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# Is It Time for India's Rocket Force?

Bimal Monga

*Lacking conventionally armed, ground-launched missiles with which to attack enemy forces, or sufficient defences against China or Russia's conventionally armed, ground-launched missiles, American forces routinely lose war game simulations involving China and Russia, and could very well lose a real war.*

—Timothy A. Walton, 2019<sup>1</sup>

## Introduction

The future battlefield is likely to be largely contactless where unmanned warfare, stand-off weapons and cyber and clandestine operations will take precedence over tank vs. tank or hand-to-hand combat. Towards this effort all major countries are creating assets and organisations to consolidate their space assets, galvanise capabilities in cyber domain, provide a new edge to their special forces and fine-tune their hybrid warfare options. However an equally important focus has been on boosting missile inventories and redefining its employment philosophy. Over the years there has been an alarming proliferation of missiles all across the globe, as the technology to build them has become increasingly prosaic; today 31 countries are known to be in possession of ballistic missiles.<sup>2</sup> It is not without a reason that Ian Williams, a fellow at the Center for Strategic and International Studies

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(CSIS) feels that “... we are entering an era of missile renaissance.”<sup>3</sup> The missiles, today, are being increasingly envisioned for conventional use, leading to a serious rethinking on their employment. This, to a great extent, has been precipitated by China, who stole a march over the USA and Russia, by building her capacities and capabilities in rocketry—quietly, efficiently and surreptitiously, while both these powers were bound by the stringent provisions of Intermediate-Range Nuclear Forces Treaty (INFT) for over three decades. The breakdown of the INFT has given an impetus to the missile rivalry between the USA, Russia and China; inadvertently pushing many middle-level powers also into a new missile race. A matter of concern, to the world in general and India and the USA in particular, has been the phenomenal rise of China’s People’s Liberation Army Rocket Force (PLARF), whose burgeoning inventory of missiles, and their intended use, both in the strategic and conventional domains, has made the world take notice and weigh their options.

## PLARF

*I am not interested in nuclear weapons. They are not something to use. The more there are, the harder it will be for nuclear wars to break out. If a war breaks out, it will be a war of conventional weapons. If conventional weapons are used, the art of war, such as strategies and tactics, can be emphasized and commanders can change plans to suit the situation ...*

—Mao Zedong<sup>4</sup>

Chinese missile forces, which were under the command of the Second Artillery Force/Corps, have changed conspicuously in character over the last three decades; it has evolved into the potent PLA Rocket Force (PLARF) and elevated to the fourth military service. PLARF is today assessed to have approximately 2,500 ballistic missiles<sup>5</sup> in its inventory, and is designed to undertake two major types of warfighting campaigns:

the nuclear counter-attack campaign and the conventional missile strike campaign—to ensure strategic deterrence and conduct precision strikes.<sup>6</sup>

Importantly, while a number of countries maintained strategic assets as a means of deterrence or coercion, China introduced a new dimension to the matrix by deploying conventional missiles alongside the nuclear; embracing the idea that it would fight future wars, where the line dividing nuclear and non-nuclear operations would be blurred. More than half of the Rocket Force is, therefore, deployed to carry conventional loads to “conduct medium and long range precision strikes” jointly with air power against “key strategic and operational targets,” such as command and control facilities, communications and transportation nodes, air and missile defences, and airbases.<sup>7</sup> According to the US Department of Defense, the Rocket Force deploys DF-16 missiles with a range of about 800–1,000 km, DF-21 MRBMs, and the DF-21D anti-ship ballistic missile, in conventional role. In addition, it deploys about 1,200 short-range ballistic missiles and a number of CJ-10 ground-launched cruise missiles with a range of about 1,500 km<sup>8</sup> (Table 1).

**Table 1: Chinese Conventionally Armed Theatre Ballistic and Cruise Missiles**

Missile Type	Range (km)	Warhead (kg)	CEP(m)	Number of Inventory			
				1996	2003	2010	2017
<b>SRBMs</b>							
DF-11	280-350	500-800	500-600	Small	175	700-750	1,200
DF-11A	350	500	20-30	Number			
DF-15	600	500	300	Small	160	350-400	
DF-15A	600	600	30	Number			
DF-15B	600-800	600	5				
<b>MRBMs</b>							
Df-21C	2,500	500	50	0	0	36-72	108-174
Df-16 <sup>3</sup>	800-1,000	?	?	0	0	0	

IRBMs							
IRBM	5,000	500	30-300	0	0	0	Possible
Cruise missiles							
DH-10	1,500-2,000	400	5-20	0	0	200-500	450-1,250
ALCM	3,300	400	5-20	0	0	In inventory	

Source: Compiled from *Jane’s Strategic Weapons Systems Data* IISS, *The Military Balance* 1996, 2003, 2010 and 2015; and Office of the Secretary of Defense, “Annual Report to Congress, Military and Security Democracy Involving the People’s Republic of China,” Washington, D.C., 2010 and 2014.

PLA publications have repeatedly underscored the centrality of conventional missile attacks in joint operations aimed at achieving information dominance, air superiority, and sea control, as well as countering third-party intervention. The conventional missile force will be used against high-threat and high-value targets, either as an independent conventional missile strike campaign or as a key part of joint campaign involving other services.<sup>9</sup>

The philosophy and concept of employment of missiles by China, coupled with its ambiguous No First Use (NFU) policy, has thus upset the predictability of missile deterrence and triggered a re-assessment of options by major powers.

### Impact on the USA

*We can’t afford a force structure composed of a small number of silver bullets. It makes good sense to pursue a variety of delivery systems, trajectories, ranges, velocities, propulsion types and basing domains to support broad defense and deterrence goals; the future strike will almost surely include a mix of UAVs, cruise missiles, ballistic missiles and hypersonic glide vehicles ...*

—Tom Karako, CSIS, 2019

Under the Strategic Command (STRATCOM), ballistic missiles have served as the backbone of the US strategic nuclear deterrence since the late 1950s. The Bush Administration, in the *Nuclear Posture Review* (NPR) 2001, for the first time called for the integration of precision conventional weapons with strategic nuclear forces in a new category of “offensive strike weapons.” The Obama Administration, in the 2010 NPR, further stated that the Pentagon “is studying the appropriate mix of long-range strike capabilities, including heavy bombers as well as non-nuclear Conventional Prompt Global Strike (CPGS)...”.<sup>10</sup> During the latter years of the Obama Administration and early years of the Trump Administration, the United States expanded the scope of this research and development programmes into hypersonic capabilities.<sup>11</sup> These initiatives are consistent with an expanded rationale for long-range conventional strike weapons, in general, and hypersonic weapons, in particular. Michael Griffin, the Under Secretary of the US Defense for Research and Engineering, feels that while hypersonic weapons would serve as tactical, rather than strategic assets,<sup>12</sup> the Conventional Prompt Global Strike (CPGS) weapons would allow the US to strike anywhere on earth with conventional warheads, in as little as an hour; CPGS weapons, however, would not substitute for nuclear weapons, but would supplement its conventional capabilities. Further the increase in funding for Navy’s Conventional Prompt Strike (CPS) Programme, from around US\$ 278 million in FY2019 to US\$ 593 million in FY2020, is a reflection of the growing priority and interest of the US in moving the programme towards deployment.<sup>13</sup>

It is not that conventional missiles are new to USA, their destructive potential has been demonstrated earlier during the Gulf War, in Yugoslavia, Afghanistan, Iraq and Libya; however, this programme in recent times, to an extent, has been dictated by the potential of PLARF, whose missiles are today capable of targeting ships both at sea and bases ashore, not only in Asia (and India), but also far out at sea,

including the American mainland, Alaska, Guam and the Northern Marianas. Since the end of the Cold War, the US Navy had employed its aircraft carriers to bludgeon weaker enemies, by floating close to their shores to launch air strikes, confident that their warships were invulnerable. However, the PLARF missiles have proved to be a game changer and a great leveller in the power equation; the US now fears that the Chinese will employ swarms of cheap, expendable missiles which have the capability to neutralise their most sophisticated warships; this would not only erode the superiority enjoyed by the US, but also signal a return to highly contested warfare at sea.<sup>14</sup>

Thus, there has been a growing realisation in the US, that:

absence of effective conventionally armed, ground-launched missiles with which to attack enemy, or sufficient defenses against China or Russia's conventionally armed, ground-launched missiles, American forces routinely lose war game simulations involving China and Russia and could very well lose a real war.<sup>15</sup>

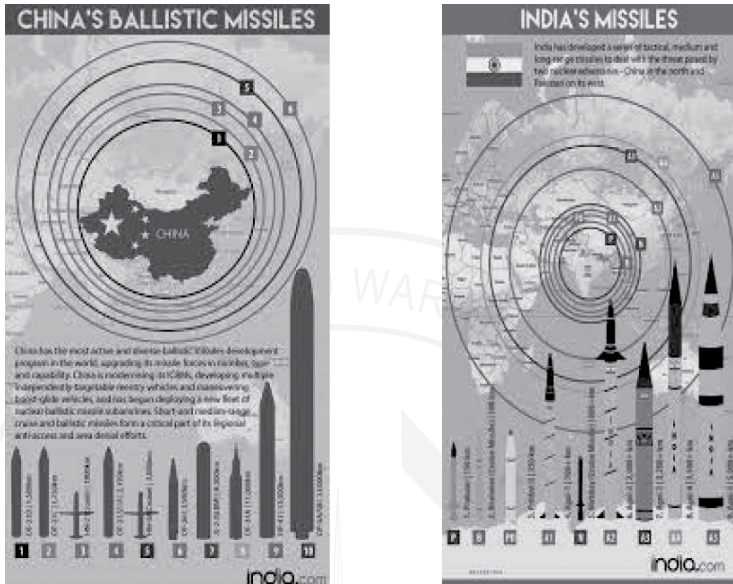
## Impact on India

*The sustained growth of Pakistan's nuclear arsenal and missile inventory, plus China's modernization of its nuclear forces and both nuclear and conventional missiles, presents an unprecedented complication for India's security.*

—Vinash Patel, 2013<sup>16</sup>

The Chinese primarily built its missile capability with an eye on the USA and Russia, but now has an intrinsic capability to use them against India too; and by all accounts this undeniably forms part of the Chinese calculus. India thus requires to seriously weigh its response options (Figure 1).

Figure 1: Comparison between Chinese and India Missiles



China's Ballistic Missiles<sup>17</sup>

India's Missiles

Source: Compiled from [www.india.com](http://www.india.com)

However, China's short, medium and intermediate range conventional missiles have the entire country and the seas beyond within striking range; and India has no answers to this threat, at present. The Chinese philosophy of warfighting propagates engaging the enemy initially in the cyber, space and information domain followed by (or concurrently) with an intense conventional Rocket Force campaign, to break the adversaries will to fight, right at the outset. While India has initiated some incremental steps in addressing and building capacities for warfighting in space, cyber and the clandestine/special forces domain, it is yet to come up with concrete measures or proposals to counter the conventional might of the PLARF.

The progressively precise PLARF missiles are capable of partially paralysing and disrupting our critical military and civil infrastructure at the very onset of a conflict, while ensuring that the engagement is kept

below the nuclear threshold; this indeed is a worrisome prospect for India. The omnipresent threat of Chinese conventional missiles is in itself coercive, during normal times; and if a war does break out, it can cause unacceptable damage and casualties. It goes without saying, that our existing missiles too *can* be used in conventional role; this however will require a concerted effort in terms of committing resources and building capacities, which is being discussed subsequently.

Imagine a scenario, where China launches an offensive, preceded by an intense missile campaign, targeting and crippling vital military and civil infrastructure, thereby causing widespread destruction, loss of morale and shaping of public opinion against the government. What are the response options available with India? Air strikes? Naval action or blockade? Ground action to capture shallow objectives? Defensive measures over a wide canvas? Diplomatic outreach? Maybe, all of the above. Thus a missile campaign, much expected and in tune with the Chinese warfighting philosophy, will invite a whole of nation (and armed forces) response right at the outset, which however, may still be ineffectual, and come with an attendant risk of escalating the situation. Now analyse the same scenario, if we had own credible conventional missile inventory? Would the Chinese still target us with missiles, fully aware that it may invite a similar and swift riposte?

So what are the options with India? Accept the inevitable and be resigned to live and fight in the shadow of conventional missile strikes, or initiate measures to safeguard own interests...

## Options for India

*Indian capital New Delhi is only 400 km away from Tibet; and from Indian borders to Beijing the distance is around 4000 km. PLA also holds credible missile defense capabilities, and it is perfectly capable of intercepting Agni V striking important targets in China. China's short*



*range tactical missiles can also constitute a sizable threat to India. If India wants to challenge China, India has to deploy several expensive ICBMs, which definitely will be a drag on Indian economy.*

—Chinese Strategic Analysts<sup>18</sup>

While India has articulated a nuclear (and NFU) policy and raised a robust SFC, the options to build capabilities to counter conventional missiles requires serious deliberations.

It goes without saying that defensive measures like camouflage, concealment, decoys, dispersion, duplication of critical assets, hardening of defences and air raids are inherent to any countermeasure; India, however, has primarily two broad options to negate, reduce or counter the impact of PLARF.

### **Ballistic Missile Defence (BMD)**

*Missile strikes on air bases would be part of opening salvos of a war by China.*

—Connor O' Sean<sup>19</sup>

The decision to go in for a ballistic missile defence, to shield ourselves from the adversaries to the North and West, is not an easy one. Conceptual opposition to BMD principally revolves around the idea that a missile shield emboldens the shielded state to take offensive actions on the false assumption that it is completely invulnerable to any retaliation.<sup>20</sup> A number of other pertinent questions too persist. Do we plan for a “Country Wide Deployment” or a “Limited Deployment”? Will Missile Defence upset the stabilising, mutual vulnerability balance, by making the effectiveness of a first strike uncertain? Will this spur the adversaries to develop larger arsenals, better technologies, penetration devices and countermeasures to thwart our BMD system?

And most importantly, does the astronomical cost and unproven technology warrant this endeavour? It is argued that even a successful Missile Defence System can never guarantee a 100 percent interception rate and the astronomical costs are prohibitive. As an example, the US continental system is estimated to have cost about US\$ 100 billion from 2002 till date; and though a pan-India system will cost much less, assessed to be anything between Rs. 50,000 crore to a staggering Rs. 250,000 crore, it will however still be unable to guarantee complete protection.<sup>21</sup> Limited and denser BMD deployment to cover important cities, economic centres and vital military and civil infrastructure may therefore be a better option.

Ballistic Missile Defence is thus one of the means, but not the only or the best way, to respond to the PLARF threat. A proactive strategy may therefore be more effective.

## Develop Own Conventional Missiles

*... global (missile) strike capability involves much more than just the delivery of a weapon to a target; it encompasses both the ability to plan rapidly, to apply the precision to the intelligence and gather that intelligence in a very rapid manner, and then to apply that intelligence to the target and understand the effect we want to create.*

—General Cartwright, Commander STRATCOM 2007<sup>22</sup>

It is widely accepted that a limited and state-of-the-art inventory of ballistic missiles, expensive but difficult to intercept, must be optimally employed as a first salvo, to punch holes in the adversaries' defence; a follow-up strike by a large number of cheaper cruise missiles, can thereafter, create opportunities for both ground and air forces to exploit and produce disproportionately effective results, both in terms of casualties and time.

Moreover, precision missiles are considered a particularly useful capability for a weaker nation to deter and create an element of doubt

for a larger and more powerful nation. The potential of conventional ballistic missiles, as a tool for signalling, diplomacy, propaganda, deterrence and retaliation, was validated in Iran's response to the US killing of the Islamic Revolutionary Guard Force Commander, Qasem Soleimani, in January 2020. The precise targeting, which prevented casualties to the US military personnel, not only confirmed the efficacy of Iran's conventional missile capabilities, but also reinforced the view that missiles can be effectively used by a weaker nation to achieve the desired strategic aim; and contrary to popular belief, also for averting further escalation.

India possesses a good expertise in the field of missiles and a dissuasive to credible strategic deterrence is already in place. However, at the same time, there exists no capacity or strategy to deter China from using conventional missiles against us. It is therefore imperative that India explores building alternative capacities, including inducting conventional ballistic missiles, to obviate being held hostage to the threat of long-range precision strikes by PLARF.

**Table 2: China and India's Land Based Strategic Ballistic Missiles**

CHINA/Type	Number of launchers	Year deployed	Range (kilometers)	Warhead x yield (kilotons)	Number of warheads
DF-4	~10	1980	5500+	1 × 3300	~10
DF-5A	~10	1981	13,000+	1 × 4000–5000	~10
DF-5B	~10	2015	~12,000	3 × 200–300	~30
DF-15	?	1990	600	1 × ?	?
DF-21	~80	1991, 2000, 2016	2150	1 × 200–300	~80
DF-26	?	(2017)	4000+	1 × 200–300	?
DF-31	~8	2006	7000+	1 × 200–300	~8
DF-31A	~25	2007	11,000+	1 × 200–300	~25
DF-41	n.a.	?	?	n.a.	n.a.
<b>INDIA/Type</b>					
Prithvi-2	~24	2003	250	1 × 12	~24
Agni-1	~20	2007	700+	1 × 40	~20
Agni-2	~8	2011	2,000+	1 × 40	~8
Agni-3	~4	2014?	3,200+	1 × 40	~4
Agni-4	N.A.	(2016)	3,500+	1 × 40	N.A.
Agni-5	N.A.	(2017)	5,200+	1 × 40	N.A.

Source: Hans M. Kristensen and Robert S. Norris, "Indian Nuclear Forces, 2015," *Bulletin of the Atomic Scientists*, vol. 71, no. 5, 79. <http://www.tandfonline.com/doi/pdf/10.1177/0096340215599788?needAccess=true>; (December 7, 2019).<sup>23</sup>

Towards this endeavour, India has the twin advantage of a relatively advanced expertise in the field of missile technology and a predominantly indigenous production line. However the decision to go in for conventional missiles is not going to be easy, it will require rigorous operational analysis, a critical cost-benefit appraisal and most importantly, immense political dexterity; it will also come with its own share of challenges—much more demanding, elaborate and complex, than just screwing conventional warheads in place of nuclear ones. An entire ecosystem, interrelated capabilities and checks and balances, will have to be built on or independent of the existing strategic infrastructure, to support induction and employment of conventional missiles. Some important and inescapable prerequisites will be:

- **Intelligence, Surveillance and Reconnaissance (ISR):** There is a requirement to improve our real-time surveillance and target acquisition capabilities to enable quick and precise engagement of targets, ensure effective Battle Damage Assessment (BDA) and follow-up strike capability.
- **Missiles:** Increased precision/accuracy (smaller CEP), improved navigation system, different ranges, a rapid launch capability and survivability are a must for conventional missiles. According to the Chinese military expert Ge Lide, India presently faces many technological difficulties, especially in developing solid-propellant rocket engine and inertial navigation components. In the field of high-performance and high-precision “Inertial Navigation Systems” India does not have independent capabilities. Till the time these technical capabilities are developed Indian missiles’ ranges and kinematic accuracy will be negatively impacted.<sup>24</sup>
- **Architecture:** The envisaged Force’s architecture, including an efficient Command and Control organisation, doctrine and tactics will require deep analysis and formulation.

- **Logistics:** Life of missiles and warheads, their maintenance, storage and movement warrants special attention.
- **De-risk:** Measures to reduce confusion between launch of a conventional and nuclear missile will have to be instituted.
- **Re-articulation** of Nuclear Policy/NFU?

Sceptics may argue that such an initiative by India may lead to a missile race in the region with Pakistan joining in to counter India with its own conventional missile force. However, this argument may be flawed, as we do not require to launch conventional missiles to target Pakistan, as our Lenticular Re-entry Vehicle (LRVs) and aircraft are sufficient to cover the requisite frontage and shallow depth of Pakistan; launch of a missile towards the west would only be a riposte to a strategic or a conventional strike by Pakistan; this fact is well understood and could be publicly reiterated.

Another red flag by the naysayers could be—that our adversaries may not be able to distinguish between the launch of a conventional and a nuclear missile; this has the potential to result in an accidental or inadvertent nuclear exchange. But the same logic is applicable to China, who has already mixed two warheads with impunity, fully aware of the attendant nuclear escalatory risk. But will nuclear escalation be immediate? A targeted country is unlikely to instinctively assume that a missile launched is nuclear tipped or for a disarming attack and immediately go in for a nuclear riposte; the stakes for any nation are simply too high. It is more likely that a country will absorb the first strike, rule out a worst-case scenario and then retaliate proportionately. A well articulated nuclear policy emphasising on NFU, along with a policy on employment of conventional missiles, with sufficient checks and balances in place, should put to rest such assumptions and fears.

## Benefit and Risk Analysis

*In the China-India context, respect for capabilities enhances the chances of engaging each other in negotiations.*

—Lora Saalman, 2013<sup>25</sup>

Induction of conventional missiles will add a complementary capability and augment India's conventional strike prowess; further, if appropriately postured, it will minimise our vulnerability to an attack. At the same time attendant risks are the same that any country fielding a conventional missile faces. It is finally for the policy and decision makers to judge whether the escalatory risks due to land-based missiles will outweigh their strategic and operational benefits.

**Benefits:** Developing a conventional missile capability will accrue some of the benefits listed below.

- Deter China from using/threatening India with its conventional missiles.
- Provide an option to use this potent capability to cause damage/destruction in event of an all-out conflict.
- Impose “caution and cost” of developing countermeasures on adversaries.
- Suppress Chinese airbases, target missile launch sites and Transporter-Erector-Launchers (TEs) and interdict communication arteries.
- Ability to acquire and engage opportunity and fleeting targets.
- Conventional missiles require a high state of readiness and reliability (exceeding 90 per cent); they thus will be able to respond promptly after a decision to launch is taken.
- It would not only lead to developing capabilities required for future wars, which are likely to manifest primarily in the non-contact domain, but also send across an important signal of capability and resolve to the adversary.

**Risks:** A slew of measures will require to be instituted to significantly pare the risks.

- Enunciating a well-formulated policy on employment of conventional missiles.
- No country would use nuclear missiles as a means of war initiation; nuclear weapons, *if used*, would be for war termination by a desperate country at the cusp of defeat. Therefore, though the inability to distinguish between a nuclear or conventional missile is a very important concern and risk, any missile launched cannot be assumed to be a nuclear missile, without positive identification. However, some measures being discussed by experts to mitigate this risk include:<sup>26</sup>
  - High-level and continuous military-to-military and political contact, consultations and discussions to keep adversaries informed about the observable and distinguishing differences between conventional and nuclear ballistic missiles.
  - Deploying conventional missiles on mobile launchers, horizontally in earthen berms, or above the ground, rather than in hardened, vertical silos used at nuclear missile bases.
  - Altering or depressing the trajectory of ballistic missiles armed with conventional warheads so that they do not mirror the trajectories followed by nuclear-armed ballistic missiles.
- Another destabilising concern is the inability to reassure adversaries that such missiles will not threaten or target nuclear forces, as this may invite a strategic response.
- Though conventional missiles contribute towards conventional deterrence, it however tends to be more dynamic than nuclear deterrence as the potency of conventional weapons is much lesser than that of nuclear weapons. It has been assessed that a small force of conventional missiles is not powerful enough to pose a credible conventional deterrence.<sup>27</sup>

- Building of conventional missile capacities and capabilities is an expensive endeavour; it will be taxing and financially draining to maintain such a force, that too in a continuous state of high readiness. Moreover, ballistic missiles are an expensive system to deliver high explosives. During extended and high-intensity wars, it may be cost-prohibitive to rely exclusively on such expendable missiles rather than on reusable delivery means like aircraft. Rough studies have shown that even a high rate of aircraft attrition, of say 5 per cent, i.e., one aircraft lost in twenty sorties, is not sufficient to make the use of ballistic missiles a cost-effective proposition, for conventional deep-strike missions.<sup>28</sup> However, if a number of fixed targets are to be addressed concurrently over a short span of time, ballistic missiles armed with potent payloads, is an effective choice.
- Lastly, as discussed earlier, it may lead to a missile race in the region with Pakistan too joining in; but then, does not Pakistan, by proxy, already have this capability available on a platter?

### **Prognosis**

India requires developing new operational concepts and capabilities, in tune with assessed future wars. To counter the PLARF (and other adversaries' missiles), we must go in for a limited BMD, to cover important cities, command and control, and economic centres, critical infrastructure and strategic assets; concurrently steps to develop capacities facilitating induction of conventional missiles into our inventory, is a must. Strategic, political and financial considerations will dictate the architecture and scale of such a conventional missile force. The decision whether the missiles will be incorporated into the existing SFC structure or in a stand-alone configuration, or as part of any other service or arm, is secondary and presently infructuous. Measures to obviate the identified risks should form part of a well-articulated conventional missile employment policy, concomitantly with a review of Nuclear (and NFU) Policy. Denial and



deception measures like hardening of defences and storages, dispersing and duplicating critical assets, to make it difficult for the adversary to locate and strike key platforms, is a continuous and ongoing process, and must be persisted with.

## Conclusion

*Deterrence is simply the persuasion of one's opponent that the costs and/or risks of a given course of action he might take outweigh its benefits.*

—Alexander L. George and Richard Smoke<sup>29</sup>

India has been a silent neighbour, observing with concern the pace, alacrity and aggression with which the Chinese armed forces have modernised and reorganised. We, however, do not require to mirror or react to all the Chinese military developments, as this would just push us into an “excessive spending and spreading thin” trap; what is required is a prudent and long-term vision to build capacities and capabilities in tune with assessed future warfighting by our adversaries. While India has initiated some measures to keep pace with the changing environmental realities, there have been no concrete steps to counter the formidable capabilities or coercive signalling and intimidation inherent to PLARF. Developing conventional missiles is not an all-encompassing panacea, but one of the many military instruments and options to counter PLARF and prepare for future wars. The long fructification period to raise such a force with the desired capabilities and characteristics necessitates a well-informed but a prompt decision by the policymakers keeping in mind the security of the country.

## Notes

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