basic principle underlying the ABM Treaty was that any effort to

[59] James M. Lindsay and Michael E.O'Hanlon, *Defending America: The Case for Limited National Missile Defense*, (Washington D.C., Brookings Institution Press, 2001), p.5.

develop a "strategically significant" defense would render the adversary vulnerable to a disarming first strike or spark an arms race. Under the provisions of SALT the US abandoned its ABM programme that was just put forward in 1967 to provide a full-fledged missile defense against Communist China's missiles, and then in 1969- to defend the Minuteman ICBMS against a Soviet attack.[60]

The Third Generation of US Missiles

The initiation of the programme for the development of third generation of US missiles was triggered by the reported evidences about the Soviet success in achieving the MIRV capability. Besides, Soviet had undertaken an intensive programme for development and deployment of a new generation of ICBMs. During the 1960s it became evident that an expanding Soviet strategic missile forces by increase in accuracy, or by MIRV developments could pose a threat to US missiles survivability. In fact the subsequent improvements in accuracy and deployment of MIRV warheads from the mid-1970s onward rendered the US ICBMs vulnerable to a Soviet missiles strike.

The US strategists and planners deliberated on the possible defenses against this threat. Among many options included the further hardening of Minuteman-Titan silos, replacement of fixed ICBMs with mobile ICBM launchers on railway trains or motor trucks or other basing schemes, deployment of additional silo-based ICBMs or installation of defensive ABM missiles.

[60] Norman Polmar, n.39, p.55.

The Strategic Air Command of the US till early 80s maintained the missile arsenal comprising 1,000 Minuteman ICBMs, 550 of which carried the three-MIRV, Minuteman-III configuration, and 52 of the large titan-II missiles. Minuteman-III carried small weapons, about 200 kiloton for each reentry vehicle, Minuteman-II warhead equaled one megaton each while Titan-II weapons each have a warhead of about 9 megaton. Some 300 Minuteman-III missiles were planned to be refitted to carry the MK 12A warhead, a three-MIRV warhead with each vehicle delivering an estimated 350 kiloton with improved accuracy.[61]

During 1966-67, the Department of Defense undertook technical study of future ballistic missiles. It recommended the development of four advanced strategic systems, two land-based and two sea-based. The land-based weapons were ICBMs in hard rock silos and ground mobile ICBMs; the sea-based systems were long-range missiles in advanced submarines, and a surface-ship missile system. However, of the four specific systems proposed, only the advanced submarine-launch long range missile survived in the form of Trident programme.

Instead, US research and development efforts were concentrated in specific technology areas, among them "the Advanced Ballistic Reentry System (ABRES) programme, refinement in the existing Minuteman guidance system that could increase accuracy, development of higher-yield RVs for the Minuteman-III (MK12A), and research into providing the Minuteman-III with a larger number of small RVs (The Pave Pepper programme). The Navy developed

[61] Ibid, p.94.

the MK 500 Maneuvering Reentry Vehicle (MaRV) that could be compatible with both the Trident SLBM and the Minuteman ICBM."[62]

The MX Programme

As a result of heightened concerns about the potential threat to American ICBMs from the new Soviet strategic missiles, the Department of Defense in mid-1970s took steps to consolidate various advanced ICBM - related technology research into the M-X project. The aim was to develop a new ICBM which would have a much enhanced survivability over the existing Minuteman-Titan missiles. The MX/Peacekeepers were deployed in 1986 and can carry 10 RVs each with 300 kiloton yield of one RV.

End of the Cold War and Reduction in Missile Forces

With the end of the cold war, Russia, the successors of former USSR and the US are no longer enemies and have begun to take concrete steps to reduce the arsenal targeted at each other. They have negotiated and concluded the strategic arms reduction agreements (START I and START II) which if implemented will bring the number of strategic nuclear warheads on each side down to 3,000-3,500. They are committed to work on the START III negotiations to cut their arsenals to no more than 2,000-2,500 strategic warheads apiece.

The Current US Missile Deployment

The MX ICBM carries the W87 warheads and the total number of launchers is 50, each with 10 W87 warheads.[63] Under START II, all operational MX missiles are to be deactivated by 2007. Despite their proposed deactivation,

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[62] Ibid, p.97.

[63] "US Nuclear Forces, 2001", Bulletin of Atomic Scientists, vol.57, no.2, March/April 2001, p.77.

"MXs continue to be flight tested under the Force Development and Evaluation Programme. Moreover, a programme is underway to extend the service life of the W87 by 40 years, presumably for use on Trident II missiles".[64]

A four part programme to upgrade Minuteman missiles is being pursued at present. It includes updating missile alert facilities, Guidance Replacement programme, the Propulsion System Rocket Engine Life Extension Programme and the Propulsion Replacement Programme. The aim is to improve Minuteman-III accuracy close to that of the current MX. The number of warheads of MK-12 and MK12-A type RVs carried by Minuteman III totals up to 1500.[65]

The submarine launch missiles (SLBMs) are placed on the Ohio-Class submarines which constitute the current ballistic missile fleet. All Trident I submarine launched ballistic missiles (SLBMs) are expected to be replaced with longer-range and more accurate Trident II D5s by 2006.

To comply with START II the navy will have to reduce the number of warheads on each missile or retire additional submarines or both. Under the agreed provisions, SLBMs can carry no more than 2,160 warheads by the end of 2004, and no more than 1,750 by the end of 2007. The total number of SLBM launchers has been fixed at 432 carrying 3,456 warheads including MK-4, MK-5. Trident IC-4 were deployed in 1979 while Trident II D5 MK-5 type was deployed in 1990 and MK-4 in 1992.[66] The MK-5 carries the W88, the most advanced warhead in the US arsenal (China has been accused by the US to have stolen the design of the same W88 warhead from US laboratories).

[64] Ibid, p.77.
[65] Ibid.
[66] Ibid, p.78.

Lastly, as part of an overall consolidation of nuclear weapons facilities the navy's Tomahawk cruise missiles with W80 (eight warheads) are the currently stored at Kings Bay, Georgia.

CHAPTER THREE

THE US MISSILE DEFENSE SYSTEMS AND THE CHINESE RESPONSE

The debate over the issue of defending the US against the ballistic missile attacks is not a recent development. In fact, the current one is the "third round" of such debate over the feasibility or non-feasibility of a defense system in the age of nuclear-tipped missiles. Anti-missile defense system has been fiercely debated due to the misgivings over the possibility of a foolproof technology against the fast moving incoming missiles. Of course, there are many more issues involved apart from the one related to technology such as the cost and the fears about the derailment of arms control.

Early Efforts

In the early years of the Cold War, a renowned strategist warned on the dangers of an unfolding nuclear age: "No adequate defense against the bomb exists, and the possibilities of its existence in the future are exceedingly remote."[1] This remained central to the missile defense debates amongst the US policy makers and has divided hawks and doves within the US administration ever since. Even after the end of the Cold War, the debate over "strategic vulnerability" and the possibility of missile defense stands unresolved. Interestingly, the drastically altered security environment in the post-Cold War

[1] Bernard Brodie quoted by Michael Krepon in "Are Missile Defense Mad?: Combing Defenses with Arms Control", Foreign Affairs, January/February 1995, vol.74, no.1, p.19.

era has, on the contrary, revived the debate over missiles defense systems and the US government has been keen on pursuing a policy for the deployment of such a system.

The initial research programme on missile defense had begun in late 1950s. However, the first possibility of an anti-missile system emerged when the US Navy in the 1960s planned for "a Sea-based Ballistic Missile Intercept System (SABMIS). The concept provided for deploying anti-missile ships in the North Atlantic and North Pacific where their interceptor missiles could shoot down Soviet- or Chinese-launched ICBMs."[2] The proposal was rejected primarily because of US inter -service policies, which favoured maintaining an army role in continental air-missile defense.

By the mid-50s, President Eisenhower authorized the operational development of nuclear-tipped interceptor missile, 'Nike-Zeus', and commissioned Project Defender to develop components for a nation-wide ballistic missile defense system. Nike-Zeus was replaced by 'Nike-X' which again was replaced by 'Sentinel'. Another major missile defense debate began in 1967 when a proposal was put forward by the Johnson administration. The "Sentinel System" as it was named would have placed nuclear-tipped interceptor missiles at fifteen sites around the country, including ten major metropolitan areas.[3] This idea of protecting American cities was abandoned by the Nixon administration as it became politically unsustainable due to protests by the

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[2] Norman Polmar, Strategic Weapons: An Introduction, (New York, Crane, Russak and Company, Inc., 1982), p.56.

[3] James M. Lindsay and Michael E. O'Hanlon, Defending America: The Case for Limited National Missile Defense, (Washington D.C., Brookings Institution Press, 2002), p. 3.

people living near the planned sites. They feared that such deployment in their backyard would make them the target of an attack. The Nixon administration, instead, proposed "to use the same interceptor technology to defend a portion of America's land-based ICBMs."[4]

The new system was called 'SAFEGUARD' and despite strong opposition it was approved by the Congress. It envisaged the deployment of an Anti-Ballistic Missile (ABM) system to protect Minuteman missiles at Grand Forks, North Dakota.[5] In October 1975 the only 'Safeguard' site was opened in Grand Forks. However, in less than two months, opposition in Congress grew and a resolution was passed to shut the base. With this, missile defense receded in the background as a political issue until President Ronald Reagan revived it in his famed 1983 "Star Wars" speech. Nevertheless, research on anti-missile systems continued, although mostly on defenses of missile silos rather than of the country as a whole.

Star Wars

In the period leading up to inauguration of the Reagan administration in 1981, the focus of anti-missile defense research had shifted from "area defense to point defense" of missile silos, and finally became a handy tool to provide a bargaining chip in arms control negotiations. In his "Star Wars" speech, Reagan encouraged the scientific community of his country to pool their talents to devise means of "rendering nuclear weapons impotent and obsolete." He directed a

[4] Ibid, p3.
[5] C. Eisendrath, Melvin A. Goodman, and Gerald E. Marsh, The Phantom Defense: America's Pursuit of the Star Wars Illusion, (Westport, Praeger, 2001), p. 5.

long-term research and development programme.[6] As a result, a comprehensive, high-profile programme, the Strategic Defense Initiative (SDI), was born, that aimed at defending the US with ground-based and space-based weapons. Once again the division surfaced within the Congress, this time largely on party lines; while Republicans argued that defending America was a moral imperative, the critics, on the other hand, mostly Democrats who argued that it was wasteful and dangerous.

At first, Reagan's programme was ridiculed, but two years later, the Strategic Defense Initiative was fully launched and its cost was estimated at $60 billion.[7] Unlike the earlier version, however, SDI remained in the research and development stage and was never deployed. President George Bush, the successor of Reagan, had earlier disapproved of SDI as Vice President, but during the 1988 presidential election campaign, came out supporting for full deployment and sought to undertake the reinterpretation of the ABM Treaty. However, he had to reconsider his plans due to the technological problems and the great cost estimates for deploying a full system. In 1991, the SDI programme was restructured as Global Protection against Accidental Launch System (GPALS), which envisaged a system designed to protect the US, its forward deployed troops, and its allies and friends from limited ballistic missile attacks.[8] The new system increased the priority of theatre missile defense programme against limited range missiles. Later, its refined version was pursued by the Clinton Administration.

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[6] Ibid, p. 13.
[7] Ibid, p. 14.
[8] Ibid, p. 19.

The TMD system came to light due to its role in the 1991 Gulf War. During that war, Iraq fired about 90 Scud missiles at Israel and Saudi Arabia– killing 28 US soldiers and terrifying Israeli civilians. The early variant of the Patriot system deployed against them could not actually stop many Scuds. But it helped prevent an Israeli retaliatory strike that might have split the US-led coalition. The Patriot has been improved since the Gulf War. Other TMD programmes have also made progress although not without hiccups. TMD programme enjoyed widespread political support because the threat of attack on the US troops from shorter-range missiles was now considered to be real. Moreover, TMD system does not seem to affect the deterrent capability of other major nuclear powers.

On the other hand, NMD remains technologically less developed and ideologically more fractured. In the US, the missile defense supporters, mostly Republicans, want above all else to protect America from direct attacks. However, most democrats who are supporters of arms control consider that deployment of NMD would seriously harm American interest by precipitating arms race. President Clinton during his tenure in the 90s was faced with this dilemma on the issue of NMD development. In 1997, his administration devised an NMD-development programme and proposed a robust funding. However, later the administration seemed to be passing the buck despite taking initiative.[9]

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[9] Michael O'Hanlon, "Star Wars Strike Back", Foreign Affairs, November/December 1999, vol. 78, no.6, p. 69.

The Concept of Missile Defense and Different Systems

A missile defense is an arrangement of defensive weapons, which are deployed to protect a particular territory by shooting down the incoming missiles. Missiles defenses can be categorized on the basis of the range of the offensive missiles they are designed to counter. The main categories are theatre missile defense (TMD) and national missile defense (NMD) and this categorization is used by the Pentagon also.

Theatre Missile Defense and National Missile Defense

The two most important version of missile defense are TMD and NMD. Though this distinction is not perfect, this works well for a country like the US which is located far away from possible threats, and given most current defense technologies. Technologically, TMD seeks to defend against shorter-range incoming missiles – SRBMs and IRBMs, while NMD defends against long-range threats or ICBMs as well as most SLBMs and many IRBMs. In theory, TMD in US is regarded as a system to protect American troops deployed abroad, as well as the territories of friendly counties near potential conflict zones, whereas NMD would protect US territory (or allies a long distance from likely threats). NMD is also described as strategic missiles defense.

A 1997 the US–Russian accord defined TMD systems as those capable of working against missiles with ranges not exceeding 3,500 kilometers. The agreement also defines TMD systems as those whose interceptor missiles do not exceed 3 kilometers per second in speed, and those that are tested only against

offensive missiles with speeds below 5 kilometers per second.[10] Missile defense systems with faster interceptors that are tested against longer-range and faster threats are defined as NMD.

A further sub-categorization of defenses can be made on the basis of the offensive missile's trajectory. It considers the stage of an offensive missile's trajectory in which the defense would try to destroy a threat and also what technologies the defense would use to find, track, and destroy a threat. The main categories in this regard are as follows: [11]

1. Terminal defenses that would work as warheads reentered the earth's atmosphere (if they had left it) but in any case in the final minutes of an offensive missile's flight;
2. Midcourse defenses that would work while enemy warheads were outside the atmosphere; and
3. Boost-phase defense that would work in the first few minutes of the offensive missile's flight.
4. Finally, the different technologies used in missile defense range from land-and sea-based interceptor missiles or air-based and space-based interceptor missiles to various types of lasers. Within each to these main areas of technology, there are also other variations, depending on how any

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[10] Stephen W. Young, "Pushing the Limits: The Decision on National Missile Defense," www.clw.org/pub/clw /coalition/libbmd.htm, November 2000.

[11] James M. Lindsay, and Michael E. O'Hanlon, n. 3, p. 40.

interceptor would physically destroy a threat and how it would be guided toward that threat.[12]

Types of Theatre Missile Defenses

Most theatre missile defenses operate in either the midcourse or terminal phase. Some operate in both, and the following discussion considers those categories together. But they can be subcategorized on the basis of how they destroy a target.

Terminal and Midcourse Defenses: There are two main types of these kinds of defenses:

1. Traditional Explosives

Most TMDs work in a simple and straightforward manner, the basic concept of which is similar to the working of a radar-guided, surface–to-air missile against an airplane. First of all, an early-warning satellite senses the heat or infrared signal from the offensive missile's booster rockets and communicates the defense battery about the missile launch. The defense battery's radar then traces the incoming missile by scanning the sky. Once the exact location is identified and the radar keeps continuous tracking of the missile, an interceptor missile is launched. The interceptor is equipped with an onboard computer and a radar receiver which help it to find an exact trajectory for itself and more precise tracking. At a proper moment, a ground control station sends a radio signal to the interceptor, causing it to detonate a conventional–explosive warhead, leading to

[12] Ibid. p. 41.

the destruction of attacking warhead. This is the basic way the existing patriot missile defense system, known as the patriot PAC-2, functions.[13]

2. Hit to Kill Interceptors

These are missile defenses based on the use of more advanced interceptor and those include the next generation of the Patriot (PAC-3), the Army's theatre high-altitude area defense (THAAD), and the Navy's area defense and theatre-wide programmes. Equipped with many miniature boosters, they are intended to maneuver so well that they can collide directly with incoming threats, obviating the need for explosives. They generally would use either their own radar or advanced infrared sensors (both Navy system and THAAD) for the final homing, having first been steered to the general vicinity of a target by radar. These approaches are known as hit-to-kill technology.[14] Hit-to-kill technologies generally operate when an enemy missile or warhead is in its descent phase or terminal phase of flight.

Boost-Phase Defenses: These may provide TMD more suitably against IRBMs compared to SRBMs (given their very short boost phases). These defenses could either be based on the use of interceptor rockets or lasers. For example, a laser based on an airplane may ultimately be used to shoot a high-energy beam at a burning rocket, rupturing its metal skin and causing it to explode.[15] A current programme is underway aiming to develop such a laser, known as the ABL (for airborne laser); the Pentagon hopes to have it operational by 2010; such lasers could eventually also be based in space.

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[13] www.fas.org/spp/starwars/programme, November 2000.
[14] James M. Lindsay, and Michael E. O'Hanlon, n. 3, p. 42.
[15] Ibid, p. 42

Type of National Missile Defense System

Similar to that of TMD, NMD systems can also work at various places along an incoming warhead's trajectory.

Terminal Defenses

These are very useful in destroying incoming warheads against small or high-value targets, but are not suited to NMD for a large country like the US. They must be based near the city or small region they are designed to protect. Nevertheless, it may be possible to combine the advantages of terminal defense with those of midcourse defense. In such system, an interceptor missile could theoretically leave the atmosphere, fly hundreds or thousands of kilometers to where an incoming threat was headed, then reenter the atmosphere to conduct an intercept.[16] It would need local radar to guide the final approach to its target, but would not need to be based near the region it was defending.

Midcourse Defenses

Compared to terminal defenses, midcourse missile defenses generally have much more time duration (15-20 minutes) to maneuver and destroy an ICBM. During that, the interceptor could travel thousands of miles and in theory then, it becomes possible to defend an entire land mass such as the US with a single base or two of missile defenses. The interceptor could be fired as soon as an enemy launch is noticed by an infrared detection satellite. They would be launched after radar picked up the missiles following a few minutes of flight. The US currently possesses radars for such purposes on it own coasts, in Alaska,

[16] Ibid, p. 43

in England, and in Greenland. These types of radars have long wavelengths that are optimal for long-range detection. A different type of radar, generally using shorter wavelengths and thus having less range but more accuracy, would then track the threatening object. It would guide interceptors towards targets until the interceptors were close enough to pick up the threats with their own sensors.[17]

More than one interceptor might be launched at a single threat, more or less simultaneously in order to ensure its destruction in case of random failures. In fact, it could take four or five interceptors to reliably shoot down a single warhead, not only for midcourse NMD but for the most types of missile defense using interceptor rockets. That is the reason why the Clinton administration advertised its proposed one-hundred-interceptor system as capable of destroying only a couple dozen warheads.[18]

Boost-Phase Defenses

These can work against both theatre-range missiles as well as long-range missiles (ICBMs). In fact, long-range missile are easier to intercept in the initial phase of flight compared to the short-range missiles. A major drawback with these defenses is that they must be located near the enemy missile launch point. That could be on land, at sea, or in the air- but necessarily near the enemy missile launch points in any case. In this system, an interceptor does not have much time and cannot cover much distance, since the boost-phase lasts only 3-5 minutes, or less for shorter-range missiles. As a result, it must begin its flight near its target. This problem is not so serious if the potential missile threat comes

[17] Ibid., p. 44
[18] Ibid, p. 44.

only from small countries that border the US allies or international waterways. But it becomes generally impractical against missiles launched from countries with large land masses, like Russia or China.

Boost-Phase defenses, as well as other types of TMD and NMD, would generally be alerted about the launch of an enemy missile by infrared-detection satellites high above the earth, which would see the strong "heat signature of the rocket". US early-warning satellites are positioned in geosynchronous orbit about 22,000 miles (36,000 km roughly) above the earth's surface.[19]

Decoys and Confused Defenses

Intercepting a missile warhead cruising at a speed of several miles per second is a tough task. Even relatively unsophisticated enemies would do everything to make a defense's job as hard as possible. The simplest way to do this would be to fire more missiles than the number of interceptors and thereby saturating the defense and ensuring that some of these could go unintercepted. If the attacker had MIRV technology, saturating a midcourse or terminal defense would be even easier and require even fewer missiles. It should be noted here that China has been seeking to acquire and deploy the MIRV technology as a part of its military modernization programme.

Some defenses only work in outer space because they depend on sensitive infra-red detectors to meet the target and such detectors can be blinded by the heat generated by air resistance, particularly if an interceptor missile is travelling at high speed. Moreover an attacker could choose to fly its shorter-range missiles

[19] Ibid, p. 46.

on trajectories that would not leave the atmosphere. This would probably require an attacker to shorten the range of many of its missiles. Furthermore, it might also move its missiles as close as possible to their target (for example, Chinese missiles aimed at Taiwan could be placed near the Taiwan Strait before launch). In that case their natural trajectories would be lower and their durations of flight would be reduced – preventing some defenses from having enough time to intercept them.

Against any defense that must work in the vacuum of outer space, the attacker has its greatest range of options. In this region, a warhead would generally have separated from its missile – or could be designed to do so almost immediately after boosting was complete. Due to these and many other reasons the decoy problem is acute and possibly incurable in the near future in the case of midcourse defenses.

However, making and using decoys within the atmosphere is supposed to be very difficult. It requires such decoys which can overcome the effects of air resistance so as not to slow down as quickly as real warheads would. Decoys that could mimic warheads within the atmosphere therefore might need small booster rockets. Countermeasures can be adopted even against the boost-phase defenses by using various methods.

Thus, we see that the missile defense involves not only very advanced technologies but a complex interaction between offense and defense. Moreover, the tools available to each side are different, and in many cases advantageous to an attacker. It means that even a less sophisticated attacker may be able to

compete successfully with a technologically advanced defender. One can easily agree with the argument that offensive countermeasures could be deployed against each and every different type of defense, in at least a partially effective manner.

The Clinton Administration Programme

The Clinton administration proposed to build a midcourse defense with an initial base in Alaska and a second to be built in North Dakota and since then, it has been the primary focus of the Pentagon's NMD efforts. The US has no other NMD system in the developing stage, though it is pursuing several types of theatre missile defense (TMD) programmes.

The 1997 Clinton proposal outlined a three-phased NMD deployment.[20] The first phase, called Capability I (CI), was designed to deploy twenty interceptors at a single site, either in North Dakota or Alaska, by 2003. The goal was to be able to shoot down up to as many as five warheads equipped with either crude countermeasures or none at all. The number of deployed interceptors would be then increased up to one hundred by 2005.

In the second phase called C2, the proposed NMD system was to be made capable of defending against an attack by warheads with more sophisticated countermeasures. It would include increased number of X-band radars, upgradation of the interceptor missiles, and expansion of the communication infrastructure so that various sensors could share data. It would also add the advanced space-based, infrared sensor, low altitude surveillance satellite

[20] Ibid, p. 83.

constellation to the ground-based radars used with the C1 capability. Besides being capable of handling more complex threats, the C2 phase would be supposedly more capable of handling threats arising from the Middle East (especially Iran), which might materialize around 2010 as estimated by the US Intelligence Community.[21] The Clinton plan also proposed a C3 phase that would be based on the deployment of more interceptors and the ability to shoot down warheads armed with sophisticated countermeasures.

In the initial period of his term, President Clinton decided to scuttle the ongoing missile defense programme, but later he opted for increased funding for TMD programmes sensing the security threats due to spread of Scud-class missiles in places like the Middle East. Unwilling to jeopardize arms control or the US-Russian relations with the NMD programme which he regarded as unnecessary, Clinton chose to cut spending on national missile defense from more than $2 billion annually to less than $1 billion. Since the Gulf War, the Department of Defense placed a high priority on developing defenses against theatre ballistic missiles (TBMs). Hence the Clinton administration redirected the focus of the Ballistic Missiles Defense Organization (BMDO, formerly the Strategic Defense Initiative Organization) away from a national missile defense system and towards the development of theatre missile defenses.[22]

The support for NMD got major boost in 1995 when the Republicans took control of Congress. As a political compulsion, the Clinton administration

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[21] Ibid, p. 87.

[22] David Mosher and Raymond Hall, "The Clinton Plan for Theatre Missile Defense: Costs and Alternatives", Arms Control Today, vol. 24, no. 7, September 1994, p. 15.

responded to the growing pressure by putting forth a proposal for an NMD system in 1997. In the following year, the efforts were intensified to develop it in reaction to the threats generated by the rapid progress in Iranian and North Korean missile programmes. The administration, in 1999, decided to push back the original deployment date by two years to 2005 and to deploy one hundred interceptors by 2007. In 2000, the administration decided to base the system in Alaska, with North Dakota still a possible second site for eventual expansion of the system.[23]

Thus, we see that President Clinton's support for national missile defense has its roots in the Republican takeover of Congress. Republicans in the Congress mandated a national missile defense by 2003. Clinton vetoed the bill but then chose to co-opt the issue; and hence he devised a '3+3' plan. The missile development by North Korea and Iran further necessitated the pursuit of NMD. Clinton submitted his missile defense budget to Congress in February 1999. The response from the Congress came in the overwhelming majorities of [illegible] a bill which declared it to be the US policy to deploy a [illegible] missile defense as soon as "technologically feasible". Before signing it into the National Missile Defense Act 1999, President sought to emphasize on relevant concerns regarding arms control and budgetary constraints.[24]

Besides this, anther issue which Clinton had to face was the ABM Treaty. Although the treaty placed no ban on C1 and C2 systems, it did not allow a territorial defense of any kind or size. It allowed only the single missile defense

[23] James M. Lindsay, and Michael E. O'Hanlon, n. 3, p. 89.
[24] O'Hanlon, Michael, "Star Wars Strike Back", n. 9, p. 78.

site which was supposed to defend only the nation's capital or an ICBM field. As a result, the administration committed itself to persuading Russia either to modify the treaty or to withdraw from it.[25] However, the pressure on the administration to keep NMD development on schedule got lessened due to a failure of an interceptor rocket tested in July 2000- the second such test failure in six months. As a consequence, in September 2000, Clinton decided that the 2005 deployment deadline was no longer realistic and announced that he was deferring any such decision about NMD deployment and the ABM Treaty to his successors.[26]

NMD under the New Bush Administration

The Bush administration inherited only one major long-range missile defense programme from the Clinton administration. The system had already failed two key tests in 2000. In a speech delivered on May 1, 2001, Bush gave an outline of his concept of missile defense which was at best an ambiguous one. But Pentagon's budget requests made for fiscal year 2002 pointed to a major boost for NMD programme. According to one estimate, the budget requests suggested a plan to deploy a minimum 1,000 defensive interceptors capable of shooting down long-range missile warheads. This is because, besides its plans for long-range missile defense, including the Clinton mid-course system and other options, the Bush administration planned to give long-range defense capabilities to two TMD programmes, the theater high attitude area defense

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[25] James M. Lindsay, and Michael E. O'Hanlon, n. 3, pp. 90-91.

[26] Steven Lee Myers, "Washington Split Deepens in Debate Over Missile Plan", New York Times, August 30, 2000, p. A1.

(THAAD) and navy theater wide systems. This would logically imply a deployment of at least 1,000 interceptors capable of long-range defense.

In December 2002, President Bush announced plans to begin deployment of a strategic nationwide missile defense system by September 30, 2004. It indicated the drastically changed priorities in the missile defense programme. His decision had lowered the bar on the acceptable standards for an effective missile system.[27] The ground-based mid-course defense (GMD) system, [28] as it is now called, has not been able to prove its effectiveness. Moreover, tests so far have all been conducted at unrealistically low speeds and attitudes making it difficult to conclude that it would work against real targets. The GMD system is now only the centerpiece of the larger Bush Ballistic Missile Defense System (BMD), a "layered" system intended to be capable of shooting down missiles in all phases of their flight – boost, midcourse, and terminal and from platforms based on land, at sea, in aircraft, and in space.

During the first two yeas of the Bush administration, the Pentagon carried out a testing programme that did not depart radically from its predecessors, though not without some changes. Five flight intercept tests of the GMD system were conducted as opposed to three flight intercept tests of the NMD system in the final two years of the Clinton administration. Moreover, all of the flight intercept test attempts in the first two years of the Bush administration were

[27] Philip E. Coyle, "Is Missile Defense on Target?", Arms Control Today, vol. 33, no. 8, October 2003, p. 7.

[28] The GMD system would consist of a set of silo-based interceptors, beginning with six at Fort Greely and four at Vandenberg Air Force Base in California.

quite similar to tests during Clinton's tenure.[29] So, in effect, there was no real technological upgradation as far as the testing was concerned. The point here is that even before it has been demonstrated that the initial GMD system works properly, Bush administration is planning even more ambitious deployments.[30] The December 17 announcement generated a muted reaction abroad, although some Democratic Congress members also strongly questioned the system's technological readiness and the motives behind the administration's decision.

The initial system to be deployed between 2004 and 2005 includes up to 20 ground-based interceptors, 20 sea-based interceptors with three ships outfitted for the their use, an undisclosed number of Patriot Advanced Capability- 3(PAC-3) missiles, and upgraded radar systems to help identify and track targets.[31] Only the 20 ground-based interceptors are designed to hit long-range ballistic missiles. The sea-based interceptors and PAC-3 missiles are designed only to protect against short-and medium-range ballistic missiles.

Testing of each of the three systems is still in early stages and at the most one can say that these have produced mixed results. The thrice testing of the sea-based system has been successful, while the ground-based system's five test could achieve a success rate at less than 50 percent, with three misses out of total five hits. The PAC-3 system could not perform better and in a series of four operational tests involving multiple missiles last February through May 2002,

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[29] Philip E. Coyle, n. 27, p. 7.
[30] Ibid, p. 14.
[31] Wade Boese, "Bush to Deploy 'Modest' Missile Defense in 2004", Arms Control Today, vol. 33, no. 1, January/February, 2003, p. 18.

only two of seven PAC-3s successfully destroyed their targets.[32] While announcing the decision for deployment, Bush claimed that the US withdrawal from the Anti-Ballistic Missile (ABM) Treaty in June 2002 "made it possible" for the US to fully explore, test, and deploy missile defenses.[33] However, the system which are to be deployed are those inherited from the Clinton administration, which was bound by the ABM Treaty and only deployment of the ground-based interceptors would have been prohibited by the accord. As we know, the ABM treaty specifically ruled out the testing, development, and deployment of strategic missile defense systems or components that were air-, sea-, space-, and mobile land-based. The treaty didn't bar research and moreover didn't prohibit work on TMD systems such as the PAC-3 that was used in Iraq.

As expected, the deployment decision by Bush administration attracted reactions from abroad especially from Russia and China. While Russia expressed "regret", the Chinese Foreign Ministry spokesman Liu Jianchao cautioned on December 19, 2002 that a US missile defense system "should not undermine global strategic stability, nor should it undermine international and regional security". Liu hinted, however, that, if China sees missile defense as a possible threat, it would respond.[34]

The Debate on Missile Defense

The US currently has no nationwide defense against missile attack. The debate over whether the US should deploy a national missile defense (NMD) has

[32] Ibid, p., 18.
[33] On June 13, 2002, the US withdrew from the 1972 Anti-Ballistic Missile (ABM) Treaty, eliminating the treaty's limits on the US ability to develop and deploy nationwide defenses against long range ballistic missiles and dampening three decades of contentious debate over whether the US should pursue such defense.
[34] Steven Lee Myers, n. 26, p. 29.

been raging since the 1960s. In 1967, the then Defense Secretary Robert McNamara, reacting to pressure from Congress to deploy an ABM system laid out a plan for building a "light" national missile defense. He said that if Americans were to deploy a heavy ABM system throughout the US, the Soviet would increase their offensive capability. He went on to explain the distinction between a "heavy" ABM (or anti-Russian) system and one that would be deployed to defend the US against an emerging Chinese nuclear threat. He finally announced- "we have decided to go forward with this Chinese-oriented ABM deployment."[35]

The debate has not changed much in last three decades since McNamara's declarations. The principal arguments for a "light" NMD still include neutralizing China's nuclear capability, although that goal has been somewhat muted, together with a strongly-felt need to defend against a small-scale attack by a rogue state or an unauthorized or accidental launch by a major nuclear power.

The main arguments against deploying NMD have not changed much, either. These are based on technological drawbacks, the high cost, skepticism about the system's performance, the ill-defined nature of the threat, the system's uncertain architecture, the case of circumventing the system, and the impact it

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[35] Jack Mendelsohn, "Missile Defense: And it still won't work", The Bulletin of the Atomic Scientists, vol.55, no. 3, May/June, 1999, p. 29.

would have on the US/China/Russian strategic relationship in particular, and global security structure and disarmament regime, in general.[36]

Today, the debate revolves around the above mentioned factors. The two opposite camps are continuously involved in ascertaining the pros and cons, the benefits and the losses in case of the deployment of NMD and have reached mutually contradictory conclusions. Within the US, the opponents, overwhelmingly Democrats, point out that the benefits of national missile defense are uncertain and costs are very high. They have argued that while effective missile defenses are difficult to build, any attempt to deploy an NMD system would jeopardize relations with Russia, China and Europe and threaten three decades of arms control.

Supporters, on the other hand, mostly Republicans, argue that the US should build defenses. They say that "revolutionary developments in radar, laser, and data processing technology are transforming missile defenses from the stuff of science fiction into a here and now reality."[37] They cite the spread of nuclear and ballistic missile technology in the states that are "virulently hostile" to American power and values, as cause of grave concern. For them, it is immoral and unacceptable and against common sense to follow a policy that deliberately leaves the American people vulnerable to attack when technology makes it possible to protect them. Moreover, supporters for the missile defense are much worried about the possible loss of American power and influence in the world owing to her vulnerability against attacks. They hold the view that the

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[36] Ibid., p. 29.

[37] James M. Lindsay and Michael E. O'Hanlon, n. 3, p. 2.

vulnerability to long-range ballistic missile attack could cause America's friends and allies to doubt its willingness to stand by its security commitments, thereby weakening support for the US around the world.

It seems that both opponents as well as supporters of missile defense have missed the opportunity to undertake a serious discussion on the issues related to missile defense so as to forge a sensible policy for the country. Each side repeats its claims with great intensity, often leading to exaggeration of the harm or promise of missile defense. Moreover, the issues related here are complicated and cannot be addressed on the basis of ideological leanings. Let us take up different issues related to missile defense, one by one, as debated amongst the supporters and opponents. This would lead to a sober analysis of the role national missile defense can play in American national security.

Technological Feasibility

Foolproof and effective defenses against long-range ballistic missiles are still only a theoretical possibility. It is agreed however, even by many NMD critics that some kinds of defenses are becoming feasible. But considerable divergence of opinion exists over which missile defense architectures make sense and how far will they be effective. Till now, a number of demonstration tests of missile defense have shown that there are enormous technical difficulties inherent in any missiles defense owing to great advantage enjoyed by any offensive missile force. However, the optimists would argue that the fact that the US cannot defend itself perfectly against every threat is no reason to give up.

In October 1999 – the Pentagon demonstrated the basic feasibility of "hitting a bullet with a bullet" in a controlled test in which a kill vehicle destroyed a warhead 140 miles above the Pacific Ocean.[38] The next two test failed due to equipment malfunctions, highlighting the difficulties that plague the development of a major weapon system as complex as missile defense. If we go by the success rate of the interceptor test, the technological readiness at current state of R&D remains questionable. However, the proponents of missile defense argue that most of these technical difficulties and engineering challenges would be overcome over a period of time.

In the year 2002, President Bush announced the plan for deployment of a "modest" (limited) missile defense in 2004, less than a week after the latest missile defense test failed. The announcement came as a surprise to the critics of NMD who raised alarm over the undue haste. Despite the modest number of tests and several failures, Lieutenant General Ronald Kadish, the head of the Pentagon's Missile Defense Agency (MDA), justified the announcement saying that the system are based on solid technology, "we do know that our fundamental technology of hit to kill, collision of the interceptor with the warheads that completely destroys the warheads, works."[39] Secretary of Defense Donald Rumsfeld justified the deployment as being better than nothing and said it is in line with the Pentagon's new spiral development approach to missile defense. The new approach is based on the principle that "you begin the process,

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[38] Ibid., p.14.

[39] Wade Boese, n.31, p.78.

you put some capability out there, and then you improve that capability in successive blocks".[40]

The skeptics and critics, on the other hand point out the technological drawbacks as one of the major reasons as to why missile defense cannot work. Effective missile defense systems are very difficult to develop - harder than their proponents like to admit. While progress to a certain extent has been achieved in TMD, a lot still remains to be done. National defenses, on the other hand, against inter-continental missiles remain a good way off. A 1998 task force headed by retired General Larry D. Welch, argued that missile defense research programmes are being pushed too rapidly in what amounts to a "rush to failure."[41] It has been frequently acknowledged even by BMDO official, that the NMD development schedule is very ambitious.

The most ardent skeptics say that as we review the evidences we can see that none of the national missile defense systems proposed over the past twenty years has ever proven in tests to be technically feasible, and that those presently under development are far from promising. They believe that it is highly unlikely that any candidate system can be shown to be militarily effective during the next eight years. That is, during the next two presidential terms neither the technology nor our testing methods will provide an assured capability to defeat long-range ballistic missiles.[42] And now since the President George W. Bush decidéd to proceed with a "modest" deployment of a national missile defense

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[40] Ibid, p.18.

[41] Michael O'Hanlon, n. 9, p.73.

[42] Craig Eisendrath, Melvin A. Goodman and Gerald E. Marsh, n. 5, p.91.

system as mentioned below, the critics argue that the decision is based on political and economic considerations, which may include the perception that the threat justifies early deployment and not on demonstrated ability to defeat the likely threats.[43]

It has been observed by the skeptics that the past two decades of efforts to develop a viable national missile defense have been characterized by exaggerated claims of "success and promises of performances" that later proved to be falling short. They say that the problem began with the false claims of proponents of the X-ray laser that helped launch the SDI programme in the early 1980s. Further claims that the Patriot theatre missile defense had proven itself in combat during the Gulf War were also not correct. Today the false claims are made that cruisers, equipped with the Aegis radar system, and armed with existing missiles and kill vehicles, can provide effective defense against both IRBMs and ICBMs. Critics point out that the test plans and targets for testing the missile defense have been optimized to ensure the likelihood of success and various test enhancement methods have been resorted to.

Even if the missile defenses eventually work on the test range, they may still be defeated by a real enemy's counter-measures.[44] We may achieve a high success rate in hitting a bullet with a bullet under controlled conditions, but what if the incoming bullet is accompanied by dozens of decoys, or is a part of a multi-missile attack designed to overwhelm defenses. We have already discussed the technical and engineering challenges for a prospective missile defense in the

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[43] Ibid, p.92.

[44] Michael O'Hanlon, n. 9, p.74.

face of counter-measures adopted by the enemy. Such counter-measures are to be expected both from a sophisticated and relatively a less-sophisticated foe. It is now an open secret that China, fearing the implications of missile defense deployment by the US, is engaged seriously in acquiring MIRV systems for its nuclear missiles forces. We thus see that the technology for shooting down long-range ballistic missiles under real-world conditions remains a hope. It is not yet a reality.

Cost Affordability:

The second major debated issue relating to missiles defense is that of the cost. According to one estimate, the US has spent about $3.5 billion a year on missile-defense programmes since President Reagan first announced the Strategic Defense Initiative in 1983. In 1999 it totaled up to around more than $50 billion.[45]

According to another estimate the total amount spent on ballistic missile defense programmes over the 15 years till 1999 was summed up at $60 billion. After that, the Clinton administration proposed spending $10.5 billion over the next five years, to boost the development of a workable NMD system. It added $6.6 billion to its defense plan for the year 2000 through 2005 for that purpose. Estimated total acquisition cost later rose to $12.7 billion through 2005.[46] The Pentagon concluded in 2000 that total acquisition costs were likely to reach

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[45] Ibid., p. 74.

[46] Roberto Suro, "Missile Sensor Failed in Test's Final Seconds, Data Indicate" *Washington Post*, January 20, 2000, p. A4.

about $25 billion (in constant 2001 dollars).[47] Even though costs increase by 50 percent in the end, they would hardly be enormous by comparison with Pentagon's fighter, submarine, and destroyer programmes and their costs. Nonetheless, they would be significant.

In the early 2002, the Congressional Budget office produced one broad estimate of the long-term costs of a long-range missile defense. Envisioning an architecture consisting of a land-based mid-course system, a sea-based mid-course system, and a space-based system, it arrived at the conclusion that total development and deployment costs could be about $200 billion during the next two decades. Assuming a roughly steady level of overall spending for TMD programmes would imply an overall spending level for all missile defense efforts of about $15 billion a year, plus operating costs for various systems once they are deployed.[48]

The Bush administration requested nearly $8.3 billion for ballistic missile defenses - a $3 billion increase over current spending levels - as part of the Pentagon's fiscal year 2002 amended budget request. The administration seemed to favour ambitious missile defenses. The Congress ultimately passed the increase amount in full. Some of the proposed increase in the budget was for system that could only provide shorter-range or theater missile defense (TMD), but much of it was for longer-range or national missile defense (NMD) capabilities. In the 2003 defense budget proposals, released in February 2002, a

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[47] Tony Capaccio, "National Missile Defense Cost Estimate Rises Nearly 20 Percent", *Defense Week*, September 11, 2000, p.2.

[48] James M. Lindsay and Michael E. O'Hanlon, n. 3, p. xx.

robust spending on missile defense was ensured, at least in the short term. The Pentagon requested $7.8 billion overall for missile defense.

Proponents of the missile defense argue that, given the stakes involved, this amount is not actually so big. They say it is cynical to argue that the US cannot afford missile defense. The cost of missile defense is one that the nation cannot afford not to bear. They point out that the total cost for missile defense is only 1-2 percent of the entire US defense budget. Moreover, the clear perception of the looming threat emboldens the proponents to support missile defense irrespective of the cost. For them, the price to pay is rather small, given the likelihood of devastations such as September eleven.

The skeptics and the opponents, on the other hand, hold that the missile defense remained the single largest weapons programme in the defense budget. What strengthens the skepticism is the viability of the missile defense system to demonstrate effectively so far with more number of test failures than successful ones. The argument is that a large sum of money will go waste - an unnecessary burden on the taxpayers. Then there is an alliance of different sections including scientists and labs, politicians and defense contractors, who have their vested interest in the project. Skeptics argue that anti-missile defense is being advanced through false claims, ranging from protection of the whole population to a system's ability to protect the country from "rogue states" and terrorist.[49]

They further point out that the anti-missile defense has been made to look more imminently deployable than it is, and claims for its success in the face of

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[49] C. Eisendrath, Melvin A. Goodman and Gerald E. Marsh, n. 5, p. 25.

its clear viability to deal with counter-measures. The potential costs are down played, although there is little doubt that if the expanded systems favoured by the current Bush administration are put in place, the cost would exceed $150 billion. Now since the Bush administration has taken decision to go for a modest or limited deployment of missile defense, the appropriations will massively increase.[50]

The Political and Security Aspect

The debate around missile defense also involves a range of political and security issues and both the proponents and the skeptics argue their own point of views.

The US has never had a nationwide defense against missile attack. The question today is whether the US will someday, out of fear of reprisal against its homeland, shift from traditional posture of projecting power abroad or eschew at last from exercising certain military options. Meanwhile, in the last few years, the potential ballistic missile threat to the American homeland as well as the US allies has been perceived to have increased, as missile delivery system technology has proliferated. The perceptions of the threat and the seriousness with which the security concerns are to be addressed today have become major issues in debate within and outside the US. The deployment of missile defense required modifying or even withdrawing from the Anti-ballistic missile Treaty. Although Bush has already invoked the withdrawal clause of the ABM Treaty,

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[50] Ibid. p. 25.

yet one should take notice of the potential consequences. (The ABM treaty is dealt with elaborately in the next chapter)

September 11 dramatically altered the politics of missile defense in the US. It has helped greatly in toning down the criticism of the White House's missile defense policies. The critics of missile defense have frequently pointed out that any such step would not only derail arms control but also antagonize other major powers, most importantly Russia and China. It would be dangerous to disregard Russian and Chinese security and strategic concerns. Although Russian President Vladimir Putin's restrained reaction to US decision to withdraw from the ABM Treaty was a sort of surprise to many, it did not mean that Russia would remain indifferent to any and all missiles defense deployments. Russia might not cooperate with the US in arms reduction treaties and would be free from any obligations under START agreements. It was evident from the tensions between Moscow and Washington in early 2002 over offensive nuclear forces.

On the other hand, the Chinese reaction is in many ways more critical than that of the Russians. China is far more vulnerable to a US missile defense than Russia because it has only about twenty long-range missiles and it is more likely to come into conflict with the US based on strategic realities. Unlike Russia, China is not a declining power but a rising one and it has specific territorial issues (most notably Taiwan) over, which it could conceivably fight a war with the US.[51] China is not a signatory to the ABM Treaty, but missile

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[51] James M. Lindsay and Michael E. O'Hanlon, n. 3, p. 9.

defense clearly affects its interests. China has never had a robust second strike capability against the US. Deployment of even a 'limited' American NMD system could have the effect of nullifying China's nuclear deterrent. Missile defense looks especially threatening to Beijing in view of years of US support for Taiwan, which has grown markedly in the last decade. China regards Taiwan a breakaway province. This is combined with the 1997 White House decision to add Chinese political and military installation back into US strategic nuclear targeting plans after a twenty-year gap.[52]

The proponents of Missile defense simply dismiss these concerns and complaints of China (and, of course, those of Russia) on the pretext of enhancement of the US security. Some of them say that, with the Cold War over, Superpower arms balances no longer have the importance they once did. And if China builds up its offensive strategic forces to counter a US defense, at least it will have fewer resources to spend on other military instruments - such as the amphibious forces that would be needed to seize Taiwan.[53]

The opponents of missile defense argue that a push for missile defense would probably go to America's disadvantage. Both Russia and China would probably improve their existing countermeasure technologies. They might also opt for deploying their nuclear forces on high-alert, thus increasing the risk of accidental war. Moreover, Russia might also curtail its cooperation with the United States to secure its nuclear arsenal. Finally, Russia and China might stop cooperating on issues that matter to Washington, particularly nuclear

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[52] Bruce G. Blair, "Trapped in the Nuclear Math", *New York Times*, June 12, 2000, p. A29.

[53] James M. Lindsay and Michael E. O'Hanlon, n. 3, p. 10.

proliferation. They might be encouraged to sell technology for developing weapons of mass destructions, building missiles and defeating defenses to countries such as North Korea, Iran and Iraq.[54] Furthermore, China might refuse to make efforts to moderate North Korea's behaviour, and take tough posture in its dealings with Taiwan.

The Threat

The proponents of missile defense in the US cite the growing ballistic missile threat faced by their nation, as the most important reason for deploying missile defense. (It is the most popular rational - the threat of a small scale missile attack from "a rogue state" - North Korea has been the most recent nominee for this role.) The current and likely future missile threat to the US comes from only five countries: Russia, China, North Korea, Iran and Iraq.[55] Out of these only Russia and China possess the ability to strike the US from their own territory. The main fear with Moscow is that of an accidental and not a deliberate attack. With China, the US has experienced an uneven and rocky relationship. Despite improvements, the US and China have been confronting over various issues including Taiwan.

The 1998 Rumsfeld Commission Report pointed out that "China is modernizing its long range missiles and nuclear weapons in ways that will make it a more threatening power in the event of a crisis.[56] Similarly, another report by National Intelligence Estimate 1999 says that by 2015, China will likely have

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[54] Ibid, p.11.

[55] Ibid, p.50.

[56] Rumsfeld Commission Report, 1999, http://www.cnn.com

tens of missiles targeted against the US, having added a few tens of more survivable land and sea based mobile missiles with smaller nuclear warheads in part reportedly influenced by US technology gained through espionage.

The critics regard the so-called perceived threat from ballistic missiles as exaggerated and ill-defined. They have branded it as a misleading assessment of missile threat. A balanced net assessment of global ballistic missile arsenal over the past fifteen years would reveal that the threat is confined, limited and changing relatively slowly.[57] In reality, there is no rogue-state long-range missile threat at present and - the recent Rumsfeld report notwithstanding - it is unlikely that one will emerge in the next decade.[58]

The list of current and future ballistic missile states consists mainly of countries that are either not a threat to the US, or are most unlikely to acquire missiles in the 1500 to 3000 kilometer range, against which the treaty non-compliant TMD system are directed.[59] Thus, the threat to the US as a rationale for Missile defense deployment goes unwarranted. Critics further argue that any deployment of missile defense (even a TMD umbrella including Taiwan or Japan) would greatly disregard Chinese security interests and it would trigger further arms modernization and build-up in the form of counter-measures.

The Chinese Reaction to US Missile Defense

Currently, China is faced with unprecedented circumstance in the form of the development of advanced theater missile defense for East Asia and national

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[57] C .Eisendrath, Melvin A. Goodman and Gerald E. Marsh, n. 5, p. 65.

[58] Jack Mendelsohn, n. 35, p.30.

[59] Spurgeon M. Keeny Jr., "The Theater Missile Defense Threat to US Security", *Arms Control Today*, vol.44, no.7, September 94, p.4.

missile defense by the United States. In a natural response to the concurrence of these two events, China could embark upon shaping a significantly larger nuclear force that could strike the United State unless Washington decided that missile defense deployment was not in its best interest and China continued to adhere to a minimum deterrent posture consistent with its currently small arsenal.[60]

The Clinton administration had held that the US needed an NMD system to defend against so-called "rogue" nations, such as North Korea, Iran and Iraq, and to shoot down a handful of missiles from an accidental launch. It had not explicitly mentioned China as one of the driving forces behind NMD. Despite this ambiguity, current US NMD plans appear sized for the small Chinese ICBM forces.[61]

The Clinton Administration had spent considerably more effort persuading Russia to accept US missile defense plan than it had openly put forth addressing Chinese concerns. China, like Russia, staunchly opposed the Clinton administration's proposed NMD system and its efforts to revise the ABM Treaty. Chinese reaction to NMD/TMD and ABM development can be better analysed by discussing the following issues:

1. Modernization programme.
2. The Debate about US and the requirements of Chinese security in the post Cold War.

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[60] Charles Ferguson, "Sparking a Buildup: US Missile Defense and China's Nuclear Arsenal", *Arms Control Today*, vol.30, no.2, March 2000, p.13.

[61] Ibid, pp. 13-14.

3. The leadership in Beijing.

4. Taiwan conflict.[62]

Modernization Programme

If the US deploys a limited NMD system, it will, in effect, damage China's currently small deterrent, pressuring China to engage in a nuclear arms build up. China's nuclear forces were developed to defend her national security interests against the possibility of nuclear blackmail. Initially, China possessed only a symbolic nuclear deterrence with no real capability to retaliate, but from 1980 when China developed the capability to launch ICBMs; its deterrence has been based on the quantitative ambiguity of its nuclear force rather than the size of its arsenal.[63]

The structure of the NMD system designed by the Clinton Administration had a clear East Asia orientation. In the C_1 phase of NMD deployment the proposed new missile tracking radar will be deployed on Shemya, on outpost well located to watch missiles from East Asia including Russia, North Korea and China. The US intention behind NMD is cause for a great concern to China. As the relations between North and South Korea are improving the voices in the USA calling for aiming the NMD at China are getting stronger. Chinese will have to explore possible response in their nuclear deployment if the US decides to deploy NMD. China is now using its diplomatic resources to influence the US on NMD deployment. The hope is that the US will take China's security concern

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[62] James J. Wirtz and Jeffrey A. Larsen (eds.), *Rockets Red Glare: Missile Defense and the Future of World Politics*, (Oxford, Westview Press, 2001), p. 185.

[63] Li Bin., "The Effects of NMD on Chinese Strategy", *Jane's Intelligence Review*, vol.13, no.3, March 2001, p. 49.

seriously when it considers NMD deployment. According to a Chinese official, "US NMD will seriously under mine the effectiveness of China's Limited Nuclear Capability from the first day of its deployment. This cannot but cause grave concern to China.[64]

Some US scholars have criticized this view of NMD leading to modernization and armament of the PLA. They believe China's forces will grow larger and more capable, regardless of whatever the US does. This point was made by a Clinton administration official in the NMD debate "Whether or not we proceed with NMD, China's nuclear forces would expand in a way that would make this system less threatening to China".[65] Washington should not let Beijing blame it for every new deployment. But it is also true that NMD is likely to affect the future trajectory of the Chinese modernization effort. One can not deny the fact that any kind of missile defense deployment by the US would find its way into a justification by China for its further armament and increase in missile forces, regardless of whether China wants it or not.

Debate of Post-Cold War Era

Following the collapse of Soviet Union, the US has surfaced as China's most important military planning problem, given the unresolved dispute over Taiwan. But at the same time, the US also has emerged as the country that can best help China modernize. Managing the bilateral relationship with Washington is thus one of Beijing Central Challenges.

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[64] Ibid, p.51.
[65] Erick Eckholm, "China says US Missile Shield could Force an Arms Buildup", *New York Times*, 11 May, 2001.

The Chinese people generally believe that a US NMD is a bad idea. China does not want to waste resources on a nuclear arms race triggered by US NMD. China is determined to focus on economic development and high growth rate - and that requires an environment free of major tensions among the great powers. Some Chinese scholars believe that National Missile Defense is actually a trick to drag China into an arms race that would exhaust its resources and harm its economic development. They argue that the collapse of the Soviet Union was largely caused by Ronald Reagan's hugely expensive military buildup and Strategic Defense Initiative, or Star Wars. The Soviet Union could not compete in that new game. In western terms, it went bankrupt. These scholars suggest that US is now trying to use the same strategy in an effort to "contain" China.[66]

NATO's war in Kosovo, capped by the Chinese Embassy bombing, fueled debate in China about its interest in the emerging international order. According to Tao Wenzhao, a Chinese analyst, four issues have dominated this debate. Did NATO's war signal a new pattern of American interventionism as a global strategy aimed at imposing global hegemony? Are peace and development still the main streams of world affairs today, or have they been replaced by power politics and hegemonism? Has China's security environment been seriously undermined is recent years? What policy should China adopt towards the United States?[67]

US plan for National Missile Defense triggers the perception that Washington is bent on denying China its rightful place as a rising great power.

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[66] Li Bin, Zhou Baogen and Liu Zhiwei, "China Will have to respond", *Bulletin of Atomic Scientist*, vol.57, no.6, November/December. 2001, pp. 26-27.

[67] James J. Wirtz and Jeffrey A. Larsen (eds.), n. 63, p. 191.

China sees "the real motives of the US government is to make use of the country's unrivaled economic and technological might to grab the strategic high ground for the 21st century in both the scientific and military fields, so as to break the existing global strategic balance, seek absolute security for itself, and realize its ambitions for world domination."[68]

The Leadership Factor

The NMD issue comes at a difficult moment for China's leaders and the Communist Party. Basic questions about how to proceed with reform and how to protect China's international interests are under intense debate in China today. There are profound concerns about the legitimacy of one party system and the governability of China. Western analysts, and many of their Chinese Counterparts, appear to agree on the following interpretations of recent developments:

- Marxism-Leninism has been discredited.
- Economic reform brings with it questions of political reform.
- The Communist Party's grip on power cannot last forever.
- Russia provides a powerful example of how not to manage the escape from communism.[69]

In an important political sense, US NMD is yet another test of China's leadership. The prospect of a the US NMD system gives new influence to the

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[68] Ibid, p. 192.
[69] Ibid, p. 193.

hard line elements in the policy process, especially those in the PLA (People's Liberation Army) and the defense industries who favour an increase in military spending.[70]

Taiwan Factor

The Chinese reaction to missile defense proposals is negative, strongly felt, and expressed mainly in terms of cross-strait relations. China worries about political trends leading Taiwan further away from its fold. The Chinese leadership with its control at home gradually eroding cannot allow itself to be accused of "losing Taiwan". Deeply conscious of its vulnerability, China believes a missile defense system put forward by the US would wholly neutralize China's small strategic force and could therefore threaten China's survival.[71]

In Taiwan, some scholars worry that the dispute between mainland China and the US over NMD could put Taiwan in an even more precarious position. They suggest that Taiwanese authorities use great caution in responding to US plans for NMD. A few Taiwanese researchers suggest that Taiwan might even play the NMD card in exchange for the mainland's tolerance of some kind of theatre missile defense for Taiwan.[72]

In 1997, China regained Hong Kong, and in December 1999 it reacquired Macao. Chinese leaders have clearly stated that Taiwan is next in line for reunification. US military aid to Taiwan serves to bamboozle those plans.

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[70] Ibid, pp.193-195.

[71] John Newhouse, "Missile Defense Debate", *Foreign Affairs*, Jan-April, 2001, vol.80, no.4., p. 106.

[72] Li Bin, Zhou Baogen and Liu Zhiwei, n. 67, p. 26.

Taiwan has expressed strong interest in receiving advanced Theater Missile Defense (TMD) from the US. Although the US has sold Patriot Advanced Capability-2 (PAC-2), a limited TMD system, to Taiwan, it has not decided whether to provide more advanced TMD, if such systems are developed in future. Taiwan's desire for US missile defense represents only one of the outstanding elements of the US-Chinese-Taiwanese missile diplomacy triangle.[73] According to Pentagon sources, by 2005, Taipei would still possess a "qualitative edge over Beijing in terms of significant weapons and equipment."

The possible future sale or sharing of US TMD systems to Taiwan is China's primary concern. Washington has not decided whether to sell such systems, but Walter Slocombe, US under secretary of defense for policy, said in 2000 that he made it clear in the talks with Xiong Guangkai, the Chinese Lieutenant General, that TMD was an issue, in part, because of Chinese missile deployments across from Taiwan.[74]

The PRC finds especially troubling the prospect of both TMD and NMD being deployed by US defenses, which it conceives to be aimed at denying Beijing any influence over events outside its territory. If NMD consolidates the view that a conflict with Washington is inevitable and that as soon as system begins to reach the field, Washington's advantages in such a conflict will only continue to grow, then the argument may prevail that the time for Beijing to act is now.[75]

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[73] Charles Ferguson, n. 61, p. 15.

[74] "US-Chinese Relations Strained over Taiwan", *Arms Control Today*, vol.30, no.2, March 2000, p.25.

[75] James J. Wirtz and Jeffrey A. Larsen (eds.), n. 63, p. 196.

China believes that unilateralism is characteristic of Bush's foreign policy and the push for a NMD system is a dramatic example of it. Some analysts believe that the deployment of a NMD system would, in turn, reinforce US unilateral tendencies because the US would feel even lesser the need to obtain the help of other countries in the future in pursuing its foreign policy objectives. First, the Bush administration publicly vowed to deploy a system before it consulted with other countries, including its allies; second, it unilaterally withdrew from the ABM treaty; third, the administration seems to have little interest in listening to critical responses when it sends envoys to explain the plan to other countries. Thus, there is obvious evidence of unilateralism in the development of NMD. Despite "consultations" with other countries, there is ample evidence that unilateralism informs the US decision-making process in a big way.

Within China, there are differing opinions as to how to weigh the damage caused by the stepped-up US commitment to TMD and NMD. Some are of the opinion that China must utilize all of its diplomatic resources to prevent the US from "selling" the idea of TMD to Taiwan. Some other experts believe that China should not react strongly to a US decision to deploy a NMD system. One scholar believes that it is the morality based "nuclear taboo" rather than nuclear deterrence that plays the main role in preventing the US from launching a nuclear attack anywhere.[76] Therefore, China should not worry much even if China "loses" its nuclear retaliatory capability because of deployment of NMD.

[76] Li Bin, Zhou Baogen and Liu Zhiwei, n. 67, p. 27.

Others believe that China must develop a more robust retaliatory force as a counter to NMD. Also rather than building many more missiles, China could deploy penetration aids on its missiles, including decoys, stealth technology and warhead mancuvering capabilities.[77]

China welcomes serious dialogue with the US in an attempt to seek a solution "that will not undermine the security interests of relevant countries."[78] There is no sign that China will change its position. Though, US has come of late to understand China's concerns with regard to deployment of American ballistic missile defense and changes in the ABM Treaty,[79] any progress in exploring the problem has been hindered by the intense partisanship surrounding the China issue generally and the particular sensitivities generated by 1999 Cox Report on Chinese espionage. Beijing's reaction to NMD is not likely to take on a definitive shape until Washington decides to use NMD to undermine China's deterrent.

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[77] Ibid., p. 27.
[78] http://www.csis.org/html/8/991105sclombe.html
[79] Ibid.

CHAPTER FOUR

MISSILE TECHNOLOGY, NON-PROLIFERATION AND RELATED ISSUES

While the US missile defense remains the most burning issue between the US and China, there are certain other missile related issues, which continue to have significant bearing on the Sino-US relations. Most important among them are those related to proliferation of missile technology, Missile Technology Control Regime (MTCR), and the Chinese espionage activities in the US. Regarding non-proliferation, the major US contention is that the illegal Chinese transfer of missile (and nuclear) technologies to certain states are detrimental to the US non-proliferation policy as well as to the US security. China, on the other hand, denies such allegations as false and regards it as a part of the US policy to contain the growing power of China. For China, the US support to Taiwan is the most crucial aspect in its relation with the US.

Another issue causing great differences relates to the allegations of Chinese espionage of the nuclear and missile technology from the US research laboratories. According to the reports, China has obtained the most advanced warhead designs of nuclear missiles through spying in US laboratories and is supposed to equip its own missile forces with them. China has outrightly denied such allegations.

Proliferation of Missile Technology

Beijing and Washington have been at odds over missile proliferation. Washington is concerned that Chinese proliferation of ballistic missile technologies is in contravention to the agreement under the Missile Technology Control Regime (MTCR), to which China has agreed to adhere, even though it is not a signatory. Further improvement in China's export control system and adherence to international non-proliferation norms are central issues in the US-Chinese relations. Missile technology transfer is the core of it.

The Third World has long been a major arms market for the Soviet and Western suppliers. However, along with others, the People's Republic of China also entered into the market of arms supply. Brazil, Israel, India, Egypt, South Africa, Singapore and China have all built up extensive domestic arms industries, and many have aggressively marketed their weapons abroad.[1] The easy accessibility and availability of higher capability arms have a major effect upon the regional military balances and security situations in several parts of the world. Some of the US officials claim that it affects the US interest.

There has been a perceived inconsistency between the China's official policy on arms exports, imports and control and the actual practice; a visible gap between promise and performance. A 1988 statement by the Ministry of Foreign Affairs, outlined the official policy of the PRC concerning arms

[1] Richard A. Bitzinger, "Arms to Go: Chinese Arms Sales to the Third World", *International Security*, vol.17, no.2, Fall, 1992, p.84.

exports: "First, our military products exports should help to strengthen the legitimate self-defense capability of the countries concerned; second, it should help to safeguard and promote peace, security, and stability in the regions concerned; and third, we do not use the military sale to interfere in the internal affairs of other states".[2] Though, China pretends officially to be a "responsible" arms supplier, it apparently follows an arms transfer policy which is most expedient and suitable. The ambiguities and wide-ranging character of China's arms transfer principles help to justify, rather than limit, China's conduct and foreign policy interests. Since the scope of the present work does not go beyond missile issues, we will look into the policy and practice of the China with regard to the sale of missiles and related nuclear technology.

The most controversial aspect of China's military transfers, as it has proved itself to be, relates to the sale of nuclear-capable ballistic missiles, missile components, nuclear energy technology and fuel and chemical-weapons components to the Middle-East. The controversy has generated periodic tensions between China and the US, between the recipient countries (Pakistan, Syria, and Iran in particular) and the US, and between branches of the US government.

On the other side of the controversy, the issues, which concern China, are the proposed US plans for missile defense, as we have already discussed in the previous chapter. The most problematic question for China is how

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[2] Quoted in FBIS-CHI, July, 17, 1991, in Mel Gurtov and Byong-Moo Hwang, *China's Security: The New Roles of the Military*, (Boulder, Lynne Rienner Publishers, 1998), p.211.

Taiwan will figure into American missile defense plans. Beijing fears that Taiwan will benefit from some kind of advanced missile defenses from the US, though the specific nature of such a system remains unclear and presumptive. It appears that China will be staunchly opposed to the provision of such systems as the PAC-3 or Aegis-equipped naval vessels, which might overtly link the US and Taiwanese defense capabilities. China sees in it a real prospect of a revival of the pre-1979 Washington-Taipei Mutual Defense Treaty.[3]

In 1988, in a highly controversial sale, China shipped several Dong Feng-3 (CSS-2) intermediate-range ballistic missiles (IRBMs) to Saudi Arabia.[4] Since the late 1980s, the US intelligence reports have pointed out that China has, notwithstanding its promise to do otherwise, sold missiles, missile components, and related technology to the Middle-East. The most important among the recipient countries is Pakistan, which received the technology for assembling M-11 ballistic missiles with a range of 300 kilometers, and Syria, which bought from China the assembling technology for M-9 missiles with range 600 kilometers. Both M-11 and M-9 are nuclear capable missiles.[5] The US asserts that over last two decades China has been thoroughly involved in nuclear weapon collaboration with Pakistan including

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[3] Bates Gill, "Can China's Tolerance Last?", *Arms Control Today*, vol.32, no.1, January/February 2002, p.9.

[4] Richard A.Bitzinger, n.1, p.89.

[5] Mel Gurtov and Byong-Moo Hwang, n. 2, p.218.

the transfer and sale of the design and enriched uranium for a nuclear bomb and missiles, which can deliver these weapons.[6]

While the authenticity of the US intelligence reports and the US motive behind such allegations cannot be established beyond doubt, China has always denied any of such accusations. It has rather disputed and argued that since joining the International Atomic Energy Agency (IAEA) in 1984, the recipients of the Chinese nuclear assistance sign safeguard agreements with the agency.[7] Moreover, by signing NPT, China has sought to prove to the world its commitment on the nuclear non-proliferation issues. However, Beijing admitted in 1991 to having sold a missile to Pakistan, but not to having delivered.[8] In the case of Syria, the Chinese officials out rightly denied that any sale took place or would take place. Hua Di, who once worked for a Beijing think-tank has categorically stated that China has never exported and will not export nuclear weapons.[9]

The Cases of Pakistan, Syria and Iran

By 1990, China's assistance in the Pakistani nuclear and missile program came under close US scrutiny. The initial concern in the US related to the reported Chinese sale of M-11 missile to Pakistan. In reaction, the US suspended the sale of the Cray supercomputer and other technologies to the two Chinese arms-exporting firms under the Ministry of Aerospace Industry (GWIC and CPMIEC) that had shipped the M-11 components. The sanctions

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[6] R. Jeffrey Smith, "US Aides see Troubling Trend in China - Pakistan Nuclear Ties," *Washington Post*, April 1, 1996.

[7] Mel Gurtov and Byong-Moo Hwang, n.2, p.218.

[8] In Missile Monitor, pp.59-62, cited in Mel Gurtov and, Byong-Moo Hwang, n.2, p. 218.

[9] Quoted in Mel Gurtov and Byong-Moo Hwang, n.2, p 218.

were lifted only when the China promised in February 1992 to abide by the guidelines of the MTCR and formally acceded to the NPT after considerable internal debate. In May 1993, the Clinton administration renewed MFN status for China, separating the trade issue with that of proliferation question. But the controversy over M-11 did not die down as the CIA charged that China was continuing the sale of M-11 to Pakistan and thus, violated MTCR guidelines. Again in mid-1993, the US blocked a high-technology sale to China related to Communications Satellites and Technology.

However, by late 1993 and early 1994, it became clearer that Clinton administration wanted greater cooperation with China, especially in the trade issues. President Clinton allowed, first, the sale of supercomputer to China and then the transfer of three US commercial satellites to be launched by China. This was not without objections, which were raised over the PLA's potential technical and financial benefits from such sale. The US, in turn, was able to extract from the Chinese, new arms-control undertakings. The China accepted a "global ban on export" of short-range missiles and also agreed to work towards a verifiable treaty "banning the production of fissile materials for nuclear weapons".[10] Nevertheless, as new intelligence reports about the arms sale poured in, the level and intensity of charges against China widened.[11] The charges were related to the deployment of missiles at a Pakistan air force base, and the construction of storage sheds and mobile

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[10] Ibid, p.220.

[11] Elaine Sciolino, "US May Threaten China with Sanctions for Reported Arms Sales", *New York Times*, July 20, 1993, p.3.

missile launchers.[12] In another charge, the CIA alleged that China has sold 5,000 ring magnets to Pakistan for producing enriched uranium. Although, Pakistan denied these charges, the Clinton administration had to consider imposing sanctions against China. This followed a political debate within the US. The Commerce Department and the State Department were pitted against the intelligence community and those in the government and in the Congress advocating a tougher China policy.

In order to avoid antagonizing China, President Clinton sided with the view of the Commerce Department and his Secretary of State, as Beijing pledged on May 11, 1996, not to sell technology or equipment related to nuclear weapons to countries, such as Pakistan that have unsafeguarded nuclear facilities.[13] The Clinton administration also received promise from Chinese officials that sales of ring magnets would not recur. On that basis, it approved a technology sale to the CNNC by Westinghouse worth over $130 million.[14] Westinghouse Corporation looked forward to sell China nuclear reactors for its expanding nuclear energy program.

Equally controversial was a case related to the PRC's military dealing with Iran, which began in 1985. The major US concern here was that certain Chinese weapons enhanced Iran's capability to control or harass shipping in the Persian Gulf and the Strait of Hormuz. Washington's attention was drawn for the first time in this regard to the Chinese sale to Iran in 1987 of

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[12] R. Jeffrey Smith and David Ottaway, "Spy Photos Suggests China Missile Trade," *Washington Post*, July 3, 1995.

[13] New York Times, May 11, 1996, p.1.

[14] R. Jeffrey Smith "China Firm that Angered Washington May Get New Deal", *Washington Post*, June 20, 1996.

Silkworm surface-to-surface missiles. The US became worried for the safety and protection of the ships in the Gulf, which operated under its control. A US threat to ban the export of advance technology subsequently compelled China to agree to cease additional Silkworm transfers to Iran. However, the transfer of Silkworm and other kinds of missiles apparently continued at least through 1991.[15]

Further in May 1995, CIA reports alleged that China made ballistic-missile technology and engineering assistance available to Iran which would enable Iran to exceed range and payload ceilings stipulated by the MTCR.[16] In addition, China was reported to have sold Iran forty low-flying, sea-based cruise missiles. After the verification by the US State Department in 1997, sanctions were being imposed on China for violating the US legislation barring advanced weapons shipment to Iran and Iraq.[17] Moreover, China and the US were also at odds over reports of an active China- Iran nuclear partnership, which began in the late 1980s and continues even today. Beijing contended that its nuclear sales and technical assistance to Iran were entirely peaceful. The US assailed the Sino-Iranian nuclear cooperation and pressurized Beijing to cancel the CNNC's sale to Iran of the nuclear power reactors. Under sustained pressure, Chinese agreed to cancel the deal.

The three cases of Pakistan, Syria and Iran highlighted the problems posed by the Chinese export of dual use technology and weapons components to the 'countries of concern.' It was difficult to simply verifying what was

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[15] Mel Gurtov and Byong-Moo Hwang, n.2, p.221.
[16] Ibid, p.222.
[17] Ibid, p.222.

sold or shipped. For example, it is difficult to say with conviction that Pakistan received M-11 missiles or components from China or that a China-Syria deal for M-9s actually took place.

Another problem involved interpreting China's compliance with international arms control instruments and regimes. The perplexing and somewhat confusing behaviour of China regarding its denials cast doubts about how much it honoured its undertakings. Though Beijing promised to honour the MTCR, but its behaviour suggested that it did not regard MTCR guidelines as binding. The Chinese government complained that limiting China's missile sales put China at disadvantage in the market for missiles. Its contention was that the western powers created the MTCR only three years after China had decided in 1984 to develop the M-class missiles for exports and one year after it had publicly displayed them for sale.[18] The Chinese leaders suspected that China's comparative advantage in shorter-range missiles was being targeted for restriction.

Most importantly, the Chinese considered all these technology sales and arms transfers as commercial transactions, performed under contract by PLA and state corporations to meet ordinary customer needs. Consequently, the interests of Chinese arms-trading firms came into conflict with the US non-proliferation policy.[19] According to Hua Di, the 1984 decision to develop tactical ballistic missiles for export, starting with the M-9, was largely based

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[18] John W. Lewis and Hua Di, "China's Ballistic Missiles Programs: Technologies, Strategies, Goals", *International Security*, Fall 1992, vol., 17, no.2, pp. 34-36.

[19] Mel Gurtov and Byong-Moo Hwang, n. 2, p.224.

on the PLA's need of income to support military research and development at a time of budget reductions.[20]

Thus, as the above discussion indicates, China's sale and transfer of nuclear capable missiles and components have been a murky area. In fact, the US official version suggested that "China's record shows restraint only when China is discovered; otherwise China will see such missiles and components being sold to whoever buys them."[21] While non-proliferation measures were very difficult to enforce and to monitor, Beijing clearly regarded the sale or transfer of technology and components as entirely legal under current regimes and, whatever the case may be, as advancing Chinese national interest in certain countries.

As we have seen, the US response to Chinese missile and nuclear-related technology exports typically involved political pressure and targeted economic sanctions. This strategy yielded limited success. It seemingly encouraged China toward more explicit commitments to the MTCR in the early 1990s, and probably prevented or delayed some weapons sales. Nevertheless, past experiences suggest that sanctions had only a limited and short-term affect on the Chinese policy. Though, these could help extract some promises from China to restrain technology export, China hardly kept her word. It "used tenuous loopholes to justify seeming violations".[22] While US sanctions had some utility, these could not by themselves effect

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[20] Ibid, p.224.

[21] Ibid, p.272.

[22] Bates Gill and Matthew Stephenson, "Search for Common Ground: Breaking the Sino-US Non-Proliferation Stalemate", *Arms Control Today*, vol.26, no.7, September 1996, pp.15-16.

substantial change in the Chinese military exports policy.[23] Thus, a great deal of skepticism and ad-hocism prevailed over the US policy of imposing sanctions on China.

Evan Medeiros of the Monterey Institute's Centre for Non-proliferation Studies viewed that although, in general, Chinese proliferation activities had reduced markedly the arena of missile technology remained a problem.[24] He further said that the sanctions imposed in September 2001 appeared to relate to specialized missile technology rather than the dual-use material involved in the majority of cases. He suggested that the sanction were now less productive than earlier, because their use "perpetuates the linkage between the overall state of Sino-US relations and the missile issue, and thus China uses the missile issue to signal this."[25]

China did not have sufficient bargaining capacity to apply same kind of political and economic pressure on the US but its approach in dealing with the US arms transfer to Taiwan was equally confrontational. China threatened to put bilateral relations in jeopardy whenever Washington pursued a containment strategy or interfered in what China considered to be its internal affairs, by providing weapons to Taiwan.

The US Position on Arms Transfer

The US policy on arms transfer was shaped by its place in the world and its perception of threats to its national interest. Today, the US, as the only

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[23] Ibid, p.16.

[24] John Hill, "USA Presses on Arms Control", *Jane's Intelligence Review*, vol. 14, no. 4, April 2002, p.47.

[25] Ibid, p. 47.

'superpower' in the world, has developed a greater stake in preserving stability in the international system. Therefore, it has adopted a policy of support for stable regimes, preserving the world order and encourages open markets and more open societies. As such, whatever it finds to be disrupting the stability, it takes action against such development especially and more so in regions where the US has allies or important interests. So, the primary concern with regard to arms transfer in any part of the globe has been whether such a transfer is stabilizing or destabilizing, as perceived by the US. Today, the US along with others, firmly believes that the spread of certain types of weapons-particularly nuclear, chemical and biological weapons as well as some of their delivery systems (missiles in particular) are almost always destabilizing.

The Clinton administration, during its tenure, followed a strict non-proliferation policy. It singled out North Korea, Iran, Iraq, Libya, Syria and Pakistan in this regard. China has been engaged in arms trade with all of these countries and it has been more intense with Pakistan, Iran and possibly North Korea.[26] Interestingly, North Korea and Iran are among the most hostile nations to the US and they cause major concern for the US security and strategic policy.

In contrast, the US regards its own transfer of conventional military technology to other countries to be contributing to the stability. The US exports a great amount of military technology and production capabilities to Japan, South Korea and Taiwan and to a lesser extent to other Chinese

[26] Ibid, p.17.

neighbours, such as Malaysia, Singapore, Thailand and Indonesia. These transfers are made under the garb of alliance treaties and military assistance and are seen as strengthening international order and stability. Understandably, China views it as detrimental to her national interest and feels threatened due to the presence of sophisticated arms in its strategic vicinity.

The domestic political compulsions, on the other hand, make the US position firm and it is difficult to compromise or deviate on such issues. The Administration, the Congress and the public are generally unwilling to ignore issues related to proliferation and weapons sales to states perceived as adversaries. While the Clinton Administration pursued a policy, which appeared to "appease" China, there has been a section of influential Congress members, who viewed 'China' itself as a threat. In the midst of strong criticism, Clinton always found himself in a very uncomfortable situation in this regard.

Another very important factor, which cuts across both ways, relates to business. The US business people are keen to do business with China and generally, resist restrictions on their economic activities there. On the one hand, economic sanctions and export controls directed at China become more difficult to maintain. Simultaneously, the rapid growth in the Sino-US civilian technology trade increases the possibilities of military use of some commercial technology transferred to China by the US firms. These indeed trigger criticism based on the fear that improper end-use of seemingly commercial technologies is possible. As many of large corporation and

trading companies related to the Chinese defence industrial base rank among China's 20 largest import-export firms, the problem of potential end-use diversion is likely to persist.[27] With growing competition in the global market for military technology, the US defense industry has been pressurizing the US government to liberalize its policy on military exports, including those to Taiwan.[28] The point here is that the economic compulsions may overshadow proliferation concerns.

In contrast to US policy under the Clinton administration, the Bush administration seemed prepared to take a much stronger stance against what is seen as protracted and serious Chinese transgressions. Arms control proved to be a key issue during President Bush's visit to Beijing in February 2002.[29] During the visit, while Taiwan remained the most contentious issue, some kind of progress in the area of arms control was visible as Secretary of State Colin Powell stated on February 23, 2002, that Chinese negotiators had given "some more flexibility that we will now be pursuing in the days ahead."[30]

The tough line taken by the US on Chinese arms transfer issue has been authored by Robert Sutter, former National Intelligence Officer for East Asia and the Pacific: "The bottom line for the US is that the Chinese continue this practice for their own interests (for example, commitment to Pakistan, leverage on Taiwan arms sales), which the US government finds grossly unacceptable, and it is willing to demonstrate this through repeated

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[27] "The 20 Top Largest Import and Export Firms in 1994". *Beijing Review*, July 10-16, 1995, p.16.

[28] Bates Gill and Matthew Stephenson, n. 22, p.17.

[29] John Hill, n.24, p.46.

[30] Ibid.

sanctions."[31] However, the tough approach may not work with a country like China, which continues to be sensitive about gaining appropriate respect from the foreign power. Chinese officials reiterate that both the US and China share common objectives in the area of non-proliferation and a foreign ministry spokesman claimed in the People's Daily that China has earnestly adhered to the agreement regarding arms control reached by the two countries in November, 2000; while the US disputes any such claim by China saying that China has faltered on many counts.[32]

The Chinese Position on Arms Transfer

China believes that the existing world order was established by western powers when China was weak and that China has not had an adequate voice in shaping the international system. Today, Beijing wants to complete the process of reunification and "standing up" in the world and sneers at the perceived attempts to "divide" or "contain" China. China's position on military technology transfer issues, like that of the US, is shaped by its worldview and foreign policy agenda. Beijing sees US policy on military technology issues as hypocritical. It has pointed out that the US is by far the world's largest arms exporter, while China's share of global military exports is relatively small.[33] China is critical of the MTCR because the regime covers ballistic missiles, which China exports, but does not cover aircrafts, which are exported by the US and its allies. It points out that no similar control applies to manned aircraft like the F-16s supplied to Taiwan, despite there being highly capable of delivering weapons of mass

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[31] Ibid, p.46.

[32] Ibid.

[33] Bates Gill, and Matthew Stephenson, n.22, p. 17.

destruction over significant distances. [34] Chinese analysts argue that the fact that the US imposes sanctions for missile exports but not aircraft is proof that the US non-proliferation rhetoric is not consistent with the US policies.[35]

Like that of the US, China's security interests determine which importers are viewed as legitimate recipients of weapons and military technology. Chinese interests in establishing its regional authority and territorial integrity make it less concerned with so called "rogue" states in the Middles East, East Asia and South Asia, which are considered as proliferation problem by Washington. It is more concerned about technology transfer to Japan, South Korea and especially Taiwan. It views military technology transfer as a means to achieve strategic goals, enhance diplomatic space and help finance defence and economic modernization. Such sales are considered as serving Chinese national interest.

MTCR and the Sino-US Relations

MTCR was created in 1987 by the United States and its G-7 allies (Canada, France, Italy, Japan, the United Kingdom, and West Germany) as a voluntary arrangement designed to restrain the proliferation of nuclear-capable ballistic and cruise missiles. The MTCR is neither a legally binding international agreement nor a treaty like the NPT- it was a voluntary arrangement designed to limit the risk of nuclear proliferation by controlling the transfer of equipments and technologies that could contribute to the development and production of nuclear-capable, unmanned delivery systems.[36]

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[34] John Hill, n.24, p. 47.
[35] Bu Ran, "Missiles: Proliferation and Control," *Beijing Review*, December 2- 8, 1991, pp. 9-10.
[36] United States Department of State Press Briefing (extract), "Missile Technology Control Regime," Current Documents, United States Department of State, April 16, 1987, p. 75.

The participants had agreed to common guidelines and to a common list of items to be controlled. Thus, these countries sought to prevent any of these nations from gaining a commercial advantage over other members.[37] The regime's list of controlled items included equipments and technologies directly relevant to the production and operation of missiles. Transfers of these goods were taken up, case by case, considering the nuclear non-proliferation concerns, the requirement of the space and missile programmes to the recipient state, and also the proliferation or non-proliferation record of the recipient nation.

The annexe of the MTCR contained two categories of lists. Category I consisted of very few sensitive items that would contribute to rapid missile proliferation, if exported. It included items like ballistic missiles, SLVs, sounding rockets, cruise missiles, and target and reconnaissance drones capable of delivering at least 500 kg over a range of 300 km or more and related sub-systems such as rocket stages, guidance sets, and rocket engines. Category II list consisted of "dual-use" items, such as propulsion components, propellants, structural materials, flight instruments, inertial navigation equipment, and so on, all of which could be used to produce nuclear-capable missile systems indigenously.[38]

Although the MTCR was not intended to limit peaceful and civilian applications of rocket technology, the regime has acknowledged the dual-use potentials of these technologies. Hence, the regime controls the transfer of civilian and military rocket technology. In the recent years, the member

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[37] Ibid.

[38] SIPRI *Yearbook: Armaments, Disarmament and International Security*, Oxford, Oxford University Press, 1998; www.sipri.se/projects/armstrade/mtcrguidelines.html

countries have broadened the regime's coverage to include all missiles capable of delivering weapons of mass destruction (WMD) as a means of combating increased chemical and biological weapons (CBW) proliferation. Also the membership of the regime has grown wider to include countries like Argentina, Brazil, Russia, and South Africa, each of which was once targeted by the regime.

China's continued missile sales (despite its agreement with Washington to "adhere" to the guidelines) have always been there on the regime's table and this constituted a major concern to the US when in March 1988, it was revealed that Beijing had entered the missile suppliers market by exporting 2,700 km range DF-3 intermediate-range ballistic missiles (IRBMS) to Saudi Arabia. Between 1989 and 1993, the situation became very bleak on this front. Among the major developments was the transfer of M-11 technology by China to Pakistan.[39] In response to this, the Bush Administration and the US Congress decided to improve and institutionalize the MTCR, but it caused a lot of controversy among the member states. The scope of MTCR was widened to include missiles capable of delivering all WMD, in order to reflect increased concern over chemical and biological weapons proliferation.

To address the missile proliferation threat from China, the Clinton Administration constructed an "incentive-based strategy" of providing it a guaranteed share of the space or satellite launch market and inviting it to participate in international space projects. This policy would make the Chinese missile industries come under a more restricted and controlled system. Since

[39] P. R. Rajeshwari, The Missile Technology Control Regime" *Strategic Analysis*, vol. xxii, no. 5, August 1998, pp.737-750.

September 1985, under the 1985 US-China Agreement for Peaceful Nuclear Cooperation, Washington also permitted American-made satellites to be launched into orbit by surplus foreign ballistic missiles. This joint venture programme was started in 1989, but was suspended in 1989 because of the Tiananmen Square massacre of pro-democracy demonstrators.[40] The programme was resumed in 1992 and a number of launches have taken place.

In response to various exports programmes carried out by China, the Bush and Clinton Administrations imposed trade sanctions against China. And under a 1994 agreement with China, Washington lifted sanctions in exchange for Beijing's promise to stop missile deals with Pakistan and abide by the MTCR guidelines. However, the export control practices of China have not improved in a major way.

The US administration was interested in making China a signatory to the MTCR, which would restrict the secret flow of sensitive technology from China to other states in South Asia as well as West Asia, the two volatile regions. The China connection attained much more significance in the wake of widespread human rights violations and the continuing Chinese transfers of nuclear and missile technology to countries like Pakistan and Iran. The Senate and the House of Representatives set up a number probes to investigate the complex affair.

Chinese Defiance

Even after agreeing to abide by the MTCR guidelines, China continued its technology transfers to many developing countries. Among the three nations of missile proliferation-China, Russia and Ukraine -China has the poorest non-

[40] Ibid.

proliferation record. Several recent revelations have continued to draw attention to Beijing's ambiguous stance on missile non-proliferation. A recent CIA report said that China had engaged in (1) the export of M-11 missiles and guidance equipment to Syria; (2) the sale of C-802 cruise missiles to Iran; and (3) the sale of blueprints and equipment to Pakistan.[41] Also, Pakistan's test-firing of the projected 600 km-range Hatf III missile in July 1997 provided further evidence of Chinese assistance to Pakistan. Pakistan's test-fired Ghauri, an IRBM, in April 1998, which is further proof of Chinese assistance to Islamabad in the field of missile technology.[42] Pakistan has a history of concealed acquisition of technology, material and missile components from foreign sources.

The testimonies provided by US officials to various Senate sub-committees indicate the extent to which China continues to aid Pakistan's missile programme. But the Pentagon's pressure dictated the US disinformation campaign for the Ghauri test and it has been passed onto a hapless North Korea. Thus, neither the space cooperation with the US nor the MTCR membership has put a halt on China's missile proliferation activities. The main aim of China is making easy money through arms exports.

The Clinton Administration was criticized for not putting an adequate level of sanctions against China. The United States had imposed sanctions twice before, for missile exports to Pakistan and once in 1997, a one-year sanction against two Chinese companies for transferring chemical weapon components to Iran. But, mostly, Washington had shown considerable flexibility towards

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[41] Ibid.

[42] Chintamani Mahapatra, "The US, China and the Ghauri Missile", *Strategic Analysis*, vol.xxii, no.3, June 1998, pp. 363-365.

Beijing on the missile proliferation issue. As one expert puts it: "President Clinton's China policy – 'trade over everything' has so trapped Washington that it can neither deal honestly with the American public and the Congress nor act effectively about China in support of other American interests. Knowing Washington would not endanger trade with China, Beijing increased its sales of missiles, nuclear material and chemical weaponry.[43]

On the other hand, China criticizes American missile proliferation policy and the MTCR as hypocritical because the United States has been the world's biggest exporter of conventional arms and China's share in the world of arms market is relatively small. China has criticised the MTCR on another account, that it includes missiles, which China exports, but does not include the export of the aircrafts, which the US and its allies export. Beijing, like Washington, views the transfer of military technology—including missile technology—as a tool for achieving strategic goals, acquiring diplomatic space, and for enhancing its say in foreign relations.

US Withdrawal from the ABM

Many observers seemed surprised by China's muted reaction to the Bush administration's December 13 announcement that the US would withdraw from Anti Ballistic Missile (ABM) Treaty. But China, since early 2001, had steadily toned down its anti-missile defense rhetoric and over the past year had gradually come to tolerate- while still opposing- the US missile shield effort.[44] China's

[43] A. Rosenthal, "China's Poisonous Lie," *New York Times*, May 27, 1997.
[44] Bates Gill, n. 3, p. 7.

official response to the US withdrawal was moderate and in fact even more conciliatory than Moscow's reaction.

Since the Clinton Administration began talks for modification within the ABM Treaty, US perhaps in partnership with Russia, might opt for a regionally based boost-phase intercept system to defeat the missile launches of North Korea on other states. Boost-phase defenses would go a long way towards alleviating Chinese operational concerns about the impact of defense on its deterrent. Indeed, Beijing might look for the possibilities of cooperation with Washington on the deployment of such systems.

China always sees the issue as surrender by Russia on issue of the ABM to America. Beijing has lobbied hard in Moscow to "firm up the Russian Spine" (as one Chinese expert put it) in order to prevent such a concession to Washington. In joint communiqués and UN resolutions Chinese leaders believe they have gained a firm Russian commitment to the preservation of the ABM Treaty. If Moscow gives way under pressure from Washington, Beijing is likely to be frustrated in its long-hope for partnership with Moscow to counter US hegemonism.[45] But with the ABM Treaty withdrawal announcement by Bush administration, the questions are: how did China come to accept this more submissive position, and for how long will it last?

In its official response Beijing maintained its opposition to the build up of strategic missile defense by the US. Second, it noted that the ABM Treaty has served as a foundation of strategic stability and that its abandonment would lead

[45] James J. Wirtz and Jeffrey A. Larsen (eds.), *Rockets Red Glare: Missile Defense and the Future of World Politics*, (Oxford, Westview Press, 2001), pp. 197- 198.

to a destabilizing arms race. Third, Beijing urged Washington to consider the views of the international community, pointing to a UN General Assembly resolution, which for the third year in a row called for the strengthening and preservation of the treaty. Finally, an indication of China's concern with "high politics" and "atmospherics"- the official Chinese statements emphasized the important international role of the US and China, which share common interests in maintaining global peace.[46]

The basis for this relatively mild response had been set over many months. Beginning in late 2000 and accelerating in early 2001, official and unofficial US interlocutors had sent clear messages to their Chinese counterparts about the likely direction of Missile defense plans in the US, especially with the arrival of the Bush administration in Washington.

As for the Chinese side, the outlines of a more "friendly" Chinese approach towards the US were already in evidence in early 2001, with a more serious, nuanced, and flexible understanding of missile defenses, a part of that overall change in tone. In essence, the Chinese response to the ABM Treaty decision was muted because the Bush administration has taken a number of steps.

First and foremost, the Chinese needed guarantee about the tenor and direction of US-China relations in general, and about the intended "targets" of the missile defense system in particular. Beijing wished to avoid being characterized as "rogue state" and on being seen as the justification for missile defence. Bush administration has taken significant steps to place the US-China

[46] Bates Gill, n. 3, p. 7.

relationships on a firmer footing: the administration quietly dropped its "strategic competitor" rhetoric, President Bush made his long planned trip to China, and the two sides have consistently emphasized the positive points in their bilateral talks.

Second, in early 2001, China expressed strong concerns about the position of the US regarding missile defence to Taiwan. In April 2001, the Bush administration deferred a decision regarding the sale of a more advance missile defense to Taiwan and adopted a more flexible arms transfer policy on a need-based approach.

Thirdly, China hoped that it would be treated with respect due to being a Great Power and having the nuclear weapon status and that its interests would be taken duly into account by the US decision makers.

Beyond the specifics of bilateral discussions on missile defense, the overall US-Chinese relationship has also experienced an improvement, another factor that contributed to Beijing's restrained reaction to the ABM Treaty withdrawal announcement. While relations have not returned to the levels of 1997-98 when the two sides exchanged high profile state summit visits, matters are much improved from 1999, when a host of problems plagued the bilateral relationship- from the Cox Committee report and its allegations on nuclear espionage to the unintended bombing of the Chinese embassy in Belgrade. Relations improved significantly in the wake of September 11 attacks after

which Washington focused its strategic attention on the war on terrorism, and China took a number of constructive steps in support of the US efforts.[47]

After all, the US remains China's most critical bilateral ally- economically, diplomatically, and militarily- making it very much in Beijing's interest to down play differences and seek stable and constructive interactions with Washington.

Continuing Differences

First, China still does not know precisely what Washington's missile defense architecture is going to look like and what its impact will be on China's missile force, conventional and nuclear. The ABM Treaty withdrawal decision does clarify some matters. At least strategists in Beijing can begin planning for a more vigorous strategic response than might have otherwise been the case had the ABM treaty not been modified. But that response has been largely reactive as the Bush administration's framework for missile defence comes into view, piece by piece. The most problematic "architecture" question, which bothers Beijing, is how Taiwan will figure into American missile defense plans.

Second, there is a lot of speculation among analysts about what precise steps China with take as part of its ongoing nuclear weapons modernization programme. China may succeed over the next 10 to 15 years in deploying a viable "second leg" of its deterrent in the form of SLBMs. Moreover, it might equip its ballistic missiles with multiple warheads. It is also likely that China would develop counter measures, such as decoys, shrouded warheads, and possibly anti-satellite weapons to defeat missile defense.

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[47] Ibid, p.8.

Nuclear Espionage

The nuclear theft episode was one significant development that had the potential to completely derail the growing levels of cooperation, which was achieved and sustained primarily as a result of Clinton's China policy of greater engagement.

On May 25, 1999, the *House Select Committee on the US National Security and Military/Commercial Concerns with the People's Republic of China* issued the declassified version of its report (known as Cox Report). It claimed to have found conclusive evidences on China's acquisition of the US technology in a number of sensitive areas, including nuclear weapons, high performance computers, and missile and spare systems. The committee's full report, which was classified top secret when it was issued on January 3, 1999, was unanimously approved by the panel's five Republicans and four Democrats.[48]

It was as early as November 22, 1998, that the *New York Times* had published an article headlined, "Chinese Atom-Arms Spying in US Reported" which began, "Chinese intelligence agents succeeded in stealing nuclear weapon and missile technology secrets from the government's Lawrence National Laboratory in the 1980s."[49] The issue was brought into focus once again when a front-page story in New York Times on March 6, 1999 came out with a detailed description of the theft of secrets by China.

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[48] "The Cox Report: selected text and Commentaries", Arms *Control Today*, vol.29, no.3, April/May, 1999. p. 17.

[49] Kalpana Chittaranjan, "Leakage of US Nuclear Secrets", *Strategic Analysis*, vol.23, no.4, July, 1999, p.607.

The Chinese espionage activity was believed to have been continuing since the 1980s but it was un-earthed only in 1995 when senior nuclear and missile experts at Los Alamos, while examining data from the most recent Chinese underground nuclear test and missile tests detected striking similarities between the Chinese and American designs. They concluded that "Beijing was testing a smaller and more lethal nuclear device configured remarkably like the W-88, the most modern, miniaturized warhead with American arsenal."[50]

Cox Committee Report

The report charged that China had "stolen" many secrets from the US and "would soon pose a direct threat to the US interests."[51] The Committee was originally formed to investigate charges that two US satellite manufacturers had illegally passed on information about ballistic missiles to their Chinese counterpart. During the course of its probe in 1998, the Committee expanded its inquiry into a broad range of questions about how China obtained secret information about the US strategic weapons programme. The committee announced in December 1998 that it had concluded its work. President Clinton received a copy of report on January 4, 1999. The Report said that the "Chinese government began systematic espionage against the US nuclear installations in the late 1970s". About that

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[50] James Risen and Jeff Gerth, "China stole secrets from Los Alamos US Officials Says", *New York Times*, March 6, 1999

[51] Report of House Committee on Theft of U.S. Nuclear Secrets by China, *Historical Documents* of 1999, Congressional Quarterly Inc., CQ Press, 2000, p.235.

time diplomatic relations between the two countries were normalized and since then espionage was continuing as of 1999.

The Findings of Cox Report[52] are:

1. The People's Republic of China (PRC) has stolen design information on the United States' most advanced thermo-nuclear weapons. The W-88, a miniaturized and tapered warhead, is the most sophisticated nuclear weapon the United Stats has ever built. The US learned about the theft of the W-88 Trident D-5 warheads information as well as about the theft of information regarding several other nuclear weapons in 1995.

2. The PRC has stolen the US design information and other classified information for neutrons bomb warhead.[53] The committee predicted that the PRC would exploit elements of the stolen design information in the development of PRC's next generation of thermonuclear weapons. The US design information about small warheads will help Chinese programme of mobile ICBMs.[54]

3. The select committee judged that the element of the stolen information on US thermonuclear warhead designs would assist the PRC is building its next generation of mobile ICBMs, which may be tested in recent future.[55] In one of the very key assertions, the committee said that the stolen secrets will assist the PRC in building smaller nuclear warheads- vital to the success of the PRC's ongoing efforts to develop survivable and mobile

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[52] Ibid. pp. 242-256.

[53] http://www.cnn.com/ALL POLITICS/resources/1999/cox-report

[54] Report of the House Committee, n.48, p.294.

[55] Ibid.

missiles."[56]Current Chinese ICBMs, which are silo-based, are more vulnerable to attack than mobile missiles. The select committee alleged that PRC would exploit elements of the stolen US thermonuclear weapons designs on its new ICBMs, currently under development. The small warhead designs will make it possible for the PRC to develop and deploy missiles with multiple reentry vehicles (MRVs or independently targetable MIRVs). Experts agree that the PRC now has the capacity to develop and deploy silo-based intercontinental ballistic missiles with Multiple Reentry Vehicles (MIRVs or MRVs). The committee takes note of the fact that in the near term a PRC deployment of mobile thermonuclear weapons or neutron bomb, based on stolen US design information, could have a significant effect on the regional balance of power, particularly with respect to Taiwan.

4. Apart from the theft of information and design of modern nuclear warheads, PRC, according to reports findings, has also stolen US missile technology and used it for its own ballistic missile applications. Moreover, the PRC has exported such military technology to a number of other countries, including regions hostile to the United States. These observations, if proved to be true, do carry serious implications for the US national interests.

The theft of the US ballistic missile- related technology is of great value to the China. In addition to ICBMs and military space lift rockets, such technology is directly applicable to the medium and short range missiles, "such as the CSS-6 (also known as the M-9), the CSS-X-7 (also known as the

[56] http://www.cnn.com/ALL POLITICS/resources/1999/cox report.

M-11) and the CSS-8 that have been developed for, among others purposes," striking Taiwan.[57]

The select committee reached on the conclusion that currently deployed Chinese ICBMs targeted on the US are based, in significant part, on US technologies illegally obtained by the PRC in the 1950s. This, therefore, implies the potential long-term effects of technology loss to the US.

In a related matter, for which the committee was originally constituted, it viewed that in the aftermath of the three failed satellite launches since 1992, the US satellite manufacturers transferred missile design information and know-how to the PRC without obtaining the legally required licenses.[58] This information has improved the reliability of PRC rockets useful for civilian and military purposes. The illegally transmitted information is useful for the design and improved reliability of future PRC ballistic missile as well. The PRC's Long March rockets, improved by the US technology assistance, are useful for both commercial and military purposes.

China's official press attacked the credibility of the report by asserting that "the specter of McCarthyism looms large in the Cox Report." A commentary issued by the New China Agency on May 27 stated that the report provided no legally tenable evidence to back up its accusations that China has stolen advanced nuclear and missile technologies and used them in its own weapons programme. The Cox Report has used "many vogue terms

[57] Report of the House Committee, n.48, p.248.

[58] Ibid, p.249.

such as "may" and "likely" to back up its accusations, the commentary observed.[59]

Response to Cox Report

As expected, the initial Chinese reaction was one of vehement denial of the accusation made in the report. The Chinese government stated that the release of the Cox Report was meant to "disturb and destroy" Sino-American relations and "to deflate attention from the US bombing of the Chinese embassy in Belgrade."[60] The Chinese government repeatedly denied that it had stolen US nuclear weapons technology. Responding to the House Committee report, Chinese foreign ministry spokesman Zhu Bhangzao said, "Some people in the US stubbornly cling to a Cold War mentality, are full of bias and hostility toward China and have tried in all possible ways to create rumours about China. Their goal is to spread the theory of "China threat" and divert attention away from the embassy bombing.[61]

In order to defuse a highly sensitive issue, the Clinton administration took the position of agreeing with most of the policy recommendation of the Cox Committee, even while disputing the accuracy of some of the factual findings and analysis. Administration also officials pointedly noted that many of the lapses cited by the committee had occurred during Republican administration.

Another important dimension of the issue relates to the alleged laxity shown by Clinton administration, which resulted in the secret transfer of

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[59] Erick Eckholm, "Chinese Press in Full Attack on Cox Report, *New York Times*, May 28, 1999.

[60] Kalpana Chittaranjan, n. 46, p.608.

[61] Michael Laris, "China has Harsh Worlds for Report", *The Washington Post*, May, 26, 1999.

nuclear and missile related information to China. Some American officials asserted that the White House sought to minimize the espionage issue for policy reasons as it "conflicted with their China policy".[62] A reconstruction by the New York Times revealed that through out the government response to nuclear theft, the issue was played by delays, inactions and skepticism - even though the senior intelligence officials regarded it as one of the most damaging spy cases in recent history. Interestingly enough although authoritative investigators alerted against the Chinese theft several months ago, influential sections of the Clinton administration questioned the gravity of the findings and stalled on taking action for fear of hurting ties with Beijing.

Although the select committee adopted its report by a unanimous vote, at least two democrat members did not fully agree with the conclusions of the report. John M. Spratt Jr. of South Carolina questioned some of the important findings of the report. The report stated that "the stolen US nuclear secrets give the PRC the design information on thermonuclear weapons on a par with our own." This was most hotly contested item in the entire report. John Spratt asked rhetorically in questioning the above statement, "Now, that's alarming, but is it accurate? I know that we have had 1,100 nuclear tests, as opposed to 50 on their part. We have built over 30,000 nuclear warheads as opposed to a few hundred, at most, on their part, so that would suggest to you that we have a somewhat greater capability for nuclear design than they do."[63]

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[62] James Risen and Jeff Gerth, n.47.

[63] The Report of the House Committee, n.48, p.237.

The assessment of the Cox Report was conducted by a panel of high level intelligence officials, chaired by Robert Walpole, a CIA national intelligence officer for strategic and nuclear programme and also by Jeremiah panel. Both panels agreed with the underlying findings of the Cox Committee that China for more than two decades had been working aggressively to obtain information about US nuclear weapons programmes.

Yet another study was conducted at President Clinton's request by the President's Foreign Intelligence Advisory Board, Chaired by former senator Warren B. Rudman, Republican of New Hampshire. The Panel focused on security procedures at the weapons laboratories of Department of Energy (ADE). Its report, issued in June 1999, said the departments "organizational disarray, managerial neglect and a culture of arrogance left it incapable of reforming itself."

In one of the broadest criticisms of the Cox Committee report, the Stanford authors challenged the Cox Committee's attack on an exchange program that enabled nuclear experts from the United States, China and Russia to visit installation in each other countries. That programme had been "carefully controlled" by US security officials, the Stanford authors said, and the Cox Committee failed to document charges against it.

The Stanford authors also refuted the prospect that specific Chinese weapons programme directly resulted from information stolen from the US. It noted that China had its own experts who were capable overtime, of developing the same weapon system as the US scientists. Moreover, it was pointed out that the Cox Committee made no distinction between information

that China might have obtained legally from public sources or that might have been acquired through theft or espionage. The Cox panel categorized all information acquired by the Chinese as "stolen."[64]

Despite the strong allegations made by the Cox report about Chinese involvement in nuclear and missile technology espionage, it is difficult to conclusively prove that PRC stole secret information from the US on nuclear warheads and weapons. However, the detailed report has pointed out that Chinese were deeply involved in an aggressive campaign for collecting secret weapon information for a long time and their weapon programme has immensely benefited from it. The review committee and panels, which reviewed the Cox report findings and prepared the damage assessment, concluded that at best China could have informed their own indigenous weapon programme with the help of nuclear secrets obtained through espionage. A close look at the Chinese nuclear programme shows that China lags far behind the US nuclear arsenal both in terms of quality and of course, quality.

The argument that PRC sought to ensure the survivability of its nuclear arsenal and also made efforts to consolidate its second strike capability and thereby, resorted to nuclear espionage does have some weight. This seems more so due to reported similarity between most recent nuclear tests conducted by the PRC and the most advanced weapons in the US nuclear arsenal, W-88. The question is that how China was able to make such advances as regards the modernization and precision of weapons is

[64] http://www.cnn.com/ALL POLITICS/resources/1999/cox report.

concerned, when its nuclear weapons programme is generally known to be one generation behind the US.

CHAPTER FIVE

CONCLUSION

Today's world is characterized by a new risk of strategic instability, after so many years into the post- Cold War era. This can be partially attributed to the decisions taken by policy makers in the capitals of major powers. The policy makers in Washington and Beijing have taken such decisions driven by their respective national interests. Such considerations combined with the current international environment and mutual perception of each other in a particular way have led them to pursue some policies which have rendered the bilateral relationship into a hot-cold mode. A cyclical fluctuation has characterized the projectile of Sino-US relation in recent years. Among other things, a particular set of issues primarily related to missiles has been a defining factor in the bilateral relations.

First, and the most important issue in the Sino-US relationship is how the tension created by growing Chinese power will be managed within an international system in which the US is the strongest and the predominant actor. Ironically the US, having a greater advantageous position in the world, is much worried about the growing Chinese power indicated by its growing economic output and rapid military modernisation. It perceives a challenge and perhaps a great security threat from China. Therefore, as the world's strongest military power with unparalleled capabilities, the US will possibly maintain or even

enhance its military superiority by engaging competitors, such as China. China as a revisionist power, on the other hand, also views the US as a potential threat. For it, the US intends to maintain a dominant position in the Asia-Pacific region indefinitely. From China's point of view, Washington seeks to capitalize on its technological prowess and economic vitality to ensure an absolute security for the US. However, China's actions are constrained by the fact that it is still substantially weaker than the US.

China has been a nuclear weapon state since 1964 and in 1980 it tested its first ICBM and two years later, its first SLBM. China's nuclear force is designed mainly for medium/long range strategic strikes (two-thirds of its total warheads) and tactical uses (remaining one-third warheads). The core of the strategic force is composed of ballistic missiles. Reportedly, about twenty Chinese missiles- a small fraction of the long-range strike force- are capable of reaching targets in the continental US.

However, at present, most of the Chinese missiles are liquid-fuelled and in a low state of alert. Beijing has no ability to launch these missiles "on warning" or at short notice. Moreover, Beijing does not have a sufficient infrastructure and logistics for sea-based and bomber-based strike capabilities and thus, it lacks the full strategic "triad" as enjoyed by the US. Beijing is aware of such deficiencies and, therefore, it is intent on modernizing its missile force to improve its range, payload, accuracy, and survivability. It wants to acquire a better ability to penetrate enemy defenses and to have more advanced command, control and

communication system. The Chinese have relied on a small number of relatively inaccurate long-range missiles to deter an American nuclear attack by maintaining a second strike capability to destroy one or two US cities. China relies on a nuclear posture characterized by a minimum deterrent and "no first use" policy for her security against a nuclear attack. What is causing anxiety among the US policy makers is that PRC is modernizing and gradually increasing the number of its ICBMs in order to narrow the gap with the US.

On the other hand, the US - believed by the Chinese to have threatened to use nuclear weapons against China in the past- enjoys a massive edge in nuclear arsenal, thereby, creating a permanent sense of insecurity and potential threat among the Chinese. Overall, China's nuclear forces are few and primitive compared to those of the US, which has 2000 land based ICBM warheads, 3,456 submarine-launched warheads and 1,750 bomber weapons including cruise missiles. The US weapons are modern, highly accurate, and many, particularly the submarine based missiles, are relatively invulnerable.

What brings China and US into intense conflict is the most pressing issue of Taiwan. China regards it as a "renegade" province whose reunification with China is prevented due to the US's long time direct or indirect support for Taiwan's nationalists. China threatens to use force, if needed, to recover the island and it apparently believes that advanced missile capabilities offer the prospect of leverage it can use to secure the island's reunification with the mainland.

China reportedly enjoys the capability to produce as many as a thousand new missiles within the next decade. Though it is difficult to say with certainty, China might deploy MIRVs- multiple independently targeted reentry vehicles, on its missiles. It may feel compelled to include MIRVs in its missile force, if the US deploys its proposed missile defense systems, the NMD/TMD. One cannot deny its possibility ten years into future.

The current US plans for missile defenses lie at the heart of the tension between the U.S. and China. Coupled with Chinese defense modernisation, the US NMD/TMD has had a detrimental effect on bilateral relations. It can be said that American decision to deploy defenses against ballistic missiles could lead China to initiate a major build up of its nuclear forces, increase Sino-Russian strategic cooperation, and endanger both efforts at arms reduction and the effectiveness of any American missile defense that are eventually deployed. China believes that the addition of even a thin US missile defense system would degrade and neutralize China's nuclear deterrent. It would upset the strategic balance to the detriment of Chinese security, although the US dismisses Chinese concerns in this regard, pointing out the threat of missile attacks from 'rogue states' and accidental launches as the rationale for its missile defence. China strongly believes that the US proposal to include Taiwan and Japan in TMD systems is aimed at containing China.

China staunchly opposes the proposed NMD system and Washington's efforts to revise the ABM treaty. It argues that any amendment or abolishing of the

ABM treaty will jeopardize global disarmament. In fact, China is more vulnerable to missile defense in technical terms and so, views it with great alarm. China's military and political calculations make it likely that it will be most vehement critic of any US plan for national missile defense and any US sales of TMD to friends and allies in East Asia.

Export of missile technology and other weapons constitute another issue area, where the US and China have been at odds. Driven by their own conception of world view and resulting security needs both the US and China have confronted on the issue. Whereas, the US exports arms and missiles to its recipient, justifying it as a stabilizing factor, it opposes Chinese arms sales on the pretext that they promote instability and thereby harm the US interest. It is well known that China has had long established arms trade with countries like Iran, Syria and Pakistan, which US considers as potentially destabilizing states. The US has often resorted to economic and military sanctions on China without achieving much success while China felt compelled to make promises, which it was never willing to keep.

President Bill Clinton's China policy promoted greater cooperation between the two countries leading to huge business and commercial gains for both. Such a policy of engagement was difficult to pursue in the wake of more pressing security and related issues on which the US and China confronted. Missile related issues remained one among them. Following the Senate Select Committee Report (Cox Report) regarding accusations of theft of nuclear and missile design secrets by the PRC, China became a great security concern in the

US. Although the Clinton administration was able to minimize the damage to bilateral relations, allegations in the Cox report triggered a debate on the nature and kind of threat China would pose in the future to the US.

Amid the controversial missile issues, which defined the Sino-US relations in the recent past, there are signs of cooperation and engagement between the two countries in commerce and trade as well as in nuclear and military matters. In order to ensure that the areas of greater cooperation do not become hostage to conflicting issues, both Washington and Beijing are becoming increasingly careful in their behaviour.

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