
MISSILE DEFENCE AND CHINA

M. S. Prathibha



MANOHAR PARRIKAR INSTITUTE FOR
DEFENCE STUDIES AND ANALYSES

मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

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CONTENTS

<i>Preface</i>	05
<i>Chapter I</i>	
CHINA'S MISSILE POWER AND MISSILE DEFENCE: TECHNOLOGICAL IDENTITY AND LEGACY	12
<i>Chapter II</i>	
EFFECTIVENESS OR EFFICIENCY? CHINESE RETALIATORY STRIKE CREDIBILITY AND TECHNOLOGICAL EDGE	34
<i>Chapter III</i>	
MISSILE DEFENCE AND THE US-CHINA DETERRENCE COMPETITION	52
<i>Chapter IV</i>	
CHINA'S MISSILE STRATEGY UNDER MISSILE DEFENCE	82
<i>Chapter V</i>	
CONCLUSION: CHINA, MISSILE DEFENCE AND IMPLICATIONS FOR INDIA	96

PREFACE

The existing power asymmetry between China and the United States is intensifying the nuclear competition between them. Nowhere is this manifested more than in their diverging views on missile defence. After the Cold War, the withdrawal of the US from the Anti-Ballistic (ABM) Treaty has raised questions about the composition of the nuclear order and its modifications. China is interested in modifying the nuclear order to accommodate its interests and legitimise its declaratory nuclear policy vis-a-vis the US. On the other hand, the US is attempting to guide the nuclear order onto the next century that can constrain the Chinese nuclear capability through multilateral arms control. In other words, the US sees the ABM-led nuclear order to be insufficient to address Chinese nuclear capability.

The issue of missile defence therefore represents all things challenging about the US-China deterrence relationship. The discourse on the relevance of missile defence to China often centres around its impact on the efficacy of China's retaliatory capabilities. Obviously, the continued lack of agreement between the two countries on establishing/accepting mutually assured deterrence leads experts to attribute the Chinese response to missile defence as an effort to counter US nuclear superiority as well as to retain its assured retaliation capabilities. Even though the technical effectiveness of US missile defence in battlefield is suspect, China's optimism about the prospects of US technological breakthroughs is taken as one of the factors behind its responses.

The Cold War history of US nuclear policy has invited theories of security dilemma and deterrence to explain the nuclear behaviour of a limited nuclear power like China. US policy makers believe that its nuclear first-strike policy during the Cold War was successful to a certain degree because it deterred the Soviet Union's conventional threat against Western Europe. Likewise, for a limited nuclear state like China, the credibility of its nuclear deterrent in the face of missile defence is predominantly taken as an analytical framework, which leads most

analysts to focus on China's response to missile defence. As a result, the Chinese missile defence countermeasures are argued to be a counter to (i) the US capability to develop a robust missile defence shield in the future, (ii) the need for technology demonstration to prove their science and technology credentials, thus gaining leverage in arms control and nuclear negotiations, and (iii) to reduce the perception of vulnerability against the US nuclear first-strike.

The US enjoys considerable nuclear superiority vis-a-vis China. China, on the other hand, has invested in the modernisation of the nuclear forces to strengthen its second-strike capability. While there is a correlation between the US desire to maintain its nuclear superiority and the Chinese investment in offensive missile capabilities and counter-capabilities such as anti-ballistic missile technology in an effort to assure its credibility, the extent to which US deployment of missile defence has challenged China's credibility or its response to it, is unclear. As China is unwilling to achieve strategic parity (parity of nuclear forces) with the US, one could hypothesise that it would have to use repeated signalling and declaratory policy, and boost the credibility of its existing forces. The success of offensive missile technology means that China would concentrate its research and development approach to modernising it to counter missile defence. Compared to defensive technologies such as missile defence, offensive missiles are considered affordable and offer distinct military advantage, even to a developing country. Not surprisingly, the explanation of Chinese behaviour has been to analyse the desire to develop more sophisticated missile capability as a way to alleviate the security dilemma posed by a stronger nuclear adversary. Most importantly, given that technologies such as missile defence are an emerging phenomena, and are yet to reach the significance of offensive missiles in warfare, and due to its resource-intensive nature, the limited Chinese response in developing missile defence on its own, is often presumed under the context of broader political competition and ambiguities posed by the adversary. In other words, the Chinese responses are a counter to the adversary's political challenge in the international system.

As a result, factors such as the security dilemma, or China's technological optimism of US capability, or indeed the self-help strategies induced by the power asymmetry and lack of clarity of the intentions of the

adversary is shown to be making the Chinese rely on a more robust nuclear response. It does not lead to an understanding on how China came to choose a robust nuclear option (as opposed to making its missiles more efficient), which leads to further obfuscation on the context of its opposition (deterrence worldview) to US missile defence. Overall, the attribution of these factors in fact makes it seem that Chinese decision-making is mired in ambiguities (as opposed to having a clear strategy against missile defence) or it is uncertain about the adversary's intentions (higher uncertainty against the adversary's motivations on missile defence). As a result, the Chinese responses are seen as leveraging against these said uncertainties, and transparency between China and its adversary's nuclear posture could somehow alleviate it. This is not to say that transparency can play no role, but it is a political decision by the two powers after reaching some sort of political consensus. The present context shows no such consensus emerging between the US and China, which can lead to transparency being part of its deterrence relationship.

The fundamentals of the Chinese state behaviour on its deterrence world-view are not probed sufficiently when attempting to find the factors behind its responses. The Chinese nuclear posture shows more than just countermeasures towards missile defence. From 2010, there is an acceleration of testing and deploying of ballistic missiles and development of new technologies such as hypersonic missiles. Clearly, Chinese strategic planning envisages use of offensive missile technology to counter the perceived threat to any potential conflict in its neighbourhood. It is also possible that since technologies involved in missile defence are not confined to just nuclear, but intersects with technologies of electronic warfare, space warfare, information warfare, and network warfare, the Chinese opposition could be about broader technological competition between the two States.

This monograph is an effort to interpret the question of missile defence and China. The arguments put forth by various scholars provide a glimpse of the relations between the two States. They give brevity to the analyses that ambiguities, or rather increase in military capabilities, are driving the action-reaction cycle between the two countries. However, these are a consequence rather than the driver of Chinese nuclear behaviour. The objective of this study is to explain the

fundamentals of the Chinese posture that is driving its responses to missile defence and its world-view.

One argues that the Chinese deterrence posture is connected to its technological identity as a missile power. The lack of distinction between nuclear and conventional in the Chinese forces is due to its deterrence posture as a missile power, rather than just a nuclear weapon power. This technological identity, where China is a missile power, has seen its continuous growth from the Strategic Missile Forces to the Rocket Forces in the present, and has spurred growth in missile-related technologies.

Secondly, this technological identity has helped China to tailor the deterrence theory to suit its limited nuclear arsenal rather than use Cold War deterrence theory. In fact, their deterrence attempts to counter asymmetric capabilities through missile forces, where China can achieve a technological edge over the US. Missile defence, termed as “anti-missile capability” in Chinese lexicon, is a threat to the identity of a missile power that was increasingly reducing the US’ credibility of extended deterrence in the Asian theatre, regardless of the wide gap between the US and Chinese nuclear postures. On the other hand, through the identity as a missile power, it was challenging the US commitments in Asia as well as the confidence in the neighbourhood to openly deter Chinese military power. This is the reason why the Second Artillery was upgraded; unlike the Russian example, the Chinese leadership left out the word “strategic” from the name, instead titled it as only “Rocket Forces,” denoting the outlook through which the Chinese saw the composition of the forces.

Third, this technological identity is crucial for the Chinese to reformulate the strategic stability based on strategic parity with the US using a broader security framework. This would mean that the missile power has to be unassailable, that the US should agree to strategic stability based on broader security rather than just stress on nuclear superiority. This attempt to create strategic stability, by not relying solely on nuclear warheads capability, has led it to see missile defence as a threat to the efficiency of its nuclear policy, thus impinging on its capability to negotiate with the US on the norms of the nuclear order.

Fourth, in the short term, the Chinese missile strategy compensates for its weak airpower capability as well as limits the risks in early campaign in any potential conflict in its neighbourhood. Therefore, the missile strategy is to strike at the US system, which as a whole operates under the rubric of strike options of the Air Force and the naval platforms. While the missile strategy to compel the adversary to forgo confrontation has come under severe stress because of missile defence, the missile strategy under missile defence-led nuclear order is to continue its advantage, and further develop advanced rocketry and missile technologies that would undermine both the perception and battlefield legitimacy of US missile defence.

Fifth, consequently, the need to protect critical infrastructure from Chinese offensive technologies has become a priority to its adversaries in the neighbourhood. This would however be determined by the features of US-China nuclear competition. And, this competition in turn would influence change in Asia's nuclear environment, as it is tied to the deterrence relationship between the two superpowers.

Missile defence shield is often associated with the imagery of future warfare with fantastic technologies that are still in the realm of science fiction. Whether missile defence intends to change the future of warfare or will be limited in its scope, is still unknown. But as India embarks on its own military modernisation, including nuclear modernisation, missile defence offers an opportunity to be in the forefront of an emerging technology as well as protection against missile threats.

Therefore, a sober reading is needed to study the two actors that are actively involved in the missile defence-influenced missile modernisation race – the US and China. Their technologies, rationale for abandoning the offence-based nuclear environment, prospects for missile defence in conflict, and importantly, new bargaining power with such states and its impact on the negotiations to decide on new nuclear and arms control norms for the future would offer key lessons. Moreover, by studying missile defence, the nature of US-China nuclear competition offers a window into the changing Chinese deterrence capabilities.

The question for India is not about whether each other's responses are predictable based on theory of arms race and security dilemma. It misses the fundamental aspects of the competition that is driving the

technological rivalry. Moreover, focusing only on the debate about the effectiveness of the missile defence in a military conflict does not sufficiently address the political nature of deploying missile defence and deterrence calculations. It is about the possible ways to assess the extent to which both countries are changing the nuclear environment due to their strategic competition and in what way missile defence encapsulates the nature of that competition.

For instance, a complex and integrated military grid architecture is emerging due to the preponderance on network-centric focus and use of space-based assets. The deployment of missile defence seems to have accelerated this situation, with its reliance on space and sea-based surveillance and secure communications network. Not surprisingly, the US insists that its military's inter-operability with its allies/partners has to be secured and should predicate on secure networks that are approved by it. In fact, the nature of US partnerships would be based on the closed nature of communication networks compelling such partners from choosing sophisticated equipment from other countries (such as S-400 systems from Russia).

India as a nuclear weapon state with its small arsenal cannot be left behind with confusions about the changing nature of its strategic environment. Ongoing strategic competition between the US and China and the race to enhance their respective deterrence has only made these questions urgent as states are entering an increasingly competitive strategic environment. Both countries would compete ruthlessly for the next technological revolution and attempt to influence other states to follow their vision. It reflects in the Indo-Pacific strategy but the military dimension is still evolving and so are China's own initiatives and development model. It is evident that the prevalent norms of the Cold War are being abandoned, which can be seen in the end of the INF Treaty. There are tough questions to be asked, as India attempts to reduce the disadvantages of the residue that is felt by other major powers, due to superpower competition as well as attempts to take advantage of such competition.

Unless the drivers and implications of the changing strategic environment are studied, confusions will persist in the decision-making system. If missile defence is indicative of tightly inter-woven security

cooperation, then security dialogues have to be looked at with fresh eyes. For instance, how does the Quadrilateral Security Dialogue (QUAD) envision the security cooperation between all four countries? How far is the Indo-US security cooperation about India's eventual entry to interests-based security cooperation in a multilateral framework that relies on interoperability and secure and closed communication system?

These questions are emerging while the Chinese nuclear modernisation against the US is putting the credibility of India's small arsenal at risk. If technological development in China is outpacing the ones in India, does it want to be part of Quad to benefit from its enhanced surveillance and response strategies? Or does India want to walk the path alone and find a mix of political and economic solutions and hedging, to counter any threat to its national security. Even if India wants to field its own missile defence, the sale of S-400 systems from Russia is the same that was exported to China. Can India afford to build missile defence in a resource-constraint environment and global economic recession? This monograph attempts to answer these questions. It aims to unravel the fundamental principles that could be discerned while engaging with the question of missile defence and China. It does present the problem from the perspective of area studies rather than from comparative perspective. It is not about analysing the drivers of US policy-making, but a way to understand the strategic environment by studying the Chinese perspectives and responses.

CHINA'S MISSILE POWER AND MISSILE DEFENCE: TECHNOLOGICAL IDENTITY AND LEGACY

INTRODUCTION

There are discernible changes found in China's modernisation of its nuclear forces in the last two decades. For instance, there has been an expansion of research and development, testing and deployment of diversified ballistic missiles and anti-missile delivery systems, which has raised questions about whether China would continue to maintain a small nuclear arsenal. It has provoked attempts to understand the drivers that are behind the rapid modernisation of China's nuclear forces.

In this context, US deployment of missile defence at its homeland and near its bases has been identified as one of the drivers that are affecting changes in China's nuclear posture. The chapter analyses the various arguments about the effect of missile defence on China and the gaps in the literature. It argues that the rapid modernisation of China's nuclear forces is not the cause but a consequence of the US deployment of missile defence. Moreover, US missile defence has not affected China's nuclear posture. It has however resulted in the development of missile capability that is both extensive as well as sophisticated. This chapter explains why this discrepancy exists and gives an analytical framework to understand the contradictions in the Chinese responses.

For crisis stability to exist in the US-China relationship, there is an effort to separate nuclear and conventional missile modernisation as separate categories. Crisis stability in this situation would mean that the US does not view any peacetime preparation as provocation or as a sign of preparation of a nuclear strike against it, and thereby subjecting China to pre-emptive strike. In other words, China's nuclear deterrence needs to be detached from its broader missile power. If not properly defined

into neat conventional and nuclear roles, the Cold War theories of nuclear deterrence and crisis stability would predict that the opaque nature of China's nuclear behaviour would lead to the problem of 'nuclear entanglement'. During the Cold War, when nuclear warfighting was part of military strategy, strategic stability was assessed to be stable and quantifiable when there were clear distinctions between a nuclear and a conventional missile attack. Therefore, China's nuclear build-up is seen as destabilising because there is no deterrence relationship between US and China, where there are practical steps to communicate nuclear and conventional build-ups or deployments.

This chapter argues that China rejects this framework of strategic stability. Instead it seeks to expand its missile power as a way to bolster its deterrence posture. China sees its missile power as part of its technological identity, which could guarantee deterrence against a nuclear threat or coercion. The technological identity and legacy has created unique features to its deterrence, such as the realisation of its strategy to use its limited nuclear arsenal to counter US nuclear primacy. In fact, this technological identity leads it to fashion strategic stability to its advantage in the post-Cold War period with the US. Therefore, US missile defence is a threat to its identity as a missile power because it questions the asymmetrical parity that the Chinese believed they had achieved with the US (mutually vulnerable even without numerical nuclear parity). While this strategy has been successful for China, its flaws are becoming more evident as the US pursues a strategy to counter China's deterrence posture.

MISSILE DEFENCE AND CHINESE NUCLEAR MODERNISATION: EXPLORING THE EXPLANATIONS

In 2001, the US decision to withdraw from the ABM Treaty and deploy missile defence made the Chinese to vociferously criticise the decision in international forums. China's opposition centred on countering the logic of "security" that the US derives from the deployment of missile defence. In China's view, the deployment would lead to "insecurity" in other countries. Moreover, the deployment of missile defence not only jeopardises the limited nuclear capability of China but also leads to an arms race in the region. Though the Chinese officials voiced their opposition in the early 2000s, these arguments are still relevant. They form the theoretical basis on which China counters the US logic of

missile defence being relevant in the post-Cold War era. In addition, these objections could be taken as the driving forces that are putting pressure on its limited nuclear arsenal, forcing China to introduce changes in its nuclear posture.

At the Conference on Disarmament, Ambassador to the UN, Sha Zukang had vocalised China's stance, stating that,

"We believe that through comprehensive and non-discriminative efforts, the so-called "missile proliferation" issue can be resolved through diplomatic and political means that is to say, through dialogue and consultations based on equal participation. National Missile Defense is not the way to solve it. We should have the confidence, including the United States-the superpower, that we can solve the problem, no matter how complicated it could be".¹

On the missile defence affecting the Chinese nuclear capability, he had added:

"Though the US Government has publicly denied that China is a major target of its NMD programme, the history of missile defence programmes and the acknowledged design capabilities of NMD show that the proposed system can be directed against China and can seriously affect China's limited nuclear capability."²

Lastly, on whether it increases the security for the US, Sha Zukang had stated:

"What the ABM treaty established is a so-called "balance of terror." Which can only provide relative security to countries. This might not satisfy some Americans in pursuit of absolute

¹ Transcript of Ambassador Sha Zukang's Briefing on Missile Defense Issue (23/03/2001), at http://zw.china-embassy.gov.cn/eng/zl/zgdwzc/200408/t20040816_6849645.htm (Accessed 23 May 2022).

² Sha Zukang, "US Missile Defence Plans: China's Views", *Disarmament Diplomacy*, 43, 2000, at <http://www.acronym.org.uk/old/archive/43usnmd.htm> (Accessed 24 November 2022).

security. Nonetheless, “balance of terror” is better than no balance at all. Between two devils, we have to opt for the less evil. And this is the best possible choice we can have until the elimination of nuclear weapons. Disrupting such a balance will only lead to greater insecurity for all countries, including the United States. In today’s world, no one can attain hegemony and absolute security, either single-handedly, or with the help of a few allies. The United States will not be an exception, though it is the only remaining super power”.³

The Chinese efforts at curbing US missile defence deployments can be traced to its efforts to impose normative limits on US space capabilities. For successful deployment of missile defence, the US has to employ wide-range space capabilities and infrastructure. China on the other hand was apprehensive that the expansion of space capabilities would enable the US to use it in a coercive manner, bolstering its use of nuclear threats against China. These concerns were raised predominantly at the Conference on Disarmament in 2001, where Ambassador Hu Xiaodi urged member states to oppose the militarisation of space and pushed for a legally binding “Prevention of an Arms Race in Outer Space (PAROS)” covering four basic obligations such as:

“not to test, deploy, or use in outer space any weapons, weapon systems or their components; not to test, deploy or use on land, in sea or atmosphere any weapons, weapon systems or their components that can be used for war-fighting in outer space; not to use any objects launched into orbit to directly participate in combatant activities; not to assist or encourage other countries, regions, international organisations or entities to participate in activities prohibited by this legal instrument. Under the above-mentioned basic obligations, all space-based weapons and all

³ “Can BMD Really Enhance Security?” Statement by Mr. Sha Zukang at 2nd China-US Conference on Arms Control, Disarmament and Non-proliferation (28/04/1999), at <http://www.china-un.ch/eng/cjkk/cjjblc/jhwx/t85310.htm> (Accessed 23 December 2019)

weapons attacking outer space targets from the earth are to be prohibited once for all.”⁴

In addition, the Chinese leadership speculated on the possible loss of reciprocal cooperation with the US. For instance, China believed that if the US was unwilling to restrict its deployment of missile defence, then they would find it difficult to cooperate with the US on nuclear arms control and non-proliferation.

“Comprehensive Test Ban Treaty (CTBT) is a very important treaty, and maybe the most important treaty in the nuclear disarmament field. CTBT is important in the sense that it would cap the qualitative development of nuclear weapons. I use the word “capping”, because in the absence of nuclear test explosions, no country, no matter how advanced technically it may be, even the United States, will not be able to develop new generations of nuclear weapons. When we talk about nuclear disarmament, it means you have to involve either quantitative and qualitative aspects or nuclear weapons. That is the importance of CTBT. To sign CTBT, China made great sacrifice. After United States conducted over one thousand tests, and after Russia conducted almost one thousand tests, China had to stop after a little bit over 40 tests. Yet, China decided to comply with the wish of the international community. China actively participated in the CTBT negotiations, and was the first to sign the treaty besides the host country.”⁵

⁴ Statement by Ambassador Hu Xiaodi for Disarmament Affairs of China at the Plenary of the Conference on Disarmament, 7 June 2001, at http://un.china-mission.gov.cn/eng/chinaandun/disarmament_armscontrol/qtxx/200106/t20010607_8412423.htm (Accessed 23 December 2022). Also see, “Letter Dated 9 February, 2000 From the Permanent Representative of China to The Conference on Disarmament Addressed To The Secretary-General of the Conference Transmitting A Working Paper Entitled ‘China’s Position on And Suggestions For Ways To Address The Issue of Prevention of An Arms Race in Outer Space At The Conference on Disarmament”, 9 February 2000, at <https://fas.org/nuke/control/paros/news/cd1606.htm> (Accessed 24 June 2022).

⁵ Transcript of Ambassador Sha Zukang’s Briefing on Missile Defense Issue, no. 1.

The Chinese officials' early interventions about the implications of missile defence and subsequent reiteration of these sentiments form the basis of its objection to the US deployment of missile defence.⁶ First, China had rejected the US rationale that missile defence can counter missile proliferation of the threshold states (North Korea). In recent times, the US has been deploying Aegis ships and Terminal High Altitude Area Defence (THAAD) against limited ballistic missile threats, which in China's view is only a pretext for reorienting these systems against Chinese ballistic missiles, affecting its limited nuclear capability. The success of North Korea's nuclear and ballistic missile programme has raised questions regarding the effectiveness of missile defence against the proliferation activities of North Korea, while bolstering the arguments of Russia and China that the US assurance that THAAD system deployment is not aimed at the North Korean threat.⁷ Second, the missile defence-induced security dilemma would facilitate other countries develop space and anti-space capabilities leading to a space race in the region. For example, China views the dual-use technologies such as radars and sensors associated with missile defence as having an impact on the credibility of its nuclear deterrence, pushing it to modernise its nuclear forces.⁸

However, Chinese concerns about the impact of US missile defence on nuclear deterrence and strategic stability have always been a post-Cold War phenomenon. Though China had always stressed on the military value of nuclear weapons, theoretical innovation in military theory, developed in the late 1980s, enabled China to use concepts

⁶ "China's Endeavors for Arms Control, Disarmament and Non-Proliferation", White Paper, Information Council of the State Council of the PRC, 2005.

⁷ Brad Roberts, "Anticipating the 2021 Missile Defence Review", *RealClear Defense*, 7 January 2021 at https://www.realcleardefense.com/articles/2021/01/07/anticipating_the_2021_missile_defense_review_655612.html (Accessed 5 January 2022).

⁸ Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and US-China Strategic Stability", *International Security*, 40 (2), 2015, pp.7-50.

such as deterrence and warfighting.⁹ During the Cold War, though the Sentinel programme was against a future ICBM threat from China, there was no use of national resources from the US to counter the Chinese nuclear capabilities. The Chinese themselves saw the Strategic Defence Initiative (SDI) as a response to Soviet advances in first-strike capabilities and were generally sympathetic to the American policymakers.¹⁰ The superpower politics of the Cold War and the anti-imperialistic rhetoric in the Chinese discourse were largely responsible for influencing China's critique of the nuclear arms race. In other words, during the Cold War, China did not use the theory of deterrence and strategic stability to oppose the deployment of missile defence. Despite concerns about the impact of the arms race on their limited nuclear capability, the Chinese concerns about SDI were a product of its pessimism about superpower politics.

Likewise, the broader cooperative partnership between the US and China influenced the latter to adopt a conciliatory attitude towards arms control. The US arms control theorists predominantly were more in favour of arms control as a way for superpowers to reduce the risks of a surprise attack and as the primary motive to achieve strategic stability to reduce anxiety caused by improvements in the nuclear capability.¹¹ It might lead one to think that the Chinese attitude towards deterrence and strategic stability has aligned with the understanding of the West. However, the Chinese are seen to be looking at arms control through a political lens, assigning no importance to the technical aspects of miscalculation. From that viewpoint, the Chinese are shown to be optimistic about crisis stability¹² and therefore have to be convinced about the dangers of escalation.

⁹ Alastair Iain Johnston, "China's New "Old Thinking": The Concept of Limited Deterrence", *International Security*, 20 (3), 1995-1996, pp. 5-42.

¹⁰ John Garver, "China's Response to the Strategic Defense Initiative", *Asian Survey*, 26 (11), 1986, pp.1220-1239.

¹¹ Colin S. Gray, "Arms Control "The American Way", *The Wilson Quarterly*, 1 (5), 1977, pp.94-96.

¹² Zhao Tong, "Calculus on Missile Defence and Hypersonic Glide", in Lora Saalman (Ed.), "China-Russia Relations and Regional Dynamics: From Pivots to Peripheral Diplomacy", Stockholm International Peace Research Institute, 2017, p. 115.

There are reasons why China was seen as closely aligned with the West on arms control. The nuclear cooperation agreement signed by the two countries in 1984 led to changing attitudes within the Chinese strategic community. The cooperation in the field of science and technology, particularly in the nuclear field, made China a huge market for the American nuclear industry. China's nuclear cooperation with the US made it to adopt stringent nuclear export controls for its domestic industry exporting to foreign countries. In 1992, in addition to overhauling its export controls, China also joined the Non-Proliferation Treaty (NPT) as a nuclear weapon state.

The US decision to encourage China to accept the nuclear arms control norms led to intense interactions between the West and China. This socialisation with elite institutions of the West and their expertise meant that the Chinese scholars and thinkers were fast becoming comfortable with Western concepts of nuclear order and strategy. Similar to its entry to the NPT, it also signed the CTBT in 1996, even though China had conducted only 45 tests compared to the US and Russia.

In 1998, after China had reduced its proliferation activities and implemented several export control practices, the US signed the Presidential Certificate for the formalisation of the nuclear cooperation agreement with China. Overall, a combination of increased trade between the US and China on nuclear cooperation and the impact of proliferation norms on the Chinese also made sure that the cooperative effects of the relationship was strong.¹³ The Chinese concessions towards the US and pragmatic attitude towards nuclear arms control created an impression that the US and China would continue to cooperate on nuclear arms control and non-proliferation. Even though the Chinese continued to view strategic parity with mistrust, US-China bilateral cooperation blunted many of the criticisms about it. Therefore, a worsening strategic competition between the two countries meant that the Chinese concerns about US nuclear posture became more

¹³ Tan Qingshan, "US-China Nuclear Cooperation Agreement: China's Nonproliferation Policy", *Asian Survey*, 29 (9), pp. 870-882.

pronounced. Missile defence becomes a focus of the distrust, where the US believes that arms control, which can include China in the future, would reduce miscalculation and inadvertent escalation, whereas China believes that missile defence would destabilise the overall stability in the political relationship.

SCHOLARSHIP ON CHINA AND MISSILE DEFENCE

The two hundred ICBM silos discovered by satellites have ignited the debate on whether China is expanding its nuclear forces beyond its minimalist posture.¹⁴ Though the US initially wanted to respond to growing missile threats from North Korea and Iran through the deployment of missile defence, there are strong viewpoints about missile defence enhancing crisis stability in the US' relationship with China and Russia. For instance, US missile defence has begun to incorporate missile defence capabilities to counter the threat posed by growing sophistication and diversification of missile forces on its air superiority.¹⁵ In fact, there is a growing consensus towards adapting missile defence to specifically meet the challenge that the Chinese missile arsenal poses for the US' ability to maintain its dominance.¹⁶ China on the other hand, supports "strategic stability" as the "cornerstone" of the nuclear order, as it had an overwhelming interest in preserving the treaty, as it limited the nuclear capabilities of the two superpowers.

Therefore, the impact of missile defence on the anxieties on states like China led to a concentrated effort to look at Chinese apprehensions in an effort to discern the responses to it. One of the primary motivations behind the expansion of China's nuclear forces are shown to be the

¹⁴ James Cameron, "China's Silos – New Intelligence, Old Problems", *War on the Rocks*, 12 August 2021 at <https://warontherocks.com/2021/08/beijings-silos-new-intelligence-old-problems/> (Accessed 1 January 2022).

¹⁵ Thomas Karako, "Missile Defence and the Nuclear Posture Review", *Strategic Studies Quarterly*, 11 (3), 2017, pp 48-64.

¹⁶ Henry Obering III and Rebeccah L. Heinrichs, "Missile Defence for Great Power Conflict: Outmaneuvering the China Threat", *Strategic Studies Quarterly*, 13 (4), 2019, pp. 37-56.

security dilemma caused by the deployment of missile defence. A serious analysis of the Chinese opposition to missile defence in the West was undertaken in an article in *Foreign Affairs*, titled 'China as a Forgotten Power.'¹⁷ The article highlighted Chinese opposition to the US withdrawal from the ABM treaty and the implications it has for China's retaliatory capability, given its small arsenal.

China's arsenal, though not as large as that of Russia, has become a source of apprehension for the US' ability to satisfy its alliance commitments in East Asia. The Russian Strategic Forces are more than capable of overwhelming the US missile defence system. However, the Chinese nuclear forces are neither as nascent as the North Korean programme nor as large as the US weapons capability. The Chinese nuclear programme has been slow but is consistent in its approach to the development of a sophisticated nuclear programme. It might be a small nuclear arsenal, but sophisticated enough to have achieved solid-fuelled technologies by the 2000s.

Several ambiguities, such as the open-ended nature of the US missile programme and confusion in the stated aims of the kind of adversary that missile defence is supposed to defend, have resulted in Chinese apprehensions that the deployment could be used against their limited capability.¹⁸ Clearly, the Chinese have managed to convey their apprehensions about the way missile defence increases their security dilemma. Scholars suggest that the way for both countries to resolve this situation is for the US to accept its mutual deterrence relationship with China and forsake space-based missile defences, and in return, for China to restrain from expanding its nuclear arsenal to exercise

¹⁷ Brad Roberts, Robert A. Manning and Ronald N. Montaperto, "China: The Forgotten Nuclear Power", *Foreign Affairs*, 2000, 79 (4), pp. 53-63.

¹⁸ Tong Zhao, "Narrowing the US-China Gap on Missile Defense: How To Help Forestall a Nuclear Arms Race", 29 June 2020, Carnegie Endowment for Peace at <https://carnegieendowment.org/2020/06/29/narrowing-u.s.-china-gap-on-missile-defense-how-to-help-forestall-nuclear-arms-race-pub-82120> (Accessed on 5 July 2021)

'assured retaliation'.¹⁹ Some ask the US to forgo a damage limitation strategy against the Chinese, thereby reducing the competition between the US and Chinese nuclear forces, as the Chinese could counter it by the innovative use of its missile forces.²⁰ In fact, Chinese reluctance to engage in arms control, according to some, could be rectified if the US addressed the issue of missile defence with the Chinese.²¹ However, the difficulty of including the Chinese within the nuclear arms control ambit was noted by the US analysts much earlier in the 1970s.²² The US and China did not have a comprehensive military dialogue on the issue of strategic stability and the issues concerning the nuclear order.

Experts argue that while the Chinese may have doubts about the effectiveness of missile defence, it might however increase the coercive aspects of US nuclear policy if the latter believes in its efficiency.²³ The impact of the effectiveness of strategic defences is also studied. For instance, some believe that strategic defences are not exactly effective and only lead to difficulties in getting countries to agree on nuclear arms control, as the concerns about it might exacerbate apprehension in countries like China, thereby impacting strategies for future

¹⁹ Zhang Baohui, "US Missile Defence and China's Nuclear Posture: Changing Dynamics of an Offence-Defence Arms Race", *International Affairs*, 2011, 87 (3), pp.555-569.

²⁰ Charles L. Glasner, and Steve Fetter, "Should the United States Reject MAD? Damage Limitation and US Nuclear Strategy Towards China", *International Security*, 41 (1), pp.49-98.

²¹ Tytti Erasto and Matt Korda, "Time to Factor Missile Defence Into Nuclear Arms Control Talks", SIPRI, 30 September, 2021 at <https://www.sipri.org/commentary/topical-backgrounder/2021/time-factor-missile-defence-nuclear-arms-control-talks> (Accessed 1 July 2021)

²² J. H. Kalicki, "China, America and Arms Control", *The World Today*, 26 (4), 1970, pp.147-155.

²³ Yousaf Butt and Theodore Postol, "Upsetting the Reset: Russian and Chinese Concerns With the Phased Adaptive Approach", *Federation of American Scientists*, 2011, pp.30-33.

expansion.²⁴ Worse, it might affect China's strategy of inducing first-strike uncertainty to the adversary, who in turn would be unsure that it has not destroyed all the nuclear missiles, thus unwilling to engage in it.²⁵ In other words, the Chinese nuclear threat perceptions about the US are extensive because they do not trust American intentions about their deployment, nor do they believe that the US might stop at limited deployment.²⁶

A more nuanced analysis of Chinese concerns portray missile defence to affect the retaliation capabilities of the Chinese forces, while acknowledging that broader security concerns, reduced budgetary constraints, and logic of rising Chinese military capabilities might also be factors.²⁷ In assessing these concerns, it also documents the confusions and ambiguities about missile defence that persist within China because of the diverse concerns such as possible technological breakthroughs, its impact on China's conventional missile capabilities, and mistrust about the US motivations.²⁸ The argument is that the impact of the missile defence is such that earlier Chinese nuclear modernisation had no reference point, but missile defence has given them one as to how to modernise it. Unlike the previous nuclear policy, Chinese now consider the US deterrence policy as a reference point to guide its own force development. For example, the Chinese decisions would be guided by new and expanding US defence capability, leading it to develop assured destruction capability.²⁹

²⁴ Greg Thielmann, "Increasing Nuclear Threats Through Strategic Missile Defense", CISSM Working Paper, June 2020, pp. 1-20.

²⁵ Wu Riqiang, "China's Anxiety About US Missile Defence: A Solution", *Survival*, 55 (5): 2013

²⁶ Susan Turner Haynes, "China's Nuclear Threat Perceptions", *Strategic Studies Quarterly*, Summer 2016, pp.25-62.

²⁷ Tong Zhao, "How (and How Seriously) Dose US Missile Defense Threaten China?" Carnegie Endowment for International Peace, 2020, pp. 12-29.

²⁸ Ibid.

²⁹ Ibid., note 19.

Though such apprehensions are well catalogued, some believe that the committed nuclear policy of China, such as No-First Use and minimal nuclear arsenal, might not be anything more than political propaganda.³⁰ In fact, they argue that Chinese capability can be seen as an indication of enhancement of warfighting principles, in an effort to counter the US and achieve its objectives in the Taiwan Straits.³¹ The correlation between missile defence and increase in the Chinese offensive capability might show correlation, but does not necessarily equal causation.³² This view considers that there might be circumstantial evidence towards the increase in Chinese force modernisation and missile defence, but no conclusive evidence to say that the Chinese might not have followed up to increase its weapons capabilities without missile defence.

The US deployment of THAAD in South Korea is often taken as an example to argue that missile defence capabilities such as radar tracking and sensors is a Chinese concern on the overall impact on its deterrence posture, hence giving credence to their opposition. Even though China believes that THAAD have security impact on China as it cannot be used effectively against the North Korean ballistic missile threat, some believe that such arguments lacks consistency. The Chinese are believed to misunderstand the objectives of THAAD, which is part of military and diplomatic response to the North Korean nuclear brinkmanship.³³ On the other hand, the US might look at missile defences as a way to bolster its alliance commitment to its allies, alleviating their fear of abandonment by sharing its capabilities, and leveraging its benefits.³⁴

³⁰ Mark Schneider, "The Nuclear Doctrine and the Forces of the People's Republic of China", *Comparative Strategy*, 28 (3): 244-270

³¹ Ibid.

³² Matthew R. Costlow, "The Missile Defence "Arms Race" Myth", *Strategic Studies Quarterly*, 2021., 15 (1): 3-9

³³ Robert C. Watts IV, "Rockets' Red Glare – Why Does China Oppose THAAD In South Korea, and What Does It Mean for U.S. Policy?", *Naval War College Review*, 2018, 71 (2): 1-30

³⁴ Robert C. Watts IV, "A Double-Edged Sword", *Naval War College Review*, 2020, 73 (1): 49-83

There are two ways that the Chinese apprehensions about the US missile defence are taken into consideration. The concerns that missile defence has a direct correlation on the ability of the Chinese ICBMs to retaliate against the US are formed on the basis of security dilemma. On the other hand, realists often look at the Chinese nuclear behaviour as a way to strengthen its capabilities regardless of the deployment of missile defence. There are a few that acknowledge the complexity of the Chinese apprehensions, but acknowledge that there are ambiguities that are present in the Chinese perspectives and it might create further instability in the US-China relations.

CHINA'S MISSILE POWER AND TECHNOLOGICAL IDENTITY:

The study of China and missile defence broadly look the Chinese apprehensions about its small nuclear arsenal and the subsequent responses to counter the security dilemma caused by it. However, confusion persists while studying the responses of China to US missile defence. For instance, several queries can be raised if one were to attribute China's modernisation of nuclear forces due to missile defence. Is there sufficient evidence to show that China has changed the robustness of its nuclear posture? Does missile defence is the cause for the rapid expansion of ballistic missile capabilities? If China is not changing its declaratory policy, then how are they changing its nuclear arsenal to counter missile defence? If the basic declaratory policy has not changed, and China has only responded through MIRV and countermeasures, is there a need to portray China's changes in its nuclear posture as robust? If China is not apprehensive about crisis instability, why is it then its posture is seen as contributing to nuclear entanglement? If China believes that its moderate changes are enough to counter missile defence, then why would its concerns change its basic declaratory nuclear policy? There is no definite framework to slot the Chinese responses as well as maintain that it has not changed its basic declaratory framework. Therefore, a more nuanced argument would attempt to study China's nuclear responses so as to argue that there would be a change in the way it would attempt to implement its retaliatory policy, while preserving its no-first use policy.³⁵

³⁵ Note 8, Fiona and Taylor.

They are also unable to agree whether the Chinese posture is indeed moving away from its professed policy of not seeking nuclear parity with the US. They do give an impressive array of the Chinese apprehensions regarding the missile defence as well as inconsistencies in arguments. However, though a wide range of scholarship examines the missile capability of China and the way it creates uncertainties for US extended deterrence, they have not given a definite framework as to how it is connected to the Chinese worldview either regarding deterrence or broader security posture. The missile power has been examined under the rubric of its salience in military strategy, i.e., use of missile power to achieve its military objectives in its neighbourhood as well as its impact on US homeland and extended deterrence.

However, there are certain characteristics that could be discerned from the existing scholarship. First, there is an effort to modernise the nuclear weapons towards survivability and credibility of its second strike. But opinion is divided over whether China is going to employ the second strike on a strategy of assured retaliation or assured destruction. Second, the number of nuclear warheads has been increasing. However, whether the increase is merely to make its second strike credible such as nominal increase to counter missile defence or to achieve nuclear parity is unclear.

Third, there is an increase in the overall military capability, but it is not clear how much China values nuclear weapons in warfighting as opposed to its conventional missiles. Moreover, this argument is further complicated by the fact that the clarity regarding nuclear and conventional missile mix might lead to nuclear entanglement during a conflict risking inadvertent escalation. Experts have predicted such uncertainties regarding China's nuclear policy. Brad Roberts says that "we can make many predictions about China's nuclear future but we must also recognise that the future is littered with uncertainties. We must also recognise the possibility that the United States may have little or no influence over the next choices China might make about its strategic future".³⁶

³⁶ Brad Roberts, "China and 2021 US Nuclear Posture Review", Testimony Before the US-China Economic and Security Review Commission, June 10, 2021, pp.2-3

Despite the challenges, historic evolution of China's policy gives us some indication as a way to discern certain characteristics that might give an understanding to the Chinese nuclear behaviour and drivers behind its response to missile defence. I argue that China's missile capability and its technologies that were developed due to its rocketry programme has enabled it to gain a technological identity as a missile power. This helps it achieve a technological edge with the US on military power, as the conventional and nuclear power of the US has always outstripped the Chinese military across the spectrum. The argument is to give conceptual understanding to the Chinese choices, therefore arriving at a logical conclusion about its responses.

This technological identity has grown out of the pioneering programme of science and technology investment, manpower and high-level political engagement has equipped the Chinese leadership to forge an identity of military power in the post-Cold War era. It has precisely provided the Chinese to focus on the integration of nuclear and conventional missiles disregarding the Cold War expectations of deterrence stability. This is why there is confusion about the nuclear entanglement and escalation, because of the Western deterrence theory that clearly seeks to distinguish the nuclear from the conventional. Or there is apprehension whenever scholars argue that non-strategic attacks by countries like China should make the US rely more on missile defence to ensure less coercion.³⁷ It is also why the methodology to assess the Chinese nuclear policy often ends in confusion and ambiguity. Therefore, the logical response to the US threat is this identity, through which flows the credibility of its nuclear posture despite the limited nuclear arsenal, has been to further create a technological edge in the missile field. The hypersonic testing is a testament to it. Moreover, apart from the technological identity, the Chinese security impinges on it.

The rocketry programmes has allowed it to develop many other forms of missile-related technologies that are designed to counter the US air and space capabilities. This technological identity underscores the Chinese

³⁷ Thomas Karako, "The Missile Defence Review in Context", in Thomas Karako and others (Eds), *Missile Defense and Defeat: Considerations for the New Policy Review*, Center for Strategic and International Studies, March 2017.

desire to close the gap in key technologies and surpass in some capability. From the Chinese view, it is none other than the system of missile capabilities that has been nurtured from its nascent science and technology goals for national defence. This is very much part of its “identity” and the associated political benefits that are entwined with the broader political concerns of the Chinese. The missile power had the technological edge to create uncertainty in the minds of the US decision-makers about the comprehensive advantage they have over the Chinese military. The missile technology formed the anchor to reduce the leverage that the US could use on nuclear threat to counter the Chinese conventional superiority.

China has expanded its space-based capabilities, with its dual-use functions, in addition to diversification of offensive missile technologies. The demise of ABM treaty had not only accelerated this kind of deployment, but also led China's foray into the testing of hyper-sonic missiles and anti-satellite capabilities. A concentrated approach is visible to reduce the credibility of any anti-missile system of the US, including the development of initial capability of its own missile defence shield. All this point to the Chinese intention to narrow its technology gap in the missile and space field against the US, at the same time, acquiring technological edge in missile and rocketry related fields.

a) Historic Factors

China's technological journey became a reality when “Preliminary Opinions on Establishing Missile Research Work” (关于建立我国导弹研究工作的初步意见) led to the creation of the Fifth Academy of the Ministry of National Defence (国防部第五研究院) to carry out missile and rocketry research. Qian Xuesen, who is considered the Father of Missiles and Father of Aerospace, led the Academy. The institute was the focal point that went on to establish branches that would pioneer research on ballistic missiles, surface-to-air missiles (Hongqi series) and air-borne missiles (HY-2 for coastal defence).³⁸

³⁸ Mei Shixiong and Mao Jun, “The First Missile and Rocket Research Institute—the Fifth Academy of Ministry of National Defense: Starting Point of China's Aerospace Dream”, (第一个导弹火箭研究机构——国防部五院：中国航天梦的起点) *Xinhua*, 10 April, 2017, at http://www.xinhuanet.com//politics/2017-07/10/c_1121295822.htm (Accessed 2 May 2021)

The missile and rocketry research is seen as fundamental to the development of China's space capabilities, especially establishment of China Academy of Launch Vehicle (CALT)³⁹ and Second Academy of China Aerospace Science and Industry Corporation (中国航天科工集团二院). From the success of the missile launches, the aerospace industry started the Long March series that led to the expansion of China's foray into building lunar probes, space stations and space crafts. Such cutting-edge technologies were seen as hard fought as it is linked to the Party's legacy from being a country of weak industrial base and poor economy, to a country with military and technological power with "cutting-edge technologies". Of course there was a great deal of pragmatism while choosing missiles rather than air power, depending on what could be achieved with Soviet assistance and the decision to imitate Soviet R-2 missile as part of the secret agreement between the Soviet Union and China (one of the six agreements). The historic experience of missile and rocketry research, along with the explosion of the atom bomb, is tied to the Party's decision-making victory by accurately predicting cutting-edge technologies, making this a foundation of China's science and technology industry, which later would encompass China's space ambitions.⁴⁰ Most importantly, it is tied to the legacy of the Party's central leadership to provide guidance to the country's important problems.

This legitimacy to the missile and rocketry programme has defined the Party's role in nurturing the military power, thus becoming part of its technological identity. As it was the foundation, by this logic, China chose to focus on missile-related fields that could enable it to produce cutting-edge technologies, such as civilian rocket industry, ballistic and cruise missiles for all the theatres (ground, air and sea), anti-satellite

³⁹ CALT (中国运载火箭技术研究院) is a subsidiary of China Aerospace Science and Technology Corporation (中国航天科技集团).

⁴⁰ Jun Wen, "The Historic Cause and Precious Spirit of 'Two Bombs and One Star'" (两弹一星"的历史伟业和宝贵精神), *Zhongguo Hangtian Bao*, 29 April, 2021

capabilities, etc. Out of the 1059 programmes, which was the code name of the first missile test, the Dong Feng (missile tests) series started to take shape and after the first test in November 5, 1960, China started embarking on a variety of missiles.

The name Dong Feng (East Wing) was taken by Mao Zedong from a line in the novel (the East Wind Overwhelms the West Wind) “Dream of a Red Chamber.” The DF series represent the ballistic missile branch of China. The first test also reiterated the Chinese desire for indigenous technology when the Soviet Union withdrew advisors after 1959. The missile and rocketry research is representative of the strategy to gain technology along with foreign collaboration as part of its strategy. Although the process of slowly establishing its credentials as missile power took time, by post-Cold War era, China had started to move towards solid-fuelled technologies in its ballistic missiles.

b) Military Factors

The importance of nuclear missiles in China's military strategy underwent dramatic changes in the post-Cold War era. The leadership after witnessing the Gulf War and precision strikes understood that the current capability would not be fared against an adversary with conventional capability that can inflict equal damage. In searching for answers, they found that the Second Artillery, which was then in charge of nuclear missiles, had to be reformed. While the Chinese did start to spend on Air Force and the Navy, the “trump card”, or the technological identity, which would lead them to be considered as a vital power, would be its missile capability. In the 1990s, they started the integration of conventional and nuclear missiles (核常兼备), not only for nuclear deterrence, but for strategic deterrence. This dual strategy became part of the Second Artillery's role and was strengthened under the military strategic guidelines of war under high-tech conditions in the early 2000s.⁴¹

⁴¹ Yang Guoliang and Sui Mingtai, “Forging the Eternal Soul of Strategic Missile Force—Commemorating the 80th Anniversary of the Founding of the Party and the 35th Anniversary of the Establishment of the Second Artillery” (铸造战略导弹部队永远不变的军魂——纪念建党80周年暨第二炮兵组建35周年), 14 June, 2001, *People's Daily*, at <http://43.250.236.5/GB/shizheng/252/5531/5540/5558/20010614/488560.html> (Accessed 25 January 2022).

The evidence of this strategy could be found in the 1995 Taiwan crisis, where the Second Artillery conducted its first deterrence operation. The Taiwan crisis in 1995 showed that the use of missiles to achieve its political objectives drew attention to China's missile strategy in a potential limited war. It may be that the demonstration of missile capability itself was more provocative rather than the threat of use of nuclear weapons.⁴²

Under conditions of information warfare, this strategy of integrating the conventional and nuclear missiles gained new salience with the strategy of “dual combat, dual deterrence” (双重作战，双重威慑). This is where analysts looking at US-China strategic stability saw the problem of nuclear entanglement. Sometimes, confusion might lead to escalation to nuclear weapons. However, the Chinese do not separate the two; the point is to turn various types of missiles into a combat system that can do both, such as launching conventional missiles but waiting for a nuclear counterattack. Earlier, not all brigades are equipped for dual role, but from the early 2000s, missiles brigades have been equipped with the dual capability. As a recent example, the DF-26 has the capability for dual roles.⁴³ The DF-17 hypersonic glide that can carry out precision strike against the adversary is part of the missile combat system, which would have to carry out the duties, nuclear counterattack, precision strikes and strategic deterrence.

CONCLUSION:

The historic and military factors form a technological identity, where China's missile power needs to be protected in order to instil uncertainty in the minds of the allies in its neighbourhood. For instance, more than any other platform that the Chinese have developed, it is the missile

⁴² Jean-Pierre Cabestan, “Impact of Peking's Missile Strategy”, *China Perspectives*, 1996 (5): 28-32

⁴³ “DF-26 Nuclear-Conventional Integrated Missile Team: New Strategic Weapon of Nuclear-Conventional Equipment Integration” (东风-26核常兼备导弹方队：核常兼备的新型战略利器), 1 October, 2019, *Xinhua*, at <http://politics.people.com.cn/n1/2019/1001/c430388-31382913.html> (Accessed 5 May 2022)

modernisation that had facilitated the US to assert its dominance in the Asia-Pacific. Ian Easton came close to calling this strategy as “projectile-based” strategy, where China chooses to use such technologies instead of the US, which uses platform-based technologies. He asserted that the Chinese adopted this strategy because of platform inferiority, financial burden and geographical advantages and admits that it upsets the regional stability.⁴⁴ However, in hindsight, it seems that China has deliberately chosen a projectile-based strategy to counter the US. The historic and technical factors show that when the need for developing cutting-edge technologies in cooperation with the Soviet Union arose, it was the missile industry that seemed the choice for such cooperation. The Soviet Union was willing to provide technical assistance, and seen as more impactful in the broader technological development. Of course the Air Force took a second seat to this ambition, precisely because of the limited resources and weak industrial base.

In the 1980s, when the Chinese elite began to seriously think about the deterrence and survival of its missiles under a US nuclear first strike, this policy to choose its missile power over others still persisted as the technological identity had set in because of the strength of the organisations (aerospace) it established over the years compared to others. Especially after the Cold War, when the conventional capability had to be increased, the conventional missiles were added as a trump card for precision strikes. Even after the Chinese economy achieved tremendous growth, and as the Air Force and Navy increased its capabilities, the strategic deterrence of the Chinese military relies on its missile power. In fact, there is an effort to make the US deal with the Chinese missile and rocketry power by gaining technological edge in these technologies so as to achieve broader strategic stability with the US. In other words, there is an effort to compel the US to abandon nuclear weapons based strategic stability of the Cold War and accept a broader framework of security cooperation.

For such an effort, platform-based equipment power is insufficient as China would not be able to achieve the technological edge needed to

⁴⁴ Ian Easton, “China’s Military Strategy in the Asia-Pacific: Implications for Regional Stability”, September 2013, Project 2049.

negotiate with the US. Moreover, the reaction of the Chinese decision-makers to focus on missile defence as opposed to many other US technical feats shows an apprehension about the prospects for success of its strategy to gain technological edge in trump card technologies. Even though the effectiveness of missile defence on its nuclear weapons capability is unclear, it opposes the deployment of these defences. Moreover, as it might reduce its second-strike capability, there should have been an emphasis on more sophisticated nuclear missiles (DF-41 is the only one dedicated to missile defence), not across the broad development of ballistic, cruise and hypersonic missiles. Therefore, it seems that China opposes not necessarily because missile defences can impact the effectiveness of its nuclear deterrence, which many experts say would be difficult for the US to achieve. But it affects the efficiency of its strategic deterrence.

EFFECTIVENESS OR EFFICIENCY? CHINESE RETALIATORY STRIKE CREDIBILITY AND TECHNOLOGICAL EDGE

INTRODUCTION

China is attempting to strengthen its second-strike capabilities, such as reliability and survivability. Its concerns about missile defence have forced it to develop its missiles with penetrating capabilities and countermeasures such as decoys. When studies argue that missile defence undermines China's nuclear deterrence, they believe that the effectiveness of its deterrence is compromised under missile defence. In other words, China's ability to conduct a retaliatory strike after absorbing a first strike becomes less probable. Therefore, it envisages a nuclear situation where China does not have the capability to do damage limitation on US homeland as their remaining missiles might be countered by the missile defence. Hence, the term "effectiveness" denotes outcome-oriented analyses of its nuclear deterrence capability.

Such an assessment though satisfies the theory of security dilemma is however highly suspect of accuracy, especially in assessing the way China wants to use the nuclear weapons capability under conditions of missile defence. The assessment satisfies in listing the Chinese concerns, which correlates to the Chinese assessments that show a multitude of concerns about various technologies associated with missile defence and the way it enhances the US's offensive conventional capability. Many of these concerns are seen as a result of the open-ended nature of US missile defence system and the uncertainty it creates in the Chinese mind of its intentions.

While the Chinese believe that the impact of US missile defence on their nuclear deterrence cannot be ignored and has responded with developing missile defence countermeasures and MIRV capabilities,

the diversification of both nuclear⁴⁵ and conventional missiles show a broader orientation against missile defence and intensification of “nuclear-conventional convergence” strategies.

I argue that more than effectiveness, the Chinese believe that the efficiency of its deterrence posture against the US military superiority is affected. While China believes that a credible and assured nuclear deterrence is sufficient to counter the US, the evidence points to the propensity to achieve qualitative rather than quantitative parity. In this instance, qualitative parity can be achieved through gaining technological edge. This technological edge commensurate with its desire to protect its technological identity and, in broader terms, its deterrence posture. Its military-industrial complex, which has been nurtured since its infancy and the high-level political support demands it to maintain it. Moreover, the integrated nature of missile and rocketry would supplement its need to conserve resources to counter the US. The deterrence posture is about creating a strategic stability with the US, where qualitative parity can drive mutual vulnerability between the US and China. For instance, the Long March series and the corresponding civilian tests helped its military to enhance its capabilities in missile and anti-missile capabilities. Moreover, it is the broader missile identity that has challenged the US ability to defend its allies in Asia.

CHINESE PERSPECTIVES ON MISSILE DEFENCE

The two schools of thought, where the first envisions that the Chinese are merely responding to the changes in the US nuclear posture that has abandoned constraints on its missile defence deployments cannot explain the broader military responses such as increase in conventional missiles. They attribute it to the condition of the Chinese planners not understanding or inflating the technicalities of the US missile defence. The second school of thought, which believes that the Chinese are anyway going to make changes regardless of US missile defence⁴⁶, dismisses the vociferous opposition by the Chinese at all levels of the

⁴⁵ M. S. Prathibha, “DF-41 Ballistic Missile Deployment: Impact on Chinese Nuclear Deterrence”, *Journal of Defence Studies*, 13 (4): 2019, pp. 51-69.

⁴⁶ Costlow, note 32.

international forum. In fact, they believe that the “missile renaissance” requires the US to adapt missile defence to address the Chinese threat.⁴⁷ For instance, the Chinese leadership conveyed its displeasure by tying up its cooperation with the US on nuclear and arms control regimes, which would also require Chinese cooperation on enforcing NPT norms on countries like North Korea and Iran. Therefore, in 2001, China believed that if the US were willing to pursue missile defence, then the US cannot expect the same level of cooperation from China as it had expected before the deployment. The use of public forums to state the Chinese stand on the George Bush Jr administration's version of the missile defence was its most active form of displaying disapproval. What they had hoped was that with enough opposition from China-led international community and US arms control community, the US will roll back the development of homeland defence.

The Chinese perspectives were diverse. The Chinese perspectives to the US missile defence evolved through three phases. First, the Chinese leadership hoped that by objecting and raising international community's ire against the US, the latter will be forced to hold back on its deployment. Thus, while the technological validity might be questioned, the political implications about the missile defence deployment have deeply worried China's policymakers. Moreover, while they had acknowledged that the Bush's plans may face financial and technical problems, but the momentum towards the deployment will not be reversed despite resistance that it might face if it does not correspond to technological success.⁴⁸

They sought to use their diplomatic channels and other sources to convince the US of the futility of the missile defence and to warn of the adverse consequences of deployment. However, as the US was persistent in its approach and in fact was increasing its global role in places like Iraq and Afghanistan, the Chinese soon withdrew this openly hostile approach.

⁴⁷ Karako, note 15.

⁴⁸ Liu Zhiwei and Li Bin, “US NMD Cost Issues and Deployment Prospects”, (美国 NMD 费用问题及部署前景), *Contemporary International Relations*, 2003 (1): 33-37

In response, the Chinese interest in building its own missile defences were possibly for technology demonstration in an effort to organically understand the challenges to ballistic missiles, and possibly a cover for developing its anti-satellite capabilities.⁴⁹ Whether the Chinese BMD and associated ASAT tests were technology demonstration capabilities or not, it is evident that the Chinese believed it would compel the US to negotiate. However, the failure of the nuclear dialogue between US and China to resolve suspicion over the latter's declaratory policy such as no-first use and the US refusal to consider such a policy⁵⁰, the Chinese side has vigorously deployed improved missiles with countermeasures and MIRV capability to counter US BMD.

Therefore, the understanding of the missile defence has evolved to take a more pragmatic approach towards the US policy, which would suit the Chinese characteristics. Unlike earlier attempts, the Chinese side has instituted a more nuanced opposition to the US role in non-proliferation and in turn is not supporting its actions with regard to Iran and North Korea. While its diplomatic approach only shows the concerns in a political language, there were many implications for China, including the radar deployments in East Asia. This, along with Aegis ships and the missile strength of the US in its naval assets in the sea nearby China, means that it has more to worry than the Bush administration plans. In fact, the Bush administration plans of having a system at the homeland and on bases to a layered approach means that the Chinese side has to take every missile deployment into consideration as it is networked together.

a) Appealing to the Arms Control and Nonproliferation Community

Accepting that its diplomatic efforts were going unsuccessful and that the US has no plans of shelving the development of its missile defence,

⁴⁹ Bruce W. MacDonald and Charles D. Ferguson, "Understanding the Dragon Shield: Likelihood and Implications of Chinese Strategic Ballistic Missile Defense", Federation of American Scientists, 2015, p. 22-23.

⁵⁰ Gregory Kulacki, "Chickens Talking with Ducks: The US-China Nuclear Dialogue", *Arms Control Today*, 41 (8): 2011, pp. 15-20.

China began to look for a more comprehensive opposition. During the Barack Obama administration, China began to work with the US experts to come to an agreement to generate certain core consensus regarding the characteristics of strategic stability in the post-Cold War era. Probably, the effort was to come to a bilateral agreement as to make sure that the deployment might not affect the Chinese capability, but will be tied to North Korean and the Iranian threats.

The nuclear dialogue, which aimed at bilateral agreement, did not come to fruition because of the fundamental differences as to what constitutes the first nuclear strike and the conditions under which the Chinese side would abandon the NFU policy. As the nuclear dialogue proved to be an eye-opener as to the differences in understanding of nuclear threshold, the Chinese side was more than willing to speed up its responses to the missile defence deployments. Meanwhile, abandoning public rhetoric, China still used international forums to mount a concentrated diplomatic pressure to criticise the rationale of the US commitment to delegitimise the US understanding of its security needs.⁵¹ There are echoes within the US arms control/scientific community about the destabilising effects of the missile defence. They believe that while missile defence does not offer any real defence against sophisticated missiles from Russia and China, the lack of US clarity on the parameters of missile defence tests (on how far the US is willing to test the different elements of missile defence technology) might lead to adverse reactions from Russia and China.⁵² Whether the Chinese concerns do align with the community or it is using them as a vehicle to advance its dissatisfaction depends on the view whether one believes in the Chinese commitment towards such values.

⁵¹ "Statement by H.E. Ambassador Wang Qun, Head of the Chinese Delegation at the General Debate of the First Committee of the 63rd Session of the United Nations Assembly", 6 October, 2008, at https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zjzg_663340/jks_665232/kjfywj_665252/t517092.shtml (Accessed 20 June 2022)

⁵² Laura Grego, "A Better Missile Defense Strategy", *Arms Control Today*, January/February 2021, at <https://www.armscontrol.org/act/2020-12/features/better-missile-defense-strategy> (Accessed 18 May 2022)

Simultaneously, China had campaigned against militarisation of space, in particular targeting the promotion of a binding treaty.⁵³ This had enabled China to claim credentials as a supporter of disarmament, and would have limited the space-based elements of the missile defence. Such a treaty would have restricted the US plans on using space based assets to track incoming missiles. The Chinese believed that the US is using the terminology of “rogue states” to signal changes in its security situation and dominate space, defined as the fourth dimension of warfare, extending its dominance in the foreseeable future.

b) Rejecting the “Security Enhancement” Argument of Missile Defence

China rejects the argument that missile defence can enhance security. First, it notes that the arms control and scientific community in the US and other security specialists oppose the deployment of missile citing the destabilising factors as well as financial burden. Therefore, the US decision to still pursue missile defence might be due to the influence of certain vested interests.⁵⁴ Therefore, the conclusion drawn seems to be that instead of pursuing a security policy that is driven by actual security considerations faced by the US, military-industrial complex aided by US imperialist proclivities support missile defence. Though many now acknowledge that technological optimism plays a role.

From the Chinese perspective, the expansion of US missile defence capabilities is to establish a global integrated anti-missile system in Asia-Pacific against China.⁵⁵ They were also unwilling to accept the US

⁵³ “Momentum Gathering For Weaponisation for Outer Space, Risk of Outer Space Arms Race Rising, Warns China’s Delegation in First Committee, Urging Binding Treaty”, GA/DIS/3421, 65th General Assembly, 25 October, 2010, at <https://www.un.org/press/en/2010/gadis3421.doc.htm> (Accessed 20 September 2022)

⁵⁴ Guo Siren, “Still Planning to Support ‘Space Umbrella’” (太空伞，还打算撑吗), *Renmin Ribao*, 4 October, 2000, at <http://www.people.cn/GB/paper68/1158/174016.html> (Accessed 5 May 2022)

⁵⁵ Deng Lizhong and Li Wei, “Among the US, China, and Russia, Which Country’s Anti-Missile System is the Strongest?” (中美俄三国，反导系统哪家强), *China Youth Daily*, 8 September 2016, <http://military.people.com.cn/n1/2016/0908/c1011-28699311.html> (Accessed 8 August 2022).

rationale that facing missile threats from rogue states such as North Korea or Iran could be rectified by building missile defences. In fact, From the Chinese perspective, the US is implementing layered missile defence that is intends to counter all types of missiles. Further, it might take the US few years to counter hypersonic threats, the Guam deployment shows an effort to use missile defence offensively.⁵⁶ Therefore, the hawkish elements in China believe that the US policy towards missile defence is driven by its desire for “absolute security”.⁵⁷ The Chinese allege that the US was following the principle of “absolute security” at the expense of international stability and non-proliferation norms.⁵⁸ Therefore, the US would invariably develop integrated global missile defence though interoperability with its allies under the strategy of great power competition against China.⁵⁹

MISSILE DEFENCE AND CHINA’S RETALIATORY STRIKE: EFFECTIVENESS OR EFFICIENCY?

There are several reasons attributed to the Chinese opposition to missile defence. The foremost seems to be the impact of missile defence on China’s retaliatory capability. In the early phase of missile defence deployments in the 2000s, China was more concerned about the

⁵⁶ The US Deploys an Anti-Missile System in Guam, Yin Zhuo: Offense in the name of Defence”(美国在关岛部署反导系统 尹卓：以“防御之名”行“进攻之实”), 20 May 2023, at https://military.cnr.cn/zt/wgfgjq/jsrp/20230520/t20230520_526258088.shtml (Accessed 25 May 2023).

⁵⁷ Yang Sheng, “US Hypes ‘Nuclear Threat’ From China, Russia To Legitimise Absolute Security and Arms Race”, *Global Times*, October 19, 2021, at <https://www.globaltimes.cn/page/202110/1236748.shtml?id=11> (Accessed 2 February 2022).

⁵⁸ Statement by Chinese Ambassador for Disarmament Affairs Hu Xiaodi at the First Plenary Session of the 2002 Conference on Disarmament” (中国裁军事务大使胡小笛在2002年裁军谈判会议一期会全会上的发言), 7 February, 2002, at <http://is.china-embassy.org/chn/zbqx/t95783.htm> (Accessed 1 July 2022).

⁵⁹ Yuan Rongliang, “Analysis on the Development and Trend of American Missile Defense System Under Great Power Competition”, *Modern Defense Technology*, 50 (2): 2022.

National Missile Defense (NMD), now Ground-based Mid-course Defense (GMD) rather than Theatre Missile Defence (TMD). While they believed that Patriot (PAC) missiles could be easily overwhelmed by China's tactical conventional missiles, its opposition to GMD has been far more reactionary. Now, though China acknowledges Japan's decision to deploy PAC-3 in Ishigaki and Yonaguni island coincides with the developments in North Korea's missile modernisation, it believes that Japan's decision to deploy it alongside SM-3 missiles aimed making that region a bridgehead in an event of a Taiwan crisis.⁶⁰ In other words, while China recognises apprehensions caused by the North Korean ballistic missile programme on Japan's decision-makers and its deployment of PAC-3 as a response to it does not correlate to that particular threat in their view. Drawing conclusions from this, China is increasingly worried about the effect of missile defence on its retaliatory strike, especially in a potential Taiwan conflict.

However, the PAC-3 still has consequence for China in case of Taiwan. While China might be confident that Taiwan's PAC-3 might not be enough to defend against Chinese missiles, it nevertheless highlights the US's political commitment against forceful unification of Taiwan with the mainland. In addition, it might compel certain sections of Taiwanese, who desire independence, to defy China. China has been arguing that the Patriot missiles and associated systems increase the air superiority of the Taiwanese and in turn threatens the security of the Mainland, and also shows that Taiwan is in a quasi-military alliance with the US.⁶¹ To counter this vulnerability, China has shown that it can to increase the efficiency of its deterrence with regard to Taiwan by diversifying the conventional missile strike through mixed use of different sets by missiles and saturation attacks by the Rocket Forces making it difficult for Taiwan

⁶⁰ Chen Shan, "Japan Deploys Patriot-3 on Miyako Island", *Huanqiu Shibao*, 9 May 2023, at <https://m.huanqiu.com/article/4CoewcQa8Vu> (Accessed 10 May 2023).

⁶¹ Sha Zukang, "Can Missile Defence System Really Improve Security?" (导弹防御系统真能增进安全吗?), Second China-US Arms Control Symposium, Monterey, US, 28 April, 1999, at https://www.fmprc.gov.cn/web/wjwb_673085/zzjg_673183/gjs_673893/gjzz_673897/hszhyhxyhgjlhh_674235/zyjh_674245/200011/t20001107_7660795.shtml (Accessed 1 January 2023).

to use the PAC-3 missiles to counter it.⁶² They showed these capabilities in the military exercises around Taiwan in 2022 after Nancy Pelosi's visit to the island. Therefore, with its indigenous systems such as the Tiangong -3 and PAC-3 missile defences, China's Rocket Forces can overwhelm Taiwanese defences through its mixed use of conventional missiles and does not affect the effectiveness of its deterrence. However, the concern of the Chinese leadership is about the efficiency of the deterrence, such as whether the Taiwanese leadership would use missile defences to reduce the perception of China's missile strength and increase its international stature, and as a result affect efficiency of its deterrence.

According to some statements by the Chinese officials, there is never an outright admission that the missile defence affects its nuclear counterattack capabilities. They do, however, mention in the publicly available sources that missile defence affects the Chinese ability to maintain a reliable and credible deterrence posture. For instance, the second strike capability, called "nuclear counterattack" in Chinese, is described in the defence white paper. When detailing the nuclear campaign by the Second Artillery, the 2013 defence white paper stated,

"If China comes under a nuclear threat, the nuclear missile force will act upon the orders of the CMC, go into a higher level of readiness, and get ready for a nuclear counterattack to deter the enemy from using nuclear weapons against China. If China comes under a nuclear attack, the nuclear missile force of the PLASAF will use nuclear missiles to launch a resolute counterattack either independently or together with the nuclear forces of other services".⁶³

⁶² Fan Wei, "Dong Feng Missiles Launched Vertically Beside the Plastic Greenhouse, Military Experts: It is Impossible for Taiwanese Military to Intercept", (东风导弹在塑料大棚旁起竖发射! 军事专家: 台军不可能拦截到), *Huanqiu Shibao*, 4 August 2022, at <https://m.huanqiu.com/article/496ggKVZ3mP> (Accessed 20 January 2023).

⁶³ People's Republic of China, *The Diversified Employment of China's Armed Forces*, State Information Council, April 2013, at http://www.china.org.cn/government/whitepaper/node_7181425.htm (Accessed 23 May 2013).

However, a fine reading would show that the missile defence's advanced capabilities such as detection and tracking would impinge on the PLARF's ability to conduct its campaign in accordance with the "nuclear-conventional convergence" equipment system. The 2019 defence white paper also reminds that the intention is to build a nuclear force:

"In line with the strategic requirements of having both nuclear and conventional capabilities and deterring wars in all battlespaces, the PLARF is enhancing its credible and reliable capabilities of nuclear deterrence and counterattack, strengthening intermediate and long-range precision strike forces, and enhancing strategic counter-balance capability, so as to build a strong and modernised rocket force..."⁶⁴

Therefore, China would have to have

"armed forces strengthen the safety management of nuclear weapons and facilities, maintain the appropriate level of readiness and enhance strategic deterrence capability to protect national strategic security and maintain international strategic stability".⁶⁵

As opposed to the argument that missile defence affects China's small arsenal, it actually affects the credibility of the Rocket Forces, and thus requires it to enhancing strategic deterrence. Compared to the previous white papers, the latter one is more precise in showing the evolution of China's nuclear policy. For instance, while the previous one looks at how China would conduct a nuclear counterattack, the 2019 paper specifies deterring wars in all battle-spaces, and the deterrence to be reliable and credible.

The reliability and credibility are important as the strategic weapons are now operating in a missile-defence related environment. Moreover, the PLA Rocket Force that operates the nuclear force would have to look at all battle-spaces as missile defence now operates under the heavy influence of space-based assets. The Chinese nuclear counterattack

⁶⁴ China's National Defence in the New Era, Defense White Paper, at <http://en.people.cn/n3/2019/0724/c90000-9600021.html> (Accessed 20 June 2020)

⁶⁵ Ibid.

and precision strike capabilities has to work under the conditions of US missile defence architecture and China has to convince its adversaries that its retaliatory strike is credible and reliable if a first strike is attempted to either counter its conventional strike or pre-empt its strike.

In this regard, it has to make sure that the Rocket Forces can use their missiles even if it is operating under the conditions of missile defence. Therefore, the implications of missile defence architecture would be more threatening to ensure that the mission is carried out without raising any questions to its credibility and reliability. But the growing sophistication of the US missile defence is problematic. For instance, according to the Chinese view, the Bush administration's missile defence plans were abandoned in turn for a balanced and advanced version of the missile defence system, where more comprehensive testing could be conducted to prove the reliability of the system. Given that the US is developing various but different anti-missile systems such as the GMD, PAC, THAAD, AEGIS sea and land-based systems, the fact that the current development is intend on integrating these various anti-missile systems, such as integration of sensors, fire-control, and improving early-warning speed, might lead to stronger combat capability.⁶⁶

If the missile defence is becoming more and more advanced, then there are also other issues from a security architecture that arises out of deployment of missile defence. This corresponds to the nature of US security partnerships. The Chinese believe that the cooperation that the US has established with other countries with regard to the missile defence will lead other countries such as Japan, India and Europe to accept the US standards and integrate into the US military system, thereby entering into a closer partnership with the US. In this regard, the joint early-warning system that the US has established with Japan alongside Aegis interceptors would not affect the effectiveness of China's strategic deterrence but nevertheless has an impact on the US-China balance exacerbating the asymmetry between them.⁶⁷ In the early days of US

⁶⁶ Ibid., Note 55.

⁶⁷ Wang Zheng and Yu Xiaoling, "Assessment and Reflections on the Current Asia-Pacific Nuclear Situation" (当前亚太核态势评估与思考), *Renmin Ribao*, 8 July, 2015, at <http://cpc.people.com.cn/n/2015/0708/c191095-27273304.html> (Accessed 2 October 2022).

ABM deployment, analysts had looked at the existence of nuclear taboo in international relations and believe that there is no need for China to respond to the missile defence as the US decision to a nuclear first strike on China would be unthinkable.⁶⁸ But quickly such notions were abandoned to argue that the missile defence may lead to coercion, so it was reasonable to expect China to take some technical measures to counter the deployment.⁶⁹

Even before the formal withdrawal from the INF treaty, the Chinese were looking at Russian assessments to arrive at a conclusion about the plans that the US will engage in the near future and the impact it will have on the missile capability.⁷⁰ The withdrawal from the INF treaty in 2019 is not viewed in isolation. The worrying trend for China is the comprehensive modernisation of the US nuclear forces at a time when Chinese believe that they should reduce the strength. In Chinese view, the US nuclear modernisation programme that aims to strength all the three wings of the nuclear services with upgrades and new equipment means that its offensive forces have been greatly enhanced with the help of new developments in the field of missile defences.⁷¹ Therefore, missile defence is also a showcase in to the larger US nuclear policy and about whether it is committed in retaining its older but larger arsenal, or it is seeking to extend its dominance in the face of much improved Chinese and Russian nuclear forces.

Though some believe that the missile defence system could be overwhelmed with numbers as in such as attrition and the interception

⁶⁸ Shi Yinhong, "US National Missile Defence Programme and China's Countermeasures" (美国国家导弹防御计划与中国的对策), *Pacific Journal*, (4): 2000, 39-44.

⁶⁹ Li Bin, "Analysis of China's Nuclear Strategy" (中国核战略辨析), *World Economy and Politics* (09): 2006.

⁷⁰ Ma Jun, "Will MRBMs Resurrect? (中程导弹会否“复活”?)", *PLA Daily*, 8 December, 2017, at http://photo.chinamil.com.cn/bqtk/2017-12/08/content_7859670_4.htm (Accessed 2 December 2022)

⁷¹ Fang Xiaozhi, "Be Alert To New Trends in US Nuclear Deterrence" (警惕美核威慑新动向), *PLA Daily*, 5 September, 2019, at <http://military.people.com.cn/n1/2019/0905/c1011-31338023.html>

capability of missile defence system is suspect.⁷² But others believe that there are indications that it can affect China's small arsenal. The Chinese already believe that the now-stopped SBIRS programme already had some capabilities that could accurately track the ballistic missile. Further, the dynamics of the missile defence technologies are changing rapidly, where countries are developing and deploying multiple systems, as the defence penetration of offensive missiles are increasing in long-range precision weapons, leading to more emphasis on anti-missile and air defence capabilities in countries like the US.⁷³ On the other hand, despite US assurance that its missile defence is not aimed at the Taiwan contingency, from the Chinese perspective, the US is increasing its anti-missile arms export to Taiwan.⁷⁴ As a result, there is greater flexibility from the Chinese side to cooperate with Russia on missile defence, especially in technologies such as early warning systems from ballistic missiles.⁷⁵ Therefore, China would have no choice but to counter the US system by relying on its own systems rather than cooperate with other strategic partners even though they might have high degree of political consensus.

Moreover, the Trump administration's plans increase the Chinese apprehensions about US nuclear primacy. For China, the Trump administration had much grander ambitions about US nuclear weapons. The discussions about deploying low-radiation nuclear weapons, medium-range ballistic missiles, and submarine launched cruise missiles

⁷² Zhang Qiang, "How Good is DF-41 Missile?" (东风-41导弹到底有多牛?), *Science and Technology Daily*, June 2, 2017, at http://jiangsu.china.com.cn/html/edu/info/9183109_1.html (Accessed 2 January 2023).

⁷³ Ma Jialong and Luo Xiao, "Take the Pulse of the New Developments in World's Air-Defence and Anti-Missile" (把脉世界防空反导新发展), *PLA Daily*, 3 March 2022, at http://www.81.cn/jfjbmap/content/2022-03/03/content_310604.htm (Accessed 2 December 2022).

⁷⁴ *Taipei Times*, "Taiwan Thanks US for Patriot Deal", February 2022, at <https://www.taipetimes.com/News/front/archives/2022/02/09/2003772795> (Accessed 5 May 2022).

⁷⁵ Alexander Korolev, "China-Russia Cooperation on Missile Attack Early Warning Systems", 20 November 2020, *East Asia Forum*, <https://www.eastasiaforum.org/2020/11/20/china-russia-cooperation-on-missile-attack-early-warning-systems/> (Accessed 2 May 2022).

all threaten the hard-won nuclear retaliatory capability that the Chinese have developed in the last decade.⁷⁶ The Chinese already believe that the US with its modernisation programme, which was started during the Obama administration, has severely weakened the Russian nuclear deterrence as US deployment of interceptor missiles are expected to touch 1000 in 2022.⁷⁷

They believe that it is one of the reasons for the acceleration of the Russian missile defence development and deployment. But others have a different viewpoint. They believe that the missile defence does not weaken the Russian deterrence, as the size of the Russian nuclear weapons is overwhelming, and the US missile defence is unable to identify the real warhead if countermeasures are deployed.⁷⁸ Therefore, they warn that responding to the US nuclear policy is a waste of resources and a free falling into the US strategy of pouring money into defence rather than economy. For instance, they warn that

“the progress of the US missile defence will eventually weaken China's nuclear retaliation capabilities, but due to the doubts about the effectiveness of the US missile defence capabilities, China needs to carefully evaluate the impact of anti-missiles rationally and carefully decide on its response policy. It should be noted that the US has used missile defence to fool China and if China is too concerned about missile defence and overreacts, it will jump to the trap that was set up by the US...for China it is not only about overreacting, but fooling into building a Chinese

⁷⁶ Fang Xiaozhi, “Be Alert To New Trends in US Nuclear Deterrence” (警惕美核威慑新动向), *PLA Daily*, at <http://military.people.com.cn/n1/2019/0905/c1011-31338023.html>

⁷⁷ Mu Huaiyu, “What is the Result of Nuclear Missile and Anti-Missile Competition?” (核导与反导竞争的结果是什么), *Zhongguo Qingnian Bao*, 29 March, 2018, at http://zqb.cyol.com/html/2018-03/29/nw.D110000zqgnb_20180329_2-11.htm (Accessed 2 December 2022).

⁷⁸ Wu Riqiang, “Strategic Arms Competition: China is not Fooled by the US Anti-Missile System, Resist the Need to Reciprocate” (战略武器竞争：中国莫被美国反导系统忽悠，抵制核对应诱惑), *Pengpai Xinwen*, 17 March, 2018, at https://m.thepaper.cn/kuaibao_detail.jsp?contid=2031681&from=kuaibao (Accessed 2 May 2022).

National Missile Defence System. China can definitely explore technologies related to missile defence, but unless the technology of target discrimination is effectively solved, it will be a waste of money to spend on missile defence system".⁷⁹

REGIONAL DETERRENCE

The Japanese and American joint development of missile defence is seen as another factor of missile defence. The interoperability between Japanese and American forces and their joint development of AEGIS ships have direct impact on Chinese ability to successfully reunify with Taiwan. The AEGIS ships are deployed in the vicinity of the Chinese neighbourhood and affect its security in many ways. According to Chinese sources, they had perceived initially that the SM-3 was much more effective than the previous versions with more than 1000 kilometres range and had the ability to distinguish between dummy and real warheads.⁸⁰ In addition, the interceptor missiles could also be used as offensive missiles as they have ASAT capabilities and could be modified as offensive weapons. Therefore, for China, through the joint development of missile defence, the joint offensive capability of the two countries would nevertheless increase due to the nature of the technologies involved in the development of interceptor missiles. Of course, they believe that the drone technology would be ineffective against missile defence given the US performance in the Saudi oil strike and the inability of the Patriot missiles to perform in an optimal manner.⁸¹

The Japanese integration into the American missile defence is extended to such an extent that there are fears that it is too integrated to the grid.

⁷⁹ Ibid.

⁸⁰ The New Interceptor of the US and Japan Missile Defence System is Offensive (制造最新拦截弹 美日导弹防御网富进攻性), 28 June, 2006, at http://www.chinadaily.com.cn/jjzg/2006-06/28/content_627814.htm (Accessed 2 June 2020).

⁸¹ Teng Jianqun, "US Missile Defence System Has Turned into 'Maginot Line of Defense'" (美导弹防御体系正变成“马奇诺防线”), 24 September, 2019, at http://www.ciis.org.cn/chinese/2019-09/24/content_40903704.html (Accessed 15 May 2021).

For instance, there are concerns that Japanese have to rely on US satellite and radar information so that it can use its missile defence system effectively and further instigate concerns about US abandonment or lack of independence in decision-making in terms of ballistic missile attack.⁸² On the one hand, the Chinese do not believe that missile defence cooperation between Japan and the US is beneficial for Asian security though they might understand the concerns about the North Korean missile threat. They also believe that the North Korean missile threat could be managed as long as the US is willing to make a security commitment to the North Koreans and the nuclear brinkmanship is generally aimed towards the Americans rather than the Japanese. However, the reality of the Japanese dependence on American decision-making system is beneficial to the Chinese as they believe that the US-Japan alliance also serves as a constraining factor on the Japanese leadership. Hence, if the missile defence is also contingent on the American assessment of the situation, then the Chinese believe that they would be able to manoeuvre through their bilateral channels with the US.

However, even though it might correspond to Japanese security, the concern about the integrated American and Japanese forces are likely to be on the potential conflict over Taiwan. Here they believe that the regional deterrence is very much affected by the deployment of THAAD. In Chinese view, they affect regional security of many countries such as Russia and China and does not stop the denuclearisation of the Korean peninsula.⁸³ The Chinese opposition to THAAD was so vociferous that it took economic and trade countermeasures to compel the South Koreans to stop the installation of the THAAD radars.⁸⁴ But

⁸² Yuki Watai, "Is Japan's Ballistic Missile Defense Too Integrated with the US?" *The Diplomat*, 28 November, 2018, at <https://thediplomat.com/2018/11/is-japans-ballistic-missile-defense-too-integrated-with-the-us/> (Accessed 2 May 2019).

⁸³ *Xinhua*, "THAAD Jeopardizes Regional Strategic Balance-Xi", 3 July, 2017, at http://www.xinhuanet.com//english/2017-07/03/c_136413217.htm (Accessed 20 December 2022).

⁸⁴ *Xinhua*, "China's Opposition to THAAD is Justified, Sufficient", 17 March, 2017, at http://www.xinhuanet.com//english/2017-03/17/c_136137321.htm (Accessed 8 October 2022).

unlike the missile defence in the US homeland, the Chinese are unable to articulate the insignificance of THAAD in the South Korean security dilemma given the North Korean ballistic and nuclear tests in the past few years. However, China perceives a more direct threat from THAAD as their radars, in Chinese view, will be able to read the signals from the Chinese incoming ballistic missile attack as it is closer to the Chinese land.

Overall, the range of the US missile defence has led China to conceive a wide-ranging political and military threat emanating from the US. Though they perceive that some of the technological capabilities are suspect, they are under pressure to take some technical measures just to reduce the tremendous pressure on its nuclear capability. They would have to in order to negotiate with the US from the position of equality or strength. As with the US, the Chinese also have instituted a wide range of measures to counter the US missile defence deployments in Asia, while avoiding an arms race.

CONCLUSION: EFFICIENCY OR EFFECTIVENESS?

From the Chinese perspective, one could discern that the effectiveness of the Chinese retaliatory capabilities is not uniform. They are more optimistic about their ability to counter the missile defence capabilities, when related to nuclear counterattack strategy despite many concerns. Or they believe that China can manage to develop countermeasures to effectively counter missile defence. Then what drives China's intense opposition to missile defence? As argued in the previous chapter, China's technological identity hinges on it being acknowledged as a missile power, i.e., the Rocket Forces' capability to mount a challenge and a trump card against militarily coercive conflicts. When looking at the requirements of the missile campaign, it becomes much more difficult for China to achieve its objectives, where missile defence could play spoilsport in reducing the leverage. In other words, China's missile capability, which evolved from historic conditions, does have a security and military advantage of making it seem more powerful, leading allies and partners to doubt the US capacity to confront it. However, if missile defence leads to reduction in confidence of China's missile performance alongside the increase in assurance of US extended deterrence, it might affect the efficiency of China's deterrence. Rather

than effectiveness, efficiency involves the process through which systems engage, in this instance, their deterrence credibility. The process of establishing the credibility of its deterrence becomes suspect even though many would believe that China can counter missile defence in terms of nuclear counterattack capabilities. Therein lies China's dilemma about responding to the deployment of missile defence only by increasing its nuclear warhead stockpile, exclusively nuclear missiles. Rather it is best to achieve technological edge with respect to the US, thereby not only adhering to its nuclear commitments, but also increasing the risks for the US for confrontation. In addition, it would cement its reputation as a technological power, and further reiterate its technological identity as a formidable missile power.

MISSILE DEFENCE AND THE US-CHINA DETERRENCE COMPETITION

INTRODUCTION

This chapter analyses the way missile defence is shaping the US-China deterrence competition as both countries attempt to shape and influence the nuclear order in the post-Cold War period. The deployment of missile defence has come to shape competing worldviews of the two countries' credibility of nuclear deterrence, and by extension, the legitimacy they derive from holding their respective adversaries at check. Though China's conventional missile capability is outpacing at a significant level, it would like to negotiate in the nuclear order to define its power status in the international system. The effectiveness of missile defence in deterrence may not be well-known, but it affects the power competition and nuclear norms.

It is not that missile defence is accepted as an effective way to counter ballistic missile. The expert opinions are overwhelmingly negative about it.⁸⁵ If missile defence is not effective, why do the Chinese feel compelled to oppose it?⁸⁶ What did the US hope to achieve by developing missile defence deployment if it is not effective against Chinese missiles (implicit)?

⁸⁵ Decades of Official Investigations of Missile Defence Consistent: Botched Program with Serious Technical Problems, July 25, 2005 at <https://www.reed.senate.gov/news/releases/decades-of-official-investigations-of-missile-defense-consistent-botched-program-with-serious-technical-problems>

⁸⁶ William Thomas, "Physicists Argue US ICBMs Defenses are Unreliable", American Institute of Physics, March 2022, at <https://ww2.aip.org/fyi/2022/physicists-argue-us-icbm-defenses-are-unreliable> (Accessed December 2022).

I argue that missile defence characterises the way both countries are attempting to negotiate the nature of their deterrence relationship. This attempt is fraught with mutual apprehensions. The US wants China to reveal the end-result it seeks through its enhanced military and technological capabilities. From the Chinese side, paranoia about the US first strike means that it wants to continue to conceal its capabilities and maintain an ambiguous nuclear posture. As a result, the US is unwilling to acknowledge the NFU policy without transparency, and the Chinese are unwilling to constrain its nuclear modernisation without the assurance of no first-strike from the US.

The second argument is that the Chinese strategy to redefine the deterrence posture is an attempt to establish a broader security framework rather than one which exclusively focuses on nuclear weapons parity.

BETWEEN DIPLOMACY AND TECHNOLOGICAL RESPONSE:

China has learned to live with the missile defence-dominated nuclear order even after Bush left office and Obama reduced the scope of the deployment. Many believe that it might be short-term as there could be other administration which might expand the scope if it believes the technology to be feasible. From the Chinese side, the way then is to respond to missile defence without getting into arms race with the US and while keeping the international pressure on the US for a tighter arms control with Russia. They also believe that some bilateral arrangements could be made given the interdependence between the US and China and its rising status because of its economic power. Certainly, some believes that because there are adverse impacts on the Chinese deterrence capability, the US and China should engage in nuclear dialogue and prevent any security dilemma from emerging out of the missile defence predicament.⁸⁷

⁸⁷ James McKeon and Mark Melamed, "Engaging China to Reduce Nuclear Risks," in *U.S. Nuclear Policies for a Safer World*, June 2021, pp. 36–46, https://media.nti.org/documents/NTI_Paper_U.S._Nuclear_Policies_for_a_Safer_World.pdf.

Obviously from the American perspective, the way out is to have a multilateral arms control system that includes China.⁸⁸ They do not accept the current situation that the arms control are limiting only the US and Russian forces, leaving out the Chinese nuclear forces. The emerging situation in the nuclear order is thus dependent on whether the US is willing to limit its defensive and offensive forces near Asia and whether China would come under pressure to join arms control in order for it to limit US forces while accepting some on its own. Reversely, it is true that the Chinese want multilateral arms control treaties that involve the US and Russia in terms of their space system that would be in their favour if there are limits to the US deployments in space.⁸⁹

It is generally believed that given its small arsenal, China will be most reluctant to enter multilateral arms control with the US and Russia. Not when it is worried about the extent and range of the anti-missile system and its impact on maintaining credible deterrence. For instance, clearly, one of the aspects of the missile defence system, the radar systems, which are deployed in Japan and in the Aegis ships, are more worrying for China as it could give the US much needed advantage over the Chinese ballistic missile threat.

More than any other administration, it was during the Obama administration that the US and China attempted to conduct nuclear dialogues. In China's view, the goal was to make the US accept Chinese NFU policy, thus entering an agreement where both sides would agree not to use nuclear strike first. In other words, the Chinese wanted the US to abandon its first strike policy and enter in to a mutual deterrence relationship on the basis that it would accept that the Chinese side would not use nuclear weapons first. However, this was not acceptable to the US. In turn, the US wanted assurances from the Chinese side as to what would be considered as a nuclear attack on the Chinese. As the Chinese strategic forces are opaque and the nuclear and the conventional missiles are not distinguished, the Chinese side could never answer

⁸⁸ Frank G. Koltz and Oliver Bloom, "China's Nuclear Weapons and Prospects for Multilateral Arms Control", *Strategic Studies Quarterly*, 7 (4): 2013, 3-10.

⁸⁹ Zhang Baohui, "The Security-Dilemma in the US-China Military Space Relationship: The Prospect for Arms Control", *Asian Survey*, 2011: 51 (2): 311-332.

these questions properly. For instance, as to the US question of whether attacking the Three Gorges Dam would be considered as a conventional or a nuclear strike, the inability of the Chinese side to reconcile as to under what conditions they would not use nuclear weapons, proved to the US that NFU policy cannot be trusted when the existence of the regime is under threat.

Therefore, the nuclear dialogue between the US and China was not successful. Both sides hardened their attitudes towards each other. Mostly, the Chinese side, which had already initiated their countermeasures against missile defence, was more than comfortable with raising their deterrence level against the US.

INFLUENCES ON CHINESE STRATEGIC THINKING:

Though the missile programme is seen as a delivery vehicle for nuclear weapons, seen less important than the significance of the explosion of the nuclear bomb, the Chinese leadership drew its considerable resources to making the missiles its delivery of choice to the extent of ignoring its Air Force. The Second Artillery, obfuscated to hide the real name, were exclusively dealing with strategic missiles till the end of Cold War. If technological identity has led it to achieve technological edge as a way to counter missile, how does missile defence shape US-China deterrence competition? What does it mean for China as it negotiates its deterrence relationship with the US?

China's development of its nuclear arsenal has been purposefully kept confined to modernising the quality of its deterrence rather than the quantity. Several factors influence its nuclear policy. Chief among them is their paranoia about the US nuclear threat. The US nuclear threat during the Korean War in 1951 was the impetus for China to pursue nuclear weapons capability. Though whether the nuclear threat was effective in influencing the Chinese behaviour to a peace agreement in the Korean War is suspect,⁹⁰ the problem might be with the poor nature of American deterrence signalling.

⁹⁰ Edward Friedman, "Nuclear Blackmail and the End of the Korean War", *Modern China*, 1 (1): 75-91, 1975. Also see, Rosemary Foot, "Nuclear Coercion and the Ending of the Korean Conflict", *International Security*, 13 (3): 92-112, 1988-89.

In Chinese view, the American behaviour was considered as nuclear blackmail.⁹¹ The Chinese felt they were unable to push the US for a peace settlement and instead forced to react to the nuclear threat imposed by the US by engaging in brinkmanship. That is, they were forced to call the American bluff through belligerent actions. As a result, the Chinese believed that more than military usefulness of nuclear weapons, they are utilised to coerce an adversary in political negotiations to come to a peace settlement. At that time, the rationale for the Chinese leadership was that with a small nuclear arsenal, the blackmailing of a nuclear first strike would reduce.

Secondly, the Soviet Union also played a role in China's nuclear modernisation. Despite some historic irritants, the Chinese side had a fairly successful relationship with Joseph Stalin of Soviet Union. While the Korean War prompted the Chinese to initiate the nuclear programme, without the technical and scientific aid of the Soviet scientists and technology, the jump-start to the Chinese nuclear programme might have been more time-consuming. Contrary to Stalin, the Khrushchev administration's policies on China, especially the withdrawing of the alleged promise on delivering the sample of the bomb and technical data, had a profound influence on the Chinese nuclear psyche.

Unlike the American nuclear threat, the deterioration in its relationship with the Soviets, the nuclear threat and military confrontation that it represented was felt more immediately and the chances on broader escalation through border skirmishes were much more likely.⁹² The withdrawal of Soviet support and subsequent bitter bilateral relations might have facilitated the Chinese in arriving at the conclusion that an indigenous capability is necessary to have influence within the communist

⁹¹ Nuclear Blackmail as a term is complex and is different from coercion. For a detailed analyses, See, Jeff McMahan, "Nuclear Blackmail", in Nigel Blake and Kay Pole (Eds), 'Dangers of Deterrence: Philosophers on Nuclear Strategy', Routledge: London, 1983.

⁹² Geoffrey Hudson, "Paper Tigers and Nuclear Teeth", *The China Quarterly*, 39: 64-75, 1969.

bloc, just as it is a counter to the American dominance.⁹³ It might have been garnering prestige within the communist bloc during the Cold War, or the Asian bloc in contemporary times, China sees the nuclear modernisation not only as a counter to the nuclear threat that the US sees over China, but also to maintain its own dominance within the Asian/African bloc.

Both cases prove the political value of possessing the nuclear weapons and the ability of China to assert either supremacy or equality depending on the power differentiation. In fact, the bargaining power of China increased after the nuclear testing and its defensive outlook blunted many criticisms about the nuclear programme.⁹⁴ A small and defensive arsenal differentiated it from other powers at the early stage and it capitalised on it by forming an international image that helped it to propagate that it practised nuclear restraint in its foreign policy unlike the superpowers during the Cold War. It could be that having a nascent arsenal during the 1960s, the Chinese might have downplayed the military value of nuclear weapons considering the apprehensions about a pre-emptive strike against their nuclear installations by the US.⁹⁵ Not discountable was the fact that the initial nuclear capability still lacked in discussions on deterrence with the outside world. Engaging in polemics about superpower politics and portrayal of itself as a responsible power within the communist bloc and Third World, the Chinese views were unclear at best about nuclear proliferation or disarmament.⁹⁶

What is however distinct is the declaratory policy by China about its no-first use of nuclear weapons that has been consistent. With its many

⁹³ Morton H. Halperin, "Chinese Nuclear Strategy", *The China Quarterly*, 21: 74-86, 1965. Also see, Morton H. Halperin, "Chinese Nuclear Strategy: The Early Post-Detonation Period", *Asian Survey*, 5 (6): 271-279, 1965.

⁹⁴ Walter C. Clemens, Jr., "Chinese Nuclear Tests: Trends and Portents", *The China Quarterly*, 32: 111-131, 1967.

⁹⁵ Oran R. Young, "Chinese Views on the Spread of Nuclear Weapons", *The China Quarterly*, 26, 1996, p. 148.

⁹⁶ Jonathan D. Pollack, "Chinese Attitudes Towards Nuclear Weapon, 1964-9", *The China Quarterly*, 50: 244-271, 1972.

advantages, whether it is reduced reliance on large-scale nuclear arsenal or its effect on crisis stability during any military crisis, the NFU policy was debated as a way to be included in the arms control initiatives in the 1970s.⁹⁷ The desire for an independent nuclear capability with equal dosage of suspicion about pre-emptive nuclear strike from its adversaries such as the US has had an impact on its nuclear restraint.⁹⁸ The defining characteristic about the Chinese nuclear arsenal then might be the leadership's self-imposed restraint on the quantity of nuclear weapons and the voluntary policy of observing NFU in its deterrence posture. Contrarily one could argue that in a military conflict, voluntary policy of NFU does not matter. That in the due course of a conflict, China can expedite the defence production of its missiles and nuclear weapons. It may be true that declaratory policy might not match nuclear targeting policy of a particular country. However, the push for resources after the Cold War suggests that Chinese investment has diverted more into developing the conventional capability of the Rocket Forces.

Chinese Nuclear Modernisation:

Chinese nuclear policy predominantly looked towards establishing a second-strike capability and, consequently, making it credible. To what extent nuclear restraint comes into play? First, as mentioned above, practising nuclear restraint did not only serve the Chinese leadership in cutting the unnecessary costs of producing a large arsenal, but also took in to consideration the technological constraints on its nuclear weapons programme. For the question of "how much is enough to deter", the Chinese strategic thinking at that time decided that a small arsenal is enough. The small nuclear arsenal meant that the Chinese were much more invested in improving the quality of its nuclear weapons, i.e., the credibility, rather than quantity.

Second, the Chinese leadership accorded high-priority to the nuclear weapons programme and resources were utilised to maximise its

⁹⁷ Richard H. Ullman, "No First Use of Nuclear Weapons", *Foreign Affairs*, 50 (4): 669-683, 1972.

⁹⁸ John Wilson Lewis and Xue Litai, "Strategic Weapons and Chinese Power: The Formative Years", *The China Quarterly*, 112: 541-554, 1987.

capability to gain sophisticated technology. For instance, it is well-known that despite the disturbances created by the Cultural Revolution, which slowed down the nuclear programme, the Chinese leadership continued to give high priority to it.⁹⁹ As a result, by the 1970s, the Chinese weapons programme matured enough that it could develop ballistic missile capability and sea-based deterrence.

As mentioned above, the 1970s saw maturation of the Chinese nuclear arsenal, which capacitated China to be termed as a formidable nuclear power, under the club of a nuclear triad.¹⁰⁰ During the 1980s, the Chinese nuclear weapons gained second-strike capability through the development of ICBMs. However, the credibility was low due to the silo-based nature of its missile capability. The 1980s also saw emphasis more on strategic nuclear weapons rather than tactical nuclear weapons and significant investment in developing sea-based deterrence.¹⁰¹ No doubt many of the changes in the 1980s were driven by the changes in its military strategic guideline that added “modern conditions” to it.

Post-Cold War Nuclear Modernisation

John Lewis and Xue Litai noted that initially the Chinese did not have a coherent strategy or doctrinal policy regarding its use of nuclear weapons, but in the 1980s, theories about deterrence and strategic stability slowly made into the vocabulary.¹⁰² The technological sophistication that was achieved in the 1980s probably needed some strategic guidance as to the focus and direction of the nuclear and missile modernisation. No other systemic change offered the Chinese the way to look at its strategic forces than the end of the Cold War.

⁹⁹ John Wilson Lewis and Xue Litai, *China Builds the Bomb*, Stanford University Press, 1991.

¹⁰⁰ Sungjoon Han, “China’s Nuclear Weapons: Development and Policy”, *Asian Perspective*, 1 (2): p.231

¹⁰¹ Robert S. Wang, “China’s Evolving Strategic Doctrine”, *Asian Survey*, 24 (10): p. 1047, 1984.

¹⁰² John Wilson Lewis and Hua Di, “China’s Ballistic Missile Programs: Technologies, Strategies, Goals”, *International Security*, 17 (2): 5-40, 1992.

Nothing affected the way the US looked at the Chinese nuclear modernisation or the Chinese looked at the improvements in the US military technology unlike the events that followed the end of the Cold War. After the Cold War, relevance of nuclear weapons as a centre for strategic stability, in turn as a marker of bi-polar movement in the international system, slowly diminished as new military technology in conventional capability were creating far more effective destruction in conflict zones. The 1990 Gulf War was one such example. There is sufficient evidence that the PLA as an organisation underwent profound changes after the Gulf War.

The Chinese missile forces followed suit and developed conventional missiles that could be used in a conflict without triggering a nuclear escalation. Instead of dividing the conventional and nuclear tasks, the strategic missiles forces, the then PLA Second Artillery Corps, shouldered both conventional and nuclear tasks. Throughout the 1990s, the modernisation of the Second Artillery was supposed to integrate the conventional and nuclear missiles roles (核常兼备) clearly reflecting that the Chinese leadership saw reduced nuclear roles and increased conventional roles for the organisation. Advanced Technology Warfare (高技术战争), as the Chinese called it, saw the future warfare using new technological revolutions in information technology, biotechnology, and space technology that had impact on the combat capability of the troops. A number of publications came out in China regarding the impact of these new kinds of military technology on warfare and military strategy.¹⁰³ Though some adjustments were made after the US role in Iraq on the continuing relevance of ground forces as opposed to the Gulf War, consensus remained that regardless of the dominance of certain military service branch, the war was fought

¹⁰³ Peng Guangqian, "Winning a Local War under High-Tech Conditions" (打赢高技术局部战争), Chinese Academy of Sciences, 4 June, 2006, at http://www.cas.cn/xw/zjsd/200906/t20090608_640950.shtml; Wu Xingzuo, "High-Tech Warfare is not a Myth (高科技战争并非神话)", China Contemporary International Relations", 31, *Renmin Ribao*, 2000, at https://www.cas.cn/xw/zjsd/200906/t20090608_640950.shtml (Accessed 20 May 2021).

on information conditions.¹⁰⁴ What is of importance to this study is that the Chinese came with the feeling that there was urgent need for military modernisation within the PLA. With respect to its nuclear forces, more attention was paid to making its second-strike capability credible in addition to expanding the conventional missile capability of the then Second Artillery.

The 1990s was also a period of many test launches of its ballistic missiles that indicated that they were much more confident of having a credible second-strike capability. The development of solid-fuelled missiles facilitated this, and much needed concerns about protecting that credibility, which they fought so hard to develop, came to the fore. The move from liquid-fuelled to solid-fuelled missiles was natural evolution of the deployment patterns as nuclear countries would move towards making their deterrence credible. But the 1990s was much more about developing conventional capability and more emphasis was put on SLBMs.¹⁰⁵ It was only after the 1999 National Day Military Parade that the début of DF-31 could be seen.¹⁰⁶ The mix of missiles in the 1999 military parade showed its priorities in its deployment. Apart from conventional missiles, it showed a nuclear missile and solid-fuelled missiles, portraying a slow but consistent move towards improving the credibility of its second strike capability. In fact, the slow pace of nuclear modernisation led some to speculate that the US nuclear primacy was here to stay for the foreseeable future.¹⁰⁷

¹⁰⁴ Wei Yuejiang, "Differences Between the Iraq War and the Gulf War (伊拉克战争与海湾战争的区别)", *Renmin Ribao*, 23 April, 2003, at <http://www.people.com.cn/GB/junshi/62/20030423/978575.html> (Accessed 20 June 2022).

¹⁰⁵ For a detailed view on the submarine programme, see, John Lewis and Xue Litai, "China's Strategic Seapower: The Politics of Force Modernisation in the Nuclear Age", Stanford University Press, 1995

¹⁰⁶ Documentary Film: China's 50th National Day Military Parade 1999, at <https://www.youtube.com/watch?v=5pkVfGcyfDs>: Also see, 1999 National Day Military Parade, *China Daily*, 27 August, 2009 (Updated), at http://www.chinadaily.com.cn/60th/2009-08/27/content_8623814.htm (Accessed 3 July 2022).

¹⁰⁷ Keir A. Lieber and Daryl G. Press, "The End of Mad? The Nuclear Dimension of U.S. Primacy", *International Security*, 30 (4): 7-44, 2006.

Few conclusions can be drawn on the Chinese nuclear modernisation till the 1990s. China had consistently looked at developing nuclear weapons in a limited fashion to use as a deterrent against threat or use of force against any large-scale military interventions. That holds true to a large extent as per publicly available sources even today.¹⁰⁸ Second, it had used its declaratory policy not only to differentiate itself from the US or Russia, but to avoid any pre-emptive attacks from the US, simultaneously reducing the need for a large arsenal. After the opening-up and reform, Deng Xiaoping kept military modernisation as the last programme in his “Four Modernisation” programme.¹⁰⁹ It also meant that China did not believe that a large arsenal is necessary for a mutual deterrence relationship like it was between the US and erstwhile Soviet Union during the Cold War. In Chinese view, making an adversary cautious about first strike could be done with a limited arsenal as long as its deterrence is sufficiently credible.

Chinese nuclear modernisation thus hinged on the need to maintain credible deterrence capabilities with its adversaries, while negotiating with them to come to an agreement on accepting Chinese deterrence qualities. In the Chinese case, it translated into accepting the NFU policy, therefore admitting to vulnerability from the Chinese nuclear capability. Accepting China’s NFU policy would mean that its small arsenal has attained the purpose of deterring big nuclear powers and no unnecessary resources would be spent in expanding its nuclear arsenal. It joined the NPT and the CTBT, and entered into several nuclear regimes that imposed export control on the country. With the access to the Western arms control experts and international cooperation on nuclear issues, the Chinese nuclear thinking became much more focused on developing a deterrence theory and larger issues of strategic stability and deployment of defensive systems such as missile defence. A point to be noted is that China had never supported the US Strategic Defence Initiative, but the exposure to the Western elite networks meant that the Chinese were able to put forth its stance in a substantial manner than before.

¹⁰⁸ Hans M. Kristensen and others (2023), “Chinese Nuclear Forces, 2023”, *Bulletin of Atomic Scientists*, 79:2, 108-133.

¹⁰⁹ The Four Modernisations of Deng Xiaoping were Agriculture, Industry, Science and Technology and Defence.

The Chinese sought to reduce the bargaining position of the US and the tactics that the Americans may employ through coercion in any potential conflict. If a limited and credible arsenal is enough to make the adversary pause on using nuclear threat or the movement of nuclear forces around its periphery to induce uncertainty in Chinese war planning, then nuclear deterrence would achieve its harder objective. The Chinese call it deterring “nuclear threat”. During the Cold War, they used to call it nuclear blackmail. The concept of nuclear threat is more complicated than the use of nuclear weapons, as even the movement of nuclear forces of US through the contested waters could be seen as nuclear threat. Hence, the objective of nuclear deterrence is to reduce the US supremacy and confidence in its nuclear forces and prevent any tendency to use its nuclear advantage to compel China to agree to a settlement that is disadvantageous to Chinese interests.

The Cold War arms control treaties further influenced China's strategic thinking. Arms control treaties such as the SALT I limited strategic defences and capped further increases in silos and launch tubes. SALT II further limited nuclear delivery vehicles and, though not signed, the spirit of the letter was followed until the 1979 Soviet invasion of Afghanistan. START I and II also stated reducing the nuclear arsenal to a more manageable (3000-3500) warheads. The START II never materialised, and the new framework called the New START was signed in 2010 limiting the warheads to 1550. China might have liked the arms control agreements to further improve and limit these nuclear warheads given that it has a modest arsenal.

US THREAT ASSESSMENTS AND MISSILE DEFENCE

The US might have perceived a threat to its nuclear dominance, therefore defensive measures such as missile defence could have been deployed to induce doubts in the adversaries' mind about the effectiveness of their retaliatory strike.

In 2018, the US Air Force cancelled further launching of satellites that were connected with the Space-Based Infra-red System (SBIRS)¹¹⁰.

¹¹⁰ *Breaking Defense*, “Overhead Persistent IR is How Hypersonic and Maneuverable threats Will Be Tracked”, February 7, 2023, at <https://breakingdefense.com/2023/02/overhead-persistent-ir-is-how-hypersonic-and-maneuverable-threats-will-be-tracked/>

The SBIRS is a satellite cluster that is supposed to warn incoming ballistic missiles through its orbits at both geo-synchronous earth (currently 4 satellites) orbit and highly elliptical orbit (HEO). It was one of the technological systems that was to provide battle-space awareness for the necessary defences against an incoming missile attack. After cancelling the programme, the US decided that it would build a next generation missile-warning satellite, called the Next-Generation Overhead Persistent Infrared-System (Next-Gen OPIR)¹¹¹ that will be part of the Operationally Resilient Ground Evolution (FORGE) system. This shift was in response to the advanced capabilities of states like China and Russia in their ballistic missile and hypersonic missile. The US found that the SBIRS satellites were more vulnerable to the attack and countermeasures.¹¹² The earlier plan was to replace it with Next-Gen OPIR, which was jammed into a five-year cycle denoting the urgency in which the US was approaching the early warning system, to be launched in 2028.¹¹³

However, even as the US accorded priority to tracking of missiles through space-based systems through satellites in higher-orbit, the US Space Force has shifted its priority to putting satellites in lower and medium earth orbit to better defend against hypersonic threats.¹¹⁴ This

¹¹¹ "Next Generation Overhead Persistent Infrared GEO Satellites Embracing Rapid Acquisitions with Successful System Requirement Reviews", Air Force Space Command, June 6, 2019, at <https://www.afspc.af.mil/News/Article-Display/Article/1870883/next-generation-overhead-persistent-infrared-geo-satellites-embracing-rapid-acq/>

¹¹² Valerie Insinna, "Air Force Sets Ambitious Goal to Procure Next Missile Warning Satellite in Five Years", *Defence News*, April 17, 2018, at <https://www.defensenews.com/digital-show-dailies/space-symposium/2018/04/18/air-force-sets-ambitious-goal-to-procure-next-missile-warning-satellites-in-five-years/>

¹¹³ Sandra Erwin, "Congress Reviewing New Request To Reprogram Funds for Next Generation OPIR Satellites", *Space News*, July 29, 2019, at <https://spacenews.com/congress-reviewing-new-request-to-reprogram-funds-for-next-generation-opir-satellites/>

¹¹⁴ Theresa Hitchens, "Space Force Phasing Out Missile Warning From GEO, Will Focus on Lower Orbits", *Breaking Defense*, September 21, 2022, at <https://breakingdefense.com/2022/09/space-force-phasing-out-missile-warning-from-geo-will-focus-on-lower-orbits/> (Accessed December 1 2022).

shows that at least from the US perspective, apart from the public declarations about China's nuclear weapons, it is the larger missile and rocketry were its concerns.

These fast-changing understanding of the technological requirements are part and parcel of the missile defence architecture. Developments in satellite and missile tracking and its assessments on US ability were only possible when they analysed the performance of US ability to guard against the Chinese missile attack. However, these continuous assessments have always been ongoing. For instance, on June 13, 2002, when the US administration unilaterally withdrew from the ABM treaty, the then American President George W. Bush initiated plans for a missile defence against a limited Intercontinental Ballistic Missile (ICBM) strike. The ABM treaty, which was signed between the US and Soviet Union in 1972, limited the development and deployment of defensive weapons such as anti-missile interceptors against ballistic missiles, one of the delivery vehicles of nuclear weapons.¹¹⁵ The official American explanation to develop missile defence is to defend against a limited and long-range ballistic missile attack on its soil from North Korea. The steady progress in the North Korean nuclear and ballistic missile programme was shown as the primary motive for deploying the missile defence capability. In fact, the missile defence system is not supposed to be effective against the advanced missile forces of China.

Again, American plans for deploying missile defence is not new. The US had dabbled in anti-missile systems in the 1940s, which morphed into the Sentinel system in the 1960s that was specifically deployed anticipating a Chinese ICBM threat in the future.¹¹⁶ Sentinel became the Safeguard programme during the Nixon Administration in the 1970s, and many efforts to have a large-scale deployment against massive

¹¹⁵ Both countries were allowed to only deploy two ABM sites, where each ABM site could only have 100 interceptors and 100 launchers. The two ABM sites were supposed to protect the capital and the ICBM launch area respectively.

¹¹⁶ Steven A. Hildreth, "Ballistic Missile Defense: Historic Overview", CRS Report for Congress, July 9, 2007, at <https://fas.org/sgp/crs/weapons/RS22120.pdf>

ICBM attack were often discarded because of scepticism from various quarters over the cost of technology and its viability. The debate around missile defence was most intense during the Ronald Reagan Presidency when he increased the funding of the missile defence for his Strategic Defence Initiative (SDI).¹¹⁷ The SDI programme was fantastical in its vision of a global defensive system, so far ahead of the technological imagination that it was quickly dubbed in the popular imagination as “Star Wars”.

The SDI envisioned that the defensive systems should embrace a long-term research and development programme into the various BMD technologies and part of the countervailing strategy to deter the Soviet Union. The biggest argument against the BMD was that it was unnecessary as the US has formidable sea-based deterrent that is sufficient to deter a nuclear attack. The defensive systems however are put in motion on the basis that it would help in negotiating peace if deterrence fails to prevail.¹¹⁸ Despite many issues concerning the technological capability of the systems,¹¹⁹ there were nevertheless some arguments supporting SDI within the realm of common defence if the technology proved to be feasible.¹²⁰ The SDI Organisation and the Innovation Sciences and Technology Office looked at various technologies such as the directed energy weapons, etc. Only after the end of the Cold War, the George Bush Sr administration in the 1990s

¹¹⁷ Address to the Nation on Defense and National Security, President Reagan SDI Speech, March 23, 1983, at <http://www.atomicarchive.com/Docs/Missile/Starwars.shtml>

¹¹⁸ For a detailed analysis on the BMD efforts and strategies and its motivations and speculations, see U.S. Congress, Office of Technology Assessment, *Ballistic Missile Defence Technologies*, OTA-ISC-254 (Washington, DC: U.S. Government Printing Office, September 1985).

¹¹⁹ U.S. Congress, Office of Technology Assessment, *SDI: Technology, Survivability, and Software*, OTA-ISC-353 (Washington, DC: U.S. Government Printing Office, May 1988).

¹²⁰ Jerome Slater and David Goldfischer, “Can SDI Provide a Defense?”, *Political Science Quarterly*, 101 (5): 839-856.

proposed budget cuts for the SDI, thereby curtailing the spending power of the organisation. The SDI became the Global Protection Against Limited Strikes (GPALS). The Clinton administration finally closed the SDIO of the Reagan era and formed the Ballistic Missile Defence Organisation, which formally ended the Soviet style understanding of the ICBM threat posed to the US. In fact, after the end of the Cold War, the missile defence started to look at limited ICBM threat from nuclear threshold states such as North Korea and Iran and anticipated a system that might protect it against ICBM threats in the future. The reduced importance of the nuclear weapons in the 1990s also enabled the US to focus more on arms control reduction methods instead of diverting attention towards large-scale missile defences. For instance, the various arms control treaties were intended to effectively and methodically reduce the nuclear weapons deployment of the US and Russia.¹²¹

By the end of Cold War, defences largely came to be seen as a stabilising force in the nuclear environment. This purposeful limiting of defences against offensive nuclear weapons had turned the existing condition of 'mutual vulnerability' into a norm. This vulnerability existed because in a relationship between offence and defence, when a state builds defensive forces such as missile defence, the corresponding state has to increase its offensive forces to overwhelm the defence shield. Thus, states will attempt to outdo each other to protect their offensive capability through increased defence spending, inducing instability in arms race. The ABM treaty established precise limitations on the testing, development and deployment of missile defence. By accepting mutual vulnerability, the US and the Soviet Union developed a mutual deterrence relationship — to allow each other to be vulnerable to a successful nuclear strike. But the end of the Cold War also became a time when these concepts such as defence-offence balance began to be questioned and concerns were raised whether, given the technological

¹²¹ Amy F. Woolf and others (2020), "Arms Control and Nonproliferation: A Catalogue of Treaties and Agreements", CRS Report for Congress, 26 March 2020, at <https://apps.dtic.mil/sti/citations/AD1099624> (Accessed 3 February 2021).

changes in the conventional capabilities, these concepts could be relevant in the post-Cold War conflict.

The George Bush administration in 2001 once again ignited the relevance of missile defences against ICBM threat to the United States. The newly reformed Missile Defence Agency (MDA) became responsible for the development of missile defence. As before, the criticism centred on the effectiveness of technology, especially its performance in the Gulf War.¹²² The first test was conducted in 1999 for GMD. Ground-Based Mid-Course Defence consists of a multi-booster and an exo-atmospheric kill vehicle (EKV) that uses a hit-to-kill technology. The Bush plan also had a sea-based component that uses the ship-based missile (Standard Missile 3) and the AEGIS combat system. The current missile defence deployment are more advanced and designed to counter short, medium and intermediate range missiles, and shows that many of the planned programme have come to fruition.¹²³ The deployment also looked at THAAD, Patriot missiles and air-borne missiles. Missile defence was also geared towards Europe and interceptors or radars were placed in the NATO countries as part of the US alliance strategy.¹²⁴ However, the study of the European factor in missile defence is beyond the scope of this study. Though, the European response to the missile defence planning is based on political realities of the European defence in respect to its relations with Russia and China, NATO has expanded missile defence cooperation.¹²⁵

¹²² Honor Hsin, "US Ballistic Missile Defense", *Harvard International Review*, Fall 2003, 15-16.

¹²³ Missile Defence At A Glance, Arms Control Association, August 2019, at <https://www.armscontrol.org/factsheets/missiledefenseataglance>

¹²⁴ David P. Fidler, "Introductory Note to the Agreement Between Republic of Poland and the United States of America Concerning the Deployment of Ground-Based Ballistic Missile Defense Interceptors in the Territory of the Republic of Poland", *International Legal Materials*, 47 (6): 1042-1044, 2008

¹²⁵ European Integrated Air and Missile Defense Center, "US Exercises Ballistic Missile Defense of Europe Plans with NATO", February 3, 2021 at <https://www.usafe.af.mil/News/Article-Display/Article/2491976/us-exercises-ballistic-missile-defense-of-europe-plans-with-nato/> (Accessed 3 March 2021).

The Bush administration's policy of missile defence was also driven by few factors. As mentioned before, the missile defence was always about technological research and foray into possible technologies that could be harnessed against any anticipatory technological leaps from adversaries. Secondly, there was an understanding that in the post-Cold War era, concepts such as Mutually Assured Destruction (MAD) was not relevant to the changed security environment. In fact, it was argued that MAD is no more useful in describing the nuclear environment as the US would achieve nuclear primacy as Russia and China would not be able to catch up to the US nuclear weapons capability.¹²⁶ This irrelevance of the negotiated peace captured in the Cold War as MAD became more clear, the technological revolution that started to be visible in the 1990s as the "Revolution in Military Affairs", the case of understanding offence-defence dynamics became more pronounced. In other words, more debates emerged on the actual impact of offence-defence balance on the military outcomes and whether this balance had a significant effect on the military outcomes of the conflict.¹²⁷

What one might discern in these debates is that the US has always strived to dominate the nuclear space and only catered to MAD under excruciating circumstances. The struggle to maintain nuclear primacy was thus always the part of US grand strategy.¹²⁸ Missile defence has been mentioned each time the US felt vulnerable to the nuclear dominance that it enjoyed. No wonder after the Cold War, US saw no reason to maintain conditions that was suitable to MAD. It may also be a reason why missile defence that shook the fundamentals of the arms control treaties are now followed by other arms control treaties agreed during the Cold War. Thus the drive to continue the missile defence despite reservations was a way to signal to the adversary that it maintains dominance and can force the adversary to a settlement favourable to the US.

¹²⁶ Kier A. Lieber and Daryl G. Press, "End of MAD? The Nuclear Dimension of US Primacy", *International Security*, 30 (4): 7-44, 2006.

¹²⁷ Kier A. Lieber, "Grasping the Technological Peace: The Offense-Defense Balance and International Security", *International Security*, 25 (1): 71-104, 2000.

¹²⁸ Kier A. Lieber and Daryl G. Press, "The Rise of Nuclear Primacy", *Foreign Affairs*, 85 (2): 42-54.

As mentioned above, in the 1990s, the US nuclear primacy was based on the understanding that the Russian economy would not surge enough for it to pose sufficient threat to the US and the Chinese nuclear modernisation was slow to take a lead in threatening the US nuclear primacy. But the 1990s also was a period of breakthroughs in Chinese nuclear modernisation.¹²⁹ They had finally cracked the solid-fuelled rockets in their development programme and were looking at more survivable nuclear weapons. The Bush administration had many discussions and dialogues with Russia on the US decision to withdraw from the ABM treaty. The understanding was that the US unwilling to be constrained by any more treaties, whereas the Russian side wanted some arms control treaties that could curtail the deployment of offensive weapons.¹³⁰

Obviously, the reduction in the deployment of offensive weapons, such as reducing the nuclear arsenal, continued in the Obama Administration. These efforts were initiated during the Bush Administration and showed that maintaining large arsenals to the level of Cold War era threat perception was not needed any more. There are some factors that led to these changes. One, US began to comprehensively assess its entire nuclear arsenal to determine the way in which it could transform its deployment of nuclear forces. It is in this context that the current missile defence plans should be located.

When President Obama looked at the Bush plans for missile defence, he lowered the bar for the deployment. Shelving the missile defence for Europe (sensors in Czech and Poland), the anti-missile strike catered to the available technology such as countering short and medium-range

¹²⁹ A counter to the argument of US nuclear primacy could be seen in Zhang Baohui, "The Modernisation of Chinese Nuclear Forces and Its Impact on Sino-U.S. Relations", *Asian Affairs: An American Review*, 34 (2): 87-100, 2007. Zhang argues that the primacy of US nuclear domination is illusionary and that China had made several strides in its second strike capability and would find it easy to expand its offensive strategic capability to overcome missile defence system.

¹³⁰ Lynn F Rusten, "U.S. Withdrawal from the Anti-Ballistic Treaty", National Defense University, January 2010.

missiles.¹³¹ Obama's plan differed in terms of not placing specific interceptors in Europe, rather placing sea and air based interceptors that would nevertheless protect Europe, called the European Phased Adaptive Approach (EPA).¹³² In other words, the policy is to have a layered approach, where the US would place SM-3 interceptors in the sea-based missile defence as well as on land called the Aegis ashore, specifically for European protection. The Asian part of the plan was that the US would deploy THAAD in South Korea, which it eventually deployed to launchers in 2017. Even during the Obama administration, a combination of technological feasibility and the lack of adequate tests of the missile interceptors meant that the direction of the missile defence was once again questioned. Obviously, the missile defence is a sharply divided matter on partisan and ideological grounds in the US.

But a deeper look shows that the missile defence has not succeeded due to lack of satisfactory technological prowess. It is unclear whether partisan and ideological orientation would have mattered if the technology was more feasible. It is now however clear that the missile defence adjustments in the current period is very much driven by the quality of Chinese and Russian nuclear strengths. Whereas earlier, the focus of missile defence was centred around anticipatory threats and the belief that Cold War structures were unneeded for the current time. The more recent changes to the deployment of missile defence came from primarily the Chinese technological sophistication in ICBMs and missile defence countermeasures.

MISSILE DEFENCE AND ITS OPPONENTS

The saga of missile defence has a number of opponents. Most cite the cost of the research programme, viability of the technology,

¹³¹ David Jackson and Ken Dilanian, "Obama Scraps Bush Missile Defense Plan", *USA Today*, at <https://abcnews.go.com/Politics/obama-scraps-bush-missile-defense-plan/story?id=8602322> (Accessed 20 June 2020).

¹³² Michaela Dodge, "President Obama's Missile Defense Policy: A Misguided Legacy", The Heritage Foundation, September 15, 2016, at <https://www.heritage.org/defense/report/president-obamas-missile-defense-policy-misguided-legacy> (Accessed 2 June 2022).

effectiveness of missile defence to counter ballistic missile attack and the security instability it would cause in the region as reasons to restrict its use and deployment. This is best encompassed while looking at the missile defence test that the MDA conducted in March 25, 2019, called the Flight Test Ground-Based Interceptor 11 test (FTG-11). The GMD is supposed to successfully protect the US homeland against limited intermediate and long-range ballistic missile attack. Through a series of inter-connected networks of communications systems, radars and sensors, the Ground-based Interceptors (GBI) uses a hit-to-kill technology to destroy an incoming missile. The technology of the missile defence has to be sophisticated that, through a series of radars deployed at various sites and other space-based assets, the system should be able to detect and track the missiles so that the interceptors could be deployed.

The director of MDA Vice Admiral John Hill stated that the agency would carry out the tasks laid out in the missile defence review. For instance, the GMD is one of the principal deployments of missile defence that would have the most impact on the Chinese credibility. The testing proved to some extent that the GMD can defend against limited ballistic missile attack but cannot differentiate between actual warheads and decoys.¹³³ A simple ballistic missile attack is fine for the anti-missile system, but not the sophisticated missiles of the Chinese with their advanced inertial navigation system and MIRV capability. But the US had already downgraded the missile defence to defend only against limited ballistic missile attack, never explicitly the Chinese ICBM threat. Though the Chinese threat was often taken as one of the factors that pushed for the need to maintain US dominance in the military conflict, the Obama plan was to protect the forward deployed troops, in the extended deterrence area.

At least the plan was to see how far the SM-3 interceptor in the Aegis deployed ships were progressing in terms of their interception capability and see whether it could be converted to protect land-based ballistic

¹³³ FY2022 Annual Report for the Office of the Director, Operational Test and Evaluation, Missile Defence System, 2022, at <https://www.dote.osd.mil/annualreport/> (Accessed 2 February 2023).

missile threats.¹³⁴ Problems though persisted. Even though the missile defence was aimed against nuclear threats, the US is far more concerned about Chinese propensity to use conventional missile capability against US interests in the Pacific in a conflict over territorial sovereignty. In this case, nuclear delivery vehicles apart from long-range missiles are necessary in forward looking bases. The nuclear deployment to protect against massive conventional strike capability was a significant challenge as the US was already looking at NEW START agreements that would limit US nuclear arsenal to 1500.¹³⁵

Therefore, a realistic assessment of US missile defences became a priority once again. First, the missile defence in terms of assessing the test launches has no “real-world capability”, meaning that it did not match the combat conditions and since very little oversight is given to the programme, there is no objective way of determining the capability of the system.¹³⁶ Given that China has been expanding its nuclear forces and modernising the strategic forces, the ability of the missile defence to defend against Chinese missiles becomes suspect.¹³⁷ Second, the testing of the interceptors was not sufficient, it was far from the required parameters, and seemed to be failing operating requirements.¹³⁸ Although the test conducted in June 2019 was done to prove that it did perform the hit-to-kill technology successfully to hit the ICBM

¹³⁴ Report to Congress on Assessment of the Ground-Based Midcourse Defense Element of the Ballistic Missile Defense System”, Acquisitions, Technology and Logistics, May 2010, at <https://missiledefenseadvocacy.org/wp-content/uploads/2015/04/2010-DOD-GMD-Report.pdf> (Accessed 2 June 2020).

¹³⁵ Sam Goldsmith, “U.S. Conventional Access Strategy: Denying China a Conventional First-Strike Capability”, *Naval War College Review*, 72 (2): 2019

¹³⁶ Laura Grego, George N. Lewis, and David Wright, “Shielded from Oversight: The Disastrous US Approach to Strategic Missile Defense”, Union of Concerned Scientists, July 2016.

¹³⁷ March Schneider, “The Nuclear Doctrine and Forces of the PRC”, National Institute of Public Policy, November 2007.

¹³⁸ David Axe, “Why Did The U.S. Military Delay a Key Missile-Defense Test for 13 Years”, *The National Interest*, June 8, 2019, at <https://nationalinterest.org/blog/buzz/why-did-us-military-delay-key-missile-defense-test-13-years-61802> (Accessed 2 June 2020).

threat and the second interceptor could differentiate between the debris and see whether there was another object within the debris and intercepted the target, there are clearly many concerns. Following the test, General Samuel Greaves said:

“This test was the first salvo engagement of a threat-representative ICBM target by two Ground Based Interceptors (GBI), which were designated GBI-Lead, and GBI-Tail for the test. The GBI-Lead destroyed the reentry vehicle, as it was designed to do. The GBI-Tail then looked at the resulting debris and remaining objects, and, not finding any other reentry vehicles, selected the next ‘most lethal object’ it could identify, and struck that, precisely as it was designed to do.”

And regarding the differentiation in objects, he stated:

“But this test was different because we launched within a very short period of time two Ground-Based Interceptors operationally released by the combatant commander using their operational processes –which is very important — and the lead interceptor intercepted the ICBM-representative threat. But what’s most important is that it created a debris field — and this test has been 10 years or more in the making — and the importance of that was the trailing — the second — interceptor was able to discern the debris from the next most lethal object — I can talk about it in a classified forum — and also intercepted that object. What that means is [an] enemy concept of operations which seeks to confuse our missile defense system by launching junk or debris would not be successful, that’s why it was a success.”¹³⁹

However, even the latest test is met with skepticism that the test was a success with regard to distinguishing a warhead from the debris and

¹³⁹ Testimony of Lieutenant General Samuel A. Greaves Before the Senate Armed Services Committee, April 2019, at <https://www.armed-services.senate.gov/hearings/19-04-03-missile-defense-policies-and-programs> (Accessed 2 February 2021).

other countermeasures that an adversary might use to confuse the missile defence.¹⁴⁰ But the US was confident that at least Guam was well protected by the missile defence systems against North Korean ballistic missile threat.¹⁴¹

Fourth, the cost of missile defence is still considered extraordinary given that US needs to allocate its defence budget more efficiently. Already, the Obama administration had initiated the nuclear modernisation programmes that would take chunk of the defence budget.¹⁴² A combination of more sophisticated Chinese and Russian technology in challenging US dominance both in nuclear and space has made these revelations more relevant. In the past year, missile defence programmes had undergone more changes in terms of objective and direction. The hypersonic missile threat and the cost and technological feasibility mean that more mature understanding of missile defence is emerging.

CURRENT STRUCTURE OF MISSILE DEFENCE-BASED NETWORK AND COOPERATION

The United States currently has 44 ground-based interceptors within the GMD matrix and plans to increase it to 63 by 2023. There are two factors behind considering the missile defence deployment. One is the

¹⁴⁰ What did the FTG-11 Actually Prove?, at <https://mostlymissiledefense.com/2019/04/04/what-did-ftg-11-actually-prove-april-4-2019/> (Accessed 2 May 2020).

¹⁴¹ Zenny Phuong, "Missile Expert: Guam is Heavily Protected by Missile Defence Systems at Sea and On the Ground", *CNS News*, August 2017, at <https://www.cnsnews.com/news/article/zenny-phuong/missile-expert-guam-heavily-protected-missile-defense-systems-sea-and>

¹⁴² Loren Thompson, "Obama Backs Biggest Nuclear Arms Buildup Since Cold War", *Forbes Magazine*, December 15, 2015, at <https://www.forbes.com/sites/lorenthompson/2015/12/15/obama-backs-biggest-nuclear-arms-buildup-since-cold-war/#123558b92a0f>; Also see, Congressional Budget Office, "Projected Costs of U.S. Nuclear Forces, 2021 to 2030", May 24, 2021 at <https://www.cbo.gov/publication/57240> (Accessed 23 December 2022).

institutional assessments of missile defence deployments and their understanding. Second is to look at the Trump administration's plans for missile defence and support for the plans within the US defence establishment and whether it coincides with what the Navy or Missile Defence Agency has been saying about the prospects for defending against a more sophisticated ballistic missile threat in the coming era of hypersonic missiles.

The Trump administration's missile defence can be seen from the 2019 missile defence review. In this report, China was clearly identified as a significant threat to the US dominance in the Indo-Pacific region, especially the former's various types of ICBMs, including the solid-fuelled ones.¹⁴³ The report explicitly stated that missile defence would look at new technologies for sophisticated threats than North Korea and would follow a multi-layered approach to missile defence such as integrating active missile defence and passive missile defence measures to counter ballistic threats and if deterrence fails, then it would attack all the launch pads of the ballistic threats.¹⁴⁴ Overall, the US would continue to deploy GMD and pay attention to THAAD, Aegis sea-based missile defence and Aegis Ashore, a land variant, and PAC-3 for regional allies. Currently, there are 38 Aegis ships deployed around the world, and that will increase to 60 by 2023. With regard to China, US missile defence assets in East Asia would comprise of THAAD and Patriot in South Korea, Aegis ships deployed in Japan, AN-TPY-2 radars in Japan, Patriot in Japan and THAAD in Guam. Unlike the previous systems, the missile defence agency would look at multiple object kill vehicle (MOKV) to engage the targets.

In 2019 a major report was released by the US Government Accountability Office (GAO) about the state of affairs of missile defence. This report stated that missile defence has increased the capability to integrate various systems but suffer from developmental

¹⁴³ Office of the Secretary of Defense, "2019 Missile Defense Review", 19 January 2019.

¹⁴⁴ Ibid.

challenges and testing failures.¹⁴⁵ Nevertheless, the salvo test of 2019 was considered as an achievement by the missile defence agency and acknowledged by the Chinese as an achievement. Given that the Trump administration had made it clear that the US wanted to counter the growing missile threat from China, the new director of missile defence agency Vice Admiral Jon Hill stated that the MDA was “refining its approach to global layered missile defence” and might look into services handling the missile defence programme, one of the long standing problems with the US Navy.¹⁴⁶

A major criticism against Trump’s plans for missile defence was the return of the space lasers, as in the past. One of the changes that has been seen was the decision to stop the current EKV programme, which the MDA was looking towards redesigning called the RKV (Redesigned Kill Vehicle) and look for next generation kill capability. The technical problems were too great to overcome and the programme was halted.¹⁴⁷ Meanwhile, neutron particle beam programme has halted and energy was focused on microwave and lasers. But there were other encouraging news that was at least of significance to China. One was the sophistication of the radar systems have improved exponentially. For instance, SPY-6(V)1 is 100 times more sensitive than any other current

¹⁴⁵ Delivery Delays Provide Opportunity for Increased Testing to Better Understand Capability, Report to the Congressional Committee, GAO-19-387, June 2019.

¹⁴⁶ Jen Judson, “US Missile Defense Agency Boss Reveals His Goals, Challenges on the Job”, *Defense News*, August 2019, at <https://www.defensenews.com/pentagon/2019/08/19/us-missile-defense-agency-boss-reveals-his-goals-challenges-on-the-job/> (Accessed 2 May 2020).

¹⁴⁷ Jen Judson, “Pentagon Terminates Program for Redesigned Kill Vehicle, Preps for New Competition”, *Defense News*, August 21, 2019, at <https://www.defensenews.com/pentagon/2019/08/21/dod-tanks-redesigned-kill-vehicle-program-for-homeland-defense-interceptor/> ; Also see Oriana Pawlyk, “Pentagon Halts Work on Directed Energy Beams to Stop Enemy Missiles”, *Military.com*, September 4, 2019, at <https://www.military.com/daily-news/2019/09/04/pentagon-halts-work-directed-energy-beam-stop-enemy-missiles.html> (Accessed 23 May 2020).

radars deployed in the field.¹⁴⁸ Second, there was going to be an increased coordination among different agencies on space-based sensors against the hypersonic threat, especially in the LEO constellation for missile defence.¹⁴⁹ The radars now play a big role in determining the success of the missile defence system.¹⁵⁰ In general, higher technologies are now part of Trump's strategy for missile defence, including an emphasis on space based system.¹⁵¹ Apart from this, there are also changes to the Navy BMD system in the understanding that the Aegis ships should not be limited to protecting the land sites, severely limiting the possibilities of the Navy.¹⁵²

The Joe Biden administration is expanding the capability of missile defence not only to defence against ballistic missiles but also cruise and hyper-sonic missiles, and adjustments within the MDA shows such changes. Probably the interception might happen either in sea or space depending on the threat level and the sophistication of newer missiles such as SM-6. The push towards missile defence, despite various problems, shows that in the era of strategic competition, the US is unwilling to accept any vulnerability in its nuclear deterrence when it comes to the Chinese second strike capability. In fact, the US has consistently showed that any attempt by the Chinese to prove that they

¹⁴⁸ New Aegis Radar to be 100 Times More Sensitive than Current Radar (May 22, 2019), at <https://mostlymissiledefense.com/2019/05/22/new-aegis-radar-to-be-100-times-more-sensitive-than-current-radar-may-22-2019/> (Accessed 3 May 2022).

¹⁴⁹ Sandra Erwin, "New Tri-Agency Office to Coordinate U.S. Missile Defence Space Programs", *Space News*, September 16, 2022, at <https://spacenews.com/new-tri-agency-office-to-coordinate-u-s-missile-defense-space-programs/> (Accessed 2 December 2022).

¹⁵⁰ Air and Missile Defense Radar, 20 Sep 2021 at <https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166758/air-and-missile-defense-radar-amdr/> (Accessed 15 May 2022).

¹⁵¹ Congressional Research Service, "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issue for Congress, RL 33745, August 2, 2021.

¹⁵² L. Paul James, "Rethink Navy Ballistic Missile Defense" October 2019, at <https://www.usni.org/magazines/proceedings/2019/october/rethink-navy-ballistic-missile-defense> (Accessed 3 March 2022).

have a credible nuclear deterrent capability against the US would be challenged.

US-CHINA DETERRENCE FISSURES

The continued improvements in the Chinese nuclear arsenal in the 1980s drew considerable attention as to the effect it has on the US first strike capability. However, the lack of a strategic guideline, that should have guided the Chinese nuclear modernisation, was absent. After the end of the Cold War, China expanded the role of the missile forces to include both conventional and nuclear missile forces. Since the Chinese Air Force was unsophisticated, conventional missiles had to take on the role in the initial operational campaign. Second, sea-based deterrence had to be improved upon to ensure that its second-strike capability remains credible, as land-assets are more vulnerable than sea-assets.

It engaged in the nuclear arms control and disarmament initiatives to oppose any large scale changes to the nuclear order that was instituted during the Cold War that had curtailed the nuclear capability of the superpowers. This nuclear order facilitates the Chinese case, as it could keep its cost of nuclear modernisation low and avoid unnecessary arms race. But the withdrawal of the US from the ABM treaty in 2001 created a profound impact on the thinking of the Chinese nuclear fraternity.

First, the US never accepted the NFU policy declaration of China. Though the NFU has been discussed repeatedly regarding its contribution to deterrence, whether the policy could hold true when there is a threat to the regime has been left unanswered by the Chinese strategic community. The mutual understanding between the US and China regarding the conditions under which the NFU could be disregarded are not clear. For instance, there is no clear understanding whether a conventional attack on Chinese nuclear forces would trigger the Chinese leadership to abandon the NFU policy.

The US withdrawal from the ABM treaty seems to have shaken the confidence that China had about its second-strike capability and the dawning that the US was unwilling to accept any mutual deterrence relationship with China. While Chinese saw the changes in the US understanding of the nuclear order as threatening to the stability

established during the Cold War and became suspicious of the US rationale that it was against a limited ballistic missile attacks like from North Korea or Iran. However, the US assessed the Chinese nuclear modernisation gain greater sophistication and maturity in its deployment.

There were proponents for the US to accept the NFU policy with regard to China. In fact, impressive developments in making ICBMs had led many to speculate that the US should acknowledge that China has developed minimum deterrence capabilities provided China does not have grand territorial ambitions in areas like the South-East Asia.¹⁵³ The acceptance of China's deterrence capabilities thus had conditions pertaining to its ambitions to attain broader political ambitions in the international community. Moreover, there has been some indications that the US and China having gone through many crisis situations have come to appreciate some red lines and are thus more cautious of each other's interests in the region.¹⁵⁴ Clearly, from the US perspective, Chinese ambitions in Asia are tied to the US accepting its deterrence capability. As long as the intentions of the Chinese are not clear, the US is unwilling to accept any more concessions with the Chinese nuclear arsenal.

CONCLUSION

The US decision to withdraw from missile defence and now from INF treaty points towards few factors. That missile defence and its push have always increased the advantage of US over its adversary. The only time the US has committed to arms control has been when it is proven beyond doubt and ability that it has a clear disadvantage over the adversary. Even then, the negotiated peace has been temporary. The negotiated peace strategy such as the MAD has only been possible as the Soviet Union had objectively more weapons than the US and was able to prove that it can overwhelm the US in a military conflict.

¹⁵³ A. Doak Barnett, "A Nuclear China and US Arms Policy", *Foreign Affairs*, 48 (3) 1970, 427-442.

¹⁵⁴ J. H. Kalicki, "China, America and Arms Control", *The World Today*, 26 (4): 147-155, p. 151, 1970.

The missile defence with respect to China has not led the US to buy into the understanding that China would follow NFU and its limited arsenal is enough to counter the US. Obviously, the analysis of Chinese nuclear retaliatory capability shows that restraint in US pre-emptive strike is already there. Thus, to some extent, the US understands the threat posed by the Chinese retaliatory capability.

Second, given that the US still does not accept Chinese nuclear deterrence, missile defence is the way to show that its threat is still not enough to initiate a complete change in the US pre-emptive behaviour when it comes to its interests in the Pacific.

Third, the continuous criticism within the missile defence community means that despite oversight and bloated defence budgets, a certain sense of realism is seen in the deployment patterns. In fact the recent changes show that there are some significant improvements which might not be an overall improvement in the missile defence agency, but could prove threatening to the Chinese. Unlike the Russian, the Chinese missile strategy would be wary of by minor qualitative missile defence improvements such as radar and sensor capabilities.

Thus, the missile defence need not achieve everything, but slight advancements would prove detrimental to the Chinese than the Russians.

CHINA'S MISSILE STRATEGY UNDER MISSILE DEFENCE

INTRODUCTION:

It is clear that China is in conflict about the nature and intention of the US missile defence system. But it is evident that the Chinese perspectives have evolved, especially after the Cold War, as the strategic competition between the US and China intensified. Before the Cold War, the missile defence was mostly seen in light of competition between the superpowers, but after the Cold War, especially in the post-2000s decades, the Chinese perspectives about US intentions have hardened.

Because of the economic and trade relations between the two countries, some believed that they could resolve the bilateral irritants diplomatically, including the issue of nuclear balance between the two countries. But even after the Obama administration's restriction of the missile defence, the continued nuclear modernisation and a more layered approach to missile defence has led the Chinese to believe that the trend towards missile defence cannot be reversed.

The significance of this understanding has changed the way the Chinese have looked at the missile defence. Whereas the idea was to convince the US to change its stance or bilaterally negotiate with the US to come to an understanding about the Chinese nuclear deterrence, now, the resources are diverted to understand the effectiveness of the US missile defence system.

The Chinese perspective now is not about convincing the US to roll back on the missile defence, but as to how accurately can the Chinese assess the technological capability of the US, the seriousness in which the US might approach the missile defence and cooperation with regional partners based on missile defence and the further uses of

interceptor missiles as offensive forces. Because unless the Chinese are able to correctly assess the exact nature of the US missile defences, they would not be able to erect an appropriate response in line with their publicly propagated belief of not being part of the global arms race.

Taking lessons from the collapse of the Soviet Union, China had to be careful not to overextend the defence expenditures beyond the strength of the economy. Therefore, any change to its nuclear posture has to be in line with its defensive strategy doctrine and limited arsenal. It cannot raise the cost of producing more offensive missiles to offset the missile defence deployments. The response to missile defence then has to be calibrated within the set rules of the Chinese nuclear policy and accept that there would be some vulnerability with the Chinese retaliatory capability due to the US deployment of the missile defence.

The Chinese response to the US missile defence has been varied. First, they had to look at their existing missile strengths and the possible upgrades that could be brought within the missile strength that could counter the missile defence. Second, they have to improve the new missiles to such an extent that when they are deployed, they could act as a counterweight to the missile defences. Third, China has to develop its own limited missile defence as a technology demonstrator so that it could negotiate with the US, if there could be a chance to have a temporary agreement. Fourth, it has to continue to increase the reliability and credibility of its second-strike capability in addition to space-based assets so that the missile defence architecture would not be able to detect its ballistic missile targets.

I argue that China's missile strategy is to extend both nuclear and conventional capabilities, and gain technological edge in its missile combat system. I also argue that it is unlikely that China will expand its nuclear arsenal to a large extent, and will be content to just increase the robustness of its deterrence.

CHINESE VIEW ON OPTIONS:

The Chinese would have to respond to the US missile defence because of few factors. First, they believe that they do not have any choice

available given the fact that they cannot use their diplomatic resources to counter the US as they cannot match up to the unipolar movement of the US. This means that the dominance of the US is so entrenched that on issues such as security, the Chinese side is unable to impose any kind of restriction on the US security agendas. It is true of the missile defence also. In Chinese view, there is no state that can stop the US security agenda of absolute security through missile defence even though it is impossible to achieve absolute security on your own.¹⁵⁵ In other words, the Chinese do not believe that the US is developing missile defence for purely security needs, but to secure privileges in the international community vis-a-vis other states.

The Chinese also believe that they would be able to counter the missile defence through MIRV capability with solid and liquid-fuelled missiles and there is no need to retire some of the liquid-fuelled missiles as they had planned before the advent of post-Cold War missile defence. Other asymmetric strategies include developing an advanced ASAT capability so that the US space-based assets that are part of the missile defences are under threat from Chinese ASAT capabilities. The intent of the technology demonstrations is to show the US that China has a number of options for responses without resorting to an arms race.

CHINA'S NEW MISSILES

China continues to test offensive missiles, upgrade older missiles, establish new missile units and develop missile defence system. Among its nuclear missiles, China initiated the deployments in the DF-21 missiles and conventional SRBMs such as the DF-11 and DF-15 missiles. Many improvements were made and China started deploying improved version of DF-21A nuclear missiles, DF-21C conventional missile and DF-21D anti-ship missile. While the DF-21A missiles are nuclear capable, the DF-21C and DF-21D carry conventional warheads. After

¹⁵⁵ *Huanqiu Shibao*, "US Missile Defense Cannot Buy Absolute Security" (社评：美导弹防御计划买不来绝对安全), 18 January, 2019, at <https://mil.huanqiu.com/article/9CaKrnKhbot> (Accessed 3 January 2021).

this cycle of deployment, the Rocket Force once again deployed improved missiles such as the DF-31 and DF-31A and conventional missiles such as the DF-16 and DF-15B (DF-15B is nuclear capable). Newer and improved missile that are considered quite advanced as per Chinese perspectives are the DF-41, DF-31B and DF-26. Unlike the DF-41 and DF-31B, the DF-26 has both nuclear and conventional roles.

The DF-31A is a solid-propellant, road-mobile ICBM that has the capability to evade missile interceptors and an increased range of 12,000 kms. Considered as the second-generation strategic ballistic missiles, the DF-31A was developed to improve the precision, survivability and penetration capability. The DF-31A can disperse quickly after a nuclear threat has been issued, using motorised transport-erector-launch (TEL), and also hide within the underground mountain tunnel system. It has the potential to survive and can be used for counterstrike because of its capability to penetrate missile defence through MIRV capability.

Most importantly, DF-31A was put under active deployment, while an upgraded DF-31B was under development. While DF-31A was seen deployed in Central China in 2012, the first test flight of DF-31B was conducted on September 25, 2014, from Yaiyuan Satellite Launch Centre in Shanxi Province. However, it is speculated that the DF-31A, though mobile, uses roads for launching preparations, remains highly vulnerable to the surveillance capabilities of the US, thus could be vulnerable to a potential attack. The DF-41, on the other hand, when starting deployment, would be a formidable addition to the DF series. For China, the deployment of the DF-41 (东风-41), a three-stage, road and rail mobile, solid-fuelled ICBM with a range between 12,000 and 14,000 kilometres comes as one of the most promising measures.

China's upgradation of its older missiles is also underway. For instance, the Chinese believe that one of the earlier understandings was that

'the original Dongfeng-31 A was originally designed only to attack the west coast of the United States, but the modified 31 AG of Dongfeng-31 A interior assembly has special designed installation plant, which could allow the missile to complete a orbit change through at a high altitude, the special vector propulsion device,

so that the tactical maneuver avoids the interception of the US antimissile system".¹⁵⁶

Thus, for China, it has to retain the DF-5 missiles as they provide more options for deployment and MIRV capability as well as it could be put in a fixed launcher and there is no need for complicated launcher/trailers that would have to be modified to carry its weight. The Chinese want the DF-5 missiles as they have "large payload, large range, strong penetration ability, powerful damage, is a strong shield to safeguard national sovereignty and national dignity".¹⁵⁷ The advanced nature DF-5C liquid-fueled missiles had to be showcased for deterrence purposes. According to one report,

'It was to show the international community China's determination to play a strategic game, its science and technology strength... Also, the unveiling of DF-5B was not seen as enough, therefore wanted to demonstrated the ability to test-fire the DF-5C... and against the THAAD deployment, which has disrupted the regional strategic balance'.¹⁵⁸

There are several reasons why the Chinese will continue to rely on liquid-fuelled missiles while developing its solid-fuelled missiles. For instance, they believe that

'first, the supporting system is too large, and the cost of construction and maintenance is much higher than that of silo-based missiles. Second, the precision of mobile ballistic missiles is relatively low, the warheads are smaller, and cannot fit many

¹⁵⁶ China Has Already Both DF-31 and DF-41, Why Does it Still Has DF-5 missiles? (我国已有东风31东风41 为何还保留着东风5液体导弹), at <https://mil.sina.cn/sd/2019-09-03/detail-iicezrq3031297.d.html?vt=4&cid=65898> (Accessed 20 February 2023).

¹⁵⁷ Ibid.

¹⁵⁸ "The DF-5C Missile, Exactly How Powerful is it?" (东风-5C导弹威力到底有多大?), *Science and Technology Daily*, 12 February 2017, at http://www.xinhuanet.com/mil/2017-02/12/c_1120450991.htm (Accessed 2 February 2023).

sub-warheads. Third, today, with the popularity of long-range precision strike weapons, the viability of land-based mobile missiles is relatively low, while the survivability and strike capability of silo-based intercontinental missiles with super-reinforced missile wells can be reassuring'.¹⁵⁹

While China has upgraded the liquid-fuelled missiles, it also continues to deploy the DF-41 missile, which was seen in the 2019 military parade. In Chinese view, the DF-41 ballistic missile is the most appropriate answer to the missile defence deployment of the US. They believe that

“dongfeng-41 has a range of about 14,000 kilometers, can carry multiple sub-guided nuclear warheads, and carry high-performance decoys that can confuse and deceive anti-missile interception systems, coupled with the maneuverability, it has a strong penetration ability. In addition, Dongfeng-41 also uses a high-mobility launch platform, which can be hidden and deployed on China's vast territory through roads and railways. This makes the missile defense system that the United States has spent years of hard work facing a weak situation”.¹⁶⁰

The DF-41 thus makes a significant contribution to the Chinese response matrix. Moreover, its technical capabilities, according to the Chinese, have some advantage over the US missile defence system in its homeland. For instance, they argue that the DF-41's

“MIRVs can improve the missile's ability to strike damage and penetrate the defences. MIRVs can solve the problem of fewer missiles and more targets, and can launch attacks on multiple

¹⁵⁹ *Aerospace Knowledge*, “Already Have the DF-41 Missile, Then Why Have the DF-5 Series? That is the Real Killer!”, (有了东风-41导弹，为何还保留老兵东风-5号？这可是真正的大杀器)， at https://www.thepaper.cn/newsDetail_forward_6015434 (Accessed 4 May 2023).

¹⁶⁰ China's 11th Flight Test of DF-41 is Significantly Different Than the First 10 Tests”, (中国第11次试射东风41导弹 与前10次有明显不同), at <https://mil.sina.cn/sd/2019-11-29/detail-iihnzahi4196038.d.html> (Accessed 3 May 2022).

targets simultaneously. In addition, the MIRVs also make the missiles more capable of penetrating, leading the opponent 's anti-missile measures to be too late to respond".¹⁶¹

Thus, the Chinese response in terms of increasing its missile strength has been about improving the older missiles to add the MIRV capability and increase the striking capability of the newer missiles. By combining these two strategies, they are able to counter the missile defence to some extent, especially in terms of posing a threat to the US homeland or countering the US missile interceptors within the US. In addition to the missile forces' modernisation, the Chinese leadership also modernised the Rocket Forces so that they are capable of handling the nuclear missiles in the integrated fashion in response to the missile defence threat.

To make sure that these ballistic missiles poses the threat it is supposed to, the organisation that handles the equipment, the Rocket Force was also upgraded and their duties made more comprehensive than before. For example, Xi Jinping had already given instructions on four issues that the Rocket Force have to improve on to become modern: i) have both nuclear and conventional components according to the strategic requirements of the global deterrence, deterrence and combat capability of nuclear and conventional weapons to deter the whole region ii) enhance the credibility and reliability of the nuclear deterrence and nuclear counterattack capability iii) strengthen precision strikes for long-range and iv) enhance strategic checks and balances, meaning that it has to demonstrate the power of China's role.¹⁶²

¹⁶¹ Qiu Yue, "DF-41 Ranked Most Advanced Missile" (东风-41已跻身世界最先进导弹行列), at <http://military.people.com.cn/n1/2018/0609/c1011-30047293.html> (Accessed 4 May 2019).

¹⁶² Wei Fenghe and Wang Jiasheng, "Keep in Mind the Precepts, Listen to Party Command, Strive Hard to Build a Powerful Modern Rocket Army", (牢记训词 听党指挥 努力建设强大的现代化火箭军) *Qiushi*, 2016 (3), at <http://military.people.com.cn/n1/2016/0202/c1011-28105170.html> (Accessed 3 November 2021).

The Rocket Forces have been asked to become a modern rocket army for this reason that their responsibilities have expanded to a large fashion. For instance, after the reform, the Rocket Forces have

‘thoroughly implement the strategy of reforming and strengthening the army, aiming at the construction of a powerful modern rocket army in accordance with the strategic requirements of “nuclear-conventional intergration and multi-domain deterrence” and the core requirements of “ready to fight, launch on time, and effectively destroy”. All efforts are focused on fighting and all kinds of work are going hard, so as to accelerate the improvement of strategic strike capabilities”.¹⁶³

Therefore, the Rocket Forces are keen on implementing “strategic capabilities”, and also carrying out combat-base training in order for the forces to train with missiles. As per the Chinese report, President Xi urged the Rocket Forces to take a leap by calling for “new breakthroughs be made in improving strategic containment capabilities, making new breakthroughs in improving the level of combat readiness, and making new breakthroughs in strengthening strategic use”.¹⁶⁴ The Chinese believe that the way the Rocket Forces are organised are also changing due to the development in technology as “the missiles getting smaller and smaller, the strike accuracy is getting higher, the damage is getting stronger and stronger, and the style of the missile soldiers is stricter and more realistic.”¹⁶⁵ Therefore, the organisation of the nuclear forces has also been made more modern to respond to the increased concerns about the reliability of its retaliatory strike.

CHINESE ANTI-MISSILE SYSTEM:

Though the Chinese air-defence system was sought during the days of Mao Zedong, China officially launched the programme in 1967. Only

¹⁶³ China’s Rocket Force Army Strike Level Leaps To New Level, 中国火箭军战略打击能力跃上新台阶, at http://www.xinhuanet.com/politics/2019-10/04/c_1125072032.htm (Accessed 24 June 2022).

¹⁶⁴ Wang Weidong, “Building a Powerful Modern Rocket Force”, (建设强大的现代化火箭军), *PLA Daily*, at http://www.81.cn/2019qglhzt/2019-03/10/content_9446620.htm (Accessed 20 June 2022).

¹⁶⁵ Ibid.

in the 1980s did China achieve some breakthroughs in high-speed missile and advanced phased array radar technology. Later in 1980s, they also achieved some improvements in early-warning technologies. But it took them more than a decade to test anti-missile systems in 2010 and 2013 respectively to showcase that they possess interception of a ballistic missile technology. However, most Chinese claim that their programme is at an initial phase, but believe that it has a very great historic significance as it could provide the necessary military strategic stability with the US as China is involved in various land and maritime disputes in its region.¹⁶⁶

The Chinese themselves distinguish their missile defence programme from the American one. The Chinese National Missile Defence (中国国家导弹防御系统) is the HQ (Hongqi) series that was part of the Russian S-400 exports. For instance, China has deployed HQ-9 in Paracel Islands and it's built by the China Precision Machinery Import Export Corp (CPMIEC). The HQ-9 is comprised of command and control centre, guidance radar vehicle, and a four-celled HQ-9 launcher vehicle. The HQ-9 has a surface-to-air missile capability and has a range of 200 kilometres, where the launcher vehicle flies at a high and low altitude and a battalion-level combat system is equipped with eight launch vehicles. The CNMD contains three parts, such as air defence, sea defence and ground-to-ground defence, and is considered part of active defence military strategy. For instance, the HQ-9A is an air-defence system that can intercept aircraft, helicopters, cruise missiles and short-range missiles below 20,000 metres.¹⁶⁷ A version of HQ-9 is also being developed for sea defence called the Type-052C destroyer in a vertical launch and the ground-to-ground include the DN-2, a type of anti-satellite missile.

The HQ-9 can control 6 missiles and can set up to 3 to 6 targets and in an interval of 5 seconds, where it establishes the six most threatening

¹⁶⁶ Ibid., note 155.

¹⁶⁷ What is the Difference between TMD, NMD and CNMD? (TMD、NMD以及CNMD到底有什么区别?), 11 December, 2017, at <http://cj.sina.com.cn/article/detail/5868872487/520969> (Accessed 15 July 2022).

targets. A brigade combat unit consists of 6 battalion-level units and each brigade can engage up to 48 air targets at a time.¹⁶⁸ One of the technologies that China was investing is the ballistic missile strategic early warning system (弹道导弹战略预警卫星计划), through which a number of radar installations have been instrumental in making their mid-course interception system more efficient.¹⁶⁹ Chinese missile defence has been improved due to its cooperation with the Russian on their S-400 missiles. For instance, the HQ-19 (ASAT) has been derived from the HQ-9 missile defence, which can intercept at the range between 1000-3000 kilometers. Whereas the ASAT HQ-19 is suitable for medium-range missiles and low-orbit satellites, it cannot ascertain higher altitude interception. But in the improvements and breakthroughs the Chinese made in Large Phased Array Radar (LPAR), they were able to make improvements in the ASAT technology. For example, the Chinese news website reported that the LPAR that China has developed a range of over 5000 kilometres, and the goal of this radar is to track missiles that are being launched from Japan, Guam, and South Korea.¹⁷⁰ The 2007 test hit the target 800 kilometres away from the earth and in 2010, the test was for mid-range target, whereas the 2013 test was for high-altitude test. In addition, there were also technologies to blind the satellites to make sure they cannot do their reconnaissance effectively.

The Chinese missile defence system has already some capabilities that are advanced according to domestic sources. For instance, in 2013, they believe that the Chinese missile defence

“consists of a long-range early warning system, an interception system, and a command management system. It is mainly used

¹⁶⁸ Ibid., note 167.

¹⁶⁹ “The US Exposed China's New Giant Early Warning Radar, Is China's Space Missile Early Warning Capabilities are Catching Up to the US?” (美曝光中国新巨型预警雷达，中国空间导弹预警能力直追美国?), *Aerospace Knowledge*, 6 May 2022, at https://www.thepaper.cn/newsDetail_forward_17969364 (Accessed 20 October 2022).

¹⁷⁰ 解码中国反导系统水平有多高：打卫星都没问题，(Understanding the Chinese Anti-Missile System's Standard Level, Hitting Satellites are no Issues), at <https://mil.news.sina.com.cn/jssd/2019-04-10/doc-ihvhiqax1423510.shtml> (Accessed 3 June 2020).

to detect and track enemy mid-range and long-range ballistic missiles, and then launch interceptors from land to fly on enemy ballistic missiles. It was intercepted in the middle, preventing it from flying over our country. The system composition of the land-based mid-range missile defense system is complex and technically extremely difficult" ... in theory, China 's land-based mid-range anti-missile technology tests are far more difficult to achieve than the US-made "Patriot" air defense missile system that intercepts only a few dozen kilometers of ballistic missiles at the end.¹⁷¹

While it may be advanced than the patriot missiles, but when compared to the US GMD interceptors or THAAD radar capabilities or the Aegis SM missiles, the analyses of the Chinese interceptor missiles still unclear. The Chinese do not have the sophisticated technology of the interceptors that the US or Russia have in their research and development. China also does not have many military bases like the US where it could install the missile defence radars. The Chinese could have that in the disputed islands of the South China Sea, but they do not have alliance partners like the US, nor do they have the ability to move freely in their ships like the US naval assets. The Chinese naval ability is still far from the US naval capability. Their JL-3 missiles that have been undergoing testing are yet to be deployed in the seas. However, while the Chinese may have tested several land-based mid-course missile interceptors in 2010, 2013, 2014, 2018, 2021, and 2022, their missile defence is still against IRBMs. Probably, the Chinese leadership probably wanted to keep it at the nascent stage as they do not believe that the Chinese should have a missile defence to counter US strategic missiles. In many ways, the Chinese through their NFU policy accept the reality that the US has an overwhelming advantage over the Chinese nuclear force.

¹⁷¹ China's Land-Based Mid-Course Anti-Missile Success Is More Difficult Than Patriot Terminal Interception", (中国陆基中段反导成功难度超爱国者末端拦截), at <http://mil.news.sina.com.cn/2013-01-28/0912714063.html> (Accessed 20 December 2022).

Hence, it makes no sense in terms of their nuclear policy to have as many interceptors as possible to counter the US and it is considered as a drain on the financial resources of the Chinese defence industry. Therefore, the Chinese leadership has intentionally kept the development of the missile defence at a nascent stage rather than go for a fully-developed national and theatre missile defence like the US. In other words, unless absolutely required, like in the South China Sea, the Chinese would be unwilling to develop and deploy missile defence in a large-scale basis. As the Chinese military sites in South China Sea require protection from the US naval and air assets in the sea and also in Philippines, the missile defence deployment only makes practical sense to the Chinese if they have to protect their air stripes being bombed by the US forces.

Apart from DF-41, DF-5B/C and DF-31A/G, other missile related developments show that China's missile strategy is to gain technological edge in the combat system holistically. Its responses are not confined to the nuclear missiles but also on dual capable ones. For instance, its DF-26 has enhanced its capability to achieve certain edge in terms of increasing capabilities in dual function (dual deterrence and dual combat). Scholars who do risk analysis see a problem of nuclear entanglement. However, nuclear entanglement is a problem encountered if there is a vertical path to escalation domination. If the US wants to achieve escalation domination in the conventional-to-nuclear ladder, the Chinese have no wherewithal to withstand the US military power. The execution of missile strategy is to make the US to forgo the option of escalation. In other words, while the Chinese strategic deterrence makes way for the Rocket Forces to be ready for nuclear counterattack, the missile strategy is to provide the Chinese with precise strike options without risking nuclear strike. Therefore, while upgrading its Second Artillery to Rocket Forces, unlike the Russian and Chinese, China left out nuclear or strategic from its identity. It is evident from the actual name of the Second Artillery, the Strategic Missile Forces.

The upgradation to Rocket Forces show that nuclear missiles while form the backbone of nuclear counterattack, it is only one of the responsibilities. The Rocket Forces by taking responsibility of its missile arsenal has shown that the missile strategy (integration of conventional and nuclear) has come under pressure because of the missile defence.

CHALLENGES:

China had further identified that despite the economic success, the Chinese science and technology is still far from achieving the integration of large-scale systems collectively called as the systems-of-systems (SoS) architecture.¹⁷² These capabilities are crucial if China was to achieve integration between its various equipment systems and interoperability between its services and an effective use of civilian dual use technologies and military assets. The Chinese leadership is cautiously avoiding an arms race with the US and focuses its resources on the economic development. Even the technologies that are useful for the missile defence, the Chinese would like that to have civilian impact on its science and technology industries rather than military use only. For instance, the integration of systems are required if China wants to further develop its economy on the basis of fourth industrial revolution. Thus, in the future, the Chinese will focus on dual-use technologies rather than only on military-use.

Moreover, the Chinese military organisations are still undergoing reforms and restructuring. They do not have the organisational or technological sophistication yet to handle technologically superior weapons systems. It would require the Chinese military to undergo various other operational command and personnel training in order to handle the complicated battle-space awareness. For instance, it is “necessary to adhere to training in combat and training in combat mode, and it is difficult to make good use of training activity platforms such as garrison training exercises and live-fire launches to accelerate the promotion of the rocket army’s strategic capabilities.”¹⁷³

The varied Chinese responses are catered to the local characteristics of the Chinese military. In other words, the leadership can only address and develop the kind of weapons system that the Chinese military has

¹⁷² Wang Mingzhe, “Large-scale Integrated System Architecture Research: Progress and Challenges” (大型集成系统体系结构研究进展与挑战), *Systems Engineering Theory and Practice*, 2008 (6): 163-170.

¹⁷³ *Ibid.*, note 164.

the capacity to handle in peacetime or wartime operations. Otherwise the Chinese troops would be overwhelmed by the kind of systems that are required and the expertise that they need to develop to train to handle such systems, especially in information warfare conditions. While the missiles themselves might not be an issue, but the software and the associated systems would require far more training at the brigade and battalion levels in missile bases, for both anti-missile brigades and nuclear missile bases.

CONCLUSION

CHINA, MISSILE DEFENCE AND IMPLICATIONS FOR INDIA

When Xi Jinping came to power, the overwhelming consensus was that the existing system had run out of steam to guarantee economic growth. While keeping this factor in mind, he instituted the most wide-ranging military reforms that the Chinese military had seen in decades. This is in line with the perception that after witnessing few decades of economic growth, unchecked corruption within the CPC and bureaucratic extravagance was affecting the legitimacy of the party (mainly by Hu Jintao's time). Therefore, the new Chinese leadership showed far reaching concerns about the Chinese military than before. However, the Chinese economic concerns always outweigh the military concerns. For instance, if China were to avoid the middle-income trap, there needs to be major economic restructuring to lead China from an investment-based economy to a consumption-based economy.

In addition, the lack of modernisation was widely visible. Xi Jinping came to power believing that the system required a major shakedown and vested interests have to be forcefully removed. Since 2012, he has initiated several reforms along with anti-corruption drives, re-designing the system to become accountable and also to counter political rivals opposed to his reform plans. Most importantly, he wanted the Chinese production to move away from low-technology to high-technology goods and encourage innovation and modern management system.

But the resistance to the Chinese reforms are plenty, and forceful centralisation of power together with top-down reforms have not been entirely successful under Xi's leadership. The answer is simple. Under Xi, the State-Owned Enterprises (SOEs) are still monopolising market share, and factories have not transitioned to high-technology goods, besides some select areas. In the Chinese view, therefore, the Belt and Road Initiative (BRI) would have to be pushed vigorously

given that the Chinese economy would take some more years to transition. In the meantime, the BRI is essential in keeping the Chinese economy from collapsing and to engage the over-capacity industries to be in economic activities in other countries, where the markets are yet to saturate.

Such struggles show that Xi is far from reaching the stature of Mao. His political rivals expect much more from him, especially to deliver on his promises to the Chinese public. In fact, the economic liberalisation and open information have made the Chinese people demand quality of life, including environmental protection, legal rights, reducing high health costs, and affordable living. Xi has surely focused on such reforms, but he has also strengthened party ideology and central authority to not only reduce the space for Western liberal values among the CPC cadres, but also preserve the Chinese socialism and CPC legacy.

The reforms and the restructuring of the Chinese military along with the anti-corruption drives show that while the economic and the political grip of the CPC is under question, and the vast resources are engaged to mitigate these issues, President Xi is equally concerned about military matters. Therefore, the decision to expand the robustness of the Chinese nuclear arsenal is going to continue. China has been strengthening its nuclear deterrence capabilities in response to the expanding missile defence deployments of the US in China's immediate and extended neighbourhood.

The Chinese responses to missile defence have to be understood in this larger context. While the concerns about missile defence are plenty, they are not to the level that the Chinese leadership would abandon its long-held policy of nuclear strategy and the limits it has placed on its arsenal. The perspectives on the missile defence and political purposes behind the US missile defence has led China to believe that responding to the US need for absolute security would be detrimental to Chinese interests and would lead it to the same path and fate as that of the Soviet Union. Even if these concerns are upheld widely amongst the Chinese leadership and the larger strategic community, equal caution is exercised to assess the extent of US technological success with regard to the missile defence performance in regional conflict. In fact, the assessment of the Saudi conflict shows that the Chinese still believe that asymmetric responses to missile defence are best and cheapest. A

patriot missile could be rendered incapable in response to a creative use of drone technology, thus giving false confidence to the states.

Therefore, the Chinese would continue to deploy countermeasures, including chaffs, decoys, dummy warheads, etc., to confuse the radars and other asymmetric methods, to counter missile defence rather than go for large-scale offensive or defensive deployments. Moreover, an analysis of their missile modernisation shows a more complex picture. The upgradation of the older liquid-fuelled missiles shows that their confidence in the solid-fuelled has not reached satisfaction level. Secondly, they believe in utilising the existing resources rather than go for newer missiles at all costs. Third, China has made substantial improvements in the deployment of the DF-41 missile. Once the technology matures, more options could be brought to the table. Moreover, they have once again shown the technology demonstration with regard to the hypersonic technology. While they conducted the glide vehicle test as showcased in the 2019 military parade, these hypersonic missiles, if developed and deployed, would pose a major challenge to the missile defence system that still struggles in terms of complicated target discrimination.

Therefore, the Chinese responses to missile defence echo a larger concern about the American geo-political motives in Asia. It is also tied to the US's desire for nuclear primacy and the struggle to maintain a credible nuclear retaliatory strike capability against the US homeland. Consequently, the strategic competition between China and the US is driving the intentions and motivations behind their respective deployment of sophisticated weapons systems. Overall, the Chinese response in this regard is to focus on asymmetric methods such as MIRV capability, thus not increasing the number of strategic missiles, rather opting for missile defence countermeasures and showcasing technology demonstration capabilities.

IMPLICATIONS FOR INDIA:

India being a member of Quad and strategic competitor of China in the South Asian region has reasons to be worried about the Chinese nuclear developments. India's nuclear weapons programme in part is aimed at maintaining a credible deterrence against Chinese missile strength. Moreover, the deployment of the Indian nuclear forces is

aimed at extending their range so that could be placed further away from the Chinese reach.¹⁷⁴ The primary aim of developing Agni V is to have a strategic deterrent against the Chinese nuclear forces. While the Indian ground-launched ballistic missile might pose a significant threat to the Chinese given the dominance it shows in its land-based missiles, India's sea-based deterrent provides a much better option.

The implications for India would come from the Chinese compulsion to have technology demonstration capabilities against the US. For instance, the initial missile defence capability of the Chinese could pose a threat to the Indian deterrence capability. However, given that India is developing sea-based deterrent, it would be possible for India to counter the Chinese missile defence. Currently, India has its own missile defence capabilities such as the Prithvi Air Defense (PAD), Advanced Air Defence (AAD) and Terminal Phase Missile Defence. But it may not have the capability to protect against ICBMs and also does not have target discrimination abilities.

While these capabilities could be discussed further, the implications for India are far reaching in terms of its future policy and present choices in the Indo-Pacific. For instance, while modernising the Indian nuclear forces might be a national decision by taking into considerations India's economic and political resources, but, like for China, it would have to be in the context of rising strategic competition between China and the US. The US nuclear primacy in Asia has been challenged by the growing sophistication of the Chinese and Russian missile strengths and the increasing bonhomie between Russian and Chinese leaders. The quickest way for the US to reassert its dominance and the leadership in the Indo-Pacific is to increase its nuclear deployments in the region and, at the same time, decrease the vulnerability that its nuclear forces faces from these missiles, including the North Korean nuclear missile threat. Therefore, the strategic competition has complicated the nuclear

¹⁷⁴ India Planning Missile To Target All of China From South Bases, July 14, 2018, at <https://economictimes.indiatimes.com/news/defence/india-planning-missile-to-target-all-of-china-from-south-bases-us-report/articleshw/59573600.cms?from=mdr> (Accessed 12 June 2020).

situation in Asia by bringing the nuclear deployment of these countries in the highly contested land and maritime borders in Asia.

India, on the other hand, faces complex challenges in its security environment. On the one hand, it has two nuclear neighbours with whom it has intense border disputes, and, on the other hand, it is actively involved with Japan, America and Australia in the Indo-Pacific strategy. But India's military modernisation is dependent on both Russian and, now growing, American arms exports. This has placed several challenges before the Indian decision-makers. This is more significant as China's maritime footprint in the Indian Ocean region increases and the Chinese nuclear submarines would be part and parcel of the Indian Ocean region. Also, both India and China are still modernising their submarine capability and thus have more instability in their relationship than the US-Russia nuclear balance.

Unlike China, India also does not have SLBM capability, contended to theatre ballistic missiles in its sea-based deterrence. INS Arihant has already made the deterrence patrol which shows that India would face continuing challenges in learning to operate the complicated machinery and would have teething problems faced by other countries earlier.¹⁷⁵ In fact, accidents are one way to understand the strides made in the military modernisation. In order words, unless new things are tried, accidents do not happen; thus it shows that the Indian deterrence patrols are going to learn from these mistakes like any other country and would improve safety procedures in the future.

Given that Indian Navy is intended on building more submarines,¹⁷⁶ it would add to the robustness of the Indian deterrence capability. However, the more the Indian capability is be added through

¹⁷⁵ India Did Major Damage to a New \$3 Billion Submarine By Leaving a Hatch Open", *The National Interest*, April 13, 2019, at <https://nationalinterest.org/blog/buzz/india-did-major-damage-new-3-billion-submarine-leaving-hatch-open-52292> (Accessed 30 June 2022).

¹⁷⁶ "Indian Navy plans to build 24 submarines, including six nuclear warships", *Business Today*, 29 December 2019, at <https://www.businesstoday.in/top-story/indian-navy-to-build-24-submarines-including-six-nuclear-warships/story/392809.html> (Accessed 5 May 2020).

technology indigenisation, technology imports and research and development collaboration, more will be the pressure on the Indian decision-making to take sides in the growing strategic competition. One of the major challenges facing the Indian military planners is that the missile defence enabled architecture has shown that the communication networks are becoming more secure and there are many ways in which the countries that are cooperating with each other can secure their networks from being compromised from the adversaries.

If India were to participate in the US Indo-Pacific strategy (and the growing defence cooperation with the US shows that it would be compelled to secure its communication networks), it would mean that it has to discard any foreign component in its weapons systems. A good example of this would be the Russian S-400 systems. For the US, the Russian systems are a risk to its interoperability with India and to have a system of secure communication networks. For the US, its weapons systems and interoperability are there to ensure that it can overcome the anti-access and anti-denial strategies against its operations. In the US view, for example, “the F-35’s stealth characteristics, information management systems, and electronic warfare capabilities might be compromised by any synergistic operations that would inevitably occur if India had already integrated the S-400 into its air defense network”.¹⁷⁷ If the US wants India to be a partner in the Indo-Pacific, then Indian defence and communication networks have to be effectively closed off to any other country’s weapon systems. The missile defence with its sophisticated communication and radar systems are one of the technologies that the US will be reluctant to accept.

Moreover, even as the Indian nuclear forces mature, they have to ensure that communication networks are secure. India’s missile defence programme thus faces a dilemma, of whether to maintain independence like the Chinese nuclear and missile defence system, or be integrated in to the US system like the Japanese Self-Defence Forces.

¹⁷⁷ How Can US-India Relations Survive the S-400 Deal?, at <https://carnegieendowment.org/2018/08/29/how-can-u.s.-india-relations-survive-s-400-deal-pub-77131> (Accessed 3 July 2022).

CHOICES FOR INDIA AND INDIA-CHINA NUCLEAR BALANCE:

India's nuclear strategy with regard to China is to force it to come to an understanding on nuclear balance and the use of nuclear forces on each other. It might also help in making Chinese view of India as a nuclear weapon state more pronounced. In other words, either through military modernisation or collaboration with other states, the purported strategy has to be to make China accept India as a nuclear weapon state. India's nuclear modernisation is still in the process of acquiring a reliable second-strike capability unlike the Chinese, who had achieved it in the late 1980s.

In the field of missile defence, like the Chinese, India is also a newcomer though it has benefitted from the closer cooperation with the US. Thus, in the coming future, there are many ways in which India's choices could evolve in the emerging nuclear environment. First, it is to be seen whether India would like to be part of the US defence architecture. As India and the US are expanding and deepening their cooperation, this would be a significant option available for India. For instance, India and the US has already signed the Communications Compatibility and Security Agreement (COMCASA)¹⁷⁸ and Logistics Exchange Memorandum of Agreement (LEMOA) and the third foundational agreement called the Basic Exchange and Cooperation Agreement (BECA) for geospatial cooperation. This would enable India to be part of the US defence architecture and rely on US information and communication system for war planning. Therefore, the Indian missile defence networks cannot be of Russian origin. If India decides to further sign documents increasing the defence cooperation between the US and Indian defence forces, then maintaining independence would cost India as it would neither be able to enjoy the full benefits of US

¹⁷⁸ India-US sign COMCASA: What is it and how does it help Indian defence?, *Business Standard*, 6 September 2018, at https://www.business-standard.com/article/economy-policy/india-us-sign-comcasa-what-s-what-and-how-it-helps-indian-defence-118090600988_1.html (Accessed 3 May 2020).

cooperation nor will it be able to integrate all its weapons systems fully as per the future of warfare based on network centric aspirations.

Secondly, if India wants to maintain independence, then it would have to look for indigenous ways to develop its own technologies and make vast efforts in the field of science and technology and high-science education, and retaining highly-skilled technicians and scientists within the country. However, like China, this would also require many ways of pooling national resources and long development cycles. Technological leaps are not possible without large scale structural changes in the country and long-term economic development.

Third, India has to develop a strategy that can co-opt these systems while maintaining some degree of independence and cooperation based on interests in specific areas of conflict. This strategy seems to be most popular among the Indian policy-makers as they grapple to retain certain autonomy in foreign policy decisions. However, this strategy comes with many pitfalls and difficulty in navigating differing and complex interactions between India and its strategic partners. If the understanding is for India to maintain strategic autonomy, then Indian defence policies would be subordinate to certain hierarchy of political principles. For instance, strategic autonomy assumes that India does maintain some autonomy or would be able to maintain autonomy in the decisions of consequences. However, the increasing strategic competition shows that maintaining autonomy while attempting to develop Indian economy, which requires extensive international cooperation, would not be possible.

In a strategically uncertain international environment, where India is dependent on technology that is available with the Western powers, it would be difficult to anticipate that India would not be able to avoid certain costs to its strategic independence. The possibility of India being asked to shoulder certain responsibilities in return for investment and technology in the development help that India seeks is high. The way for India is to rely on transfer of low and medium-technologies that has less relevance for the US, but will help the Indian system to absorb and mass produce such technologies. Focusing excessively on high-technology that the Indian infrastructure cannot absorb would be a waste of India's diplomatic resources. In other words, even if India wants to maintain independence in the missile defence architecture, it

would be difficult given the demand from India for high-technology. If high-technology is the strategic currency, then maintaining independence from US defence architecture would be difficult.

Therefore, the Chinese responses to US missile defence and the US responses in the post-Trump administration period have complicated the nuclear and missile deployments in the Indo-Pacific. In future, the US will attempt to deploy MRBMs in the Indo-Pacific in response to the increasing Chinese missile strength. If India is to protect itself from Chinese missile strength, then it has to become part of the US defence architecture, thereby ensuring that it has ample details about the tracking of the ballistic missiles. The protection of key Indian infrastructure from the Chinese missiles thus becomes key in this scenario. However, if India and China come to an understanding about the border dispute and resolve it, then these scenarios about Chinese missile attack would be less significant. Since India's concerns about Chinese nuclear and missile modernisation emerges due to its border dispute with China and the possibility of Chinese intervention in the India-Pakistan conflict, then any bilateral arrangement between India and China regarding certain security assurances would negate the need for India to become part of the US defence architecture.

The Chinese opposition to missile defence and its support to offense-based mutual assured destruction as a cornerstone of strategic stability clash with the current nuclear order. China does not accept and is uncomfortable with the changes in the US nuclear policy and the associated changes in the US extended deterrence in East and Southeast Asia. In many ways, India and China share similar views on the nuclear strategy and the extent of the role of nuclear weapons in modern warfare. However, the emerging nuclear environment might place India and China in different positions and supporting various measures that are at odds with each other.

The missile defence is going to increase China's missile edge compared to India. It would be time-consuming for India to develop a strategy that places missiles at the forefront. It would not create apprehension amongst the Chinese planners as they would believe that their missiles are far superior to the Indian ones regardless of lack of nuclear crises between the two countries. The missiles are China's trump card against

platform based US strategy that has huge weapons systems that could be targeted by ballistic or cruise missiles, and many of those operating far from its territory. In India's case, however, missile related strategy would be insufficient to instil confidence in its ability to counter the Chinese missile threat. The option for India is to develop asymmetric capabilities against the sophisticated missiles of China. This would require India to focus on cyber, unmanned and space-based capabilities to counter China. Most importantly, AI (Artificial Intelligence) research in military is crucial and might align with India's technological base.

Missile Defence is a complex system of inter-dependent capabilities. One might not fully understand the extent of its success in the near future. It might depend on the US's capability to harness its science and technology industry, to build its military-industrial complex, and its ability to share financial burden with its allies and partners. Whether India would want to be part of that system, not only to share the burden but to protect it against attacks, and be part of the closed and secure communication system, is a pertinent question to ponder upon. The military threat of China must be studied more carefully to ascertain how the Chinese military capability might play out in the India-China deterrence balance. In this regard, India's missile defence journey might be integrated with the overall assessment of affordability and utility.

China has considerably improved its missile defence capabilities which is generally thought as a way to counter the US nuclear superiority after the abolition of the ABM Treaty. However, the Chinese responses show a broader understanding that the US nuclear superiority is more than a competition to reduce the efficiency of the Chinese deterrence. The monograph shows that the responses of the Chinese state has been influenced by its identity as a missile power that had built considerable deterrence benefits without succumbing to nuclear arms race with the US.

Dr M. S. Prathibha is an Associate Fellow at the East Asia Centre in MP-IDSA. She researches on Nuclear policy and strategy of China, China's Elite Politics, military and strategic force modernisation, and East Asian security dynamics. She won the China Government Scholarship to read Political Theory and Mandarin at School of Marxism, Beijing Normal University. She is a Member of the Editorial Board of Strategic Analysis (Routledge). She received her doctorate from Chinese Studies Division, School of International Studies, Jawaharlal Nehru University. She has Master's in International Studies and Bachelor's in Mathematics.



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Manohar Parrikar Institute for Defence Studies and Analyses

No.1, Development Enclave, Rao Tula Ram Marg,
Delhi Cantt., New Delhi - 110 010
Tel.: (91-11) 2671-7983 Fax: (91-11) 2615 4191
Website: <http://www.idsa.in>