

LET THE SPIRIT OF FREEDOM TOUCH NEW SKIES.  
HAPPY INDEPENDENCE DAY, INDIA



AIR POWER

Vol. 10 No. 3 • Monsoon 2015 • (July-September)



OVER 60 YEARS, 5 AIRCRAFT TYPES, 1 NATION  
TOOFANI | MYSTERE IV | ALIZE | JAGUAR | MIRAGE 2000

[www.rafale.co.in](http://www.rafale.co.in)



# AIR POWER

*Journal of Air Power and Space Studies* Vol. 10 No. 3 • Monsoon 2015  
(July-September)



## Contributors

- Dr. Manpreet Sethi • Group Captain P A Patil  
• Group Captain Vivek Kapur • Wing Commander R K Narang  
• Dr. Sumati Sidharth • Group Captain Manoj Kumar • Dr. Stuti Banerjee  
• Ms. Hina Pandey • Commander Yogesh V Athawale • Ms. Swati Arun

CENTRE FOR AIR POWER STUDIES, NEW DELHI

boeing.co.in

# TOGETHER. BUILDING THE FUTURE.

Boeing is proud of its longstanding partnership with India. A partnership India can depend upon to meet its developing requirements, from surveillance, strike and mobility platforms to C4ISR, unmanned systems and support services. The most advanced systems and technologies providing the greatest value for India today and tomorrow.



## CENTRE FOR AIR POWER STUDIES

### SUBSCRIBE NOW

	<b>DEFENCE AND DIPLOMACY</b>	
	IN PURSUIT OF NATIONAL SECURITY	
VOL. 4 NO. 4	ISSN 2347 - 3703	JULY-SEPTEMBER 2015
	<ul style="list-style-type: none"> <li>Analysing the Greek Crisis and Similarities with India <i>Nitin Gadkari</i></li> <li>Challenges of the Security Transition in Afghanistan Post US Drawdown <i>Shalini Chawla</i></li> <li>Al Qaeda to Islamic State: A Lesson Failed <i>Aersh Danish</i></li> <li>Post-Earthquake Nepal and the Constitution: An Opportunity Missed for an Inclusive and Fair Constitution? <i>Uday Deshpande</i></li> <li>China's Foreign Policy Towards Sri Lanka: Implications For India <i>Shaheli Das</i></li> <li>Assessing the Challenges of Detering China <i>Swati Arun</i></li> <li>India-China Military Space Cooperation: Evolving Beyond Joint Statement to Engagement <i>Kiran Krishnan Nair</i></li> <li>China's Military Aviation Industry <i>Ravinder Singh Chhatwal</i></li> <li>Cyber Security Challenges for India: An Assessment of its Preparedness <i>E. Dilipraj</i></li> </ul>	
	JOURNAL OF THE CENTRE FOR AIR POWER STUDIES	

### SUBSCRIPTION RATES

<b>In India</b>	<b>Rs. 225/- per copy</b>	<b>Rs. 800/- per annum (4 Issues)</b>
<b>Overseas</b>	<b>US \$ 35 per copy</b>	<b>US \$ 130 per annum (4 Issues)</b>

TO SUBSCRIBE CONTACT:

KW PUBLISHERS PVT. LTD.  
4676/21, ANSARI ROAD, DARYAGANJ, NEW DELHI 110 002  
T: +91.11.23263498 / 43528107 • E: KNOWLEDGEWORLD@VSNL.NET • W: WWW.KWPUB.COM



# *AIR POWER*

**Journal of Air Power and Space Studies**

Vol. 10 No. 3, Monsoon 2015 (July-September)



## **CENTRE FOR AIR POWER STUDIES**

### **VISION**

To be an independent **Centre of Excellence on National Security** contributing informed and considered research and analyses on relevant issues.

### **MISSION**

To encourage independent and informed research and analyses on issues of relevance to national security and to create a pool of domain experts to provide considered inputs to decision makers. Also, to foster informed public debate and opinion on relevant issues and to engage with other think tanks and stakeholders within India and abroad to provide an Indian perspective.



## **AIR POWER**

CENTRE FOR AIR POWER STUDIES

New Delhi

*AIR POWER* is published quarterly by the Forum for National Security Studies for Centre for Air Power Studies, New Delhi.

### **Board of Trustees**

Shri **M.K. Rasgotra**, former Foreign Secretary and former High Commissioner to the UK **Chairman**  
Air Chief Marshal **O.P. Mehra**, PVSM, former Chief of the Air Staff and former Governor Maharashtra and Rajasthan  
Air Chief Marshal **S.P. Tyagi**, PVSM AVSM VM, former Chief of the Air Staff  
Secretary Defence (Finance), Ministry of Defence, 139 South Block, New Delhi (Ex Officio)  
Dr. **Sanjaya Baru**, former Media Advisor to the Prime Minister  
Captain **Ajay Singh**, Vice President, Jet Lite Airways, former Deputy Director Air Defence, Air HQ **Managing Trustee**  
Air Marshal **Vinod Patney**, SYSM PVSM AVSM VrC, former Vice Chief of Air Staff and Director General, Centre for Air Power Studies (Ex Officio)

AIR POWER Journal welcomes research articles on defence, military affairs and strategy (especially air power and space issues) of contemporary and historical interest. Articles in the Journal reflect the views and conclusions of the authors and not necessarily the opinions or policy of the Centre or any other institution.

**Editor-in-Chief** Air Marshal **Vinod Patney**, SYSM PVSM AVSM VrC, (Retd)  
**Editor** Dr Manpreet Sethi  
**Distributor** KW Publishers Pvt. Ltd.

All correspondence may be addressed to

Editor-in-Chief  
AIR POWER  
Arjan Path, Subroto Park, New Delhi 110 010  
Telephone: (91.11) 25699131-32 Fax: (91.11) 25682533  
e-mail: [diroffice@aerospaceindia.org](mailto:diroffice@aerospaceindia.org)  
[capsnetdroff@gmail.com](mailto:capsnetdroff@gmail.com)  
website: [www.capsindia.org](http://www.capsindia.org)

© Centre for Air Power Studies

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system without permission from the Director General, Centre for Air Power Studies, New Delhi

ISBN: 81-87966-30-0

AIR POWER Journal is published four times a year and is distributed by  
**KW Publishers Pvt. Ltd.**  
4676/21, First Floor, Ansari Road, Daryaganj, New Delhi 110 002  
Telefax: 23263498 e-mail: [knowledgeworld@vsnl.net](mailto:knowledgeworld@vsnl.net)

Printed and Published by Air Marshal Vinod Patney (Retd) on behalf of the Forum for National Security Studies (the Trust running the Centre for Air Power Studies, New Delhi) and Printed by Glorious Printers, 1597-98, Pataudi House, Daryaganj, New Delhi 110002 and Published at P-284, Arjan Path, Subroto Park, New Delhi 110 010.

RNI REGN No. DELENG/2006/18450



# CONTENTS

Vol. 10 No. 3, Monsoon 2015 (July-September)

<b>Editor's Note</b>	v
1. <b>DETERRENCE IN OUTER SPACE: THE US WAY</b> <i>Manpreet Sethi</i>	1
2. <b>CYBER ATTACKS ON SATELLITES: A PARADIGM SHIFT IN ASAT APPLICATION</b> <i>P A Patil</i>	17
3. <b>COST-EFFECTIVENESS AND UTILISATION OF AIR POWER IN FOURTH GENERATION WARFARE</b> <i>Vivek Kapur</i>	33
4. <b>"DESIGN AND MAKE IN INDIA": MILITARY AIRCRAFT</b> <i>R K Narang</i>	59
5. <b>MANAGEMENT OF STRATEGIC RESEARCH AND DEVELOPMENT IN DEFENCE</b> <i>Sumati Sidharth and Manoj Kumar</i>	79
6. <b>THE UNITED STATES AND IRAN NUCLEAR DEAL</b> <i>Stuti Banerjee</i>	95
7. <b>AN ASSESSMENT OF NPT REVIEW CONFERENCE, 2015: EXPECTATIONS, OBLIGATIONS, DILEMMAS AND OPPORTUNITIES</b> <i>Hina Pandey</i>	111

8. **EXTRA-REGIONAL POWERS IN IOR:  
IMPERATIVES FOR INDIA** 137  
*Yogesh V Athawale*
9. **THE PROBLEMS WITH CHINA'S XINJIANG POLICY:  
LINKAGES BETWEEN DOMESTIC AND  
EXTERNAL BEHAVIOUR** 161  
*Swati Arun*



## EDITOR'S NOTE

Space, nuclear issues and geo-politics continue to dominate discourses on strategic issues.

The salient position that space occupies in the American scheme of things is well known. More particularly, the American military is so heavily dependent on space assets that space control is an essential prerequisite before any military action is envisaged. Although China's space potential is increasing rapidly, the gulf between the space capability of the US and any other country is vast. Therefore, it follows that loss of some space assets will have a far more debilitating impact on the US than on any other country. There are many ways to interfere with the adversary's space capability, and technology is fashioning even more effective means to interfere with the functioning of space assets and, may be, ensuring deniability as well. Some means readily available to many space-faring nations are cyber attacks, direct ascent to attack missiles, co-orbital satellites, Directed Energy Weapons (DEWs), jamming, etc. **Dr Manpreet Sethi**, in her article on the choices with the US, argues that there are many initiatives taken by the US to ensure not only space supremacy but also total space control. However, the US is fast recognising that offensive action may not be the best option and is now joining other countries in adopting confidence-building measures. The US is also joining other countries in a complementary and coordinated endeavour to ensure that space remains a 'global commons'.

Still on the subject of space, **Gp Capt P A Patil** argues that 'direct attack Anti-Satellite (ASAT) operations' no longer comprise the method of choice to hinder the adversary's space capability. A paradigm shift has taken place towards soft kills, temporary or permanent. The options available are many, and growing. These include interference with communication links through cybernetic attacks, jamming, hacking of computer controlled systems, etc.

These options have the added advantage of deniability. Again, to interfere with space assets, access to space may not be necessary as it is easier to interfere with, or damage, ground-based control stations.

The manner in which conflicts are prosecuted is rapidly changing and the spectrum of conflict is continuously enlarging. Yet air power continues, and will continue, to play a major role in the conduct of war, including fourth generation warfare. However, it is prudent to analyse the cost-effective way to do so. In a relatively detailed and well analysed study, **Gp Capt Vivek Kapur** discusses the strengths and weaknesses of different weapon systems to recommend a cost-effective use of air power. A highly recommended read.

Ever since the prime minister spoke of "Make in India", the phrase has excited the imagination of many. In the military domain, the concept is particularly relevant. **Wg Cdr R K Narang** examines the issue with a view of determining what is feasible. He gives his view of what can and should be done. He covers the historical background and warns that as we move forward, we are likely to encounter many commercial, legal and other pitfalls, particularly as the profit motive will remain a cardinal factor. He cautions that we must be careful of the military, bureaucratic, industrial and political combine. A very important recommendation is that we must find ways to enhance our skill levels, both qualitatively and quantitatively.

**Sumati Sidharth and Manoj Kumar** question why strategic Research and Development (R&D) in the defence sector is lagging behind whilst that is not the case in other sectors. They argue that the Defence Research and Development Organisation (DRDO) should have done much better, given that it has a captive market and the funding is also reasonable. One of the many recommendations is that DRDO should be more open and approachable. Also, the tendency to operate within silos both within DRDO and without should be eschewed.

This issue carries two articles on nuclear matters. Much has been written about the 'Iran nuclear deal', and when **Stuti Banerjee** wrote the article, it was very much a 'work in progress'. Even though the US Congress has failed to stop the deal, there are still many bridges to cross and more articles



on the subject will find a place in future issues of our journal. Stuti traces the history of US-Iran relations and argues that the deal is good for both the US and Iran, and both countries need to have it implemented in letter and spirit. She touches on regional imperatives as well.

The second article on nuclear matters is by **Hina Pandey**. She essays an assessment of the nuclear Non-Proliferation Treaty (NPT) Review Conference, 2015. Possibly as expected, not much came of the deliberations and a formal final document proved elusive. The conference was marked for the salience given to the humanitarian impact. With so little gained by the Review Conferences, possibly it is time for a relook at the functioning of the NPT.

China's growing presence in the Indian Ocean Region (IOR) is a cause for concern. It poses a challenge to the other players in the region and has led to a complex interplay of global politics and economics. **Cdr Yogesh V Athawale** traces the history and seeks answers to what India should do to retain regional leadership and ensure that the Indian Ocean remains a zone of peace. He has done a scholarly study and his recommendations are worth reading even if some may have differing views on their viability.

Xinjiang and the Uighur movement will possibly remain a thorn for China for some time at least. It stands to reason that in a large country like China, an authoritarian central government has to exercise strict control over a peripheral region. China also has to be careful over the possible impact of the Uighur movement on Tibet. It is a complicated situation and **Swati Arun** tries to demystify China's approach to the region.

Happy reading.



# DETERRENCE IN OUTER SPACE: THE US WAY

**MANPREET SETHI**

Strategic stability between the US and USSR during the Cold War was anchored in deterrence based on mutual vulnerability or Mutual Assured Destruction (MAD). It is assumed that in outer space too, deterrence based on reciprocal ability to cause destruction would apply amongst the major space-farers to keep acts of extreme disruption at bay. So, as the stakes of nations and private players would grow, so would the vulnerabilities of each, individually and collectively. This then, it is expected, would prevent any one player from taking steps that could be destabilising for all others as well as for self.

While this appears pragmatic in theory, it is equally true that the vulnerabilities of different space players are currently poised at different levels. At this juncture, the US has the maximum dependence on space for civilian and military activities. More than 60 percent of all global civil space expenditure and 80 percent of the world's military activity is undertaken by the USA. Close to half of all satellites in orbit – 528 out of 1,265 – are American.<sup>1</sup> It is small wonder then that Bob Work, US deputy secretary of defence, while addressing the American space community at a conference in April 2015 said, "Space is deeply enmeshed in our force structure and is central to our way of deterring, assuring and war-fighting".<sup>2</sup> Obviously,

---

Dr **Manpreet Sethi** is an ICSSR Senior Fellow at the Centre for Air Power Studies, New Delhi..

1. Guilhelm Ponent, *Space in a Changing Environment: A European Point of View* (Paris: IFRI, April 2015), p. 4.
2. Jim Garamone, "Work: Space Domain Presents Challenges, Threats", US Department of Defence Press Release, April 16, 2015.

**As existing space-faring nations become more deeply invested in space, and as more players – state and private – join hands in this endeavour, common sense tells us that the risk of warfare in space should recede for the mere fact that it would affect far too many players and not allow for selective targeting.**

the USA also has the maximum to lose in the case of any disruption of the space environment. As graphically stated by the US Deputy Assistant Secretary of Defence for Space Policy, Douglas Loverro, “US space capabilities allow our military to see with clarity, communicate with certainty, navigate with accuracy, and operate with assurance”<sup>3</sup>. While this translates into a huge advantage, it also spells a vulnerability that the US is, of course, well aware of, and working towards redressing. Russia and Europe too are dependent on space. But less than the USA. And, countries like China and India are yet to become overly dependent on the medium, hence, their vulnerabilities are also comparatively lower compared to others, though certainly higher than what they may have been a decade ago. As existing space-faring nations become more deeply invested in space, and as more players – state and private – join hands in this endeavour, common sense tells us that the risk of warfare in space should recede for the mere fact that it would affect far too many players and not allow for selective targeting.

However, national ambitions that are aimed at wresting space control and denying freedom of access in outer space to others lead to responses of hedging that can easily cause mistrust and misjudgment of each other’s actions and intentions. So, as each tries to safeguard his freedom of action, the result may eventually be a tendency to step on the other’s toes triggering off an unwanted and inadvertent escalation. The offence-defence spiral that has played out on Earth so many times and in the case of so many weapon systems, can very well repeat itself in outer space too. As Kenneth Waltz had rather presciently stated, “As ever, dominance coupled with immoderate behaviour by one country causes others to look for ways to protect their

---

3. Statement of Douglas Loverro, deputy assistant secretary of defence for space policy, before the Senate Committee on Armed Services, April 24, 2013.

interests".<sup>4</sup> Nothing indicates that outer space would be immune from this tendency.

Since the USA is the current leader in this high ground and its actions have a widespread and profound impact on those of others, it would be instructive to examine the contemporary American thinking on how it believes it could/should exercise deterrence in outer space. This paper undertakes an examination of the US National Security Space Strategy declared in 2011. Based on this study, the paper will identify the current US approach to the concept of an International Code of Conduct (ICoC).

#### US NATIONAL SECURITY SPACE STRATEGY, 2011

Through the years of the presidency of George Bush Jr from the early 2000s, the US seemed to believe that it could individually dominate outer space owing to its superior investments in the domain through the Cold War period. Space dominance was indeed the flavour of all US space vision documents that were written during this phase. The US National Space Policy, 2006, adopted a belligerent and nationalist tone when it rejected "any limitations on the fundamental right of the US to operate in, and acquire data from, space". In doing so, it even emphasised that the US was prepared to take unilateral action to "dissuade, deter, defeat and, if necessary, deny, any space related activities that are hostile to its interests".<sup>5</sup> The policy clearly stated that "freedom of action in space is as important to the US as air power and sea power." This was interpreted by a British newspaper in these words, "Space is no longer the final frontier but the 51st state of the

**The US National Space Policy, 2006, adopted a belligerent and nationalist tone when it rejected "any limitations on the fundamental right of the US to operate in, and acquire data from, space". In doing so, it even emphasised that the US was prepared to take unilateral action to "dissuade, deter, defeat and, if necessary, deny, any space related activities that are hostile to its interests".**

---

4. Scott D Sagan and Kenneth N Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (New York: WW Norton, 2003), p. 149.

5. White House, National Science and Technology Council, "National Space Policy, 2006". Available at <http://www.ostp.gov/>

United States.”<sup>6</sup> Consequently, the US openly opposed development of any new laws that could restrict or prohibit its access to, or use of, outer space.

This remained the tone of the US space policy until 2011, when the next iteration of the policy came along. The new version was formulated against the backdrop of two changed realities. The first, of course, was the change in the occupant of the White House. With a Democrat president, the general approach to space security was one that did not favour weaponisation of space and was more inclined towards multilateralism. The space policy accordingly came to be premised on a concept of “collective assurance”.<sup>7</sup> This was to be created through interdependence based on international agreements and cooperative operational tactics and procedures. Throughout his two presidencies, Obama has emphasised multilateral diplomatic approaches to resolving contentious issues. It is interesting that the latest National Security Strategy that President Obama released in February 2015 also lays emphasis on a rules-based international order. This focus of his Administration has been reflected in the country’s approach to space issues too.

The second change in the environment was brought about by the evident display of the space and counter-space capabilities of China. In fact, in the year 2010, China equalled the number of American launches at 15 satellites.<sup>8</sup> And, in 2011, it surpassed the USA by reaching the figure of 18 launches in one year. On the counter-space front, in January 2007, China had already conducted an Anti-Satellite Test (ASAT) which displayed the ability to hit another satellite with a kinetic kill vehicle. Later the same year, China launched its first lunar probe, the Chang’e, which brought back scientific data and a map of the Moon to successfully establish China’s credentials in deep space exploration. In 2008, with the successful launch of the Shenzhou 7, which took three men on a three-day mission to outer space, China became the third country to have an astronaut perform a space walk. In 2010, China demonstrated a successful Ballistic Missile Defence (BMD) intercept and also launched a second lunar probe, the Chang’e 2. In September 2011,

---

6. Bronwen Maddox, “America Wants it All – Life, the Universe, and Everything”, *The Times*, October 19, 2006.

7. Christopher Stone, “Re-thinking the National Security Space Strategy: Chinese Vs American Perceptions of Space Deterrence”, *The Space Review*, November 4, 2013, <http://www.thespacereview.com/article/2395/1>

8. Jeff Foust, “Space Challenges for 2011”, *Space Review*, January 3, 2011.

China placed the Tiangong 1<sup>9</sup>, an experimental space lab into orbit. Two successful dockings with this spacecraft have since been conducted. The first of these was of the Shenzhou 8, an unmanned capsule in November the same year itself. But in June 2012, taking a step further in its human space flight and orbital space station programme, China launched the Shenzhou 9, carrying three astronauts (one of them being a woman) to dock with the orbiting lab. The crew successfully returned to Earth on June 29 after spending three days in space. With this feat, China was able to demonstrate its ability to manoeuvre a space capsule to rendezvous with, and attach itself to, a port on the station in order to transfer people and material to sustain a space station. Three more Shenzhou missions are expected to further the ability of the country to manoeuvre in space and sustain long-duration life support systems, thereby laying the foundation for a future space station, which is scheduled to become operational by 2020. Meanwhile, in May 2013, China conducted another test which it qualified as a “high altitude scientific research mission” designed to “investigate energetic particles and magnetic fields in the ionized stratum and near-Earth space”<sup>10</sup>, but which the US has termed as another ASAT. The launch of the rocket Dong-Ning 2, from the Xichang Satellite Launch Centre was described as a ground-based, high Earth orbit attack missile.

Interestingly, officially, the US has expressed little concern on these developments. But, testifying at a hearing before the House Armed Services Committee in January 2014, Ashley Tellis described the threat posed by China’s current and evolving counter-space capabilities to US space operations as “extremely serious” and “particularly problematic”.<sup>11</sup> He recounted the relevant Chinese capabilities as ranging from direct ascent and co-orbital ASAT programmes, to electro-magnetic warfare, to directed energy and radio frequency weapons to cyber attack. Indeed, China considers American dependence on space as the US military’s soft ribs and strategic weakness. Faced by this kind of reality, the current tranche of

---

9. The Tiangong 1 weighs less than 10 metric tonnes compared to the International Space Station’s 400 metric tonnes.

10. Zachary Keck, “China Secretly Tested an Anti-Satellite Missile”, *The Diplomat*, March 19, 2014.

11. Ashley Tellis at the hearing before the House Armed Services Committee, available at <http://www.spaceonline.com/news/hasc-told-chinas-counterspace-capabilities-extremely-serious?utm>. Accessed on January 31, 2014.



**The ideas being considered in this category include use of higher orbits, larger number of spacecraft, distribution of mission systems over-linked satellites, and on-orbit spares as well as satellite sensor shielding and collision avoidance manoeuvres.**

US space policies is now planned along four main vectors to address the perceived threats from China's capabilities. As Adm Haley, commander of the US Strategic Command (STRATCOM) said in 2014, "Deterrence is more than just the triad. We are highly dependent on space capabilities, more so than ever before. Space is fully integrated in our joint military operations as well as in our commercial and civil infrastructure. But, space today is contested, congested and competitive."<sup>12</sup> The four trajectories along which the US is developing its space deterrence are briefly elaborated in the following paragraphs.

#### *Increasing Resilience of Own Space Assets*

One approach that the US has taken to protect its space assets is to enhance technological measures that can protect its satellites from willful disruption by an adversary. The ideas being considered in this category include use of higher orbits, larger number of spacecraft, distribution of mission systems over-linked satellites, and on-orbit spares as well as satellite sensor shielding and collision avoidance manoeuvres. In order to minimise the chances of loss of mission critical capability to a single point failure, there is a move towards building passive resilience. The new satellite technology is being designed for shorter lives of no more than a decade compared to the 30 years of earlier satellites. It is believed that this would also revive a sagging US space industry<sup>13</sup>, which really is the backbone of future launches. Much literature from US space agencies and think-tanks has been published over the last decade or so lamenting the incoherence in the US space strategy as pertaining to incentivising the space industry with a certain guarantee of launches and

---

12. Joshua Alvarez, "STRATCOM Commander: Deterrence Remains Foundation of National Security", Centre for International Security and Cooperation, News Release, December 10, 2014, available at <http://www.cisac.fsi.stanford.edu>.

13. The US share of global satellite manufacturing and launch revenues is stated to have decreased from 60 percent in 1997 to 40 percent by 2006 owing to the difficult and restrictive export control regulations of the Administration. For more, see Futron Corporation, "State of the Satellite Industry", Report, June 2007, pp. 15-16.

satellites. In 2011, the US Air Force (USAF) had proposed a solution in the form of EASE or Evolutionary Acquisition for Space Efficiency which envisaged measures such as block buys for the Evolved Expendable Launch Vehicle (EELV) instead of small inefficient purchases that did not allow contractors to plan ahead and make use of economies of scale, "fixed price contracts on mature systems and a stable engineering line for technology insertion"<sup>14</sup>. Technological solutions of the kind being considered for enhancing resilience are believed to be able to address the existing challenges in the internal and external dimensions.

**More and smaller satellites would, therefore, form a network that could compensate for the loss of one. This would also make it easier to replace the degraded satellite quickly.**

#### *Dissuasion Through Disaggregation*

Yet another response being crafted by the US to deal with perceived threats is that of disaggregation of the space architecture. This pertains to the "dispersion of space-based missions, functions or sensors across multiple systems spanning one or more orbital plane, platform, host or domain."<sup>15</sup> Such a system is geared to avoid threats, ensure survivability, and build the capacity to reconstitute, recover or operate even through adverse events.

It seeks to convey the message to the adversary that his attempts at degrading US space capabilities would not be able to meet the objective since the numbers and missions of satellites would be so disaggregated as to deny victory. Therefore, this is essentially deterrence by denial and envisages distribution of a mission over a number of smaller spacecraft, instead of the traditional approach of having large satellites, with each one carrying multiple payloads. More and smaller satellites would, therefore, form a network that could compensate for the loss of one. This would also make it easier to replace the degraded satellite quickly. The idea of fractionalised space or Programme F6 was actually first explored by the US Defence Advanced Research Projects Agency (DARPA) in 2006 as an alternative to the existing US format in space that was based on creating single, stand-

14. Robert S Dudley, "Five Roads to Space Dominance", *Air Force Journal*, July 2011, pp 25-28.

15. USAF Space Command, *Resiliency and Disaggregated Space Architectures*, White Paper 2014.

alone satellites tasked with one specific mission. As an alternative, it was proposed that each sub-system of a satellite would be a micro-satellite, many of which could then be networked.<sup>16</sup> This would provide immunity against the failure of one sub-system affecting the entire mission. It would also allow modules to be standardised and produced in large numbers for all kinds of networked clusters, thereby providing economies of scale in production. Such clusters would enhance survivability as also make replacement easier without having to undertake the launch of a big satellite. However, the issue of cost trade-offs, in this case particularly, the necessary spending on communications between and amongst the networked satellites, which would be more vulnerable to jamming than a bigger satellite's internal sub-systems, is still an unaddressed issue. Meanwhile, if others follow this trend, the Low Earth Orbit (LEO) will certainly get even more crowded. Meanwhile, it should not be forgotten that the US already has alternate systems that provide it with operational security. For example, the US possesses a number of airborne platforms that can duplicate and outperform many missions performed by satellites. The U-2, Joint Surveillance and Target Attack Radar System (JSTARS), E-2C Hawkeye and Unmanned Aerial Vehicles (UAVs) of many types perform Intelligence, Surveillance, Reconnaissance (ISR) functions. In fact, it is notable that even in the case of the Iraq War of 2003, which is widely considered to be a space-enabled war, the US Air Force "employed 80 aircraft that flew nearly 1,000 ISR sorties... collecting 42,000 battlefield images... 2,400 hours of SIGINT coverage and 1,700 hrs of moving target indicator data".<sup>17</sup>

### *Deterrence Through Threat of Retaliation*

As part of its larger deterrent strategy, response in self-defence to attacks on space assets remains a major plank of the US space strategy. This includes not necessarily responding in space since such retaliation would jeopardise the attacker and perhaps his allies too. There are many ways to damage or disable satellites without physically killing them. Meanwhile, attacks on the supporting infrastructure on Earth, as well as disabling satellites through the

16. For more on this, see "US: Satellites and Fractionalized Space", *STRATFOR Analysis*, May 6, 2008.

17. Jaganath Sankaran, "China's Deceptively Weak ASAT Capability", *The Diplomat*, November 13, 2014.

use of jammers, lasers, cyber attacks, etc is always an option. As warned by Dudney, "Any serious attack on US space-based systems could well attract a harsh US reponse by air, sea, or land, and at any point on the globe. Indeed, this kind of threat appears more credible than the one narrowly focused on space".<sup>18</sup> With many soft kill capabilities now available, hard kill or ASAT is even considered a case of overkill for the collateral damage it is likely to cause. It is not surprising, therefore, that nations are not known, at least publicly, to maintain an arsenal of weapons meant to carry out attacks on assets in space.

As Michael Krepon, a noted space strategist and co-founder of the Stimson Centre said in his testimony before the House Armed Services Committee on January 28, 2014, "When so much latent capability exists to mess with satellites and infrastructure, dedicated capabilities can be unnecessarily costly and redundant."<sup>19</sup> But, as he points out, being able to use these requires better space situational awareness, improved command and control and intelligence capabilities. The build-up of these capabilities would enable deterrence of an attack or even attribution of responsibility, thereby threatening retribution.

Interestingly, another strategy of propping up deterrence that the US has adopted is that of getting its armed forces and government agencies to hold a "day without space" exercises. The idea behind such simulation exercises is to indicate the readiness of the US to absorb an attack on its space systems and yet be ready to fight and prevail in combat even when outer space benefits are not available. This approach also includes enhancing the number and capabilities of reconnaissance aircraft, UAVs or other terrestrial communication platforms that can substitute for space-based systems. The objective of such an exercise is to disabuse the adversary of the idea that his attacks on US space assets would be able to disorient or disarm the US enough to deprive it of the capability of retribution.

### *Diplomatic Overtures*

In its efforts at diplomatic engagements to address the concerns of space security, the US appears to be moving along two lines: collaboration with allies to shore up space and counter-space deterrent capability; and guarded

---

18. Dudney, n. 14.

19. Testimony as reproduced on the Stimson Centre website. Accessed on January 31, 2014.

support for rules-based space governance. The first approach comes from suggestions made by strategists such as Ashley Tellis that the US should engage with allies such as Japan, South Korea, India and Australia on “challenges posed by China’s counter-space programme”.<sup>20</sup> This approach recommends reaching out to allies to leverage their space capabilities in a complementary manner. Besides other nations, the US is also willing to engage with international organisations, and commercial firms. As a step in this direction, for example, the US STRATCOM has changed the USAF led Joint Space Operations Centre at Vandenberg, California, to a combined space operations centre featuring foreign partners. The US has today 50 Space Situational Awareness (SSA) agreements with nations, international organisations and commercial entities. Some of these include countries such as Australia with which the US jointly operates a C-band ground-based radar system from the southern hemisphere as also a space surveillance telescope placed in both Australia and Canada which, through its Sapphire sensor, feeds into US SSA data, and France, which too was amongst the first to join the US space situational awareness network. This has come to be known as the Combined Space Operations (CSpO) concept, essentially a “multinational effort focused on cooperation, collaboration, and the integration of military space activities to strengthen deterrence, improve mission assurance and enhance resilience while optimizing resources across the participating countries”<sup>21</sup>.

Such a collaborative network performs two important functions. Firstly, it has already proved its mettle in providing forewarnings on possible collisions. According to USAF Lt Gen Raymond, in 2014, spacecraft operators across the world carried out 121 manoeuvres to avoid collisions with debris. Nearly 30 collision alerts are believed to be received by STRATCOM every single day.<sup>22</sup> The second idea behind this network is to leverage the capabilities of others which are fast growing, to add diversity and resilience to the American architecture. This would deny an aggressor the opportunity to take up a fight on a one to one basis since, given the networking of

---

20. Tellis, n.11.

21. Loverro, n.3

22. Beth Duff-Brown, “The Final Frontier has Become Congested and Contested”, *CISAC News*, Stanford University, March 4, 2015.

systems of many countries, it would end up attacking multiple countries, which would expand the scope of the conflict and reduce the odds of the attacker achieving the desired outcome at an acceptable cost.

Information sharing is obviously the key to the success of such a system. But it is equally seen as walking a tightrope on how much to share for international security and how much to hold back for national security. In fact, it may be recalled that way back in 1996, Joseph Nye and William Owens had recommended in an article that since the US had an advantage in information collection, processing and dissemination capabilities, it could dissuade others from building the same by using these “for political purposes that had broad international support.” Their particular contention was that the US’ willingness to share its situational awareness edge for mutual benefit “as a force multiplier for diplomatic responses to emerging security problems” instead of threatening others, would reduce their motivation to spend on building such capability, thereby degrading the US information advantage.<sup>23</sup> However, there were few takers for this idea of cooperative security at the time since the US was smug that it had preponderance in the domain after the collapse of the Soviet Union. China was yet to reveal its strength in outer space and was certainly not seen as a threat by the USA. Perhaps it was the American showcasing of its force capabilities from the space domain that led others to strive for the same. Today, the US Space Command feels threatened by this “competitive gold rush in space, depicting it as a lawless Wild West”.<sup>24</sup>

The second approach taken by Washington is to support multilateral efforts aimed at formulation of rules of the road to promote responsible behaviour in outer space. Tellis, however, places little faith in these measures, particularly in their being able to help the USA meet the threat from China. As he stated in his testimony, “Even good confidence-building measures are unlikely to constrain China’s evolving counter-space warfare programs in any meaningful way.”<sup>25</sup> He opines that “the idea that Chinese counter-space

---

23. Joseph S Nye and William A Owens, “America’s Information Edge”, *Foreign Affairs*, March/April 1996, pp. 20-36.

24. US Space Command, *Vision for 2020*, 1997 document, as cited in Nancy Gallagher and John Steinburner, *Reconsidering the Rules for Space Security* (Cambridge, MA: American Academy of Arts and Sciences, 2008), p. 24.

25. *Ibid.*



**The idea that Chinese counter-space activities would diminish in intensity as Beijing slowly became a space power of significance has also proven to be illusory. Without a doubt, China is a major space-faring nation today.**

activities would diminish in intensity as Beijing slowly became a space power of significance has also proven to be illusory. Without a doubt, China is a major space-faring nation today." This is certainly the case. China has a total of 105 satellites in space and annually launched more satellites than the US did for a period of 2-3 years. Yet, as Tellis states, "Beijing appears to have concluded that the 'delta' between its own and Washington's dependence on space for the fulfillment of their respective national aims favours China rather than the US." So, while any disruptive action in space would be harmful to China too, it would cause relatively more

damage to the US owing to its greater dependence on space-based assets. Nevertheless, it is true that the current US Administration has lent support to the ICoC as a Confidence-Building Measure (CBM) of some value.

### *Spreading Vulnerabilities*

Early in 2014, US Deputy Secretary of State William Burns, expressed a strong desire for encouraging increased collaboration in space. Speaking at the International Space Exploration Forum, he called upon countries to "make space exploration a shared global priority".<sup>26</sup> He identified three specific areas for this collaboration: more countries joining the International Space Station (ISS)<sup>27</sup>; encouragement to the commercial space sector to set up joint entrepreneurial ventures; and increased collaborative effort in defending the Earth from Near Earth Objects (NEOs) like asteroids<sup>28</sup> and comets and even space debris.

---

26. Marcia S Smith, "State Department Wants Space Exploration to be 'Shared Global Priority'", <http://www.spacepolicyonline.com>. Accessed on January 31, 2014.

27. The US Administration took a decision in January 2014 to keep the ISS operational at least until 2024 and not de-orbit it in 2020. The move was welcomed not only by NASA but also private companies like SpaceX and Orbital Sciences Corp that have been contracted to carry cargo to and from the ISS.

28. It may be mentioned that President Obama had launched an Asteroid Redirect Mission in 2013, but Congressional funding to NASA for the project was unclear at the time of writing this article.

Undertaking such projects would not only get the US to share the cost of such missions, but also get other countries to share the risks that might arise from any deliberate attempt by a nation to disrupt the environment. While China is working independently on having its own space station before the end of this decade, the entry of private enterprise in a big way for space tourism, cargo transportation to and from the space missions, or even for exploratory forays for minerals on asteroids would certainly raise the stakes, and indirectly promote pressures on nations to accept the rules of the road that promote safe and sustainable use of space as a priority.

**The entry of private enterprise in a big way for space tourism, cargo transportation to and from the space missions, or even for exploratory forays for minerals on asteroids would certainly raise the stakes, and indirectly promote pressures on nations to accept the rules of the road that promote safe and sustainable use of space as a priority.**

#### **CURRENT US APPROACH TO INTERNATIONAL CODE OF CONDUCT**

As is evident in the declared space doctrine of the USA, it is looking to secure its space assets by both building counter-space capabilities that include defensive measures that address the vulnerabilities of its spacecraft as also offensive capabilities that can deter/fight malafide attacks. But, at the same time, realising the limitations of these approaches, the US is also investing in diplomatic measures that create a regulated environment for the space activities of all.

The turnaround that came about in the US position towards the ICoC can be attributed to a realisation and acknowledgement of the vulnerabilities that space operations suffer from in the contemporary situation where “Nations – from Iran to Cuba, from Ethiopia to Libya – can, and often do, jam satellite links”.<sup>29</sup> With a growth in space debris, kinetic ASAT capability as well as soft kill methods such as microwave, laser and cyber weapons, it is not surprising that the head of the USAF Space Command, William L Shelton described space as a “pretty tough neighbourhood”.<sup>30</sup> For a country

---

29. Dudley, n. 14.

30. Ibid.

whose military power primarily depends on space-based surveillance, reconnaissance, navigation, communications and weather systems, this is not a surprising conclusion to reach.

It is in this context that the American space strategy of 2011 eschewed the earlier approach of space dominance in a unilateral fashion for acquiescence to the logic of participating in formulation and acceptance of some rules of the road. The current buzzwords through 2012 to now have been support for measures that help generate transparency and confidence-building in outer space operations and strategies. Deputy Assistant Secretary, Bureau of Arms Control, Verification and Compliance, Frank Rose, said on January 17, 2012, "The Obama Administration is committed to ensuring that an ICoC enhances national security and maintains the inherent right of individual and collective self-defence, a fundamental part of international law."

The US favours a system that encourages other space operators to share space flight data, develop databases and warn of space object collisions, and thereby create less debris. Such norms of good behaviour, it is now believed, would bring more stability into the environment by promoting less selfish behaviour since that would essentially be to the detriment of all. On the contrary, the rules of the road would allow for safe and secure use of outer space in a sustainable fashion, encourage less unintentional interference, promote more efficient use of crowded orbit slots, and cause less mistrust.

There is, of course, opposition to acceptance of the ICoC within the US. Republicans, for instance, are particularly of the view that such a code, despite not being legally binding and exempting legitimate cases of self-defence, would nevertheless make the US highly averse to continuing its ASAT programme. This would compromise protection for its space assets. It is for this reason that for decades, American presidents and Congress have refused to accept any space arms control that could "snare"<sup>31</sup> the US into giving up a key advantage. Washington has been more in favour of an instrument that is "equitable, effectively verifiable, and enhances the national security of the US and its allies". A report prepared on the US National Security

---

31. Description of space arms control as used by Dudney to refer to the view of one set of Congressmen. Dudney, n.14, p. 10.

Strategy and the New Strategic Triad by an Independent Working Group on Missile Defence and the Space Relationship, in 2012, clearly identified the triad as a multi-layered defence architecture for homeland and regional missile defence, a modernised, precision, mission versatile nuclear arsenal, and a range of space capabilities and their uninterrupted use.<sup>32</sup> The report also recommended to the US government to “reject the draft EU Code of Conduct for Space” and create a “21st century Brilliant Pebbles Space-based Missile Defence Program”.<sup>33</sup> This school of thought underscores the need for eventual deployment of space-based interceptors if the US has to have a multi-layered and integrated missile defence. With this in view, there is a recommendation that the US should avoid getting entangled in international agreements that could end up significantly limiting US freedom of action. Moreover, the US would not be able to verify or monitor whether others were complying with the restrictions and might only end up impeding its own capabilities “while allowing less scrupulous signatories to flaunt (*sic*) the largely unverifiable EU CoC”.<sup>34</sup>

It is difficult at this moment to predict whether the return of a Republican to the White House in 2016 might make such views more popular. For the time being though, the official view in the US is that it is in everyone’s interest to act responsibly and protect the safety and sustainability of the space domain. “A more cooperative, predictable environment enhances US national security and discourages destabilising crisis behavior”.<sup>35</sup> The sad reality of this demand is that in getting to such an instrument, the US too would have to tie its hands in some form in order to get others to agree to reining in their capabilities that have the potential to cause harmful interference. The US cannot hope for an “equitable and effectively verifiable” mechanism that nevertheless keeps it above others. In any case, the vulnerabilities for the US are disproportionately higher and, hence, its need for others to follow some rules of the road is also that much greater. It is keeping this in mind that the US STRATCOM that is responsible for providing space situational awareness has entered into agreements with

---

32. “US National Security Strategy and the New Strategic Triad”, Report by Independent Working Group on Missile Defence and Space Relationship, published by the Institute for Foreign Policy Analysis, Inc, April 2012. p. 3

33. *Ibid.*, p. 6.

34. *Ibid.*, p. 12.

35. Loverro, n. 3.

**The vulnerabilities for the US are disproportionately higher and, hence, its need for others to follow some rules of the road is also that much greater.**

as many as nearly two dozen launch providers and satellite owners to provide collision warnings.

A Department of Defence (DoD) factsheet released on the ICoC clearly states, "As more countries and companies field space capabilities, it is in our interest that they act responsibly and that the safety and sustainability of space is protected. A widely-subscribed Code can encourage responsible space behavior and single out those who act otherwise, while reducing the risk of misunderstanding and misconduct." What has appealed to the US about the ICoC is the fact that it focusses on activities and not unverifiable capabilities. It is in this context that it is seen as strengthening national security.

US space strategies and policies are known to shift with changes in the White House and Congress. There is no way of guaranteeing, therefore, that the current pragmatism in favour of multilateralism, or a rules-based approach to space security would persist after the 2016 elections. However, it should nevertheless be clear to the US leadership, irrespective of its political orientation, that outer space is a medium that cannot be appropriated as a national asset. Its usage and integration in the economies, societies and militaries of nations across the globe is a reality that the US will have to reconcile with. Cooperation and collaboration to build means of collective deterrence would, therefore, be far more useful and effective in the future rather than returning to the times when the US believed that it could achieve and sustain space dominance. It still might be the player with the most wide-based spectrum of capability. But it is not immune to the counter-space capabilities of others. If all are to continue to sustainably use the medium of the high ground, then pragmatism demands that restraint and a spirit of sharing will have to be respected and accepted.

# CYBER ATTACKS ON SATELLITES: A PARADIGM SHIFT IN ASAT APPLICATION

**P A PATIL**

The space-faring nations have consistently worked towards exploitation of space technology to acquire an unequivocal advantage in economic growth and national security. The pursuit for eminence in the space sector runs parallel to contesting for space supremacy, fuelling research and development in the fielding of space weapons. Advances in development of space-based weapons get constrained by the technological wherewithal required for launching and managing space assets. Though no space-based weapons have been deployed, space assets are still vulnerable and subjected to a wide variety of attacks. While kinetic energy attacks are limited to military powers with established satellite manufacturing and launch capabilities, the testing and evaluation of Directed Energy Weapons (DEWs) is restricted by the techno-logistic potential of a nation. However, for indulging in space negation efforts, as will be established, access to space is neither a prerequisite, nor mandatory.

Space negation efforts would include physical attacks on ground stations or by exploiting the vulnerabilities in the satellite command, control and communication links. While conventional strikes on the ground segment may not be attempted against a stronger adversary, the more subtle but

---

Group Captain **P A Patil** is a Senior Fellow at the Centre for Air Power Studies, New Delhi.



**Any accidental or deliberate disruption of satellite transmissions can cause catastrophic damage to a nation's economy by affecting the financial institutions, transportation systems, electrical power grids, communication systems and automated services.**

equally effective way forward would be sabotaging of satellites' communication links using cybernetic attacks. A satellite in orbit is small but central to the massive ground-based support infrastructure. Any accidental or deliberate disruption of satellite transmissions can cause catastrophic damage to a nation's economy by affecting the financial institutions, transportation systems, electrical power grids, communication systems and automated services. On the military front, it can hamper or result in considerable breakdown of operational capability. Irrespective of the services provided, a breakdown in satellite services directly affects and jeopardises the economy and security of a nation. This growing reliance on satellite services now poses a fundamental threat to nation states as disruption of satellite services and their applications has become feasible by the covert means of cyber attacks.

Satellites being integral to modern warfare are fundamental to the strategic depth of the nation. On the operational front, they comprise a credible force enhancer and form a vital component of force application. Going by the conventional perception and definition of weapon systems, cyber attacks on satellites in a strict sense would be difficult to categorise as Anti-Satellite (ASAT) weapon attacks. While this analogy might have been true in the past, cyber attacks and mitigation techniques are being increasingly utilised in all facets of warfare and are now acknowledged as a new dimension in modern warfare. As modern war-waging equipment relies heavily on information technology for command, control and functionality, cyber warfare now finds itself intricately linked with the operational capabilities of forces fighting in the land, air and sea domains. One may perceive satellites as complex hardwired systems driven by software utilities commanded from the ground to enable precision strikes, improve, and provide for, navigation across the globe, extend communication in otherwise inaccessible terrain and

widen the scope of Intelligence, Surveillance, Reconnaissance (ISR) for successful operations. Like all networked infrastructure on the ground and at sea, satellites in orbits and their controlling ground stations are equally vulnerable and susceptible to cyber attacks. The functionality of all space-based assets or objects transiting through outer space rests to a great extent on onboard embedded software (which is subjected to remote command and control) for provision of services and applications. In view of this, and the future war-waging designs eyeing for projection of power towards and from outer space, it seems apt to include cyber attacks on space assets as part of the space weaponisation process.

**All satellites are driven by extensive digital controls which are highly vulnerable to interference. The satellite operation rests on the commands relayed from control stations based on the ground, monitoring the satellite response.**

### **CYBER WARFARE AND ITS RELATION WITH SPACE**

Prior to establishing the link between cyber warfare and space, it would be prudent to describe what constitutes cyber warfare. Cyber warfare is the unauthorised penetration by, on behalf of, or in support of, a government into another nation's computer or network, or any other activity affecting a computer system, in which the purpose is to add, alter, or falsify data, or cause disruption of, or damage to, a computer, or network device, or the objects that a computer system controls.<sup>1</sup>

When talking of space-based assets, we can say that space and cyber space are closely interlinked and satellites can be viewed as computers placed in orbit with very long and very vulnerable wireless fidelity (wi-fi)-like data links to ground stations and users.<sup>2</sup> All satellites are driven by extensive

---

1. Richard A. Clarke and Robert K. Knake, *Cyber War: The Next Threat to National Security and What to do About It* (Harper Collins Publishers), p. 70.

2. Col M V "Coyote" Smith, "Welcome to the Age of Space and Cyber Warfare", presentation at American Centre for Democracy's symposium on "Energy, Space and Cyber Security-Current and Future Threats," on September 30, 2013, at <http://acdemocracy.org/welcome-to-the-age-of-space-and-cyber-warfare/>. Accessed on January 13, 2015.

digital controls which are highly vulnerable to interference. The satellite operation rests on the commands relayed from control stations based on the ground, monitoring the satellite response. All satellites use Telemetry, Tracking and Command (TT&C) sub-systems to communicate with ground stations. The TT&C is used to monitor the satellite's health, its overall status and exact location in space. It also accepts the required commands for processing of onboard data and manages the application payloads (imaging, communication, navigation, etc) and, in turn, relays the response to the ground. The TT&C relies extensively on the integrated software which in the modern-day context can be reconfigured as well as updated remotely from the ground. This reliance on software makes the satellites vulnerable to cyber attacks and a number of instances have come to the fore where satellites operations have been interfered with. These occurrences or attempted cyber attacks are not restricted to, or against only, military space assets. Satellites, whether military, civil or commercial, irrespective of their ownership, are susceptible targets for state and non-state actors as well as individuals. The attacks involve effects from temporary irritation to partial or complete breakdown of services. The successful culmination of a cyber attack may involve minimum paraphernalia required, in terms of just a computer and an internet connection. The matter gets complicated as cyber attacks are covert and deceptive in nature. Any cyber attack, whether on a ground system or a space asset would follow similar execution irrespective of the target and would be hard to detect. On detection, ascertaining the time of attack becomes difficult and attributing the attack to any party is extremely challenging as the attacker, by and large, would have covered his tracks.

While interference with satellites, intentional or unintentional, has been common, many instances of hacking of satellites have been reported, with some cases even reporting complete loss of control. As aptly stated by William J. Lynn III, former US deputy secretary of defence, "The willingness of states to interfere with satellites in orbit has serious implications for our national security. Space systems enable our modern way of war. They allow our war-fighters to strike with precision, to navigate with accuracy, to

communicate with certainty, and to see the battlefield with clarity. Without them, many of our most important military advantages evaporate.”<sup>3</sup>

### **PRINCIPAL CYBER THREATS TO SATELLITES**

Extensive use of satellites in direct support of operations came to the fore with the Gulf Wars and since then there has been an incremental integration of satellite services with the emergence of network-centric warfare amongst the global powers. Moreover, during the Gulf War, instances of blocking satellite services were witnessed and in the aftermath of the war, stray incidences of taking over of the complete controls by unidentified attackers using cyber means have been reported. Cyber attacks are mainly aimed at interfering with, and taking over, the controls of a satellite. While military satellites are obvious targets, commercial satellites also are vulnerable during times of conflict. Cyber attacks on satellites and peripheral infrastructure use the techniques of jamming, eavesdropping, hacking and seizing of overall control. The penetration of the cyber and information domains by the hacker community has forced the satellite industry to initiate measures to safeguard satellites and associated sub-systems from cyber threats. While the development of mass-to-target weapons and DEWs continues, new inroads have been made by initiating disruption, degradation or incapacitating a satellite or its services by means of Information Warfare (IW). As new concepts emerge, the developments of IW ASAT capabilities now fall in a very different league of ‘silent intrusion systems’ and due to the capability of IW in degrading, de-orbiting or making a satellite dysfunctional, the IW attacks can be categorised in the league parallel to kinetic and directed energy weapons. This categorisation of drawing parallels with kinetic weapons and DEWs can be debated, but it must be taken into account that ASAT attacks now ride on the asymmetric applications which no longer demand use of high powered directed energy systems or kinetic kill to impair or damage a satellite. Despite the fact that no satellite has

---

3. William J. Lynn III, “A Military Strategy for the New Space Environment,” *Washington Quarterly*, 34, no. 3, Summer 2011, pp. 7-16.

been lost or destroyed by cyber means as on date, the occurrence of such an eventuality cannot be ruled out in the future.

Military satellites use hardened protection measures making them difficult to get compromised as compared to commercial satellites that are often dual use in nature, providing support services like communication and reconnaissance. As military or civil satellites come under the category of strategic asset, loss of any satellite or its services is liable to cause economic distress to a nation. Nation states can also resort to obstruction of satellite operations as a coercive measure for political signalling. A cyber attack on a satellite can affect its performance, causing temporary degradation in its services and can extend to cause irreversible permanent damage. These attacks may be blatant or covert in nature. The attacks could be directed at disrupting a particular service and target satellite, irrespective of its orbital altitude. While a number of cyber attacks against non-military satellite services have been reported and documented, a majority of instances of cyber attacks or attempts either go unnoticed or even if noticed, are not made public by the satellite operators for fear of losing their credibility and standing in the international market. On the military front, such attacks would not generally be publicised as the attacker would not be in a position to evaluate the efficacy of his attacks. Only a few cases of cyber attacks and attempts on military satellites have been acknowledged and that too after the required corrective action to mitigate the threat had been put in place.

As will be seen subsequently, most cyber attacks are temporary and reversible in nature. While instances of taking over complete satellite controls have come to the fore, destruction of a satellite by a cyber attack has not been attempted. However, complete takeover of controls may permit the attacker to manoeuvre the satellite, and if need be, the attacker could be in a position to de-orbit the satellite, push it out of orbit into space or manoeuvre it to collide with another space asset.

### **SATELLITE JAMMING**

Satellite jamming is a widespread hacking technique by which the attacker deliberately transmits a signal at the same frequency and with higher

power so as to interfere with the legitimate signal between the satellite and the user by means of flooding or overpowering of uplink or downlink transmissions. In fact, jamming a satellite would involve subduing of the actual signal in unwanted noise so that the real signal is no longer legible to the processing circuitry of the receiver system and, thus, cannot reach the user in a comprehensible form. This type of localised jamming would only be of temporary nature and the jamming effects would be negated in time with the removal of the jamming signal. All satellites are installed with a number of transponders which amplify the received signal (uplink signal) and then retransmit it towards the earth at a modified frequency, using frequency converters (downlink signal). Most communication satellites are placed in the geo-synchronous orbit for continuous coverage and use fixed frequencies for uplink and downlink transmissions. A cyber attack could be directed towards the satellite or used to attack the computers and peripheral infrastructure of ground stations. While modern-day military as well as commercial satellites use encoded signals as an anti-jamming technique, a powerful signal at the correct frequency can defeat such protection measures. While many nation states use dedicated military satellites, the dual use commercial satellites are more vulnerable to jamming attacks and can be exploited in crisis situations. There are two types of satellite jamming techniques: orbital jamming and terrestrial jamming.

**Orbital Jamming:** Here the attacker targets the uplink and overrides the legitimate transmission from the ground terminal to the satellite. Thus, in a real sense, the jamming is directed towards the satellite, preventing the receiver of the satellite from receiving the uplink signal. Further, the efficacy of jamming on a commercial service like communication and television broadcast could be effectively monitored by observing the affected services. This will not be so in the case of a dedicated military satellite as the attacker may not be in a position to process the received signal in the absence of a dedicated configured receiver. As communication and broadcast satellites receive and transmit signals over a wide footprint, it is feasible to carry out cyber attacks on a satellite from any area under its cone of coverage, making it extremely difficult to pinpoint the source of attack. An attacker

**Terrestrial jamming is aimed to interfere with the downlink signal of the satellite and enables the attacker to inhibit a useful signal reaching the ground station or receivers, affecting a particular service being provided through the satellite.**

jamming the uplink transmission requires the satellite to be visible during the attack. Thus, communication and broadcast satellites would be more vulnerable to such attacks than satellites in Low Earth Orbit (LEO). To target satellites in LEO, the cyber attacks additionally would require tracking equipment as the satellites are moving at higher speeds. Further, the attacker will be forced to plan the time of attack over a short duration in a feasible window of opportunity.

**Terrestrial Jamming:** Similar to the technique used for orbital jamming, terrestrial jamming is aimed to interfere with the downlink signal of the satellite and enables the attacker to inhibit a useful signal reaching the ground station or receivers, affecting a particular service being provided through the satellite. Unlike the jamming of the uplink, in this, the power requirement is much less, and generally such jammers are positioned in the vicinity of receivers or ground stations. Thus, the source of jamming can be identified and tracked relatively easily. As compared to uplink jammers, downlink jammers are simple and inexpensive. They may be bought off the shelf or easily built by amateurs using instructions available on the internet.

**Instances of Satellite Jamming:** Satellite jamming has been a common occurrence in the past two decades and has been resorted to by both state and non-state actors, particularly those targeting television broadcasts and communication services for censorship purposes. The cases of jamming date back from the time satellites have been used for television and radio broadcast services. In 1995, the Kurdish satellite channel 'Med TV' was jammed by the Turkish authorities citing that its broadcast supported terrorism and violence. In the present century, we have had instances of countries like Cuba, Iran, Libya and Ethiopia resorting to jamming of satellite communications and television broadcasts originating from Europe and the United States. During the Crimean crisis, Russia had reported

that cyber attacks were being originated from western Ukraine to block TV transmissions. In addition to broadcast transmissions, jamming of Global Positioning System (GPS) signals and satellite telephones has now become a common phenomenon worldwide. A comprehensive list of jamming incidents has been compiled by Jason Fritz BS, entitled "Satellite Hacking: A Guide for the Perplexed."<sup>4</sup> These incidents as well as attempts of jamming instances are not only against commercial and civil satellites, but against military satellites as well. Jamming attacks against satellites providing operational support came to the fore in the Gulf Wars and

in the Israel-Lebanon War of 2006. As of today, sophisticated technologies for jamming satellite signals are readily available and can be procured 'off the shelf' from the commercial market. The United States has on its inventory a mobile counter-communication system which could be used to selectively and effectively jam satellite communications during a period of conflict, or a period of interest, on a temporary and reversible basis.<sup>5</sup> China has also developed jamming techniques to jam satellite communications.<sup>6</sup>

**GPS Jamming:** One of the frequently used jamming attacks is against GPS signals which are critical to operations and navigation. GPS signals at published frequencies are transmitted from semi-synchronous orbit (~ 20,000 km) in the power range of 50 watts from a satellite. The power received at the ground equipment is not much, thus, making the GPS receivers susceptible to jamming. GPS jammers are now widely available –

**GPS signals at published frequencies are transmitted from semi-synchronous orbit (~ 20,000 km) in the power range of 50 watts from a satellite. The power received at the ground equipment is not much, thus, making the GPS receivers susceptible to jamming.**

---

4. Jason Fritz BS, "Satellite Hacking: A Guide for the Perplexed", *Culture Mandala: Bulletin of the Centre for East-West Cultural and Economic Studies*, vol. 10, no. 1, December 2012- May 2013, pp.21-50.

5. Jim Wolf, "US Deploys Space Satellite Jamming System", at <http://www.rense.com/general59/jam.htm>. Accessed on February 5, 2015.

6. Brian Bremner, "As China Stalks Satellites, US and Japan Prepare to Defend Them", at <http://www.bloomberg.com/bw/articles/2014-07-17/u-dot-s-dot-japan-prepare-to-defend-satellites-from-chinese-attack>. Accessed on February 6, 2015.



instructions to build a jammer are available on the internet. Thus, a satellite navigation system which requires investment of billions of dollars can be disrupted with jamming equipment costing only a few dollars. Russia markets jamming equipment of the size of a cigarette packet, which, with a power output of one watt, can deny GPS services in a radius of 80 km.<sup>7</sup>

**Space-Based Jamming:** Space-based jamming would involve the jammer being placed on a satellite in the vicinity of the target satellite. A jammer placed on a satellite would be effective with much smaller power levels as compared to ground-based jammers. However, pointing the jammer power to the satellite antenna and maintaining the jammer power for a prolonged duration is a difficult proposition. Orbiting the jammer in the same orbit is possible but effective jamming power would be lost. Incidents of space-based jamming have also been reported over contested orbital slots and allocation of frequencies. In 1997, Indonesia used its satellite, Palapa B1, to jam the transponder of the communication satellite APSTAR-1A, leased by the island nation of Tonga from the Hong Kong-based APT Satellite Company over a disputed orbital slot.<sup>8</sup> While many reports termed the incident as intentional jamming, it emerged that the jamming took place due to the two satellites being in near vicinity to each other, owing to disputed orbital slots.<sup>9</sup> Using a satellite platform for jamming equipment does not seem to be a practical proposition as a jamming attack is feasible using ground-based jammers, and any attack planned is bound by the window of opportunity in both time and space.

## EAVESDROPPING

Eavesdropping on a satellite would amount to securing unauthorised access to the satellite transmissions without affecting the normal satellite operations and, in a legal sense, would portend stealing of information. This information would be used to decipher the plans of the adversary and could be used effectively

7. United States Department of Defence, Rumsfeld Space Commission Report, p. 20, Washington, DC.

8. Fritz BS, n. 4, pp. 21-50.

9. Jeffrey Lewis, "The Role of Non-State Actors in Outer Space Security", Building the Architecture for Sustainable Space Security Conference Report, March 30-31, 2006, United Nations Institute for Disarmament Research, p.34.

to spoof the transmissions for deceiving the enemy. To avoid eavesdropping attacks, hardened encryption algorithms can be used. However, use of complex encryption standards has its own drawbacks, with escalation in the cost of operations, as well as a drop possible in the overall performance by a margin of 80 percent.<sup>10</sup> Satellite communications without hardened encryption in particular are susceptible to be compromised by off-the-shelf tools and software. One such software called 'SkyGrabber' was sold by a Russian firm, Sky Software, for \$26 off-the-shelf and was used by hackers in Iraq and Afghanistan to capture unencrypted video feeds of the Predator Unmanned Aerial Vehicles (UAVs).<sup>11</sup> While the hackers weren't able to interfere in operations, they did use the accessed data to pinpoint areas under military surveillance and the pattern followed by drones for reconnaissance operations for adopting defensive measures.<sup>12</sup> This, in turn, could have helped the insurgents in predicting the position of, and tracking, locating and destroying the Predator drones of the United States during the 2003 invasion of Iraq.<sup>13</sup>

The other type of eavesdropping commonly encountered is the interception of communication of satellite phones and decrypting the messages using commonly available software on the internet. There are more than 100,000 satellite phone (satphone) subscribers worldwide and they are being widely used in disaster relief and military operations which are sensitive in nature.<sup>14</sup> While satellite phones do use encryption algorithms, these encryption algorithms can be broken easily using software tools readily accessible on the internet.<sup>15</sup>

---

10. Pierluigi Paganini, "Hacking Satellites... Look up to the Sky", <http://resources.infosecinstitute.com/hacking-satellite-look-up-to-the-sky/>. Accessed on December 9, 2014.

11. Pierluigi Paganini, "Satellite Infrastructures: Principal Cyber Threats" at [http://www.aofs.org/wp-content/uploads/2013/12/131203-Paganini-Satellite-infrastructures-Principal-cyber-threats\\_Final.pdf](http://www.aofs.org/wp-content/uploads/2013/12/131203-Paganini-Satellite-infrastructures-Principal-cyber-threats_Final.pdf). Accessed on December 3, 2014.

12. Paganini, n. 10.

13. Chris Cole, "Rise of the Reapers: A Brief History of Drones", October 6, 2014, at [http://dronewars.net/2014/10/06/rise-of-the-reapers-a-brief-history-of-drones/#\\_ednref22](http://dronewars.net/2014/10/06/rise-of-the-reapers-a-brief-history-of-drones/#_ednref22). Accessed on January 20, 2015.

14. Benedikt Driessen, Ralf Hund, Carsten Willems, Christof Paar, Thorsten Holz, "Don't Trust Satellite Phones: A Security Analysis of Two Satphone Standards", Horst-Goertz Institute for IT Security, Germany at <http://gmr.crypto.rub.de/paper/paper-1.pdf>. Accessed on January 20, 2015

15. Ibid.

## **HIJACKING AND SPOOFING**

Hijacking of a satellite involves unauthorised access to the satellite for the purpose of overriding legitimate transmissions with illegitimate transmissions. The attacker's aim is to make use of the available platform to suit his cause by hijacking a particular service or application. While any permanent damage to the satellite and sub-systems is ruled out, the attacker overrides or corrupts the legible signal. A successful hijacking involves eavesdropping and spoofing operations. Spoofing can be perceived as an advanced jamming technique where the jamming signal imitates the characteristics of the actual signal and the content of the jamming signal is replaced with a fake signal for manipulating the contents. Spoofing, thus, would require additional intelligence on the exact characteristics in terms of frequency of transmission and the power with which the signal is expected at the receiver. Signals with gross deviations in the received power levels at the receiver are subjected to be filtered out. A hijacking incident would involve replacement of the original content in a televised or radio broadcast. On the military front, such an attack would be aimed to deceive by planting misleading information and feeds. Hijacking incidents of television and radio broadcast are mainly resorted to as part of psychological warfare and for imposing censorship. For a comprehensive list of occurrences involving hijacking incidents, one may refer to the list of jamming incidents compiled in the work of Jason Fritz.<sup>16</sup>

## **CONTROL**

The attacker in these cases penetrates the Tracking, Telemetry and Control (TT&C) using cyber means and modifies the controlling software to manipulate the services, applications and commands to the satellite. Taking over the function of the satellite by the attacker would entail gaining of complete access to the TT&C link and, thus, enable the attacker to manipulate the controls to manoeuvre or destroy the satellite by de-orbiting it out of its slated orbit. The relatively less serious type of attack is when the control gained is partial, in that the attacker is able to assume unauthorised control of the satellite sub-system. Examples of this type of attack would include

---

16. Fritz BS, n. 4, pp. 21-50.

taking over the control of the antenna or shifting the orientation of the satellite, making it unusable to the owner. While manipulation of the signal transmission may not necessarily make the satellite defunct, it can render it useless to the rightful owner for prolonged or indefinite periods. One such incidence came to fore in the year 1998 when the high resolution imager of the US-German ROSAT satellite was destroyed owing to exposure to the sun. Investigations by the National Aeronautics and Space Administration (NASA) revealed that the orientation altered as a consequence of cyber-intrusion at the Goddard Space Flight Centre and the attack allegedly originated from Russia.<sup>17</sup> As of now, while manipulation and taking over of control of satellite services has been witnessed on numerous occasions, there have not been instances of satellite destruction due to hacking. In its report to Congress, the US-China Economic and Security Review Commission (USCC 2011) states that “at least two US government satellites have each experienced at least two separate instances of interference apparently consistent with cyber activities against their command and control systems.” The report explicitly brought out the following malicious events experienced by US satellites owing to alleged cyber attacks by Chinese hackers.<sup>18</sup>

- On October 20, 2007, Landsat-7, a US Earth observation satellite jointly managed by NASA and the US Geological Survey, experienced 12 or more minutes of interference. This interference was only discovered following a similar event in July 2008 (see below).
- On June 20, 2008, the Terra EOS (Earth Observation System) M-1, a NASA-managed programme for Earth observation, experienced two or more minutes of interference. The party responsible for this had achieved all the steps required to command the satellite but did not issue the commands.
- On July 23, 2008, the Landsat-7 experienced 12 or more minutes of interference. The party responsible did not achieve all the steps required to command the satellite.

---

17. Keith Epstein and Ben Elgin, “Network Security Breaches Plague NASA”, at <http://www.bloomberg.com/bw/stories/2008-11-19/network-security-breaches-plague-nasa>. Accessed on February 2, 2015.

18. US-China Economic and Security Review Commission Report, November 9, 2011, pp. 215-217.

**Unless hardened measures and anti-jamming techniques are adopted, the loss of satellite control could allow the attacker to damage or destroy a satellite by steering it out of the slated orbit.**

- On October 22, 2008, the Terra EOS AM-1 experienced nine or more minutes of interference. The party responsible achieved all the steps required to command the satellite but did not issue the commands.

While the hackers were able to gain complete control to command the satellite in the case of the Terra EOS, it is possible that they were assessing the vulnerability of the satellite control system.

The likelihood of these attacks originating from an individual hacker could probably be ruled out as no motive was spelled out. That leaves the possibility of the attack being attempted at the behest of government sponsored hackers – a possibility as the attacks were carried out by incorporating measures to obscure the attempts and cover up tracks. Issuance of a command to manipulate the satellite in such a scenario would have amounted to an ASAT attack and thereby subject to international ramifications. This makes it very clear that unless hardened measures and anti-jamming techniques are adopted, the loss of satellite control could allow the attacker to damage or destroy a satellite by steering it out of the slated orbit. Further, the required anti-jamming measures call for specialised hardware and software encryptions which have to be imbedded into the satellite at the design stage itself. Once the satellite is launched, only limited upgrades in software would be feasible. The hacking of controls would make it possible for the attacker to manipulate the services and associated network infrastructure. In the developing network-centric scenario, multiple attacks on a set of satellites could paralyse a nation's network support from space and compromise its operational capability.

## CONCLUSION

With cyber attacks, the employment of ASAT technology has not been limited to acts against military satellites alone, nor is it restricted to use by the US, USSR and China. With the advent of information systems across

the globe, and growing dependence on satellite services in the commercial and social structures, a cyber attack can take a toll of a nation's economy and break its will to fight a war. Nation states not having the requisite technology and wherewithal for launching of space assets as well as those with not so advanced conventional military power, find themselves alienated from the developments in the field of kinetic and directed energy space weapons. The only option to offset a conventional and technological disadvantage is to adopt an unconventional and asymmetric approach, through the covert means of cyber attacks. Incidents of jamming, hacking and taking

over the control of satellites are phenomenal in numbers, and are becoming routine in nature. Many of the cyber attacks on satellites go undetected, and if detected, are not reported. As can be evaluated from the few documented attacks discussed earlier, gaining access to satellite controls would allow an attacker to destroy or damage a satellite, force it to de-orbit, manipulate the transmissions and gain important information on the data collected by the satellite. The technology development in the past had not catered to the new kind of threats as counter-technologies in general never precede new developments. Most nations rely heavily on space-based assets and the vulnerability of these assets necessitates protective measures which at times tend to become aggressive so as to deter the adversary. This would hold in conventional conflicts but may not work against non-state actors engaged in asymmetric attacks. A weaker country with the capability of engaging in cyber attacks can exploit the space dependence of its stronger adversary and create chaos without being traced and detected. Asymmetric warfare of this kind is very much prevalent and is now being actively pursued by both state and non-state actors.

**Incidents of jamming, hacking and taking over the control of satellites are phenomenal in numbers, and are becoming routine in nature. Many of the cyber attacks on satellites go undetected, and if detected, are not reported.**

# COST-EFFECTIVENESS AND UTILISATION OF AIR POWER IN FOURTH GENERATION WARFARE

VIVEK KAPUR

## INTRODUCTION

Since air power made its advent on the battlefield about a century ago, it has come to occupy a pivotal position in the execution of warfare. With the passage of time, increasing capabilities have made air power ever more potent and also much more expensive to acquire and utilise. The changing nature of modern conflict calls for a relook at the design, equipping, and optimal utilisation philosophies for the air forces to remain effective in modern warfare.

The trend discernible in modern warfare is such that in most cases, at least one of the parties in the conflict may not be a state with conventional armed forces but a non-state entity or a proclaimed state, such as the Islamic State (IS) which has declared itself to be a state, but lacks the conventional military and other infrastructure common to nation states, as we understand the term. This change calls for a reassessment of the means of fighting such wars. This paper uses primarily the US and Western examples to highlight points due to the best availability of data on Western weapon systems.

---

Group Captain **Vivek Kapur** is a Senior Fellow at the Centre for Air Power Studies, New Delhi.

**Valid military demands for more flexibility along with further technological breakthroughs led to incorporation of capabilities wherein the fighter-bomber could undertake both missions in the same sortie.**

## **EVOLUTION OF MODERN MILITARY AIRCRAFT**

Early military aircraft were grouped into specialist roles as bombers, aircraft designed to deliver ordnance on surface targets, and fighters, which were designed to seek out, engage and shoot down other aircraft. This division was forced by the then prevailing limitations of technology that was at the time unable to provide both capabilities in the same airframe. In the years since the end of World War II (WW II), advances in technology enabled the provision of both air-to-air and air-to-ground capabilities on a single aircraft. This move led to the then new designation in military aircraft: the 'fighter-bomber'. Early fighter-bombers required to be prepared for the air-to-air or the air-to-ground mission before taking to the air. Thereafter, the aircraft was restricted for that mission, to that role alone. Valid military demands for more flexibility along with further technological breakthroughs led to incorporation of capabilities wherein the fighter-bomber could undertake both missions in the same sortie. This new capability was first evident in the US Navy's (USN's) and US Marine Corps' (USMC's) F/A-18 "Hornet". McDonnell Douglas Corporation, capitalised on this new capability with full page advertisements in aviation journals touting the F/A-18's ability to carry adequate air-to-ground as well as air-to-air ordnance with minimal degradation in performance while being able to switch between air-to-ground and air-to-air missions at the flick of a single switch in the cockpit.<sup>1</sup> The F/A-18 in its generation embodied the best illustration of the ability to combine both air-to-air and air-to-ground roles in the same airframe. Bombers, especially heavy bombers, were fielded from the 1970s onwards primarily by the two superpowers, the US and Soviet Union, later Russia, and by China. Most

---

1. See, "The Versatile McDonnell Douglas FA-18 Hornet was Used by the USN and USMC to Succeed a Variety of Aged Carrier-Based Fighting Aircraft", URL: [http://www.militaryfactory.com/aircraft/detail.asp?aircraft\\_id=57](http://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=57). Accessed on December 3, 2014.



bombers in service with the two superpowers came to be regarded as 'strategic bombers' based upon their range and payload ability, and acknowledged nuclear attack tasking. The US has retained its strategic attack capability based upon manned bombers even after the demise of the Soviet Union as has Russia, the Soviet Union's successor state. Bombers have been used operationally by the US in tactical roles in Iraq, Afghanistan and Kosovo.<sup>2</sup> Russia continues to operate its bombers though these are mostly utilised in "show the flag" missions in international air space but close to the North Atlantic Treaty Organisation (NATO) countries' borders<sup>3</sup> and in the Pacific Ocean areas to showcase its military might.<sup>4</sup>

**The new cutting edge US fighter, the F-22 "Raptor", designed to successfully penetrate the Soviet Union's dense air defences through use of its advanced LO technology continued to be developed even after the end of the Cold War.**

The US commenced development of Low Observable (LO) or stealth technology to defeat Soviet air defences but retained this technology even after the end of the Cold War, despite the very high cost of the technology; costs resulted in just 21 B-2 "Spirits" being finally built. The new cutting edge US fighter, the F-22 "Raptor", designed to successfully penetrate the Soviet Union's dense air defences through use of its advanced LO technology continued to be developed even after the end of the Cold War. The total production run of this aircraft was finally capped at 187 due to the very high cost per unit. The follow-on fighter meant to replace a large number of earlier fighters in the US as well as in the air forces of its allies, the F-35 "Lightning-II", continues to be developed towards entering active squadron service. This fighter has suffered consistent time slippages as well as cost overruns. Fielding of these LO aircraft, in terms of fighters as well

---

2. Marcus George, "Profile: B-52 Bomber", *BBC News*, <http://news.bbc.co.uk/2/hi/americas/1632521.stm>. Accessed on November 18, 2014.

3. Chris Johnston, "RAF Intercepts Russian Bomber Approaching UK Airspace", *The Guardian*, <http://www.theguardian.com/uk-news/2014/nov/01/raf-russian-bomber-uk-airspace>. Accessed on December 3, 2014.

4. "Long-Range Air Patrols put Russian Strategic Bombers near Guam", URL: <http://rt.com/usa/207783-russian-bombers-planes-guam/>. Accessed on December 3, 2014.

as bombers, has enabled the US to maintain an unassailable technological advantage over all its potential adversaries. This has been accomplished at the cost of reduced force levels in numbers and very high costs in the development as well as operation of these aircraft. To put these figures in perspective in the Indian context, the Indian Air Force (IAF) contracted with Israel for three Phalcon Airborne Warning and Control System (AWACS) for a total cost of \$1.1 billion for all three aircraft.<sup>5</sup> A quick comparison puts the cost of one US Fifth Generation (Gen 5) fighter (see Table 1), at close to, actually a little higher than, that of a Phalcon AWACS in the IAF's service.

The underlying common factor is that all these LO aircraft were developed for a conventional war scenario as it prevailed in the mid to late 20th century. In Western Europe, fighter developments have not gone for fully LO designs such as the F-22, F-35 and B-2 but have tried to reduce signatures to a lesser extent while incorporating advanced sensors and swing role capabilities. The most recent advanced combat aircraft from Western Europe, the French Rafale and multi-national Eurofighter Typhoon, feature swing role capabilities and reduced signatures short of LO technology application as seen in US fighters. As a result these two European fighters, though not as expensive as the F-22 and F-35, still cost a considerable amount. Costs of purchase and operation of several modern fighter aircraft are placed below at Table 1.

The high purchase and per flight hour costs of the most modern Western fighters and the B-2, built for conventional warfare, fall more into perspective if seen against the same parameters for the previous generation of fighters from these Western countries (the F-16s, F-18s, and F-15s, for their latest versions in the early 21st century). In sharp contrast, fighters from non-Western sources are much cheaper to purchase as shown by the unit costs of the MiG-21-93 at \$ 27 million and the newly built Russian Sukhoi Su-30MKs at \$ 50 million each. The MiG-21-93 and Su-30MK feature no LO. These older technology MiG and Sukhoi fighters from non-Western sources could be expected to have limited survivability in aerial combat against fighters that feature LO technology and

---

5. Rajat Pandit, "India to Launch AWACS Project to Counter China, Pak", *The Times of India* (New Delhi), <http://timesofindia.indiatimes.com/india/India-to-launch-AWACS-project-to-counter-China-Pak/articleshow/14253161.cms>. Accessed on December 3, 2014.

could reasonably be expected to have greater vulnerability than advanced LO fighters to modern anti-aircraft defences. That apart, these aircraft can get most other tasks of combat air power done at a much lower cost, especially if operating in a relatively permissive air environment where an opposing air force is either non-existent or of a much lower capability and, hence, unable to interfere in any major manner with one's own air operations.

**Table 1: Unit and Operating Costs of Modern Fighters**

<b>Aircraft Type</b>	<b>Purchase cost per unit in \$ million</b>	<b>Operating cost per hour of flight in \$</b>
Typhoon	199	18,000
Rafale	102.6	19,000
F-22	420	61,000
F-35A / B / C	181 / 252 / 299.5	Not Available (NA)
B-2	2200	135,000
<b>Aircraft Type</b>	<b>Purchase cost per unit in \$ million</b>	<b>Operating cost per hour of flight in \$</b>
F-16 latest versions	30	7,000
F-18 latest versions	67	11,000-14,400
F-15 latest versions	100-108	28,000-30,000
A-10	20	17,716
MiG-21-93	27	NA
Sukhoi Su-30MK	50	NA
Su-25	13-15	NA

Source: David Noland, "Bombers: Northrop B-2", <http://www.infoplease.com/spot/northropb2.html>. Accessed on November 10, 2014.

Ralph Vartabedian and W.J. Hennigan, "F-22 Program Produces few Planes, Soaring Costs", *Los Angeles Times*, <http://www.latimes.com/business/la-fi-advanced-fighter-woes-20130616-dto.htmlstory.html>. Accessed on November 17, 2014.

"How Much the F-35 Really Cost?", *Defense Update News*, [http://defense-update.com/20140103\\_much-f-35-really-costs.html#.VGrQssl1eZQ](http://defense-update.com/20140103_much-f-35-really-costs.html#.VGrQssl1eZQ). Accessed on November 9, 2014.

"Military Aircraft Costs", *Defense Issues, Defense News and Analysis*, <https://defenseissues.wordpress.com/tag/eurofighter-typhoon-cost/>. Accessed on November 11, 2014.

Older Western aircraft costs are also useful for an understanding of the costs of advanced LO aircraft. The US A-10 "Thunderbolt" is a role specific Close Air Support (CAS) aircraft similar in performance to the Soviet, Su-25, an equivalent dedicated CAS fighter. The per hour cost of operation is

not available for this type as is the case for most Soviet or Russian aircraft.

While the A-10 and Su-25 were specialised dedicated aircraft for close air support operation to friendly land forces in close contact with enemy land forces, the ultimate in this close air support operation of air and land forces is the armed and attack helicopter. Unlike fixed wing aircraft, the helicopter flies at much lower speeds and, thus, is able to persist in the area for much longer while having more time to acquire fleeting targets in the turmoil of the tactical battle area. The helicopter's ability to land even on unprepared level surfaces enables greater coordination with the friendly land forces involved. The first armed helicopters were used by French forces in their operations in Indochina. The AH-1 Huey Cobra was purpose built as an attack helicopter and entered active combat service in 1967 in Vietnam.<sup>6</sup> The Soviets developed armed variants of the Mi-8 utility helicopter and later the Mi-24/25 "Hind" dedicated attack helicopter. The European Union (EU) developed the Tiger attack helicopter while China and India have developed the Z-10 and Light Combat Helicopter (LCH) respectively.

These developments bring out that since its advent, the armed, and more so the attack, helicopter has proven its worth in land combat, driving new developments in the field. In the current operations against the Islamic State (IS) by the coalition led by the US, the US Army AH-64 "Apache" helicopters based at Baghdad airport have been used alongside Russian supplied Mi-35M attack helicopters of the Iraqi Army.<sup>7</sup> In the kind of situation being faced in the current military operations against the IS, the attack helicopter is a very potent and suitable weapon system. The attacks against the IS comprise basically attacking relatively small groups of foot soldiers, at most mobile on pick-up trucks and similar commercial vehicles, and armed primarily with personal infantry level weapons. The IS forces lack the heavy armament typical to conventional armies and look more like irregular guerrilla forces than anything else. In such circumstances,

---

6. Ibid.

7. James Rush, "ISIS Air Strikes: US Brings in Apache Helicopters as British Jets Target Militants in Iraq", *The Independent*, <http://www.independent.co.uk/news/world/middle-east/isis-air-strikes-british-jets-carry-out-latest-attack-on-militants-in-iraq-9777284.html>. Accessed on December 2, 2014.

conventional military air power is bereft of lucrative targets such as artillery, Multiple Launch Rocket Systems (MLRS), armoured vehicles, etc. The attack helicopter, due to its proximity to the combat area, could be more effective in locating, tracking and effectively engaging these forces as compared to conventional fixed wing aircraft.

The helicopter does, however, suffer from a major drawback. It is relatively slow and very vulnerable to surface fire, even from small arms. Being slow moving and designed to operate in close proximity to surface forces, the helicopter is also very vulnerable to Low Level Quick Reaction Missiles (LLQRMs). LLQRMs, captured from Iraqi Army stocks, along with machine guns of various calibres, are known to be in the possession of the IS.<sup>8</sup> There are reports that IS fighters have shot down Iraqi Mi-35M attack helicopters with these LLQRMs, despite the Mi-35M's self-defence suites<sup>9</sup>. Hence, the use of attack helicopters carries a possible cost in potential losses of aircraft and their crew.

The alternative is to utilise Remotely Piloted Aircraft (RPA) such as the US MQ-9 "Reaper" and the MQ-1 "Predator". These RPA are able to surveil large areas effectively due to their long endurance and with a man in the loop, in the form of the controller who could be located anywhere in the world while using Satellite Communication (Satcom) to keep in contact with his RPA, and engage identified targets through the "Hellfire" missiles carried onboard the RPA. Both the Predator and Reaper are analogues of the earlier armed attack helicopters in that these are essentially reconnaissance machines adapted to an armed attack role.<sup>10</sup> Purpose designed attack RPA continue to be under development in many parts of the world. The RPA has major advantages over even the attack helicopter. The first of these is that the RPA removes friendly humans from the battlefield more than the attack helicopter, a manned machine, does. The RPA can carry out search and strike attacks by day as well as by night, with its operator as far away as on the

8. "ISIS Fighters Seen with Advanced Antiaircraft Missiles", *Al Arabiya News*, <http://english.alarabiya.net/en/News/middle-east/2014/10/28/ISIS-fighters-seen-with-sophisticated-antiaircraft-missiles.html>. Accessed on December 2, 2014.

9. Ibid.

10. "Predator RQ-1 / MQ-1 / MQ-9 Reaper UAV, United States of America", <http://www.airforce-technology.com/projects/predator-uav/>. Accessed on December 3, 2014.

**In this comparison of attack helicopters and RPA, the RPA is seen to be ahead in cases where loss of lives or PWOs situations are not acceptable.**

other side of the globe from the area of operation. This has been amply demonstrated in the Predator and Reaper operations in Afghanistan, Yemen and Iraq. The attack helicopter conveys a level of shock and helplessness to ground forces at their receiving end. Modern attack helicopters carry very heavy armament comprising heavy machine guns, and large numbers of unguided rockets and guided missiles.

The helicopter is inherently a very noisy machine, and its approach can be detected, even in the absence of radars, through hearing its noise comprising the engine sound as well as the rotor beat. Advances in engine as well as rotor blade technology have been successful in reducing the helicopter's audio signature to some extent. The audio signature has not been, and may never be, eliminated completely. Even RPA have a distinct audio signature which, due to their altitude of operation and design, would be less of an issue than for attack helicopters. Hence, the approach of attack helicopters would in all probability be detected by the intended targets with adequate time to prepare LLQRMs and other weapons for defence against them. While the attack helicopters can deliver awesome firepower effectively against irregular forces such as were found in Afghanistan, Iraq and in current operations against the IS, it is only a matter of time before some are lost to enemy fire with concurrent loss of lives or Prisoners of War (POWs) situations developing. In this comparison of attack helicopters and RPA, the RPA are seen to be ahead in cases where loss of lives or POWs situations are not acceptable.

The attack helicopter has far greater ability to focus concentrated firepower on targets as it carries much greater armament than currently available armed RPA such as the Predator and Reaper. There are other advantages of having a man on the spot as no machine has yet been able to match the human ability for situation analysis and innovative reaction to dynamic situations.

Another limitation of the current armed RPA is that their slow speed and, hence, high transit time requires bases in the vicinity of the operations area

for them to operate from. Thus, RPA used in Afghanistan usually flew out of bases in Afghanistan or from neighbouring Pakistan as was the case in Iraq as well as Yemen.<sup>11</sup> The current operations against the IS in Iraq and Syria would require operating RPA from suitable bases in the region. Presently, candidate bases are likely to be available in Israel, Turkey, Jordan, Saudi Arabia, and other US allies, but this may not always be the case. The attack helicopter also requires basing in the area of operations, usually closer than an RPA, due to its limited radius of action. Ideally, the attack helicopter should operate in close coordination with troops or special forces.

In view of these relative merits and demerits of the RPA and attack helicopter, it is apparent that there is merit in the use of each in isolation and in their close coordination with each other. In this context, the unfolding operations by the coalition led by US against the IS are likely to prove very interesting in giving pointers towards the likely path ahead. This aspect merits a revisit a few months, hence, by when empirical evidence should be available in the public domain to pursue the arguments for and against each of these two airborne weapon systems.

#### **DEVELOPMENT OF MODERN AIR-TO-SURFACE WEAPONS**

The first air-to-ground weapons ever used from heavier than-air-aircraft in 1911 were free fall bombs, initially just hand grenades.<sup>12</sup> Over the years from the first use of aircraft in hostilities till the late years of World War II

**Another limitation of the current armed RPA is that their slow speed and, hence, high transit time requires bases in the vicinity of the operations area for them to operate from. Thus, RPA used in Afghanistan usually flew out of bases in Afghanistan or from neighbouring Pakistan as was the case in Iraq as well as Yemen.**

---

11. Nick Turse, "America's Secret Empire of Drone Bases", <http://www.worldcantwait.net/index.php/features/covert-drone-war/7447-americas-secret-empire-of-drone-bases>. Accessed on December 3, 2014.

12. "The War in the Air - Summary of the Air War", <http://www.firstworldwar.com/airwar/summary.htm>. Accessed on November 18, 2014.

the nature of the weapons used by aircraft against ground targets remained essentially unchanged in that these comprised machine guns and / or cannons<sup>13</sup> mounted on the aircraft along with unguided “dumb” or “iron” bombs that were basically free fall weapons. As the type of weaponry in use was entirely unguided, the number of weapons that required to be used to obtain the desired destructive effect on the target was large. This is the reason for the famous large bomber missions, going up to the British Royal Air Force’s (RAF’s) 1,000 bomber raids against Germany,<sup>14</sup> that were flown during World War II.<sup>15</sup> On October 14, 1943, the US Army Air Force’s (USAAF’s) Eighth Air Force mounted a 351-bomber raid to destroy the *Schweinfurt* ball bearing factory in Germany.<sup>16</sup> Despite the large number of bombers used, the factory suffered only a two-thirds drop in production and not total destruction. The USAAF bombers suffered 19 percent losses to enemy defensive action despite friendly US fighter escort being available.<sup>17</sup> The ability to deliver weapons accurately remained a human skill that could not be easily replicated. The need to destroy a target, hence, required a large number of weapons to be dropped on it in the hope that an adequate number would impact on it and cause the desired damage. There was need for accurate intelligence on the location, hardening, layout, etc. of targets for air-to-ground attacks to be successful.

Several new guided air-to-surface weapons were developed in this period spanning the 1950s to the mid-1970s. These included the US Air to Ground Munition (AGM)-12 “Bullpup”, AGM-62 “Walleye”, Guided Bomb Unit (GBU)-8, and the first Laser Guided Bomb (LGB), the Texas Instruments developed Bomb, Laser, and Terminal Guidance (BOLT) -117,

---

13. The difference between aircraft mounted guns and cannons essentially is that the former fire solid projectiles that have only a kinetic impact on the target while the latter fire rounds that incorporate an internal explosive charge that is designed to explode on impacting the target and, thus, to cause more damage.

14. “The Thousand Bomber Raid”, [http://www.historylearningsite.co.uk/thousand\\_bomber\\_raid.htm](http://www.historylearningsite.co.uk/thousand_bomber_raid.htm). Accessed on November 18, 2014.

15. V Kapur, “Precision Weapons in Aerial Warfare”, [http://www.idsa.in/issuebrief/PrecisionWeaponsinAerialWarfare\\_vkapur\\_080512.html](http://www.idsa.in/issuebrief/PrecisionWeaponsinAerialWarfare_vkapur_080512.html). Accessed on November 17, 2014.

16. “World War II: Eighth Air Force Raid on Schweinfurt”, <http://www.historynet.com/world-war-ii-eighth-air-force-raid-on-schweinfurt.htm>. Accessed on November 12, 2014.

17. *Ibid.*



later redesignated as the GBU-111. Its successors are today's Paveway-I, II, III and IV LGBs.<sup>18</sup> Earlier, such guided weapons mimicked the World War II vintage German "Fritz X" in incorporating a man in the loop command guidance with all its limitations. Later, autonomous guidance systems based upon electro-optical, Infra-Red (IR), laser and other parts of the Electro-Magnetic (EM) spectrum were developed.

An unavoidable characteristic of these new high technology weapons that enabled more accurate ground target attack through exploitation of the EM spectrum for target detection and guidance was high cost per weapon due to the incorporation of high technology, more precise high end manufacturing process requirements, and the Research and Development (R&D) costs involved. With newer developments that promise better performance, the cost of each weapon inevitably climbs even higher. A US Paveway-II LGB in the early part of this century cost \$ 23,700 in a large production run.<sup>19</sup> A single US Mk-82 iron or dumb 500 lb bomb, in contrast, cost a mere \$ 268.5.<sup>20</sup> The costs involved in a modern high technology war are very high. The 25-hour-long, covering a total of 11,418 miles, delivering a total of 45 x 2,000 lb satellite guided bombs, Global Positioning System (GPS) guided Joint Direct Attack Munitions (JDAMs) mission flown by three Whiteman Air Force Base, Missouri, USA-based USAF B-2 bombers against Libyan air defence targets in March 2011<sup>21</sup> would have cost merely \$3,375,000 in the per hour flying cost of one B-2. The three aircraft formation of B-2s cost in dollar per flying hour totals up to \$ 10,125,000. Each 2,000 lb JDAM itself costs \$ 21,000<sup>22</sup>. Hence, the 25-hour-long mission that destroyed Libyan Air Force hangars and other ground infrastructure cost \$ 945,000 for the 45 JDAM weapons used alone. This totals up to a full mission cost of \$ 11,070,000, including the per hour

---

18. Kapur, n.15.

19. Ibid.

20. "Mk82 General Purpose Bomb", <http://fas.org/man/dod-101/sys/dumb/mk82.htm>. Accessed on November 18, 2014.

21. Richard Hartley-Parkinson, "Touchdown: B-2 Stealth Jets Return After Epic 11,500 Mile Journey to Bomb Libyan Aircraft Shelters", <http://www.dailymail.co.uk/news/article-1368337/Libya-crisis-B2-stealth-bombers-25-hour-flight-Missouri-Tripoli.html>. Accessed on November 18, 2014.

22. "GBU-38 JDAM", [http://www.deagel.com/Bombs-and-Guidance-Kits/GBU-38-JDAM\\_a0101074003.aspx](http://www.deagel.com/Bombs-and-Guidance-Kits/GBU-38-JDAM_a0101074003.aspx). Accessed on November 19, 2014.

flying cost of the B-2s and the cost of all the weapons utilised. It is, of course, for the planners and their staff in the operating air force to determine if the cost of the mission was worth its benefit. To an outsider, with access to only open source information, the cost of the mission appears exorbitantly high and basically unsustainable given that in view of the relative obsolescence of the Libyan Air Force and its lack of any effective air defence capability in 2011, the desired effect could have been achieved through other less resource intensive means such as cruise missiles or earlier generation carrier or land-based aircraft already available in the Mediterranean Sea region.

The earlier US air attack on Libya in 1986 (Operation El Dorado Canyon) that utilised 1960s' vintage F-111s flying out of air bases in the UK, supported by a few US Navy carrier-based essentially electronic support assets took place at a time when the Libyan Air Force was much more coherent and effective than in 2011, but was successful despite non-availability of expensive LO aircraft albeit at the cost of one F-111 being shot down.<sup>23</sup> The loss of the lone F-111 cannot be attributed to just absence of high end LO capability in that mission. Even during the Gulf War of 1991, despite the great asymmetry in capabilities of the coalition aligned against Iraq and the Iraqi military, coalition aircraft that followed low low low (lo lo lo) level flight and attack profiles suffered relatively high losses to opposing anti-aircraft systems while medium medium medium (med med med) and high high high (hi hi hi) level attack profiles (predominantly by Gen 4 or earlier technology aircraft) were relatively unscathed<sup>24</sup>; The Operation El Dorado Canyon Libyan raid in 1986 followed a lo lo lo profile, thus, flying through even the engagement envelope of opposing air defence artillery systems. There is no information about the Libyan weapon system anti-aircraft artillery or Surface-to-Air Missile (SAM) that the ill-fated F-111 was shot down by in 1986. The B-2 raid on Libya was probably meant more as a demonstration of the long reach of the US Air Force's (USAF's) high end

---

23. "Op El Dorado Canyon", [http://www.globalsecurity.org/military/ops/el\\_dorado\\_canyon.htm](http://www.globalsecurity.org/military/ops/el_dorado_canyon.htm). Accessed on November 19, 2014.

24. Christopher Bellamy, "Britons Died in Gulf War 'Due to MoD Interference'", <http://www.independent.co.uk/news/britons-died-in-gulf-war-due-to-mod-interference-1321938.html>. Accessed on November 18, 2014.

hardware than for operational reasons that eliminated the possibility of less costly assets being used. Given the figures of weapon as well as per hour flight cost, as stated earlier in this paper, it is quite easy for the reader to work out the cost of similar missions by other Gen 5 or Gen 4 aircraft. This high cost per weapon delivered to the target makes the guided weapon cost-effective when used against difficult, well defended targets that could cost much more to attack if less capable and less costly weapons were used, thereby possibly endangering attacking aircraft, used in larger numbers to cater for the reduced accuracy of each weapon, and forced to fly closer to the target and each of which aircraft cost several million dollars.

In sum, modern costly guided weapons are best utilised in situations where not using them would result in the target not being attacked effectively and / or put expensive attack aircraft or lives in unnecessary jeopardy. Use of LO technology is best suited for situations where non-use of such aircraft may jeopardise the mission due to the presence of effective enemy air defences. It is unlikely that even the US would be able to sustain such expensive military operations for much longer in the near to medium term as we go into the 21st century.

### **CHANGING NATURE OF WAR**

Since World War II, in the mid 20th century, the nature of predominant warfare has been changing in many ways. The post World War II years saw the emergence of two blocks of superpowers, the Warsaw Pact led by the erstwhile Soviet Union and the North Atlantic Treaty Organisation (NATO) led by the US. These blocks wielded irresistible military power as compared to other nations. In the era of a military balance, including a nuclear weapon fuelled deterrent posture between these two superpowers, inter-state military conflicts took place for the most part between the lesser powers of the world, often as proxies for the two superpowers. However, the bulk of conflicts since 1945 have involved non-state actors or insurgent groups acting against nation states. This trend towards the latter type of conflict has been growing at an alarming rate. The trend has spawned a new discourse on the nature of warfare with the current prediction being

that the world is seeing a transition towards Gen 4 warfare. These non-state forces typically lack any heavy military equipment and combat air power. They comprise predominantly lightly armed irregular 'foot soldiers' who indulge in guerrilla campaigns, presenting no major targets such as regular military forces have in terms of command headquarters, logistics nodes, logistics lines, heavy equipment (armoured vehicles and heavy artillery) locations, bridges, factories, etc. to attack. Even their leadership is diffused and 'widely distributed' in the sense that there is no known location for the seat of leadership or a very clearly specified hierarchy at the upper levels of the leadership that can be located and targeted. The density of fighters per unit area is also quite low as compared to conventional military forces as the latter rely upon massed firepower for achievement of objectives while the non-state forces operate as an amalgamation of light raiding parties more than anything else. In sum, the new nature of fighters that are being seen emerging in many parts of the world—the Naxalites (Maoists in India), the Taliban in Afghanistan, Kurd forces in northern Iraq, northwest Iran and southern Turkey and now the Islamic State (IS), earlier the Islamic State of Iraq and Levant (ISIL)—are seen to conform to this new nature of opponents that nation states are facing. Since 1945, there have been approximately 160 armed conflicts in the world of which as many as 75 percent have been Low Intensity Conflicts (LICs), which have taken place generally in less developed parts of the world and have mostly involved regular military forces on one side, fighting guerrillas, terrorists, and even women and children, on the other. Despite being low technology in nature, LICs have been very bloody, causing significantly more casualties than conventional wars since 1945. In the years since 1945 till date, only LIC has resulted in change of borders. Even in the 1971 Indo-Pak War which created the new state of Bangladesh, the result was in large part the outcome of the indigenous Bangladeshi Mukti Bahini (an irregular insurgent force, weakening through guerrilla attacks, and continually harassing, the Pakistan Army in erstwhile East Pakistan and, thus, assisting the advance of the Indian Army. Hence, the results of the 1971 Indo-Pakistan War cannot be attributed to conventional war alone. The results of such border changes are usually recognised by the

same international community that frowns upon conventional wars aimed at redrawing boundaries. China post World War II against the Chinese Nationalists and the Vietnamese Communists against South Vietnam, the latter supported by the US, are examples of LIC changing borders with the acceptance by the international community while the ill-fated Iraqi invasion of Kuwait in 1990 is an example of the international community not accepting conventional military operations aimed at changing borders, leading to the conclusion that what we are used to classifying as LIC/terrorism/guerrilla operations or an 'adaptation of war' is actually WAR in its most elemental sense and this is likely to increase in scope and use in the foreseeable future as it was in the years before war came to be artificially regulated, and so ending the era of what we today call conventional war fought by dedicated military forces in fairly clearly demarcated battle areas, with fixed and rigid rules imposed by the Western countries for their own advantage. Hence, the trend in warfare appears to be towards what has been labelled Gen 4 warfare.

### **CHANGING NATURE OF TARGETS**

From the air power practitioner's point of view, this new type of warfare presents new challenges. In the past, in conventional warfare between nation states, clearly discernible military targets were available. These included massed formations of armour, troop concentrations, vital infrastructure such as airfields, Petrol, Oil and Lubricants (POL) depots and their transportation networks, lines of communication, both road and rail, centres of manufacturing, ports, etc. apart from the seat of the opponent's economic and political power. The problem in earlier times was developing air forces able to effectively address the vast number of potential targets available. There was also a relatively clear demarcation between non-combatants and military forces. It was only in rare cases that non-military targets were attacked by regular military forces and this was ascribed to retaliatory action or other overpowering political direction. Fears of collateral damage were not too great in regular military activities due to the ease in recognising military and non-military targets and a widely accepted demarcation that

**What are now faced are widely dispersed bands of personnel who look like the general population and do not usually opt to wear distinct, easily recognisable uniforms, armed with personal weapons, some of which could be quite powerful, and able to mix with the surrounding population due to appearance and cultural similarities.**

kept the non-military targets free from military attack in terms of the generally understood and accepted 'rules of war'. With the changing nature of warfare, the earlier targets have vanished overnight. What are now faced are widely dispersed bands of personnel who look like the general population and do not usually opt to wear distinct, easily recognisable uniforms, armed with personal weapons, some of which could be quite powerful, and able to mix with the surrounding population due to appearance and cultural similarities. These bands of armed personnel faced by the nation state do not depend upon the

vast infrastructure that regular armies did. Hence, the target list shrinks drastically. This type of warfare has been called LIC as in this type of conflict, the major capital weapons of regular warfare—warships, submarines, main battle tanks, bombers, howitzers, etc—are generally conspicuous by their absence. Regular military forces built for interstate warfare suddenly find themselves at a loss about what and how to target, and how. Weapons designed to take out massed battle tanks are suddenly redundant as there are no tanks on the battlefield. Even the battlefield of old is not there anymore. The irregular forces of LIC-based non-state actors converge rapidly where required, overwhelm their targets, and disperse again to move to their next area of interest. At most, these people may be targeted when they are seen to be converging to take over an area of interest to them. This, however, would require accurate knowledge of their intentions through possibly Human Intelligence (HUMINT), not the easiest thing to obtain when dealing with secretive, well organised, quasi-terrorist organisations. The leadership of such organisations is also very mobile, with protection through dispersal and pre-decided chains of succession. Al Qaeda was based upon a large network of individual small organisations. All of these independent small

organisations were for the most part kept ignorant about each other except where their task required the information, that too on a need to know basis. These independent cells were directed from a distance to carry out supporting activities in pursuit of the overall objective. The matrix organisation-like structure ensured survivability of the overall organisation in case of elimination of any one particular easily identifiable leader. Elimination of Osama bin Laden, the head of Al Qaeda, in a conventional organisation could have been expected to lead to the unravelling of the organisation, however, even after Osama's death, Al Qaeda remains a going concern for all intents and purposes. The same is likely with other similar organisations that are at the centre of conflict in most parts of the world.

**The matrix organisation-like structure ensured survivability of the overall organisation in case of the elimination of any one particular easily identifiable leader.**

#### **ACCURATE AND RELEVANT INTELLIGENCE**

It has been mentioned earlier that good intelligence has been a prerequisite for effective air-to-ground attack. The nature of earlier air attacks, such as during World War II, saw very large numbers of weapons being dropped in the target zone. Of these, the final spread often covered a few square kilometres. Even if the bombers failed to target the intended target accurately for reasons of lack of knowledge of its exact location, the unintended spread of the bombs dropped gave some hope that at least a few bombs would detonate close enough to the intended target to cause damage. Large bomber raids and bombers that carried very large numbers of weapons in effect aimed for a shotgun principle in engaging targets. Guided weapons such as the Paveway LGBs, JDAMs, etc. can typically impact within ten to three metres of their aim point. Such accuracy is useless unless the pilot delivering the weapon knows where the weapon should be delivered for the desired effect. In addition, he must be able to acquire, identify, and track the aim point so as to place the sighting system for the weapon correctly where desired. This high accuracy of modern PGMs makes it imperative that they be aimed at

the correct target. Hence, development of more accurate weapons has led to a complementary requirement for intelligence of a much higher calibre than was the case before. For these weapons to be used effectively, there is need for very accurate and up-to-date intelligence on the location and other parameters of potential targets. In addition, weapon target matching needs to be done to, firstly, match the target characteristics and desired destruction level with the weapons and also, in view of the high cost of such weapons and their support infrastructure, to match the cost and benefit of addressing a particular target. In modern Gen 4 warfare, this intelligence requirement increases even more as it is quite likely that the hostile elements may surround themselves with innocent people by design. The challenge now is to obtain intelligence accurate and up-to-date enough to accurately engage the hostiles while causing minimum, ideally nil, collateral damage. Weapons able to deliver this capability include the US GBU-39 Small Diameter Bomb (SDB) , and laser guided 70mm (2.75 inch) calibre rockets being tested by British Aerospace Systems, to name just two. The most accurate air-to-ground weapons remain LGBs while other bombs exploit the IR, optical, and radar parts of the EM spectrum for guidance. All of these weapons require accurate intelligence on target locations and characteristics. LGBs also require laser illumination of the target for guidance. This illumination could be carried out by an airborne platform or by special forces troops inserted in the area for target designation by the use of small portable laser illuminators. IR, optical and radar-based weapons usually depend only upon their onboard sensors for guidance. In the absence of special forces, other infiltrators could also be employed for laser target designation. The latter may, in some circumstances, be more effective than special forces if they are able to merge with the local population or are drawn from that population itself.

The means of obtaining this intelligence require some thought. Firstly, it could be expected that modern means of intelligence collection through use of satellites, reconnaissance aircraft, Signals Intelligence (SIGINT) and Electronic Intelligence (ELINT) assets would be used. In addition, especially in Gen 4 warfare, the need of HUMINT increases manifold. Despite the modern means of intelligence gathering, the fact that Gen 4



warfare, combatants are trained and equipped to eschew modern weapons and to practise guerrilla type tactics makes HUMINT essential when fighting such opponents. Gen 4 combatants are likely to use non-military technology more than military technology. While not usually possessing high power military grade communication sets, these people could be adept at the use of cellular phones and internet-based communications, including social media sites for effective communication and coordination. This fact, coupled with the diffused nature of the leadership in many Gen 4 warfare organisations, increases the importance of intelligence gathering, moving beyond traditional military arenas of operation to keep a track of what is traditionally civilian technology also. There is no escape from the necessity of obtaining up-to-date and accurate intelligence from all possible means for air power to be utilised effectively.

#### **IMPERATIVES OF ACCURATE ATTACK AND COLLATERAL DAMAGE**

Unlike conventional military forces, the new non-state forces have no issue with merging with the local population for camouflage as well as protection. Often, they desire members of the local population to be the target of the opponent's attack in order to harvest the resultant anger against the attacker amongst the local population to bolster their ranks. The willingness of the new non-state forces to mingle with the local population presents great challenges for conventional military forces in dealing with them. Conventional militaries require to ensure that while engaging the non-state armed personnel, they cause no, or at least, minimal collateral damage. This is not easy for military organisations designed, trained and equipped to use the maximum required force to destroy the enemy. There is need for a change in mindset as well as equipment and its utilisation philosophy. Weapons should now be used in carefully controlled situations and utmost care must be taken to ensure that innocent bystanders are not harmed even at the cost of taking casualties. Any casualties caused to innocent bystanders, covered by the term 'collateral damage', by application of the military power of a state's forces operating against non-state forces are usually blown out of proportion as instances of brutality and war crimes and lead to the state forces suffering a major

propaganda loss. Hence, there is great pressure to avoid collateral damage. This can be seen in all regions where conventional military force is being used against new style irregular forces. The imperative to reduce collateral damage has forced all modern militaries that are engaged in such warfare or foresee the need for engaging in such operations in the near future, to induct PGMs. The search for cheap PGMs has led to the new satellite guided bomb, the JADM, as the weapon of choice as it costs appreciably less than the earlier LGBs, etc. Smaller calibre accurate weapons such as the US SDB<sup>25</sup> have been developed to reduce the collateral damage effect in LIC operations. Guided relatively small calibre rockets have also been developed to ensure accurate delivery and just enough warhead effect to destroy the intended target without collateral damage.<sup>26</sup>

#### **COST VS. EFFECTIVENESS OF HIGH END AIR POWER IN LIC**

The typical target that the new type of warfare most usually presents is a small group of individuals armed with assault rifles, a few grenades, and, may be, a man portable missile launcher spread over a few tens of square metres. The identity of these people is not usually available. Hence, they could be lowly foot soldiers at the bottom of the non-state militant organisation or even members from amongst its top commanders. Their presence is unlikely to persist for much time as once they have done what they gathered for, they could disperse in small numbers into the surrounding countryside to move towards their next objective. Such fleeting targets require near full time surveillance of the area under consideration with real time monitoring of the myriad sensors to spot, analyse and classify such fleeting targets on priority for appropriate action. This surveillance task itself is prohibitively expensive in terms of equipment and manpower resources. Reducing the sensor-to-shooter time lag has become even more important today with the fleeting nature of the new targets. The solution so far has been to arm the surveillance

---

25. Kris Osborn, "Air Force Tests Small Diameter Bomb II to Hit Moving Targets", <http://defensetech.org/2014/07/16/air-force-tests-small-diameter-bomb-ii-to-hit-moving-targets/>. Accessed on November 19, 2014.

26. "Affordable Precision", <http://www.raytheon.com/capabilities/products/lgr/>. Accessed on November 19, 2014.

RPA with light PGMs such as the US Hellfire missile on the Predator and Reaper RPA. These craft have been used extensively in Afghanistan, Yemen and the Middle East with some success, but notable failures as well, in that innocent people were often attacked. Such errors could be ascribed to errors in the analysis of the imagery data, coupled with faulty HUMINT or Technical Intelligence (TECHINT).

Surprisingly, there have been missions flown by very high end LO aircraft such as the B-2 and F-22 on such LIC operations.<sup>27</sup> Given the total absence of any opposing air power in such scenarios, this defeats understanding. LO aircraft are designed to penetrate contested air space successfully. If there is no opposing air force at all, then their use is overkill by several magnitudes as even unarmed light aircraft could possibly operate in such air space unmolested. These LO aircraft usually use PGMs as their weapon of choice. Given the cost per flight hour of such LO aircraft and the high cost of especially Western PGMs, the cost-benefit ratio of spending several million dollars to kill two or a dozen lowly armed guerrillas needs some serious thought. The other aircraft currently in use against LIC type forces in Iraq and Syria, which were earlier used in Libya, for instance, include the Eurofighter Typhoon and French Rafale. These Gen 4+ aircraft also carry a high cost per flight hour; though admittedly much lower than that of the US LO fighters. The PGM weapons used by both the Gen 4+ and Gen 5 aircraft still cost about the same in both cases. These fighters also deliver a very high cost per mission. The high cost is easily justifiable if the mission targets the top leadership of the LIC force and delivers benefits out of proportion to the actual casualties caused on the ground. However, given the difficulty in determining the location and, at times, even the identity of this leadership, this is like looking for a needle in a haystack.

The cost of using this high end equipment designed and built for a very different scenario in this manner appears to be a waste that could pull the operating country into the dark well of economic downfall. The most suitable

---

27. Colin Clark, "F-22s Used In Syria Strikes; Right Force, Right Time, Say Analysts", <http://breakingdefense.com/2014/09/f-22s-used-in-syria-strikes-right-force-right-time-say-analysts/>. Accessed on November 19, 2014.

**The cost of using this high end equipment designed and built for a very different scenario in this manner appears to be a waste that could pull the operating country into the dark well of economic downfall.**

airborne platform for such LIC dominated scenarios is, of course, the attack helicopter. This machine carries awesome firepower, is slow and close enough to the targets for better recognition, has high persistence as compared to fixed wing aircraft, can deploy guided munitions to avoid collateral damage and is mobile enough to redeploy rapidly in response to dynamic situations. The helicopter is, however, vulnerable to even small arms fire and, thus, especially in its attack helicopter

*avatar*, comes suitably equipped with armour plating to protect crucial parts of its airframe and engine(s). Other aircraft suitable for such missions date back to Gen 3 fighters such as the US A-10 "Thunderbolt" and Soviet era Su-25 "Frogfoot". Both these aircraft were designed as Close Air Support (CAS) aircraft and were intended to be operated in the tactical battle area in support of friendly forces against enemy surface forces. Hence, these aircraft were designed to be able to deliver adequate firepower accurately and incorporated extensive self-defence hardening in terms of armour plating and redundant systems to make them very difficult to destroy. In the US operations in Kuwait and Iraq as part of the Gulf War of 1991, 70 of the 144 A-10 aircraft deployed for operations in the area suffered damage. However, by the end of the war, 14 of the damaged aircraft had already been repaired and returned to service, indicating the high ability of these CAS designs to take punishment and survive. Such specialist CAS aircraft cost much less than more advanced LO aircraft to develop and build and are, hence, more affordable for such missions. The close proximity of their operation to the targets enables some reduction in PGM usage and, hence, costs. Most trainer and old generation light fighter aircraft could be modified into suitable and effective platforms for use in this scenario at a fraction of the cost of a single Gen 4+ or Gen 5 aircraft. The use of Gen 4+ and / or Gen 5 aircraft to undertake LIC operations in which expensive aircraft use costly PGMs to take out individual fighters of the non-state forces appears to be

a sure way to economic doom. Intelligence agencies require a revamp to deliver better actionable intelligence and targets. Targeting individuals can be justified if these individuals are positively identified as the top leadership of the non-state organisation in a situation that such attacks will yield commensurate benefits.

The demise of old target systems of conventional war extends to attacks on oil refineries and other oil facilities. In the conventional warfare of old, nation states' economies depended upon availability of POL products for the country to function as well as for effective military operations. Thus, destruction of oil facilities was deemed to have an effect on the outcome of a war. This effect would not in most cases be immediate as any sensible opponent would have stockpiled reserves for several days or even weeks of operation. However, ultimately, destruction of oil facilities would be expected to lead to a favourable outcome due to fuel starvation caused by disruption of oil supplies and exhaustion of strategic and tactical reserves. In the case of non-state opponents, oil facilities become a much less effective target. By definition these non-state forces are independent of the trappings of nation states and do not rely upon mechanised armed forces. Hence, the relevance of attacking oil facilities in such operations against non-state opponents is greatly reduced, even to the point of futility. Exceptions may exist like in the current case of the IS which is using oil from captured oil fields to generate funds for its operations.<sup>28</sup> In this unique case, some attacks on oil facilities may yield medium term results through reducing the resource flow of the IS. Thus, this brings out the importance of a careful analysis of the opponent to identify suitable targets for immediate / short-term, medium-term as well as long-term effects.

**The use of Gen 4+ and / or Gen 5 aircraft to undertake LIC operations in which expensive aircraft use costly PGMs to take out individual fighters of the non-state forces appears to be a sure way to economic doom.**

---

28. Eline Gordts, "How ISIS Uses Oil To Fund Terror", [http://www.huffingtonpost.com/2014/09/27/isis-oil\\_n\\_5877008.html](http://www.huffingtonpost.com/2014/09/27/isis-oil_n_5877008.html). Accessed on November 19, 2014.

## ANALYSIS

The changing nature of war requires military forces to carry out a detailed and effective analysis of their environment in the medium and long-terms to determine the nature of capabilities required to be inducted. Failure to do so could result in the situation that the US and most of the West find themselves in today. These countries are saddled with very powerful and effective air power assets that cost as much as many smaller countries' Gross Domestic Product (GDP) but impose penalties of forcing operation of very expensive missions which are clearly not sustainable in the long run. These expensive missions are also not effective in the new environment as their high cost would suggest. The West often justifies the use of its most advanced technology in this unsustainable manner by holding that these costs are preferable to loss of lives of their troops involved in ground operations. The aim seems to be to fight and try to win "bloodless wars" at least in terms of their own casualties. It needs to be emphasised here that wars cannot be fought and won without casualties. If there is a will to fight, this performance has to be accompanied by the willingness to take reasonable casualties. Political and military planners require to ensure that they are not seduced by the glitter of 'gold plated' high end weapons programmes to an extent that the other end of the spectrum is ignored. The military forces of a nation should be configured to deliver the capabilities actually required and not capabilities that belong to a different era or to an out of vogue type of operation.

Ideally, both ends of the spectrum of warfare as we know it should be covered. There should be viable high end, medium end and low end capabilities planned for, and inducted, with relevant doctrines, tactics, etc. also in place. This catering for both the high as well as low end of the possible spectrum of conflict could be termed as development of 'balanced military forces'.

It is true that there is a strong line of thinking that military forces require to put in place capabilities that assist in effective and efficient discharge of their tasks and these military forces should not bother about costs, etc. However, it is a truism that all countries, even the superpowers, are facing economic difficulties. In such a situation, it behoves military leaders to also

give some thought towards the cost of the capabilities they desire to put in place. Here it should be borne in mind that there is a tendency in military forces all over the world to opt for the very best equipment in preference to equipment that could be less advanced but can do the job at hand. It should be kept in mind that “the excellent is the sworn enemy of the good enough”.

## CONCLUSION

Aircraft technology has developed at a rapid pace in the past century. The advances in technology have delivered near science fiction analogues into the hands of war-fighters; near invisible combat machines, precise “smart” weapons, a near ubiquitous surveillance capability, robotics on the battlefield, etc. One of the most interesting of these is the advent of LO technology and PGMs. In conventional warfare for which these LO aircraft were designed, they can be game changers. LO technologies as well as PGMs carry a very high cost of acquisition as well as operation. The nature of war has also changed to become more LIC in nature, with dispersed lightly armed irregular opposing forces operating at the lower levels of technology. The utilisation of advanced LO equipment against LIC opponents has been carried out in the recent past but in view of the costs involved, this appears unsustainable. Targeting of individual opposing fighters with expensive weapons released from expensive to own as well as operate aircraft seems a sure way to bankruptcy, given that killing individuals at the rough cost of several thousand dollars per head when there are tens of thousands to kill, would reduce even the US or China to penury in a few months. Military aviation requires retaining the earlier capabilities of the Gen 3 era of specialist CAS aircraft and attack helicopters for effective operations against LIC opponents, given the current rise of this kind of warfare. These issues have a bearing on the force structure planning of all modern air forces and ignoring them would not be advisable. It should also be borne in mind that in any conflict, both sides require to be ready to accept casualties. Military planners, in an era of resource shortages, will, in all probability, increasingly require paying heed to the cost of their equipment as well as its effectiveness.

# “DESIGN AND MAKE IN INDIA”: MILITARY AIRCRAFT

R K NARANG

*Make in India is a lion's step: its symbol is a lion made of cogs.*<sup>1</sup>

*Design in India is as important as Make in India*<sup>2</sup>.

— Narendra Modi,  
Prime Minister of India

*Make in India is an opportunity to make India  
truly and globally competitive*<sup>3</sup>.

— Cyrus Mistry, CEO Tata Group

## INTRODUCTION

The Prime Minister of India, Narendra Modi's emphasis on the need for "Design in India" during the launch of the "Digital India Week" is a significant statement, which has the potential to take the "Make in India" campaign to a higher level.<sup>4</sup> The Indian government, in an endeavour to give a major

---

Wing Commander **R K Narang** is a Research Fellow at the Centre for Air Power Studies, New Delhi.

1. "Modi's 'Make in India' Campaign: Top 10 Quotes", September 25, 2015, [http://www.business-standard.com/article/economy-policy/modi-s-make-in-india-campaign-top-10-quotes-114092500440\\_1.html](http://www.business-standard.com/article/economy-policy/modi-s-make-in-india-campaign-top-10-quotes-114092500440_1.html). Accessed on July 2, 2015.
2. "PM Modi Launches Digital India Campaign: As it Happened", July 2, 2015, [http://zeenews.india.com/business/news/technology/pm-narendra-modi-to-launch-digital-india-campaign-today\\_130358.html](http://zeenews.india.com/business/news/technology/pm-narendra-modi-to-launch-digital-india-campaign-today_130358.html). Accessed on July 3, 2015.
3. n. 1.
4. "Digital India Week: 'Design in India' as Important as 'Make in India', says PM Narendra Modi", July 1, 2015 <http://www.financialexpress.com/article/tech/digital-india-week-live-narendra-modi-all-set-to-launch-e-hospital-e-signature-more/92878/>. Accessed on July 2, 2015.



**About 60 percent of India's requirement of weapons is being met through imports. With an allocation of US\$ 37.4 billion for defence and despite being the largest importer of arms, India has not been able to meet its defence needs and there are plans to spend INR 250 billion in the next 7-8 years on capital acquisitions.**

push to its dream project "Make in India" in the defence sector, awarded 56 defence manufacturing permits to private companies in the last one year<sup>5</sup>. India, with 14 percent of international arms imports, was the largest importer of arms in 2014 with almost three times more share of the volume of the arms imports than the second placed China.<sup>6</sup> About 60 percent of India's requirement of weapons is being met through imports. With an allocation of US\$ 37.4 billion for defence<sup>7</sup> and despite being the largest importer of arms, India has not been able to meet its defence needs and there are plans to spend INR 250 billion in the next 7-8 years on capital

acquisitions.<sup>8</sup> The present government is trying hard to encourage "Make in India". The government has issued 56 licences to the private companies in the last one year, which is 48 licences more than the 8 licences issued during the last three years of the United Progressive Alliance (UPA) government.<sup>9</sup> The government had earlier allowed 49 percent Foreign Direct Investment (FDI) in the defence sector to support "Make in India".<sup>10</sup> There is a provision to allow FDI beyond 49 percent subject to clearance by the Cabinet Committee

- 
5. Manu Pubby, "Boost to Make in India: Modi Govt Awards 56 Defence Licences to Private Cos Like Mahindra, Tata & Pipavav", *The Economic Times*, June 27, 2015, <http://economictimes.indiatimes.com/news/defence/boost-to-make-in-india-modi-govt-awards-56-defence-licences-to-private-cos-like-mahindra-tata-pipavav/articleshow/47837004.cms>. Accessed on June 29, 2015.
  6. Rajat Pandit, "India's Arms Imports Almost Three Times of China, Pak", SIPRI Report, March 17, 2014, <http://timesofindia.indiatimes.com/india/Indias-arms-imports-almost-three-times-of-China-Pak-SIPRI-report/articleshow/32190097.cms>. Accessed on June 29, 2015.
  7. Defence Manufacturing, <http://www.makeinindia.com/sector/defence-manufacturing/>. Accessed on June 30, 2015
  8. Ibid.
  9. Pubby, n. 5.
  10. Sunitha Rai, "India Increases Foreign Investment Limits In Defense and Insurance Sectors To 49%," October 7, 2014, <http://www.forbes.com/sites/saritharai/2014/07/10/india-increases-foreign-investment-limits-in-defense-and-insurance-sectors-to-49/>. Accessed on June 30, 2015.

on Security on merit basis<sup>11</sup>.

Most advanced nations have involved the private sector in the indigenous production of military aircraft. This played a key role in increasing defence aircraft production and improving efficiency. The private sector, with its efficiency and innovativeness, could become a key player in producing aircraft hardware and/ or components for the indigenous aircraft industry. However, the participation of the private sector in “Make in India” will also bring with it its inherent follies and vices. It may also bring with it cut-throat competition, an aspiration for higher profits and a desire for achieving higher sales targets in which the companies’ profits may outweigh the nation’s priorities. They may try to sell their products at all cost even if they are too expensive or do not meet all the user requirements. The government should factor in these issues while formulating policies and legal provisions.

**Most advanced nations have involved the private sector in the indigenous production of military aircraft. This played a key role in increasing defence aircraft production and improving efficiency.**

Post-graduate engineering and defence production courses at the MTech/ PhD level are needed to undertake Research and Development (R&D) in this niche field. The development of niche technologies, innovations and success of “Make in India” also require adequate expenditure on R&D. The India Air Force (IAF) is the predominant user of military aircraft among the three Services and, hence, has become its patron and plays an important role in guiding future military aviation indigenisation. This paper would study the role and impact of factors like knowledge base/higher education in aeronautics, privatisation, Public Sector Undertakings (PSUs), imports/ licensed production and indigenisation, R&D project ownership, fund allocation and tax incentives in order to make “Design and Make in India” in the defence aviation sector a success.

---

11. Press Note No. 7 (2014 Series), Subject, Review of the policy on Foreign Direct Investment (FDI) in Defence sector –amendment to ‘Consolidated FDI Policy-Circular 2014’, August 26, 2014, [http://dipp.nic.in/English/acts\\_rules/Press\\_Notes/pn7\\_2014.pdf](http://dipp.nic.in/English/acts_rules/Press_Notes/pn7_2014.pdf). Accessed on July 8, 2015

## **HISTORICAL BACKGROUND**

**HAL:** Hindustan Aircraft Limited was established by Shri Walchand Hirachand on December 23, 1940, at Bangalore.<sup>12</sup> It was placed under the Ministry of Defence in 1951 and renamed as Hindustan Aeronautics Limited (HAL) in 1964.<sup>13</sup> The HAL design team under the leadership of Dr VN Ghatage had successfully developed and manufactured many aircraft, including the HT-2 piston engine trainer, Pushpak and Krishak piston engine light aircraft, and HJT-16 “Kiran” jet trainer. These pioneers of HAL had laid the foundation of Indian aviation’s R&D.

## **MARUT: FIRST INDIGENOUS SUPERSONIC JET FIGHTER**

The IAF’s first Indian Chief of Air Staff Air Marshal S Mukerjee’s desire to indigenously develop Asia’s first supersonic fighter jet aircraft in the 1950s and the support of the then Defence Minister Mahavir Tyagi, resulted in the development of the HF-24 Marut jet fighter aircraft by HAL. It was designed by a joint team of German and HAL engineers, led by Dr Kurt Tank, famous for building the Focke-Wulf aircraft for Germany during World War II. The HF-24 Marut first flew on June 17, 1961,<sup>14</sup> making India only the sixth country in the world after the USA, UK, USSR France and Sweden to build a supersonic jet aircraft.<sup>15</sup> It was believed to be the best airframe design of its time, with high survivability and excellent manoeuvrability, which were tested in the India-Pakistan War of 1971.<sup>16</sup>

The HF-24 Marut was designed with an expected thrust of 3,700 kgf to be provided by the afterburning Bristol Siddeley (later known as Rolls Royce) Orpheus 703 engine. However, without afterburners, its engine could only produce 2,200 kgf,<sup>17</sup> which was not adequate to meet the ambitious target of

12. “Our History”, [http://www.hal-india.com/Our%20History/M\\_111](http://www.hal-india.com/Our%20History/M_111). Accessed on July 1, 2015.

13. Ibid. Accessed on July 13, 2015.

14. “HF-24, Marut”, <http://www.globalsecurity.org/military/world/india/marut.htm>. Accessed on June 30, 2015

15. V Narayan, “Indian Aviation - HF-24 Marut, First Indian Designed Jet Fighter”, January 22, 2015, <http://www.team-bhp.com/forum/commercial-vehicles-india/159928-indian-aviation-hal-hf-24-marut-first-indian-jet-fighter.html>. Accessed on July 1, 2015.

16. “HAL HF-24, Marut Fighter-Bomber (1967)”, May 03, 2015, [http://www.militaryfactory.com/aircraft/detail-page-2.asp?aircraft\\_id=366](http://www.militaryfactory.com/aircraft/detail-page-2.asp?aircraft_id=366). Accessed on June 30, 2015.

17. Narayan, n. 15.

Mach 2.0 performance, hence, restricted its employment as an interceptor.<sup>18</sup> India missed a golden opportunity when it did not accept the Bristol offer of joint development of the afterburner for the Orpheus 703 engine at a cost of Rs 5 crore.<sup>19</sup> The Marut, with its thin and swept wing, and providing high acceleration and manoeuvrability, and low landing speed was best suited for the interceptor role. It was one of the finest designs of its era and its ability to ferry at 40,000 ft with 0.9 Mach made it the fastest aircraft in the IAF's history.<sup>20</sup> In all, 147 Maruts were built before this dream project of an indigenous jet fighter aircraft was shelved in 1985.<sup>21</sup>

The curtailed lifespan of the legendary Indian fighter aircraft HF-24 Marut can be attributed to various factors, which include the reluctance of the leading defence manufacturers of the era to share advanced engines technology, sanctions imposed on India post the Pokhran nuclear blast in 1974, apprehension in India about a possible aggression by Pakistan in the late 1970s, depleting strength of IAF fighters, high expectations from the Marut, and advanced aircraft offered by the leading defence aircraft manufacturing countries.

**Marut as a Future Fighter:** The Marut is a proven design with a Mach 2.0 airframe. Its airframe could be explored for future medium range fighter aircraft. The revival of the Marut may appear to be a far-fetched idea but should not be ruled out. Aviation history has shown that many nations have continued to use proven airframe designs of the 1950s with suitable modifications, superior engines and avionics upgrades. The experience gained in designing the Light Combat Aircraft (LCA) should be used in refining the proven Marut design into a full-fledged combat aircraft. The Kaveri engine, with a dry thrust of 52 kN (5,302 kg) and afterburning thrust of 81kN (8,260 kg)<sup>22</sup> may not fully meet the requirement of the LCA, but, it could prove to be the right option for the Marut airframe.

---

18. n.14.

19. <http://defencesecurityindia.com/aerospace-2/>. Accessed on July 1, 2015.

20. Ibid.

21. n.14.

22. "Kaveri", <http://www.drdo.gov.in/drdo/English/index.jsp?pg=kaveri.jsp>. Accessed on July 1, 2015.

### **GRADUATING TO “DESIGN AND MAKE IN INDIA”**

The government has shown its intent to support its “Make in India” campaign by reviewing old policies, and has issued licences, brought in transparency and expedited decision-making. The indigenous production of military aircraft is the key area for the “Make (rather Build) in India” campaign to bring down the huge import bill. However, it is quite unlikely that any country would agree to build a military aircraft with its niche technologies to be built in India. These niche technologies are impossible to acquire and would need to be developed with indigenous effort. R&D would be crucial in designing and producing military aircraft indigenously. This field also has the potential to become a major source of revenue through export in the long run.

### **BOOST TO PRIVATISATION**

The government certainly wants to bring down the import bill and strengthen indigenous industry in this critical sector. It has taken some key steps for easing the licensing norms to encourage the participation of the private sector in defence production. The Department of Industrial Policy and Promotion under the Ministry of Commerce and Industry, in its annual report, has highlighted key initiatives in encouraging “Make in India” in the defence sector. These initiatives include exempting some of the dual use items from the defence angle licensing requirement, finalisation of the process for the industrial licence for the manufacture of Unmanned Aerial Vehicles (UAVs), removal of the restriction on annual capacity, and permission to sell defence items to other government entities.<sup>23</sup> The moves would give a boost to the participation of the private sector in defence production. These initiatives and speedy licence clearances are indication of the government’s willingness to provide the private sector with a level playing field which till now was the exclusive domain of the public sector entities and foreign vendors. These initiatives should help build a proper

---

23. “Department of Industrial Policy and Promotion”, Ministry of Commerce & Industry New Initiatives, Schemes & Programmes during the First Year of NDA Govt, [http://dipp.nic.in/English/News/new\\_Initiative\\_NDA\\_Government\\_03June2015.pdf](http://dipp.nic.in/English/News/new_Initiative_NDA_Government_03June2015.pdf). Accessed on June 29, 2015.

aerospace industry ecosystem comprising a large number of component and sub-component suppliers feeding their output in stages to the final integrators. It is a win-win situation for all—the Indian industry, the major suppliers of the world and the Indian government.

**Vices of Privatisation:** The Boeing Company had bribed and given favours to then Principal Deputy Assistant Secretary of the US Air Force (USAF) for Acquisition and Management, Darleen A Druyun to obtain information about competitors for procurement contracts worth billions of dollar from the USAF and National Aeronautics and Space Administration (NASA).<sup>24</sup> She was later employed as the vice president of Boeing after her retirement in 2002. The names of big players and high ranking officials seeking favours/ kickbacks in arms deals by US companies were also brought to public notice in another expose.<sup>25</sup> These incidents clearly bring out the influence that the arms industry enjoys in the United States and other countries. There have been many instances wherein the arms industry has put its weight behind certain senators in order to get favourable policy decisions from the US Senate. The arms industry stakeholders have made inroads into both the Democratic and Republican Parties of the United States. The key stakeholders of the arms industry held major policy-making positions in the Bush Administration and were key contributors to channelising the spending on defence.<sup>26</sup>

The vices of privatisation are also visible in India. The private sector, along with its efficiency, has brought in inflated prices and other vices. It is common knowledge that many powerful industrial houses which have been providing certain services on the behalf of the government agencies over a period of time, have monopolised certain sectors. They have been found wanting in providing the quality of service which was expected of

24. "Boeing to Pay United States Record \$615 Million to Resolve Fraud Allegations", June 30, 2006, [http://www.justice.gov/archive/opa/pr/2006/June/06\\_civ\\_412.html](http://www.justice.gov/archive/opa/pr/2006/June/06_civ_412.html). Accessed on July 1, 2015.

25. Eric Lipton, Nicola Clark and Andrew W Lehren, "Diplomats Help Push Sales of Jetliners on the Global Market", January 2, 2011, [http://www.nytimes.com/2011/01/03/business/03wikileaks-boeing.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2011/01/03/business/03wikileaks-boeing.html?pagewanted=all&_r=0). Accessed on July 1, 2015.

26. William D Hartung and Michelle Ciarrocca, Report: "Ties that Bind: Arms Industry Influence in the Bush Administration and Beyond", October, 2004, <http://www.worldpolicy.org/projects/arms/reports/TiesThatBind.html>. Accessed on June 30, 2015.

**To add to the woes, the defence PSUs were grappling with cost overruns and time delays. The inefficiency and lack of accountability of the defence PSUs were some of the reasons for the delayed timelines and cost overruns.**

them. There are reports that there have been attempts to influence certain decision-makers in order to get favourable decisions in policies or to win contracts.<sup>27</sup>

#### **CRITICAL ROLE OF PSUs**

India's focus on R&D, a key ingredient of "Design in India" in military aircraft has been, at best, average to moderate in the past. The initial gains made by our forefathers in "Design in India" in military aircraft were lost due to the shifting of focus to "Build

(read assemble) in India" under the assurance of getting new technologies.<sup>28</sup> To add to the woes, the defence PSUs were grappling with cost overruns and time delays. The inefficiency and lack of accountability of the defence PSUs were some of the reasons for the delayed timelines and cost overruns. The other factors that hindered indigenisation include lack of a long and term policy-funding support, failure to export, and reluctance to involve the private sector. The depleting inventory of weapons has often created concerns among the armed forces, resulting in greater reliance on import of arms. There appeared to be a lack of trust in the PSUs due to their inability to deliver defence equipment in a given timeframe and cost.

The above factors are too simplistic to explain the less than optimum performance of the PSUs. It would be prudent to study a little more in depth the R&D process, policy decisions, timelines and funding involved in this critical sector to draw the correct lessons. The time involved in development of key technologies, especially military aircraft, is huge. The MiG-21 aircraft, developed by the erstwhile USSR (now Russia) and the F-16 by the US in the early 1960s continue to be their flag bearers even after

---

27. Siddharth Thacker, "India: Bribery & Corruption", <http://www.globallegalinsights.com/practice-areas/bribery-and-corruption/global-legal-insights---bribery-and-corruption-2nd-ed/india>. Accessed on July 3, 2015.

28. "Light Combat Aircraft: Need for Course Correction" I, December 8, 2014, <http://www.stratpost.com/light-combat-aircraft-need-for-course-correction-i>. Accessed on July 12, 2015.

50 years. The development of niche defence aircraft technologies takes time and needs nurturing by the government and the armed forces. The F-22 Raptor, the most advanced fighter aircraft ever developed by the US too has faced many glitches and failures. It has exceeded all the time and cost estimates. However, the failures of these machines are not brought into the public domain by their governments/ companies and only successes are highlighted in the media to win contracts and create an impression of their invincibility. The Indian aircraft industry and R&D organisations too need to be supported in their endeavour if we have to achieve self-reliance in defence technology.

**Higher studies and research in the aerospace and defence production domains are important for the development of cutting edge technologies. There are some colleges and Indian Institutes for Technology (IITs) that are offering aerospace engineering courses.**

## **CHALLENGES FOR “DESIGN AND MAKE IN INDIA”**

### *Knowledge Base: A Key Pillar Missed Out*

The government has identified 25 key thrust sectors for “Make in India”, which include aviation, defence manufacturing and space. The four pillars of the “Make in India” initiative are new processes, new infrastructure, new sectors and new mindset. The government report could have included another pillar for the success of “Make in India” i.e. “new knowledge base”. The Defence Research and Development Organisation (DRDO) has identified 26 critical defence technologies and test facilities, which it aims to acquire through offsets and which need immediate attention.<sup>29</sup> These areas need to be included in the curriculum of the technical universities if India has to become a leader in defence technology.

Higher studies and research in the aerospace and defence production domains are important for the development of cutting edge technologies. There are some colleges and Indian Institutes for Technology (IITs) that are offering

29. [http://www.drdo.gov.in/drdo/English/List\\_of\\_Critical.pdf](http://www.drdo.gov.in/drdo/English/List_of_Critical.pdf). Accessed on July 13, 2015.



aerospace engineering courses. However, there is no university in India which is dedicated to aerospace and defence production studies. There are many courses on industrial production, but defence production is not being offered as a subject. The defence production engineering and aviation tool design are specialised fields and need to be included in the aerospace universities. If India has to become a major R&D and defence production hub and achieve Prime Minister Narendra Modi’s goal of “Design in India”, it would have to provide advance training to its engineers and future leaders in these niche fields.

China, aspiring to become a leader in aerospace technologies, had set up Beihang University<sup>30</sup> and Nanjing Aeronautics and Astronautics University as early as in 1952 to support aerospace R&D.<sup>31</sup> These universities provided China the necessary knowledge base and work force, and encouraged research and development to support “Make in China”. Though the Chinese were initially branded as imitative, they continued to improve their indigenous capability. They are now not only building transport aircraft, helicopters, fighters, UAVs and other defence equipment but are also supplying these to other countries. Most advanced countries have similar universities, colleges and courses to encourage higher studies and R&D in aerospace technologies.

**Creation of Aerospace and Defence Technology University:** Higher studies in the fields of aerospace and defence technology need to be given a push. India could consider setting up a dedicated “University for Aerospace and Defence Technology”. This university would provide the necessary knowledge base and trained engineers to encourage R&D and defence production in India in order to achieve “Design and Make in India”. This would also facilitate easier absorption of advanced aviation and defence technologies from other countries. The Indian National Defence University (INDU) could also include M Tech and PhD courses in higher studies on aeronautical engineering, systems integration and reliability and critical areas identified by the DRDO.<sup>32</sup>

---

30. [http://ev.buaa.edu.cn/about\\_buaa/index.htm](http://ev.buaa.edu.cn/about_buaa/index.htm). Accessed on May 22, 2015.

31. <http://iao.nuaa.edu.cn/>. Accessed on May 22, 2015.

32. [http://www.drdo.gov.in/drdo/English/List\\_of\\_Critical.pdf](http://www.drdo.gov.in/drdo/English/List_of_Critical.pdf). Accessed on July 13, 2015.

## HURDLES TO INDIGENISATION

**Delay, Deny and Destroy:** The leading arms supplying nations and their companies try every weapon in the armoury and exercise every option to ensure that prospective buyers get addicted to their products and do not develop indigenous capabilities<sup>33</sup>. Delay, Deny<sup>34</sup> and Destroy is the *mantra*. The leading arms suppliers sell advanced weapons at exorbitant costs. Limited transfer of technology is offered in order to dissuade/ delay indigenous development of similar technologies. The transfer of technology is often limited to assembly of arms, production of low end technology spares and carrying out of servicing, etc. High end technology is denied on some pretext or other. The import of advanced aircraft often pushes indigenous projects to the back seat. Technology denial, escalating costs and time overruns often make indigenous projects unviable, thus, resulting in their shelving (destruction).

**Perception Wars:** The suppliers also try to influence perceptions by highlighting weaknesses in the indigenous developmental projects in order to dissuade target buyer countries from continuing R&D in the niche defence aviation fields. However, what they do not reveal is that their own R&D had faced similar challenges while designing and producing these advance flying machines. The failures and challenges faced by the US, Russia, China, Israel and other advanced countries, though well documented, are not overtly accepted by these suppliers.

**Transfer of Technology and Offsets:** Japan, one of the closest allies of the US after the UK, has faced hefty premiums for limited Transfer of Technology (TOT) and stringent licensed production norms followed by the US in order to safeguard its technology.<sup>35</sup> It is even concerned about the likely risk of overdependence on the US in co-development projects. The

---

33. "Self-Reliance in Land Systems Through Indigenisation: The Future Perspective", April 30, 2014, <http://www.claws.in/event-detail.php?eID=419>. Accessed on July 2, 2015.

34. "Dependence of Aeronautics R&D Projects on Foreign Sources", May 12, 2015, <http://www.defense-aerospace.com/articles-view/release/3/163712/india-confronts-lack-of-advanced-materials-for-aerospace.html0> Accessed on July 2, 2015.

35. Christopher W. Hughes, "The Slow Death of Japanese Techno-Nationalism? Emerging Comparative Lessons for China's Defense Production", [http://www2.warwick.ac.uk/fac/soc/pais/people/hughes/researchandpublications/articles/hughes\\_the\\_slow\\_death\\_of\\_japanese techno-nationalism\\_jss\\_june\\_2011.pdf](http://www2.warwick.ac.uk/fac/soc/pais/people/hughes/researchandpublications/articles/hughes_the_slow_death_of_japanese techno-nationalism_jss_june_2011.pdf). Accessed on July 2, 2015.

insistence of the Chinese to honour the ToT agreements was portrayed by Western analysts as win-win for Chinese, meaning the Chinese would win twice<sup>36</sup>: it is a matter of survival for their defence industry as well as long-term business opportunity for them. Payment of bribes, influencing key stakeholders and other unfair means are resorted to for getting lucrative contracts.<sup>37</sup> Offsets are used for paying bribes and inflating the costs.<sup>38</sup>

**Licensed Production:** The supply of modern arms comes at an exorbitant cost and often results in dependence on the suppliers.<sup>39</sup> The acquisition of the MiG-23 fighter aircraft from Russia to meet the Tactical Air Strike Aircraft (TASA) requirement meant an end of the Marut.<sup>40</sup> As a follow-up, the Indian policy-makers decided to opt for licensed production (read assembly) of fighter aircraft acquired from foreign vendors. Licensed production gave India the required equipment as an interim measure but did not give it the indigenous capability and ability to produce the equipment. Though licensed production (assembly) had a few benefits, it impacted Indian R&D in aviation adversely and resulted in slowing down of India’s indigenisation process. The Marut was a promising aircraft design; however, various prototypes built by HAL were shelved.

## FUNDING FOR R&D

With \$40 billion earmarked for R&D, India is expected spend about 0.9 percent of the Gross Domestic Product (GDP) during 2015-16 against 2.5 to 3 percent being spent by most advanced countries. This is much less than the target of 2 percent set by the Indian government in 2010, which

---

36. “China’s Drive for ‘Indigenous Innovation: A Web of Industrial Policies’”, [https://www.uschamber.com/sites/default/files/legacy/reports/100728chinareport\\_0.pdf](https://www.uschamber.com/sites/default/files/legacy/reports/100728chinareport_0.pdf). Accessed on July 2, 2015.

37. “Guns and Sugar”, May 25, 2013, <http://www.economist.com/news/business/21578400-more-governments-are-insisting-weapons-sellers-invest-side-deals-help-them-develop>. Accessed on July 2, 2015

38. “Taiwan’s Frigate Corruption Investigation: Can They Collect?”, April 17, 2014, <http://www.defenseindustrydaily.com/full-steam-ahead-for-taiwan-frigate-corruption-investigation-01546/>. Accessed on July 2, 2015.

39. “Arming India into Dependency”, January 14, 2014, <http://www.thehindu.com/opinion/lead/arming-india-into-dependency/article5574316.ece>. Accessed on July 2, 2015.

40. n. 4.

was reiterated in 2012.<sup>41</sup> The spending on R&D has fluctuated between 0.6 to 0.8 percent in the last two decades, which explains the low level of innovation and slow development of new technologies<sup>42</sup>. The spending on R&D is a mirror which indicates innovations and progress. China, which was spending about 0.6 percent on R&D in 1996, steadily increased it to 2 percent in 2012.<sup>43</sup> The urgency shown by the government in giving licences to private sector entities would need to be followed by raising the budget allocation for R&D to about 2 percent. The government could also consider giving tax incentives to the companies involved in R&D. These measures would provide a boost to the development of aviation projects and in achieving the goal of "Make in India".

#### *Future of "Design and Make in India"*

The discontinuation of the manufacture of the Marut aircraft brings us to the key issue, which is that the development of indigenous engines is a prerequisite for the indigenous aerospace programme. China, despite its success in the aviation field, is grappling with lack of engine technology and has invested a huge amount of money in the development of next generation engines. Nobody in the world is going to share critical technology. The Indian Space Research Organisation (ISRO) had faced the same problem when India was denied the cryogenic engine for its space programme. However, ISRO had the support of the establishment, which was crucial for success. The Indian establishment has to stand behind Indian defence R&D organisations in achieving this national goal of indigenisation of the defence aviation industry. It must be a given that the Aeronautics Development Agency (ADE), Gas Turbine Research Establishment (GTRE) and other organisations of the DRDO would take the ownership and deliver.

---

41. Vikram Doshi and Vijay Gilde, "Budget 2014: Govt Should Extend Incentive to Boost R&D Activity in India", June 23, 2014, <http://businesstoday.intoday.in/story/budget-2014-incentive-needed-to-boost-randd-activity-in-india/1/207478.html>. Accessed on June 30, 2015.

42. <http://www.tradingeconomics.com/india/research-and-development-expenditure-percent-of-gdp-wb-data.html>. Accessed on June 30, 2015

43. "Research and Development Expenditure (% of GDP)", <http://www.indexmundi.com/facts/indicators/GB.XPD.RSDV.GD.ZS/compare#country=cnm>. Accessed on June 30, 2015.

**The IAF, with its trained engineers and aviators, could provide valuable design inputs to the defence aviation R&D agencies during the aircraft/ systems design and development phase.**

*Ownership Issues*

The success of indigenous R&D requires that users take over the ownership of R&D projects. The active role of the users in these projects has been highlighted by many armed forces experts.<sup>44</sup> Most countries involved in designing defence aircraft ensure that one of the three arms of the armed forces takes the ownership of defence aviation design and development projects. They provide design inputs and specialist advice to the aircraft design and developing agencies. The

military R&D or military supported R&D and government agencies have played a key role in the development of fighter and bomber aircraft in the US.<sup>45</sup>

**Design and Development:** The Indian Navy celebrated 50 years of the "Made in India" campaign on September 25, 2014.<sup>46</sup> The Indian Navy's Department of Naval Design (DND) has a strength of 350 uniformed officers. These officers have been trained at Indian Institutes of Technology (IITs) and equivalent institutions of the world and are playing a stellar role in design, development and construction of naval ships/ submarines in India.<sup>47</sup> They have made significant contributions in the indigenisation/ "Make in India" campaign, and in saving enormous amounts of the taxpayers money.

The IAF, with its trained engineers and aviators, could provide valuable design inputs to the defence aviation R&D agencies during the aircraft/ systems design and development phase. The IAF's Base Repair Depots (BRDs), with their experienced, qualified and competent engineers and technicians have vast experience in indigenisation and could prove to

44. M Matheswaran, "Aerospace", <http://defencesecurityindia.com/aerospace-2/>. Accessed on July 1, 2015.

45. [http://www.rand.org/content/dam/rand/pubs/monograph\\_reports/1998/MR939.pdf](http://www.rand.org/content/dam/rand/pubs/monograph_reports/1998/MR939.pdf). Accessed on July 1, 2015.

46. Gulshan Luthra and Cmde Ranjit Rai, "Navy's Made in India Campaign Marks 50 Years Naval Design Bureau Celebrates Golden Jubilee", October 2014, [http://www.indiastrategic.in/topstories3538\\_Navy\\_made\\_in\\_India\\_campaign\\_marks\\_50\\_years.htm](http://www.indiastrategic.in/topstories3538_Navy_made_in_India_campaign_marks_50_years.htm). Accessed on July 2, 2015.

47. Ibid.

be a valuable asset. The BRDs have done an exceptional job in sustaining outdated systems, some of which had been abandoned even by the Original Equipment Manufacturers (OEMs). The expertise obtained in sustaining the legacy systems by the BRDs could be utilised in further indigenisation of the systems. They have played a key role in the life extension of some equipment, thereby, reducing the cost of maintenance and saving precious taxpayers' money. Their innovations and contributions in indigenisation of critical components are well known. They could be upgraded to act as laboratories for testing and refining technological innovations. These could be upgraded as Centres of Excellence for in-house R&D and indigenisation. The in-house R&D could include upgradation/ replacement/ modification of existing systems/ software/ support systems, etc. Systems other than aircraft being purchased are equally expensive and there is a need to formalise an evaluation process similar to the one followed in aircraft evaluation, and BRDs could help in achieving this.

The human resource is one of the IAF's invaluable assets. Many engineers have excelled in their M Tech. The technical expertise obtained in higher courses like M Tech needs to be optimally utilised. The best way to utilise these experts is by using them in a directorate involved in the formulation of Air Staff Qualitative Requirements (ASQRs), TEC, field trials and BRDs. The post course utilisation and project-based tenures could prove useful in utilising their expertise.

The IAF's Aircraft Systems and Testing Establishment has played a significant role in evaluating flying machines during the development phase. However, the IAF does not have a separate directorate for aircraft design and development. Defence aviation is a specialised field in which the IAF is the only agency in India which has vast experience and expertise. The IAF could consider establishing a Directorate of Aircraft and System Design

**The IAF's Aircraft Systems and Testing Establishment has played a significant role in evaluating flying machines during the development phase. However, the IAF does not have a separate directorate for aircraft design and development.**

and Development (DASDD), having a large number of highly qualified engineers. The DASDD and BRDs together could prove to be an invaluable asset for the IAF. The DASDD could chalk out a plan for the engineering officers to undergo M Tech and PhD courses in aeronautical engineering, advanced metallurgy, system integration and reliability, etc. in universities in both India and abroad, in order to have adequate in-house expertise to give inputs on design and development aspects. This would facilitate integration of users and R&D agencies for niche aviation technologies.

### **DEVELOPMENTAL DILEMMAS**

The development of niche technology in a denial regime is a difficult and time consuming process, involving innovation, testing and trials. The evolution of technology is dynamic, which keeps improving with time and is fraught with the risk of obsolescence. By the time you achieve one technology milestone, the world has moved to another and, thus, this needs regular improvements/ updates. However, if you develop one technology and continue improving it, it may become a source of regular income as well as self-reliance. The initial MiG-21 and F-16 built by the USSR and USA respectively were quite elementary compared to the advanced versions being flown today. Therefore, it would be prudent for the users to decide a stage at which to freeze the Qualitative Requirements (QRs) for a certain number of aircraft in order to allow a development timeframe for the enhanced capabilities sought by the users in the process of development. There is need for the users to consider induction of a certain number of aircraft on realistically acceptable QRs till the aspired QRs are met.

### **ACQUISITION DILEMMAS**

The exorbitant cost of acquisition of modern fighter aircraft could have been one of the factors responsible for the Indian government going slow, and importing these aircraft in large numbers in order to reach the desired strength of 45 squadrons. The number of fighter squadrons required for a two-front war would be even higher and the cost of acquisition of such a large number of fighter aircraft from a foreign vendor would be significantly

higher, thus, may not be a financially viable option for any government. The procurement of indigenous aircraft would mean that the money is being invested within the Indian economy and would result in more jobs for the Indian people. The government would be more willing to buy indigenous aircraft in large numbers rather than importing from foreign vendors.

The arrival of the private sector, and the increased focus of the government on indigenous R&D and “Make in India” would put pressure on the PSUs to perform. As a result, the IAF would become the beneficiary. Therefore, the best way to meet the depleting strength of fighter squadrons would be to acquire a limited number of cutting edge technology fighter aircraft from foreign vendors and give a push to the manufacture of indigenous fighter aircraft. The combination of cutting edge fighter aircraft from foreign vendors through co-development or co-production or limited technology transfer, alongwith a large number of indigenous aircraft could help increase the IAF fighter squadron strength to the desired level.

### **A WAY AHEAD**

The issues crucial in achieving the prime minister’s goal of “Design and Make in India”<sup>48</sup> include restructuring higher education in aerospace and defence technologies, private sector participation, greater accountability of PSUs, ownership by the users, increasing expenditure on R&D, favourable policies, and a supportive leadership. The government could consider including the “New Knowledge Base” as one of the pillars for the success of its ambitious “Design and Make in India” campaign. The establishment of an “Indian Aerospace and Defence Technology University” could play a key role in imparting world class higher education in niche aerospace and defence technology fields.

The boost given to the private sector companies by the Indian government in the last one year was a much awaited and much needed incentive. The disadvantage faced by the Indian private sector vis-à-vis foreign suppliers would hopefully reduce to a large extent. The new polices related to licensing

---

48. “Modi Asks Youth to Innovate and ‘Design in India’”, July 2, 2015, [http://www.business-standard.com/article/current-affairs/modi-asks-youth-to-innovate-and-design-in-india-115070200056\\_1.html](http://www.business-standard.com/article/current-affairs/modi-asks-youth-to-innovate-and-design-in-india-115070200056_1.html). Accessed on July 2, 2015.



and defence equipment are expected to make defence production a more financially viable sector. It is now up to the private sector to take the lead and plunge into the lucrative high risk sector.<sup>49</sup> However, there is a need to understand that any new system brings with it both good and bad practices. Sometimes, new initiatives do not produce the desired results because the policy-makers only factor in the good aspects, and not the associated flaws and vices. Therefore, there is a need to include these factors in the policies and provide suitable legal protection measures.

A healthy combination of the private sector and PSUs could bring out the best of both. The private sector can be a key contributor in the defence production industry with its competitiveness, efficiency, cost consciousness and innovativeness. The PSUs can deliver in the R&D sector with government support, increased funding, improved efficiency and greater accountability. They can play a critical role in balancing the monopolistic attitude of the private sector and in monitoring the quality of the defence products being produced and supplied by the private sector. The government needs to factor in these key aspects in the policies related to defence R&D and production. It should provide suitable legal provisions to protect the taxpayers’ money and prevent any likelihood of exploitation by private players.

The IAF will always be a key player in the aerospace domain of the defence sector. It may have to take the initiative in, and ownership of, aviation design and development, as was shown by India’s first Air Chief S. Mukherjee, to steer the indigenisation process and “Make in India”. The setting up of the Directorate of Aircraft and Systems Design and Development (DASDD) and making IAF engineers undergo M Tech/ PhD courses in the aerospace and defence technology related subjects could help in gaining in-house experts to support indigenous design and development of niche defence aviation technologies. The upgradation of the BRDs could provide the IAF with the R&D Centres and Centres of Excellence in their respective area of specialisation.

---

49. “Northrop F-20 Tigershark Multi-Role Fighter Aircraft (1982)”, July 2, 2014, [http://www.militaryfactory.com/aircraft/detail.asp?aircraft\\_id=688](http://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=688). Accessed on July 2, 2015.

The impetus to indigenous R&D and defence production could be provided through raising the budget allocation for R&D from the existing 0.9 percent to 2.0 percent of the GDP and by giving tax incentives to the companies involved in R&D. This does not mean that there is no place for technology transfer and collaboration. Indigenisation, collaboration, technology transfer and acquisition would go hand in hand till India achieves self-sufficiency.

**The by-products of setting up the Aerospace and Defence Technology University are likely to be beneficial for indigenisation and creating a source of revenue for the government in the long run.**

## CONCLUSION

The deficiency in aviation and defence equipment for the Indian armed forces and the rising imports bills are major concerns for India. The proactive policies followed by the government to give a push to the participation of the private sector in “Make in India” in defence equipment needs to be followed by the private sector stepping forward and taking the lead to support this initiative. Some of the big industrial houses like Mahindra, Tata and Reliance, already have subsidiary companies dealing with defence equipment. However, they were cautious in the past due to the restrictive policies. They now have an opportunity to exploit the window offered by the government with 49 percent FDI, issuing of licences, relaxation of production and sale restrictions, and the call for “Make in India”. They could look for partnerships with global leaders in military aviation as well as exploit India’s inherent strengths in Information Technology (IT) and other fields to enter this area. They could also utilise the expertise available with DRDO and other defence PSUs to take it to higher levels.

The PSUs would continue to play an important role in carrying out R&D in the niche aerospace and defence technology fields. They may now have to compete with the private sector. Suitable policies and legal provisions would make India’s transition from the public sector to the multi-sector military aircraft market a smooth affair and prevent the possibility of

monopolisation and exploitation by the private sector/foreign vendors.

The by-products of setting up the Aerospace and Defence Technology University are likely to be beneficial for indigenisation and creating a source of revenue for the government in the long run. The Chinese had realised the importance of higher level education in aerospace design and development and set up many aerospace universities as early as in 1950, to embark on the journey of indigenisation. Their indigenous capability to undertake R&D and production of defence equipment, especially military aircraft, has improved tremendously since then. Sales of defence equipment have become a major source of revenue.

The enhancement of funding for R&D to 2 percent would provide the required impetus and flexibility to pursue indigenous projects. The setting up of a DASDD, upgrading BRDs and taking over the ownership of military aircraft R&D projects could give the required impetus to indigenous industry. The prolonged development timeframes necessitate that indigenous projects are persisted with. The feasibility of induction of indigenous aircraft on achieving the minimum acceptable QRs needs consideration and may well prove to be a key contributor to replenish the depleting aircraft squadron strength. It would also allow time for further R&D till the desired QRs are achieved.

Lastly, the “Make in India” concept offers the arms supplying nations and leading companies an opportunity to collaborate and benefit in the long run. The high volumes of business make it an attractive option for them. There is a need to simultaneously strengthen indigenous R&D and defence aircraft manufacturing capabilities. The higher timeframe involved in building indigenous R&D necessitates that a combination of acquisition, collaboration and indigenisation is followed. This could prove to be the best recourse to meet our defence needs as well as for the success of the “Design and Make in India” mission.

# MANAGEMENT OF STRATEGIC RESEARCH AND DEVELOPMENT IN DEFENCE

SUMATI SIDHARTH AND MANOJ KUMAR

## INTRODUCTION

Any organisation undertaking Research and Development (R&D) has a strategic focus on its respective field or context. National level R&D for a critical sector like defence acquires a larger dimension than mere business gains. It impacts the very root of independence: the foreign policy decision-making and the geo-political posturing. A nation self-sufficient in defence-application technologies does not need to make compromises for acquiring these from nations that may extract their price in more ways than one. Similarly, it would have one less variable to contend with when planning its capability projection missions in any theatre.

With this as the context, one needs to critically examine why India, a superpower in the making, continues to lag behind in such a critical area even after spending a large amount of funds on defence R&D. It has lagged behind other nations that started out on the same page but have now surpassed it. The dichotomy is stark if one is to consider the success stories being scripted in many

---

Dr **Sumati Sidharth** is an Assistant Professor in the Department of Technology Management at the Defence Institute of Advanced Technology (DIAT), Pune.

Group Captain **Manoj Kumar** is a UNEP resource person. He writes extensively on environment and technology management.

**While it is easy to strike off the lackadaisical progress in defence R&D under the public vs private sector debate, the matter is far more complex.**

other sectors viz. automobiles, pharmaceuticals, information technology, etc. In most of these sectors, Indian suppliers/manufacturers, skill-sets, and abundance of human resource put it in a coveted position in the global hierarchy. What is also immediately clear from these examples is that none of these sectors has direct governmental presence and markets have driven the growth vector. This may be somewhat of an oversimplification as there are success stories in the Indian Space Research Organisation (ISRO), which belie this hypothesis. However, it is an important point that would be elaborated upon later in the paper.

The Defence Research and Development Organisation (DRDO) is the nodal government department under the Ministry of Defence (MoD), which undertakes research and development for fulfilling the needs of the three military Services. Defence being a sensitive sector, the government has held the view that R&D in this sector should be directly controlled. Only very recently, steps have been undertaken to allow other players in this field. The Intellectual Property Rights (IPR) in the defence sector are very rigidly controlled in every nation and cartelisation is the norm. DRDO has faced these issues for a very long time and although some nations have managed to break out of the consequent laggard status, India has not yet been able to stay ahead of the technology curve.

### **THE COMPLEXITIES**

While it is easy to strike off the lackadaisical progress in defence R&D under the public vs private sector debate, the matter is far more complex. There are some specific factors that go in favour of defence R&D and should have enabled it to come of age. Some of these are identified below:

- No dearth of funding<sup>1</sup> and not much pressure on its accountability. R&D is not a field where one can apply the economic laws of returns

---

1. "India's Growing Defence Industry Base", *Defence Review Asia*, November 1, 2010 <http://www.defencereviewasia.com/articles/55/India-s-Growing-Defence-Industry-Base>. Accessed on November 15, 2014.

in a steadfast manner. However, funding is a critical resource and its availability is essential to the success of any R&D project. So this is not considered to be a stumbling block in the case of DRDO.

- Critical requirement of end products. The three Services are entirely dependent on DRDO for their technological and hardware needs. Other options like imports are explored if the requirement cannot be met by DRDO or it is of a specific urgent operational nature.
- Lack of a customer concept, which removes a lot of pressure on DRDO. Since DRDO is another department under the MoD, it does not treat the three Services like customers, which they indeed are. In the corporate world, progressive industrial R&D labs are answerable to both internal and external customers at each stage of development. However, R&D does not really take off in an overtly pressurised environment. Thus, even this factor has always been in favour (probably a tad bit more) of DRDO.

**It should be clarified at the outset that the growing trend the world over is towards spill-over technologies, those that find markets in both civil and defence applications.**

With the above-mentioned factors aligned in its favour, it is important to examine the R&D management that has been followed in the defence sector. This exercise should then lead to policy-level recommendations that would allow the defence R&D to be commensurate with the requirements of the nation. It should be clarified at the outset that the growing trend the world over is towards spill-over technologies, those that find markets in both civil and defence applications. So any R&D effort in the field of defence would automatically have some takeaways in related civil applications, leading to a cascading effect in other industrial sectors and, thus, has the potential to add to the nation's might. Therefore, the canvas is wide while considering investments in defence R&D.

It should also be noted that there are many civil application technologies that are finding their way in defence applications. Hence, the very categorisation of a conglomerate of R&D labs based on a particular nomenclature like defence

or similar sectors is to be avoided. There are labs in DRDO specialising in the fields of bio-sciences, agriculture and even food packaging. Such labs being categorised as defence labs acts as a boundary to the type of work that they are capable of. It also restricts the openness that they can display for harnessing their intellectual property rights in a market driven economy. Exports are restricted owing to the fact that the product was developed by DRDO and, thus, would need specific clearances. The scientists also know that such products are not really a priority and this stifles their creativity in such fields. This point would be referred to again later in the article.

### AN OPEN SYSTEM

In the systems theory, an open system is described in simple terms as one that interacts with external systems or with its environment<sup>2</sup>. It has porous boundaries that allow useful feedback to be exchanged with its surroundings and, also to be understood. The erstwhile R&D organisations were operated within silos and comprised an example of a closed system. This has changed in many progressive organisations around the world and the focus has now shifted to collaboration and free exchange of ideas at various stages of product development. The consequences have been faster time to delivery and reduced/shared costs. The example of the Joint Strike Fighter (JSF) being developed by the US is an example of an open model of development<sup>3</sup> as is possible to be applied in the defence sector.

DRDO still follows the old model of product development. It works within the confines of its own labs. It employs scientists at the *ab-initio* stage and they grow in the field designated or projects given to them. The 'defence tag' does not allow them free access to many international quarters or collaborations even for dual use technologies. It works mostly on projects that are the direct need of the Services. It is not inclined to develop futuristic technologies or do technology forecasting for defence applications. A knowledge collaboration model would have, probably, allowed this to happen but this is not possible in the structure that is

2. An environment is external to the system as otherwise it would be part of the system.
3. The details of the collaboration are available at [http://www.jsf.mil/program/prog\\_intl.htm](http://www.jsf.mil/program/prog_intl.htm). Accessed on July 10, 2015.

mandated for the organisation. Knowledge, human resource, market access, and technology development are undertaken in silos—sometimes mandated as a consequence of being a government department under the MoD, but mostly due to its unique position of being the only ‘defence’ research organisation in the country. An open R&D environment would force any organisation to be alive to the needs of the ‘customers’ and work towards generating innovative ideas for the survival of the organisation; DRDO is no different. The question is: how to ensure such an environment for a unique organisation like DRDO? This is a complex subject and only a few facets of this issue would be discussed in this article.

Purely as a comparison, let us take the case of the Fraunhofer Society in Germany that undertakes research in many civil and defence technology areas. Two-thirds of the Fraunhofer-Gesellschaft’s contract research revenue is derived from contracts with industry and from publicly financed research projects.

On the other hand, DRDO is dependent almost completely upon the central government for its budget, even if the output from its completed projects may not be commensurate. What is its motivation to show research output? The state of technological growth in the country requires leapfrogging certain stages of R&D lest we take another 30 years to develop a Light Combat Aircraft (LCA). It needs to be analysed whether DRDO and specifically its human resource are prepared for this.

## **HUMAN RESOURCE**

The scientific human resource for DRDO is chosen from the large number of engineering graduates passing out of engineering colleges/universities. The lure of a ‘government job’ has all but faded for the top engineering college graduates. The few who still opt for a government job, would rather work in the Indian Administrative/Police/Allied Services than as scientists in a government organisation. This is a peculiarity of the Indian education and job hierarchy system but its analysis is out of the scope of this article. DRDO controls a Deemed University (DU) in Pune called Defence Institute of Advanced Technology (DIAT). It is meant only for post graduate studies



(M.Tech) and research in the fields that mirror the work undertaken in different research labs of DRDO. DIAT is open to direct entry and the three Services' engineering graduates. It also undertakes many short-term courses for government undertakings and departments. Not many direct entry engineering graduates opt for this institute as the courses do not have wide applicability in the normal corporate stream. On the other hand, the custom-made M.Tech courses are very much in line with the requirements of DRDO. It would seem that this is an ideal situation for DRDO to induct trained scientists from the institute, specially since the former has a say in course curriculum. However, this is not the case. Intake from DIAT in DRDO does take place but is extremely meagre. Considering that courses in the institute are customised for defence applications, this is a dichotomy. On the one hand, good engineering graduates do not join the institute as the job opportunities after the specialised courses are limited and, on the other, the organisation (DRDO) for which the courses are specialised, is not interested in picking up the graduates from the institute.

DRDO normally hires graduates from good engineering institutes and then trains them at DIAT and at its labs, in the specific fields in which they are likely to work. There is no embargo on a person leaving the organisation at any stage. In this sense, knowledge management is not well done. The point to analyse is that why the graduates hired by DRDO are not really motivated to deliver even though they have been chosen over better trained engineers from DIAT. DRDO being a government organisation, works in a bureaucratic structure which is not always conducive for strategic R&D. It is difficult for such an organisation to hire human resource based on the perceived skill deficiency at the mid-level, as such provisions are rarely put to use. Lack of competition also does not stretch the goal for these scientists, giving them a sense of complacency. The job is not glamorous as these scientists are not exposed to the end results of their efforts, which has a huge impact on the three Services and the security of the nation. The role of the defence scientists in the overall strategic picture of the nation is never highlighted for providing self-motivation for the DRDO scientists. Even institutes like DIAT do not motivate young engineers to engage in research that would further

the strategic interests of the nation. Then, what is the difference between a scientist working in any other central government lab (in any department like agriculture, health or food, etc) and one working in DRDO? R&D work in every sector adds to national capabilities but as already explained in the beginning, research efforts in critical fields like defence (that is faced with technology denial regimes) have strategic connotation for the nation.

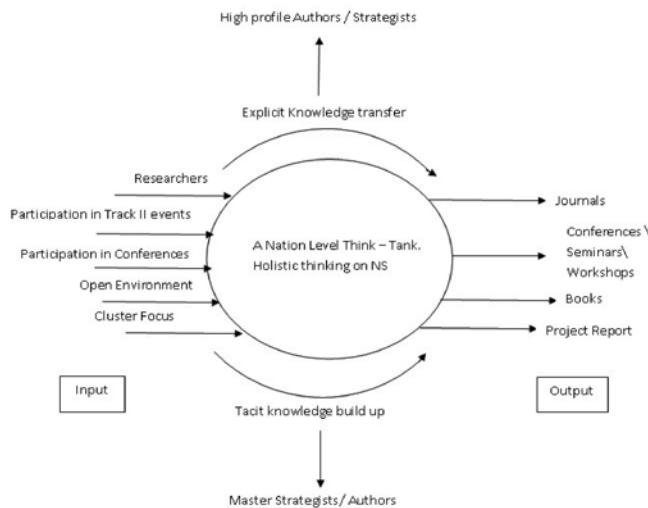
The main stumbling block for DRDO in acquiring quality engineers/scientists is the perception of the students that in a government department, mired in the 'system', R&D is not possible. Even if the research results are positive, what recognition would be bestowed upon the inventor? The earnings come as a distant third in this 'motivation to join' process. Are these the reasons why ISRO (an organisation seen to be delivering) set up its own engineering college in 2007, with a unique model of intake? Young DRDO scientists have hardly any understanding of how his/her work is useful for national security. At this stage, their focus is narrow and limited to what is required of them by their superiors in the lab. This is a recipe for frustration to set in. The alignment of personal goals with those of the organisation and then an understanding of how the organisational goals are attuned to the national strategy need to be part of their training. In the absence of a suitable training establishment which can provide them knowledge on organisational and national strategies, this is not possible. This would also add 'glamour/charm' to the work of a scientist whose accomplishment may be known only to a chosen few (owing to the nature of the product), probably not even to the customers—the three Services.

### **STRATEGIC FOCUS**

The issue that has emerged so far is that even though human resource management in DRDO can be more attuned to the resources already available, there is a dire need to provide a strategic focus to the scientists and students in institutes like DIAT so that they are better motivated, and can feel proud of their achievements. Many national level think-tanks are working in the strategic defence fields. Their work is on many levels of national defence strategies, including those dealing with cutting

edge technologies being applied in various defence applications around the world. They conceptualise ideas in the defence arena and specialise in international affairs. Centres like the Institute for Defence Studies and Analyses (IDSA), Centre for Air Power Studies (CAPS) and Centre for Land Warfare Studies (CLAWS),<sup>4</sup> etc are working on national security issues and their researchers are exposed to work in the defence industry, the three Services, government policy-making and international efforts in the field of defence. Their output is in the form of written reports, journals, project reports, books, seminars and conferences and policy recommendations. Each researcher works on a specific field and acquires in-depth knowledge in it. With long-term exposure to connected strategic issues of national security, their horizons expand and they acquire a strategic focus. Some of them go on to become respected strategists of international repute. They are consulted or their views ascertained for many governmental policies and rules that are framed. Strategists like the late K Subrahmanyam and Air Cmde Jasjit Singh and a few others fall in this category. A top level system model of a typical think-tank is shown in Fig 1 below.

**Fig.1: System Model of Think-Tanks**



4. <http://www.idsa.in/> , <http://capsindia.org/> , [www.claws.in/](http://www.claws.in/)

It is evident that such conceptual level work in defence applications arms these think-tanks with strategic knowledge that should be shared with organisations like DRDO, DIAT and other academic institutes/ industry and the three Services. At present, the academia is not exposed to such think-tanks and DRDO only interacts with them on specific projects. A wide exposure to the strategies at play at the national defence arena level as well as at the international level, for the 'knowledge-based' human resource—the so-called 'gold collar' workers—is available in the universities and research organisations. A special emphasis on exposing the knowledge workers to these aspects is necessary due to the fact that such human resource is not really motivated by the conventional sources viz. money and similar materialistic provisions. Making them realise that their contribution to nation building is important would make a very big difference to their zeal in developing technologies required for the nation's defence and similar dual use technologies. It would make the nation truly independent, by ensuring self-reliance. The strategists may not provide any technical breakthroughs but they are well suited to provide knowledge of contemporary technologies and products being developed and/or the methodologies for their development undertaken by the developed nations or even by our geo-political competitors.

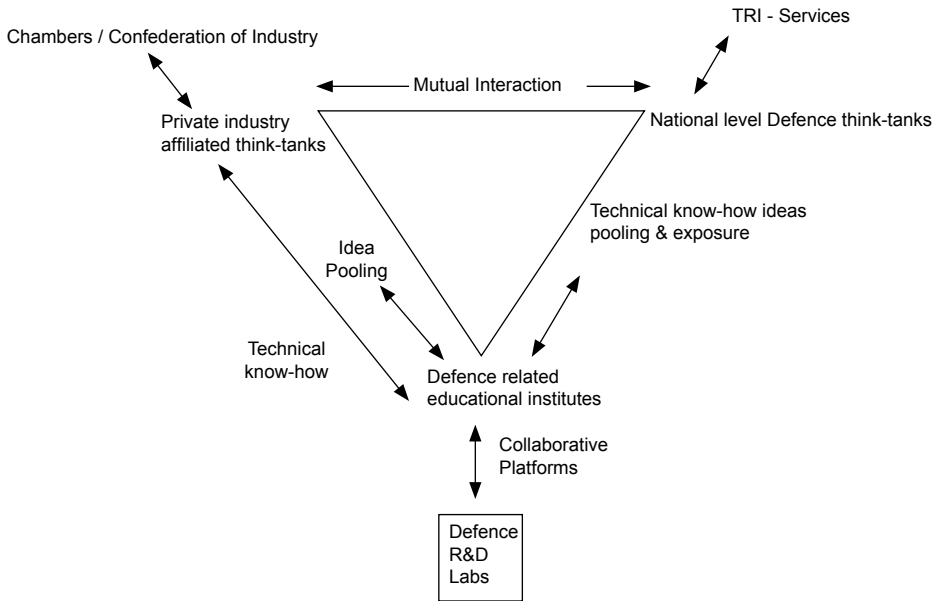
**A wide exposure to the strategies at play at the national defence arena level as well as at the international level, for the 'knowledge-based' human resource—the so-called 'gold collar' workers—is available in the universities and research organisations.**

### **THE NEW R&D MODEL**

The R&D model that emerges in the abovementioned context, stands on the three pillars of universities (academics), research labs (government and industry) and think-tanks (strategic focus). The users are exposed to all three and have the freedom to independently choose the combination that can deliver a project/ product. Even the labs have the freedom to choose

their partners and funding is based on bagging and delivering successful projects. They also have freedom to choose their human resource, customers, and markets. The government becomes a facilitator of this ecosystem. This R&D model would necessarily result in a competitive R&D environment and is depicted in Fig 2 below.

**Fig 2: The New R&D Model**



The important thing to observe in this model is the absolute freedom of the labs to engage with any partner for fructification of a project. The technology transfer for bulk manufacturing can then take place from the labs/ academic institutions to private industry/ ordnance factories/ defence public sector undertakings, depending on the product/ governmental regulations and also the respective capabilities of the manufacturers. At no stage is there an embargo on these labs undertaking projects exclusively for defence applications and there is full freedom for developing dual use technologies. The market forces would automatically determine such investments and forays. The defence sector would not be at a loss here as it is one of the most capital intensive sectors in the country.

The three Services would have to bring out their Request for Proposal (RFP) as per the existing methodology. The difference would be that they would not have to seek DRDO's go-ahead for categorising a particular project in ways specified in defence procurement procedures<sup>5</sup>. At the outset itself, DRDO and industry would be allowed to bid for an R&D or even a pure development project. All labs would also have the freedom to develop products that work on cutting edge technologies and take their own proposal to the Services/ users. After all, that is what industry does to develop new markets for any product. The government would pitch in with the necessary capital on a case by case basis and also control the export of pure defence application technologies/ products. There would still be some products, which would continue to be purely in DRDO's domain, depending on the sensitivities involved, but these would be few and it would not be difficult for the government to create a similar ecosystem in the private sector too, unilaterally or in partnership with their own undertakings.

The model described above was actually facilitated by the Japanese government after World War II. It was seen that the government facilitated technology transfer from US defence majors to their private industry, which then went on to master these technologies and is now a world leader, even partnering the same US firms<sup>6</sup>. India lost out by following a rigid government controlled structure of R&D. There are many such examples around the world where the defence sector has benefitted from the lead taken by the private industry, with the government playing the facilitator's role. The Israeli and German defence industries are fine examples of such a model.

It would be clear that the users would more than welcome any move that allows them to get world class products within a fixed time span. The "Make in India" initiative can truly benefit with such changes in defence R&D. One of the biggest beneficiaries would be the industry that develops dual use technologies as India promises to be one of the biggest markets

---

5. <http://www.mod.nic.in/writereaddata/DPP2013.pdf>. Accessed in June 2015.

6. *Arming Our Allies: Cooperation and Competition in Defense Technology*, OTA-ISC-449 (Washington DC: US Government Printing Office, May 1990).

**The private industry would find such markets, as this has a lot to do with the profits on investments that make a difference to private industry, unlike a government entity.**

in most sectors of the economy. The dual use technologies/ products, with safeguards, can even be exported to friendly countries, providing the economy of scale. The private industry would find such markets, as this has a lot to do with the profits on investments that make a difference to private industry, unlike a government entity. Overall, the nation gains, economically and geopolitically through such ventures.

The new model being suggested here may appear quite revolutionary at first. However, the Services are already contemplating such changes, much to the surprise of DRDO.<sup>7</sup> The kind of governmental funding that has been allowed for DRDO or any similar R&D lab set-up, has outlived its usefulness in a market driven economy, which India has now become. This change should have, thus, been ushered in when liberalisation and globalisation were introduced in India in the beginning of the 1990s. The government resources are not endless and there are many other social avenues that need higher funding and lower taxation.

The R&D labs working on defence applications should have complete freedom to undertake work as per their core competency. In effect, it means that if they have the capability and idea for a New Product Development (NPD) that is not a specific need of the three Services and is of dual use purpose, they should develop it as per the need of the market. This can only happen if they have an ear to the industry and a customer orientation. There are success stories by DRDO in food technologies that have dual use and can be (and also have been) easily absorbed by the industry.<sup>8</sup> At present, DRDO does not even perceive the three Services as customers, its understanding the market is a far cry. A list of 507 technologies is

---

7. "Army Invites Proposals for Designing Tanks, DRDO Surprised", *The Times of India*, June 26, 2015. <http://timesofindia.indiatimes.com/india/Army-invites-proposals-for-designing-tanks-DRDO-surprised/articleshow/47831996.cms>. Accessed on June 27, 2015.

8. "Food Technologies", February-April, 2001 <http://www.drdo.gov.in/drdo/pub/techfocus/apr2001/food.htm>. Accessed on July 22, 2015.

available on the DRDO website that have been transferred to the industry<sup>9</sup>. This does not give a true commercial value of the Intellectual Property (IP) generated. Since most of these products have been made for the armed forces and the production is not done by DRDO, they have to be transferred to the industry/ Defence Sector Public Undertakings (DPSUs)/Ordnance Factories (OFs) for production and supply. Whether these would go forward to bigger and newer markets is not DRDO's concern, as this is not its mandate. This again leads us to one point—that funding without result orientation would lead to lack of accountability, while competitive R&D is the need of the hour.

**The kind of governmental funding that has been allowed for DRDO or any similar R&D lab set-up, has outlived its usefulness in a market driven economy, which India has now become. This change should have, thus, been ushered in when liberalisation and globalisation were introduced in India in the beginning of the 1990s.**

### **INCLUSIVE EXISTENCE OF THINK-TANKS**

As already mentioned, there is a handful of think-tanks working in the field of national security. All of them have MoD linkages owing to the focus of their work and financial effects. However, the industry linked think-tanks like the Observer Research Foundation (ORF) also work on multi-dimensional subjects, including national security. Their focus is wider and their systems much more collaborative. All the defence related think-tanks in Delhi have a formal/informal working relationship. They collaborate for specific projects of national security. Some of their work is also on similar subjects and, thus, these collaborations help in developing a deeper understanding of the subject. The system is not ideal but is workable.

A formalised interaction of the industry and national think-tanks would help broaden the horizons of work in the strategic domain. The stringency

---

9. "List of Technologies Transferred to Industries" <http://drdo.gov.in/drdo/English/list-of-technologies.pdf>. Accessed on July 22, 2015.



involved due to government decision-making may sometimes hinder collaboration, which the private think-tanks would not be encumbered with. Private industry think-tanks have better financial resources and are, thus, able to take on more research projects. However, the kind of leverage with the Services that is enjoyed by the other think-tanks provides them an edge in deeper understanding of the pertinent issues. It would be clear by now that it is a win-win situation if the two enter into a synergistic partnership for projects. This is already happening but at a very reduced pace. This is one area that should gather momentum.

It is also a fact that almost none of these think-tanks venture into the domain of defence technology. The ones that do, look at it holistically as an industry sector<sup>10</sup> but do not work in specific fields of defence technology. An interaction with the academia is expected to enrich and expose their researchers to the fields that are considered worthy of exploration by the academia. This would ensure that think-tanks study these fields for the type of work going on at the international competitive level. Then they would be in a better position to support, and provide strategic focus to, the academic institutes and industry alike.

The industry's tie-up with academic institutes, facilitated by the government, is being considered for the premium institutes.<sup>11</sup> But for other institutes, this is still not the norm. While the industry and government labs, both feel the lack of trained personnel, institutes like the National Institutes of Technology (NITs) and DIAT can go in for such collaborative efforts, being facilitated by the industry chambers/ confederations and the government. As the "Make in India" efforts gather traction, opportunities for such collaboration would increase. The think-tanks can also provide platforms for such collaboration to take place by joint hosting of events and aligning the efforts towards the gaps noticed in defence acquisition/ technologies. DIAT has a special role to play here

---

10. Air Cmde Jasjit Singh (Retd), *Energising Indian Aerospace Industry* (New Delhi: KW Publishers, 2007).

11. National Centre for Aerospace Care - A Department of Science and Technology, IIT Mumbai and Boeing Collaboration. For more details, please visit <http://www.ncair.in/>. Accessed on July 1, 2015.

as it specifically prepares students in the field of defence technologies; it is a different matter that the same has not found resonance in DRDO labs.

## CONCLUSION

National level R&D for a critical sector like defence acquires a larger dimension than mere business gains. Any R&D effort in the field of defence would automatically have some takeaways in related civil applications, industrial sectors and, thus, would make the nation stronger. Investments in defence R&D will enhance the nation's potential in a cascading manner. Defence R&D forays should, therefore, not be seen in isolation as has been done till very recently. They should be used as a medium to take economic development to a higher level.

DRDO still operates within silos and follows the old model (closed system) of product development. It works within the confines of its own labs. The focus of R&D has to be shifted to collaboration and free exchange of ideas at various stages of product development i.e. an open model of development. As the complexities increase and the technologies become obsolete faster, a closed model would increasingly come under pressure. The sensitivities associated with defence would have to be managed in an altogether different manner.

The requirement of competition to bring out hidden potential to the fore has often been noticed. The same applies to R&D efforts in the defence sector. For far too long, DRDO has been nurtured with central funding, without it being driven by market forces. The demand by the industry for a level playing field is truly borne out when one considers the economics of doing research in the defence sector where economy of scale in production is not always favourable. DRDO has never been exposed to such economics and has worked in a protected environment, sure of the product finding a market with the Services if it meets 'most' of the requirements. Any management guru would tell us that till the goals are stretched a bit, the efforts by any individual or organisation remain mediocre.

The focus has to be on much better management of existing resources. The existing academic infrastructure allows for channelised research activities to take place in the applied sciences. A synergistic approach would require the coming together of industry and government research labs on a platform being provided by the academic institutions. Existing institutions like the Indian Institutes of Technology (IITs) and DIAT can play a much bigger role than what is happening at present. While a few IITs are quite active in this collaborative model of research, others are yet to participate. DIAT, being a nodal academic institution under the MoD, is ideally suited to exploit the situation and help in this nation building effort. Unfortunately, the present structure of defence R&D does not allow this to happen.

The think-tanks working in the field of defence in India have been doing yeomen service to the nation by working on national level strategies through concentrated research. The knowledge that is gained in these institutions has to be gainfully utilised by aligning the focus of research in academic institutions towards strategic goals. This would also ensure that scientists take pride in their work after appreciating their role in nation building. Thus, the R&D model that emerges places these think-tanks as an important pillar in the national efforts for self-reliance in defence technologies. Their collaboration with academia and industry would provide the synergistic vision to all the parties involved. The industry and governmental/autonomous think-tanks can also come together to provide a focus to the labs working even in the development of dual use technologies. The government has to play the role of a facilitator in these efforts. Any retrograde rules that inhibit the open model of research in the defence sector should not be imposed. The think-tanks also need to be encouraged by the government by building suitable facilitative infrastructure for free interaction to take place between all the parties working on the subject of defence R&D and strategic technologies. This is the need of the hour.

# THE UNITED STATES AND IRAN NUCLEAR DEAL

**STUTI BANERJEE**

## **INTRODUCTION**

In July 2015, the foreign ministers of China, France, Germany, Russia, the United Kingdom, and the United States (EU+3/P5+1) met with the foreign minister of Iran in Vienna to negotiate the text of the Joint Comprehensive Plan of Action (JCPOA) or the Iran deal. This deal stands on the foundation of the Joint Plan of Action (JPOA), achieved in November 2013, and the framework for this JCPOA, announced in Lausanne on April 2, 2015.<sup>1</sup> On July 14, 2015, the foreign ministers signed the deal, which involves limitations on Iran's nuclear programme and lifting of some United Nations (UN) Security Council and other multilateral and national sanctions on Iran related to its nuclear programme. The JCPOA includes a main text and annexes on the sanctions, civil nuclear energy cooperation, a joint commission, and their implementation.<sup>2</sup>

The deal is the result of nearly two years of negotiations between Iran and the other nations. In 2002, a rebel group from within Iran had revealed that Iran was developing its nuclear programme in violation of the norms of the nuclear

---

Dr **Stuti Banerjee** is a Research Fellow at the Indian Council of World Affairs, New Delhi.

1. Council on Foreign Relations, "Joint Comprehensive Plan of Action on Iran's Nuclear Program", <http://www.cfr.org/iran/joint-comprehensive-plan-action-irans-nuclear-program/p36776>. Accessed on August 5, 2015.
2. The White House, "The Historical Deal That will Prevent Iran from Acquiring a Nuclear Weapon", <https://www.whitehouse.gov/issues/foreign-policy/iran-deal>. Accessed on August 5, 2015.

**Investigations by the International Atomic Energy Agency (IAEA) revealed that Iran had failed to meet its obligations under the NPT. The revelations and the subsequent report of US intelligence confirming these developments alarmed the US and the international community.**

Non-Proliferation Treaty (NPT). Iran, which has been a member of the NPT since 1968, has maintained that it was developing its nuclear capabilities for civilian use. Before 2002, there were concerns about Iran's nuclear programme, especially within the US. Investigations by the International Atomic Energy Agency (IAEA) revealed that Iran had failed to meet its obligations under the NPT. The revelations and the subsequent report of US intelligence confirming these developments alarmed the US and the international community. In order to avoid the sanctions, Iran began to negotiate with the P5+1 and agreed to temporarily suspend activities related to uranium

conversion and enrichment, to fully cooperate with the IAEA, and to sign the IAEA's Additional Protocol agreement that authorises more intrusive nuclear inspections. However, a report by the IAEA claimed that Iran was exploiting the ambiguities in the definition of "suspension" to keep producing centrifuge components and carry out small-scale conversion experiments.<sup>3</sup> It had also been clandestinely developing a nuclear weapons programme much before 2002 and probably even a few years after that. Iran again decided to negotiate, to avoid sanctions and in 2004, it signed the "Paris Agreement" with the EU-3. Under the pact, Iran committed not only to continue its temporary suspension of uranium conversion and enrichment activities—now defined to include the manufacture, installation, testing, and operation of centrifuges—but also to negotiate in good faith with the EU-3 to pursue a diplomatic solution.<sup>4</sup> In further development of this agreement, it was proposed that in lieu of Iran's commitment to not pursue uranium enrichment and other nuclear fuel-making technologies for at least 10 years, the EU-3 offered to provide assured supplies

---

3. Patrick Christy and Robert Zarate, "FPI Fact Sheet: Timeline on Diplomacy and Pressure on Iran's Nuclear Program", <http://www.foreignpolicyi.org/content/timeline-diplomacy-and-pressure-irans-nuclear-program>. Accessed on July 27, 2015.

4. Ibid.

of nuclear fuel, disposal arrangements for spent nuclear fuel, and cooperation on a variety of political and security issues in the region. However, the negotiations broke down after Iran refused the proposal.<sup>5</sup>

In order to salvage the diplomatic process, the P5+1 agreed to assist Iran develop a light water reactor for the development of its civil nuclear programme. Iran has claimed that it has been falsely accused by the international community of developing nuclear weapons whereas its nuclear programme was for civilian use only. After Iran rejected the second proposal by the P5+1, the UN, with the support of the international community,

imposed sanctions on Iran. In 2006, the UN passed two resolutions on sanctions on Iran and in 2007, it passed a third such resolution after Iran failed to comply with demands from the international community. By the end of 2008, it had passed two more resolutions on sanctions. These sanctions that banned transfers of nuclear and missile technologies to Iran, and froze the foreign assets of named individuals and entities tied to Iran's controversial nuclear programme, banned Iranian arms exports and expanded the list of sanctioned Iranian individuals and entities, tightened restrictions on Iran's nuclear activities, increased vigilance against Iranian financial transactions, and authorised states to inspect Iranian cargo to prevent transfers of nuclear and other technologies, while urging for an end to Iran's nuclear intransigence.<sup>6</sup> By the end of 2012, Iran was facing sanctions from the international community on all economic activity, international trade and investment, and its assets were frozen.

The P5+1 and Iran once again decided to negotiate an agreement. These negotiations culminated in the July 2015 deal.

**In order to salvage the diplomatic process, the P5+1 agreed to assist Iran develop a light water reactor for the development of its civil nuclear programme. Iran has claimed that it has been falsely accused by the international community of developing nuclear weapons whereas its nuclear programme was for civilian use only.**

---

5. Ibid.

6. Ibid.

### AN OVERVIEW OF THE NUCLEAR DEAL

- Iran has agreed to transform its deeply buried plant at Fordo into a centre for scientific research. Another uranium plant, Natanz, is to be cut back rather than shut down. Some 5,000 centrifuges for enriching uranium will remain spinning there, about half the current number. Iran has also agreed to limit enrichment to 3.7 percent, significantly below the enrichment level needed to create a bomb, and to cap its stockpile of low-enriched uranium at 300 kg, or 660 pounds, for 15 years, a reduction of 98 percent.<sup>7</sup>
- Iran has agreed to redesign and rebuild the Arak reactor so it will not produce weapons-grade plutonium. The original core of the reactor, which would enable the production of weapons-grade plutonium, will be made inoperable, but will stay in the country. Under the terms of the deal, the reactor's spent fuel, which could also be used to produce a bomb, will be shipped out of the country. Iran will not build any additional heavy water reactors for 15 years.<sup>8</sup>
- Under the new nuclear deal, Iran has committed to extraordinary and robust monitoring, verification, and inspection. International inspectors from the IAEA will not only be continuously monitoring every element of Iran's declared nuclear programme, but will also be verifying that no fissile material is being covertly carted off to a secret location to build a bomb.<sup>9</sup>
- Iran has agreed to implement the Additional Protocol to the IAEA Safeguards Agreement, which will allow inspectors to access and inspect any site they deem suspicious.<sup>10</sup>
- This deal removes the key elements needed to create a bomb and prolongs Iran's breakout time from 2-3 months to one year or more, if Iran were to break its commitments. Importantly, Iran won't get any new sanctions relief until the IAEA confirms that it has fulfilled its obligations under

---

7. The White House, "The Historic Deal that Will Prevent Iran from Acquiring a Nuclear Weapon", <https://www.whitehouse.gov/issues/foreign-policy/iran-deal>; and William J. Broad and Sergio Peçanha, "The Iran Nuclear Deal- A Simple Guide", *The New York Times*, July 14, 2015.

8. Ibid.

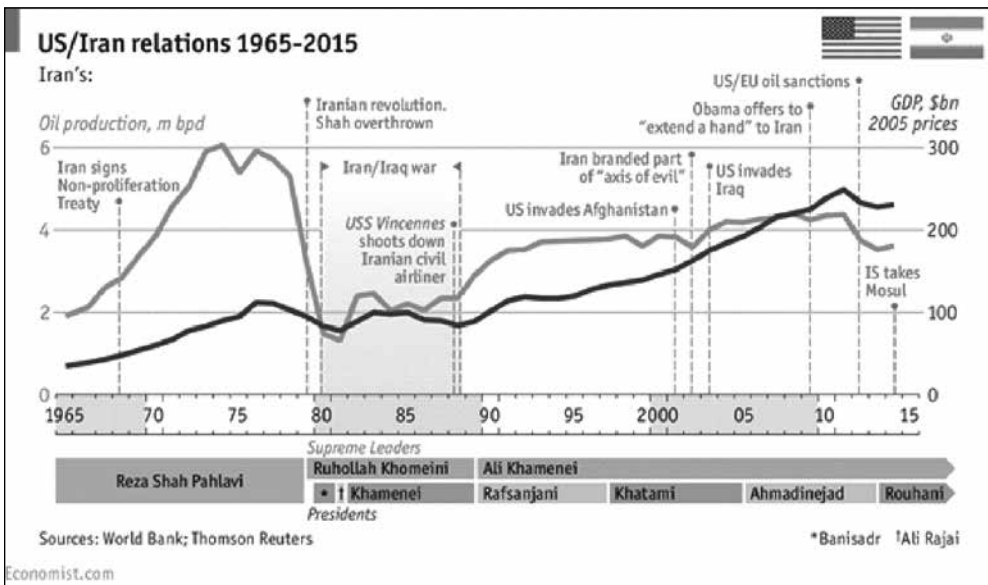
9. Ibid.

10. Ibid.

the deal. And should Iran violate any aspect of this deal, the UN, US, and EU can 'snap' /re-impose sanctions.<sup>11</sup>

## THE US AND IRAN SANCTIONS

Fig 1: US-Iran Relations, 1965-2015<sup>12</sup>



The US and Iran have an acrimonious relationship with each other. The US sanctions on Iran, however, predate these nuclear non-proliferation concerns. The US first imposed economic and political sanctions against Iran during the 1979–81 hostage crisis, shortly after Iran's Islamic Revolution. Thereafter, the US has imposed additional sanctions for Iran's support to Hezbollah, and its human rights abuse, etc. The most recent statute, the Iran Threat Reduction and Syria Human Rights Act (ITRSHRA), added new measures and procedures to the 1996 Iran Sanctions Act (ISA). The ISA authorises sanctions on businesses or individuals engaging in certain

11. Ibid.

12. "Iran Nuclear Deal", *The Economist*, <http://www.economist.com/blogs/graphicdetail/2015/07/daily-chart-iran-graphics>. Accessed on July 27, 2015.



commercial transactions in Iran.<sup>13</sup> It has to be kept in mind that these sanctions are separate from the sanctions imposed by the UN due to Iran's nuclear programme. Sanctions applied by the US, related to sponsorship of terrorism and human rights abuses are not affected by the nuclear deal.

In the years before the revolution, there were concerns in the US that Shah Mohammad Reza Pahlavi's policies were intended to develop a nuclear weapons programme for Iran. To allay these fears, Iran signed the NPT and in 1974, also joined the IAEA Safeguards Agreement, a supplement to the NPT in which it consented to inspections. The Iran-Iraq War once again highlighted concerns that Iran may develop a nuclear weapon as Iraq had a nuclear programme. These suspicions continued into the mid-1990s, when President Bill Clinton's Administration levied sanctions on foreign firms believed to be enabling a nuclear arms programme in Iran.<sup>14</sup> President G. W. Bush further signed Executive Order (EO) 13382, which blocked the property of weapons of mass destruction proliferators and their supporters. The Atomic Energy Organisation of Iran was one of eight entities listed in the annex of the EO.<sup>15</sup> Since then, the US has been at the forefront of international efforts to isolate Tehran and pressurise it to negotiate.

US sanctions have been applied with a view to isolating Iran from the international financial markets. The US has also tried to ensure that Iran is unable to generate revenue through the sale of its energy resources. An embargo on energy exports from Iran was imposed without any exception from 2012, which has resulted in loss of revenue for the Iranian government, impacting other sectors of its economy. There have been sanctions on weapons development cooperation, and the assets of Iranian individuals and institutions have been frozen in the US.

One of the main demands of Iran through the negotiation process has been for the removal of sanctions imposed on the country. The UN has endorsed the deal and this has cleared the path for the UN imposed sanctions

---

13. US Department of State, "Iran Sanctions", <http://www.state.gov/e/eb/tfs/spi/iran/index.htm>. Accessed on July 26, 2015.

14. Zachary Laub, "Sanctions on Iran", <http://www.cfr.org/iran/international-sanctions-iran/p20258>. Accessed on July 27, 2015.

15. Christy and Zarate, n.3.

to be removed from Iran. Iran will regain access to international energy markets and the global financial system once the IAEA verifies that it has granted IAEA inspectors sufficient access to its nuclear facilities and taken agreed-upon steps to restrict its nuclear programme. The comprehensive agreement directs the P5+1 to prepare the legal and administrative groundwork for rescinding or suspending the nuclear-related sanctions prior to Implementation Day. On Implementation Day, the UN Security Council will pass a resolution that will nullify the previous resolutions on the Iranian nuclear issue.<sup>16</sup>

According to the US Department of Treasury, “US sanctions relief will be provided through the suspension and eventual termination of nuclear-related secondary sanctions, beginning once the IAEA verifies that Iran has implemented key nuclear-related measures described in the JCPOA (“Implementation Day”). The US government will publish detailed guidance related to the JCPOA prior to Implementation Day. The P5+1 and Iran also decided on July 14, 2015, to further extend through Implementation Day the sanctions relief provided for in the Joint Plan of Action (JPOA) of November 24, 2013, as extended. This JPOA sanctioned relief is the only Iran-related sanctions relief in effect until further notice.”<sup>17</sup>

However, as was pointed out earlier, the US has imposed bilateral sanctions on Iran.

In May 2015, President Obama signed into law provisions for a Congressional review that places restrictions on his prerogative to waive sanctions. Under this law, the House and Senate Foreign Relations Committees have sixty days to review the agreement, during which time the president cannot suspend the sanctions regime. If the deal is endorsed by the US Congress, then the White House, in consultation with the legislature, can suspend sanctions on Iran.<sup>18</sup>

---

16. Council for Foreign Relations, CRF Backgrounder, “International Sanctions on Iran”, <http://www.cfr.org/iran/international-sanctions-iran/p20258>. Accessed on August 7, 2015.

17. US Department of Treasury, “Iran Sanctions”, <http://www.treasury.gov/resource-center/sanctions/Programs/pages/iran.aspx>. Accessed on July 27, 2015. An overview of the US Department of Treasury sanctions on Iran can be accessed at <http://www.treasury.gov/resource-center/sanctions/Programs/Documents/iran.pdf> and by US Department of State at <http://www.state.gov/documents/organization/212555.pdf>

18. Laub, n.14.

**Critics of the deal point out that the deal has failed to meet the basic requirement of the negotiations, which was ending Iran's nuclear programme. However, proponents point out that Iran has agreed to dismantle much of its nuclear infrastructure and submit to rigorous controls and inspections to which the US and other world powers agree.**

The members of the Republican Party, who are in a majority in both the Senate and the House of Representatives, and a few members of the president's Democratic Party have voiced their opinion in opposition to the deal. Speaking to the press, House Speaker John A. Boehner (R-Ohio) stated, "The interim deal has been, and will continue to be, met with healthy scepticism and hard questions. Iran has a history of obfuscation that demands verification of its activities and places the burden on the regime to prove it is upholding its obligations in good faith while a final deal is pursued."<sup>19</sup>

They claim that President Obama and his Administration, in their haste to conclude the negotiations with Iran, have agreed to a deal that is advantageous to Iran, in that it allows the removal of economic sanctions. They maintain that it was due to the effects of the sanctions that Iran had been forced to come to the negotiating table. They also point out that the deal does not guarantee that Iran will not be able to develop nuclear weapons, a vital need for US national security.

Critics of the deal point out that the deal has failed to meet the basic requirement of the negotiations, which was ending Iran's nuclear programme. However, proponents point out that Iran has agreed to dismantle much of its nuclear infrastructure and submit to rigorous controls and inspections to which the US and other world powers agree.<sup>20</sup> These measures significantly diminish the prospects of Iran acquiring a nuclear weapon. They point out that if Congress disapproves the deal and the interim agreement that preceded it,

---

19. Ed O'Keefe, "Congress Members React to the Iran Nuclear Deal", <http://www.washingtonpost.com/blogs/post-politics/wp/2013/11/23/congressional-reaction-to-the-iran-nuclear-deal>. Accessed on January 21, 2014.

20. "Republicans Fume Over Iran Nuclear Deal But Hope of Undermining Accord is Slim", *The Guardian*, <http://www.theguardian.com/world/2015/jul/14/republicans-iran-nuclear-deal-reaction>. Accessed on August 5, 2015.

then Iran has no obligation to allow inspection of its nuclear sites and there would be few restraints on its nuclear programme. This increases the chances of Iran developing nuclear weapons. The deal allows for a robust verification process that will permit Iran to develop its nuclear programme for peaceful purposes only. It has put in place mechanisms that ensure that Iran is restricted in developing its nuclear programme.<sup>21</sup> Any violation calls for immediate implementation of sanctions.

In the event that the US Congress does not endorse the deal, it is expected that President Obama would use his executive powers to veto the Congressional disapproval. The US Congress would then require a two-thirds majority to overturn the veto.

**With the imminent withdrawal of the US from Afghanistan, there is concern about the rise of radical forces in the country. While the Afghanistan government, with the help of Pakistan, is trying to negotiate with the Taliban in the country, there are growing concerns about the presence of the Islamic State of Iraq and Syria (ISIS) in the region.**

### THE US' NEED FOR THE DEAL

The political scene in the Middle East is becoming increasingly complex; disagreements have started to come to the surface, redrawing the map of alliances and conflicts among regional players and global powers. Warmth and enthusiasm was lacking during the recent visit by US Secretary of State John Kerry to the Middle East due to the US' stand on some issues, especially Iran. This posits a question on whether these growing disappointments, which sometimes are accompanied by independent actions, indicate that the US is losing its influence in the Middle East.<sup>22</sup>

With the imminent withdrawal of the US from Afghanistan, there is concern about the rise of radical forces in the country. While the Afghanistan

---

21. The Centre for Arms Control and Non-Proliferation, "The Real Facts on the Iran-Nuclear Deal", <http://armscontrolcenter.org/the-real-facts-on-the-iran-nuclear-negotiations/>. Accessed on August 5, 2015.

22. Ahmed Ezz Eldin, "Did America Lose Control of the Middle East?", [http://www.yourmiddleeast.com/columns/article/did-america-lose-control-of-the-middle-east\\_19421](http://www.yourmiddleeast.com/columns/article/did-america-lose-control-of-the-middle-east_19421). Accessed on January 30, 2014.

government, with the help of Pakistan, is trying to negotiate with the Taliban in the country, there are growing concerns about the presence of the Islamic State of Iraq and Syria (ISIS) in the region. With the announcement of the death of Mullah Omar, the leader of the Afghan Taliban faction, there has been infighting within the organisation's factions for the leadership role. This has led to a breakdown of the talks with the Afghan government. The US and Iran both are apprehensive about the increasing influence of the ISIS in the region. As a bordering nation, Iran will have more at stake if the terror group establishes its power base in Afghanistan. With the sanctions lifted, Iran could be engaged by the international community to take active part in the rebuilding process of Afghanistan.

US the faces a similar paradox in the Middle East. In Iraq, sectarian violence has been on the rise and the ISIS is able to build its influence base in some parts of the country. Yemen and Syria are in the throes of a violent civil war which has displaced hundreds and thousands of people. The rise of the ISIS and its growing influence, along with its territorial gains has added to the violence being witnessed in the region. While the US allies in the Middle East have called upon the US to intervene, the US Congress is unlikely to commit troops once again into the region, with the American public wary of any such action.

In such a situation, Iran, with its influence, could help the US stabilise Iraq. The Iranian government is also a key ally of President Bashar Al-Assad. While the US asked the UN to drop its invitation to Iran to join in the peace talks, the White House is aware that the key to the resolution of the Syrian civil war is support from Tehran.<sup>23</sup>

One advantage that the US foresees from this deal is the possibility of influencing the debate on non-proliferation in the region. The Gulf Cooperation Council (GCC) states have expressed interest in developing civil nuclear programmes, with Oman and Saudi Arabia at the forefront of this endeavour. The deal could be used as an example to persuade nations to adhere to the provisions of the NPT and IAEA protocols. It would also

---

23. Stuti Banerjee, "US-Iran: The Nuclear Talks", <http://www.icwa.in/pdfs/IBusiran.pdf>. Accessed on August 5, 2015.

help the US in preventing the spread of weapons of mass destruction and strengthening the prohibitions against their development.

Iran also provides the US with an alternate power in the region, apart from Saudi Arabia. While it would be presumptuous to say that the US is building relations to counter Saudi Arabia, its long standing ally, it can be said with some certainty that the US is exploring ways to expand its reach apart from the Saudi influence.<sup>24</sup>

The US is decreasing its energy imports from the Middle East, and many experts point to this waning interest as the reason for the US' disengagement from the region. However, the US' allies are dependent on oil from the region and one of its most prominent allies, Israel, is part of the region. With its commitment to security, its need to counter terrorism and promote nuclear non-proliferation and nuclear disarmament, the US will continue to have interests in the region, through it is speculated that it could rethink and realign its interests. It is in the US interest to have a stable peaceful Middle East and it is realising that Iran would be helpful in achieving this goal.

#### **IRAN'S NEED FOR THE DEAL**

Foreign Minister Mohammad Javad Zarif, who headed the Iranian negotiating team, has formally submitted the deal to the Iranian Parliament. A 15-member special committee has been set-up to review the deal. Iran's Parliament will need "*at least*" 60 days to review the proposed final deal with the world powers over its contested nuclear programme, a process which is similar to that of the US Congress.<sup>25</sup> Nonetheless, unlike President Obama, who faces opposition to the deal, it is likely that the Iranian legislature will endorse the deal, which has the support of the Supreme Leader, Ayatollah Ali Khamenei. There are some hardliners in the Parliament who have voiced their opposition to the deal, but their numbers are, as yet, not

---

24. Ibid.

25. "Iran Lawmakers Said to Need 'at Least' 60 Days for Nuke Deal", *The New York Times*, [http://www.nytimes.com/aponline/2015/07/21/world/middleeast/ap-ml-iran-nuclear.html?\\_r=2](http://www.nytimes.com/aponline/2015/07/21/world/middleeast/ap-ml-iran-nuclear.html?_r=2). Accessed on August 5, 2015.

significant enough to reject the deal.<sup>26</sup> However, the head of the powerful Iranian Revolutionary Guards (IRG), Mohammad Ali Jafari, has voiced his concerns on some of the provisions of the draft resolution on arms build up, etc. He has stated that the review process should examine the document for its legal merit before a final view can be announced.<sup>27</sup> As of now, it is unclear if his objections would change the provisions within the deal, given that he had expressed support for the framework agreement and the deal has the support of the Supreme Leader, who is also the commander-in-chief of the forces.

In what is being seen as an attempt to maintain a balance between the hardliners, who form the support base of the Ayatollah and are anti-US, and the more moderate and the public in Iran, who have been supportive of the efforts to end sanctions, the Ayatollah in his address at the end of *Ramadan*, stated that while he wanted Iranian officials to peruse the landmark agreement to ensure that national interests were preserved and to prevent the disruption of its political principles or military policies, Iran would not change its Middle East policy to support the US.<sup>28</sup>

Public opinion in Iran is largely in favour of the nuclear deal. The deal removes the sanctions that have been imposed on Iran and this would allow an estimated US \$100 billion to enter the Iranian economy. The deal is being viewed as important for Iran and will create more jobs as companies will now be allowed to invest in the Iranian economy.

## REACTIONS IN INDIA

The deal could open up strategic and economic opportunities for India, and, thus, has been welcomed by it. Expecting the deal to be a favourable one, India had been engaging with the Iranian political leadership since the beginning of the year. In February 2015, National Security Advisor Mr Ajit Doval visited Iran. The visit was followed by that of the Minister for

26. "Iran Parliament To Take 'At Least 60 Days' To Review Nuke Deal", <http://prophecynewsstand.blogspot.in/2015/07/iran-parliament-to-take-at-least-60.html>. Accessed on August 5, 2015.

27. "IRGC Commander Rejects Any Resolution Violating Iran's Redlines", <http://en.alalam.ir/news/1722203>. Accessed on July 21, 2015.

28. "Khamenei: Opposition to US Persists After Nuclear Deal", *Al Jazeera*, July 21, 2015, <http://www.aljazeera.com/news/2015/07/iran-nuclear-deal-150718051925210.html>.

Road Transport, Highways and Shipping, Mr Nitin Gadkari (May 2015), who signed a Memorandum of Understanding (MoU) with his Iranian counterpart for the development of Chabahar port. The port, situated in southeastern Iran, is seen by India as a gateway to both Afghanistan and Central Asia. Foreign Secretary Mr Jaishankar also travelled to Iran (June 2015). And Prime Minister Narendra Modi met with President Hassan Rouhani on the sidelines of the Shanghai Cooperation Organisation (SCO) summit in Ufa, Russia.<sup>29</sup>

For India, the deal, coming at a time when the government is emphasising its “Look West” policy, will have an impact on its energy, economic and geo-strategic spheres.

As the world’s fourth largest energy consumer that imports more than three-quarters of its oil and an increasing amount of its natural gas, India will watch with interest the deal’s impact on the energy market. India will hope to benefit, both directly and indirectly, from the Iranian oil coming to the market in the short-to-medium terms. It might import more oil from Iran, partly to keep its supplier base diversified – but to what extent will depend on the terms. India will also hope that it will lead to a further reduction in global oil prices or, at the very least, those prices remaining steady.<sup>30</sup> A fall in crude prices will enable India, which meets 80 percent of its crude requirements via imports, to pare its energy bills.<sup>31</sup> India can explore the possibility of engaging with Iran by way of an agreement that allows India to buy Iranian oil through favourable payment options. India may also explore the idea of bulk import of oil over a long period from Iran.

The other area of interest in the energy sector for India could be natural gas. India has not imported gas from Iran; nonetheless, it may want to explore the possibility of favourable terms based on India’s capacity to absorb this

---

29. Kabir Taneja, “India’s Missed Iran Opportunity”, <http://thediplomat.com/2015/05/indias-missed-iran-opportunity/>; and NDTV, “PM Narendra Modi Meets Iranian President Hassan Rouhani”, <http://www.ndtv.com/india-news/pm-narendra-modi-meets-iranian-president-hassan-rouhani-779668>. Accessed on August 5, 2015.

30. Tanvi Madan “India and the Iran Deal”, <http://www.brookings.edu/blogs/markaz/posts/2015/07/20-india-iran-nuclear-deal-madan>. Accessed on August 5, 2015.

31. Sanjay Kumar Singh, “Here’s How the Iran Nuclear Agreement Impacts India”, [http://articles.economictimes.indiatimes.com/2015-07-20/news/64638662\\_1\\_crude-prices-crude-purchases-iran-nuclear-deal](http://articles.economictimes.indiatimes.com/2015-07-20/news/64638662_1_crude-prices-crude-purchases-iran-nuclear-deal). Accessed on August 5, 2015.



**India, while it looks at avenues to strengthen its relations with Iran, would also need to balance its relations with other countries of the region, such as Saudi Arabia and Israel.**

source of energy. There is also speculation that talks on the Iran-Pakistan-India natural gas pipeline might be revived. While India would be keen to develop this idea, it will be a long-term project which would require investments and renewed negotiations.

Indian oil and gas companies, both public sector and privately owned, have been engaged in Iran, and they will now face competition as the sanctions are gradually lifted. Iran's energy sector needs better equipment, technology and investments, all of which were stopped as a result of the sanctions. India could investigate possibilities in this sector. Its oil companies can reexamine stalled projects and their viability and investments prospects. Indian companies could also seek to be part of consortia, bringing to the table their familiarity with doing business in Iran.

Beyond the energy sector, India hopes for greater exports. Some Indian companies, that have been increasingly looking abroad, see Iran as a potential market for goods and services.

The deal allows Iran to play an overt and active role in stabilising the region, especially Afghanistan. It is in the interest of both India and Iran that the Taliban and other such radical groups do not come to power in Afghanistan. While the extent of its role in the Afghan issue is not yet clear, India sees potential in developing Iran as a crucial transit point for its efforts in Afghanistan and also Central Asia, and in the future to Europe and Russia.

India, while it looks at avenues to strengthen its relations with Iran, would also need to balance its relations with other countries of the region, such as Saudi Arabia and Israel. While Israel has voiced its opposition to the deal, Saudi Arabia has not been supportive of it either. With both these nations, India's interests and connections in some areas are deeper than those with Iran. India needs to ensure that its association with Iran does not damage its relations with other countries in the region, especially in view of the close to seven million Indians working in the Middle East.

## CONCLUSION

The deal, if and when implemented, would be advantageous to relations between India and the US. It would ease an irritant in the relationship. India's relationship with Iran, in view of the US sanctions, was not viewed positively by the US Congress. Indian companies with interests in Iran were in danger of being sanctioned by the US for their role in that country, limiting their engagement with US companies. The deal would help India and the US to remove this point of contention from their partnership. It would also help the two nations to cooperate with Iran in ensuring that Afghanistan does not revert to the Taliban. If it is endorsed and implemented by the US Congress, the US may be more open to engaging with Iran on Afghanistan, a scenario supported by India.

For the US, this deal allows it to rebuild its relations with Iran which were terminated after the Iranian revolution. It is also an opportunity for the US and Iran to overcome their past differences and suspicions of each other. The US applied sanctions on Iran after the revolution; however, it was unable to isolate the country within the international community or in the region. With the region facing turmoil, it is in the US' interest to engage Iran in persuading various groups to negotiate for peace. Iran continues to have considerable influence in the region and would be an important partner for the US as it builds policies to achieve peace in Syria, and between Israel and Palestine, and to defeat the ISIS.

Iran has consistently maintained that its nuclear programme was, and has always been, for civil use. It points to the religious edicts that state that nuclear weapons are '*haram*'. For Iran, the emphasis during the negotiations has been on the removal of economic sanctions and for conduct for business with its international partners.

The deal also brings recognition to Iran as a nation that can influence the politics of the region. The rivalry between Saudi Arabia and Iran for leadership of the Gulf region has led to the two countries trying to increase their power, by supporting various factions and groups in the crisis-prone region. Saudi Arabia has been wary of Iran's rise and has been cautious in expressing its support or disapproval of the nuclear deal. The Arab region

has long been an ally of the United States and post the signing of the deal, US Secretary of Defence Mr Ashton Carter, has undertaken a tour of the region to reassure US allies that the deal would not be damaging to their security.<sup>32</sup>

With the deal, the international isolation that Iran was facing as a result of the US pressure, has lifted. Iran can now be invited to play a stabilising role in the region. The common threat to both US' and Iranian interests in the region comprises the radical/extremist groups such as the ISIS and Al Qaeda. The deal would allow the two countries to establish a tactical agreement to cooperate against these groups.<sup>33</sup> It is a possibility that the two countries may work together to bring stable governments in Afghanistan and Iraq. However, a strategic relationship emerging between the two nations is not a likely scenario.<sup>34</sup>

To believe that Iran would give up its nuclear power programme is wishful thinking. Iran's right to develop a civil nuclear programme is recognised by the international community. Both the proponents and the opponents of the deal have to concentrate on ensuring that Iran does not acquire nuclear weapons. The current deal has been able to limit the progress of Iran's nuclear programme. It has also been able to bring about a verification regime that should ensure that Iran is not able to develop nuclear weapons technology clandestinely. However, this verification regime, which is the key to implementing this deal, has to be made robust and strong, and the parties need to hold Iran accountable to it.

It is premature to judge the deal as a success in achieving support for nuclear non-proliferation or to label it a failure in stopping Iran from acquiring a nuclear weapon. The deal would need to be studied in the years to come and reviewed for its ability to achieve the ends as envisaged by both parties to the negotiations.

---

32. Stuti Banerjee, "The Iran Deal: Looking Beyond The 'Nuclear'", [http://capsindia.org/files/documents/CAPS\\_Infocus\\_SB\\_1.pdf](http://capsindia.org/files/documents/CAPS_Infocus_SB_1.pdf). Accessed on August 5, 2015.

33. Kathy Gilsinan, "Theory of U.S.-Iran Relations", *The Atlantic*, July 2, 2015, <http://www.theatlantic.com/international/archive/2015/07/iran-nuclear-deal-isis/397604/>. Accessed on July 23, 2014.

34. Banerjee, n.32.

# AN ASSESSMENT OF NPT REVIEW CONFERENCE, 2015: EXPECTATIONS, OBLIGATIONS, DILEMMAS AND OPPORTUNITIES

HINA PANDEY

## AN OVERVIEW OF THE DEBATES AND DEVELOPMENTS

In the three years prior to every quinquennial nuclear Non-Proliferation Treaty (NPT) Review Conference (RevCon), state parties hold preparatory meetings to finalise an agenda for the conference. These Preparatory Committee (PrepCom) meetings comprise a platform to facilitate discussion on various issues through a number of working papers, statements, and summaries and reports. While the final outcome of the PrepCom, known as the final summary statement is non-binding in nature, it is useful in setting the direction for the upcoming RevCon. This paper analyses the NPT in the wake of the RevCon to highlight some of the challenges this pillar of non-proliferation faces in contemporary times.

In preparation for the 2015 RevCon, the three PrepComs—in 2012 (Vienna), 2013 (Geneva), and 2014 (New York)—deliberated on diversified issues. The final NPT PrepCom concluded in May 2014. It did not reach a consensus on the final recommendations but released a working paper of sorts. The working paper was prepared by Ambassador Enrique Roman-

---

Ms **Hina Pandey** is an Associate Fellow at the Centre for Air Power Studies, New Delhi.

**The Preamble of the treaty text could be viewed as an expression of the desire of the NWS to create conditions for effective arms control. As directed by the Preamble, the NPT parties, especially the P-5, could be viewed as having the responsibility to "...ease international tensions by strengthening the trust between them, such that cessation of nuclear weapons can be brought about...**

Morey of Peru, highlights of which included the previous year's PrepCom's rhetoric on Article 6 of the NPT. However, given the inability of the PrepComs to really seize the initiative, nothing dramatic was expected out of the RevCon. And so it was.

*NPT as the Nuclear Non-Proliferation Stalwart?*

A cursory scan of the Articles of the NPT is sufficient to assess the essence and role of the treaty in combating threats to nuclear security. The NPT stands as recognition of the fact that a nuclear war will be the devastation of mankind and that the proliferation of nuclear weapons enhances the chances of a nuclear war. It is for these purposes that the NPT seeks to prevent the

wider spread of nuclear weapons. It does encourage, however, the promotion of nuclear energy for peaceful research and development under the framework of the International Atomic Energy Agency (IAEA) safeguards. The privilege of using nuclear equipment, materials, etc is limited to the parties to the NPT, defined by the law as Nuclear Weapon States (NWS) and Non-Nuclear Weapon States (NNWS). The NPT's privileged NWS are also the only five countries that are allowed to legally hold nuclear weapons.

In theory, ten Articles of the NPT govern the grand strategy towards achieving three objectives: (i) promotion of nuclear energy for peaceful purposes; (ii) prevention of the spread of nuclear weapons/technology/equipment/materials for military use; (iii) pursuit of universal nuclear disarmament.

In addition, the Preamble of the treaty text could be viewed as an expression of the desire of the NWS to create conditions for effective arms control. As directed by the Preamble, the NPT parties, especially the P-5,

could be viewed as having the responsibility to "...ease international tensions by strengthening the trust between them, such that cessation of nuclear weapons can be brought about..."<sup>1</sup>

In fact, in the introduction to the NPT, to guide the prevention of vertical nuclear proliferation, NPT parties are also advised to abstain from signalling nuclear threats in their international relations. The treaty, in principle, guides the NPT members to promote and practically move towards the goal of disarmament. Further, it also directs the state parties towards the, "...liquidation of all their existing stockpiles, and elimination from national arsenals of nuclear weapons and the means of their delivery ..."<sup>2</sup>

In the realm of horizontal proliferation too, the treaty strictly invalidates nuclear "assistance", "encouragement", or "transfer" (direct or indirect) of a military nature by one country to another. This is the first Article of the NPT under which the supplier country is prohibited from sharing nuclear technology for military use. The recipient country, on the other hand, is also legally bound by the undertaking in Article 2 of the treaty to not *receive, or seek* assistance in terms of nuclear technology, equipment, materials, etc for military use.

To prevent the diversion of dual use technology into the military programme, the NNWS are kept under IAEA safeguards for verification purposes so that the unlawful spread of nuclear technology in any form (from one state to another) may be prevented. Safeguards under Article 3 are applied on all peaceful nuclear activities of a state occurring within the

**Article 3 of the NPT can be considered as among the most significant Articles of the treaty as it categorically states, "Unless it is subjected under the IAEA Safeguards, the state parties to the NPT are prohibited to provide even the source or equipment source of special fissionable materials..."**

---

1. "Treaty on the Non-Proliferation of Nuclear Weapons, NPT Treaty Text", IAEA Information Circular , INFCIRC/140, April 22, 1970, p. 2, available at <https://www.iaea.org/sites/default/files/publications/documents/infcircs/1970/infcirc140.pdf>. Accessed February 12, 2015.

2. Ibid.

state territory. Article 3 of the NPT can be considered as among the most significant Articles of the treaty as it categorically states, *“Unless it is subjected under the IAEA Safeguards, the state parties to the NPT are prohibited to provide even the source or equipment source of special fissionable materials...”* Safeguards required by Article 3 are to be implemented in such a manner that the *“... economic and technological development and international cooperation by the NPT countries in the field of peaceful should not be hampered....”*<sup>3</sup>.

It is noteworthy that the subsequent Article 4 of the treaty provides the *“...inalienable right of the parties to develop, research, produce and use of nuclear energy for peaceful purposes without any discrimination...”* Finally, Article 6 of the Treaty links the promotion of peaceful nuclear energy with the goal of disarmament. Under this Article, each state party agrees to pursue general and complete disarmament.

In short, one can argue that Articles 3, 4 and 6 of the NPT are responsible for maintaining the integrity of the treaty. They comprise the official guidelines under which each member is accountable to promote and use nuclear energy for peaceful purposes only, equally share the benefits of nuclear energy, and help lead to disarmament.

It is ironical that these objectives are viewed as the least effective in terms of their functionality in the present times. For instance, the objective of Article 3, of preventing the diversion of nuclear material and technology from a civilian nuclear weapons programme, has come under attack after the alleged Iranian nuclear weapons related activity. China’s ongoing help to Pakistan’s nuclear programme, despite the latter not being an NPT member, is also a violation of the treaty. Likewise, Article 4 provides for the inalienable right to nuclear energy of each state party, yet the tendency to restrict a country’s right to the full fuel cycle through bilateral cooperation agreements prevails. US export laws prohibit enrichment technology cooperation. Furthermore, Article 6 of the treaty, responsible for promoting disarmament, has become more rhetoric than action.

Given the above, it is evident that the NPT has not been able to deliver effectively on three of its most important objectives. While an argument in

---

3. Ibid.

its favour can be made in that not many countries have been able to acquire a nuclear weapons capability since the treaty came into force, it cannot be overlooked that as more countries opt for nuclear power in the future, this partial incompetency of the NPT might develop into a more complex issue. Hence, the time is now ripe to find innovative ways to iron out these evolving issues into a future direction of the NPT's objectives.

### *NPT RevCon, 2015: Appropriate Timing*

The timing of the NPT RevCon, 2015, could not have been more appropriate and immediate to the near and long-term nuclear security threats. Some of these issues stand out. The RevCon took place at the time when P5+1–Iran negotiations were on an upswing, and North Korea's suspected development of a miniaturised nuclear warhead for its KN-08 Inter-Continental Ballistic Missile (ICBM)<sup>4</sup> had been reported. The US-Russia nuclear relations had taken a downturn. The US and North Atlantic Treaty Organisation (NATO) remained more committed to a robust missile defence with its deployment in Romania, Turkey and Poland in the near foreseeable future<sup>5</sup>

## **CONTEMPORARY CHALLENGES HAUNTING THE NPT**

In the 1990s, a period often referred to as the beginning of the second nuclear age, the second PrepCom of the NPT ended, ironically, two days before the Indian Peaceful Nuclear Explosions (PNEs) in 1998. Experts have

---

4. Anthony Capaccio, "North Korea Can Miniaturize a Nuclear Weapon, U.S. Says", *Bloomberg*, April 8, 2015, available at <http://www.bloomberg.com/news/articles/2015-04-07/n-korea-can-mount-miniature-nuclear-weapon-u-s-admiral-says>. Accessed on April 8, 2015.

5. The US' funding for completing work on the missile defence base at Devesulu in Romania continues, at a cost of \$169 million for construction and \$164.089 million over FY16-18 for procurement of Aegis Ashore for Poland. In addition, the Obama Administration has also requested for \$559 million for procurement of Aegis ballistic missile defence by the end of FY 2016. For details, see Frank A. Rose, "International Security and Missile Defense," Remarks at the Romania-American University/National School of Politics and Administration Bucharest, Romania, US Bureau of Arms Control, Verification and Compliance, US Department of State, March 30, 2015. Available at <http://www.state.gov/t/avc/rls/2015/239988.htm>. Accessed on April 2, 2015.



argued that a new era of nuclear weapons proliferation<sup>6</sup> (horizontal) had begun. Increasing proliferation threats were foreseen from nuclear black markets. In the contemporary times, the NPT is facing mainly two kinds of challenges: from outsiders and insiders.

### *The Non-NPT Challengers: Outsiders*

Non-proliferation proponents have looked at the treaty as being challenged from *Outside, Within, Below and Above*.<sup>7</sup> From the outside, nuclear weapons related developments in Pakistan, India, and Israel continue to question the nuclear non-proliferation regime's worth. They are referred to as outliers and every NPT RevCon has made calls for universalisation of the treaty, asking the three to join it as NNWS. This is hardly plausible. In 2008, an exception was made for India to accommodate it into the regime for its good non-proliferation record and responsible behaviour. Since then, Pakistan has made demands for similar accommodation. But, at present, Pakistan is heavily investing in the nurturing of its tactical nuclear weapons (without a corresponding operative and functioning doctrine). Pakistan, with a steady proliferation record, should not be allowed by the international community to join the nuclear regime as a nuclear weapon state. But the challenge then remains as to how to check its future proliferation activities? What innovations could be incorporated into the working of the regime to keep a check on an outsider state's activities affecting the sanctity of the treaty? In this context it is, thus, important to find answers as to how to align Pakistan towards a non-proliferation agenda, especially when it has already made its position clear on measures such as the Comprehensive Test Ban Treaty (CTBT) and Fissile Material Cut Off Treaty (FMCT).

The status of Israel's nuclear weapons, despite its policy of opacity, is estimated at 80 nuclear warheads with delivery capability by aircraft and sea-based launched cruise missiles. One of the components of this 'outside challenge' has done more harm to the NPT's prospects of a

---

6. Bhumitra Chakma, "Pakistan's Nuclear Weapons Programme" cited in Olav Njolstad, ed., *Nuclear Non-Proliferation and International Order: Challenges to the NPT* (London, New York: Routledge, 2011), p.33.

7. Njolstad, *Ibid*.

Nuclear Weapon Free Zone (NWFZ) in the Middle East. One must recognise that with the exception of Israel, all countries in the region are part of the NPT. As long as the neighbours feel threatened by the presence of Israeli nuclear capability in the Middle East, the process of an NWFZ might not see the light of day. It is known that Israel was the first state in the Middle East to have developed a large scale nuclear weapon programme. Even though Israel has maintained that it would not be the first country to introduce nuclear weapons into the Middle East region, its policy of nuclear opacity has long-term implications for the region's stability. Moreover, because the possession of nuclear weapons capability is viewed as the only "life insurance policy"<sup>8</sup> against its threat perceptions by the influential Israeli elite, any diffusion of this core security instrument is not to likely.

### *The NPT Challengers: Insiders*

#### *Growing Importance of Nuclear Weapons: A Critique of the P-5*

As mentioned earlier, the NPT has also been challenged by the insiders, through nuclear weapon development. In recent years, credible nuclear deterrence is being enhanced by all the P-5 countries. The United States is engaged in its nuclear weapons overhaul. The Russian Federation too has a major nuclear modernisation programme underway which includes nuclear delivery systems, warheads and production facilities. Another powerful P-5, China too is pursuing its BMD programme by modernising its land-based ballistic missiles. The nuclear weapons strategic developments in France and the UK too are inching towards modernisation. Both countries have sea-based deterrence as the centre of their nuclear strategy. France is currently upgrading its nuclear submarines and this is expected to be completed by 2018. The UK plans to retain its submarine nuclear deterrent force for an indefinite future. According to a 2010 British Strategic Defence

---

8. Ramesh Thakur and Gareth Evans, "Nuclear Weapons: The State of Play," Centre for Nuclear Non-Proliferation and Disarmament, Crawford School of Public Policy, Australian National University, 2013. Available at <https://cnnd.anu.edu.au/files/2013/state-of-play-report/Nuclear-Weapons-The-State-of-Play.pdf>. Accessed on July 28, 2015.

**In the United States, renewed support for the movement of nuclear disarmament was evident after President Obama launched his Prague Agenda. However, two alternative arguments against his disarmament movement have emerged lately. Critics disapprove of this objective on the basis of its impracticality. It is argued that because the ultimate goal is “not feasible,” “it is, therefore, dishonest to hold out a hope that it can be achieved.”**

and Security Review, there is a plan in place for reducing the size of the British nuclear arsenal from 160 to 120 (operational stockpile) and from 220 nuclear warheads to 180 (from the total size of the nuclear stockpile, including non-deployed) by the mid-2020s.<sup>9</sup>

All the P-5 countries retain a key role for nuclear weapons in their national security strategies. This further complicates the process of effective negotiation of the non-proliferation objectives at the NPT RevCons. As long as nuclear weapons and their threats and even presence continue to shape or influence international political gains for a country, especially the P-5, any progress on the ultimate goal of the NPT (leading the world into disarmament) would be difficult. It would be practically impossible to convince the outliers such as

India to accede to the treaty because of the unfinished pledge of the P-5 on nuclear disarmament. It is noteworthy to mention here that the NPT offers a “balance of mutual responsibilities and obligations”<sup>10</sup> between the NWS and NNWS members.

This balance is the double bargain of the NPT suggested by the eight non-aligned members of the Eighteen Nation Disarmament Committee (ENDC) in the year 1965. It is worth mentioning here that the NWS haven't delivered qualitatively on their commitment as today, the combined number of the stockpiles of their nuclear warheads remains high, at approximately

---

9. Shanon N. Kile and Hans M. Kristensen, “British Nuclear Forces”, and Philip Schell and Hans M. Kristensen, “French Nuclear Forces”, *SIPRI Yearbook 2013: Armaments, Disarmament and International Security*, 2013, pp. 300-303 and pp. 303-304 respectively.

10. David Hollaway, “The US and the NPT: Double Bargain”, cited in Njolstad, ed., n.6.

16,075<sup>11</sup> nuclear weapons.

In the United States, renewed support for the movement of nuclear disarmament was evident after President Obama launched his Prague Agenda. However, two alternative arguments against his disarmament movement have emerged lately. Critics disapprove of this objective on the basis of its impracticality. It is argued that because the ultimate goal is “not feasible,” *“it is, therefore, dishonest to hold out a hope that it can be achieved.”*<sup>12</sup> An important question is, thus, raised for the proponents of the view: what kind of security arrangement or monitoring and verification would be devised if the breakout of an order of disarmament were to occur?

Another school of thought in the US has opposed President Obama’s move to a nuclear weapon free world on the ground that such a step would eventually compel many states, especially those under the current nuclear umbrella of the US, to fend for themselves. If the US, in due course of time, were to move to deep reductions and, finally, to elimination of nuclear weapons, then the US allies, that have benefitted from the policy of extended deterrence, are most likely to seek nuclear weapons of their own. Futter and Zala have elaborated this line of argument in their article titled, “Advanced US Conventional Weapons and Nuclear Disarmament: Why The Obama Plan Won’t Work”.

The authors argue that President Obama’s strategy of increasing the role of advanced conventional weaponry in the US national security strategy in order to reinvigorate the global nuclear disarmament agenda is fundamentally flawed. President Obama’s strategy towards a world free of nuclear weapons involves two components: (1) to reduce the salience and centrality of nuclear weapons in the current defence posture; and (2) to

11. World Nuclear Stockpile Report , *The Ploughshare Fund*, updated August 28, 2015. Available at <http://www.ploughshares.org/world-nuclear-stockpile-report>. Accessed on April, 11, 2015.

12. *Ibid.*, p. 161.

mitigate the fallouts of the nuclear reductions on the US nuclear posture. President Obama is attempting to place far greater reliance upon advanced conventional capabilities.<sup>13</sup> This is being done in order to facilitate domestic conditions that would favour US nuclear reductions. This would likely be a signal to the allies of the US' security assurances through advanced conventional weaponry. It is interesting to note that although the initiative of gaining superiority in the conventional defence posture has been continuing from the previous Bush Administration, its rationale by the Obama Administration has been linked to disarmament.

President Obama's BMD development in exchange of disarmament is likely to backfire as "*existing conventional imbalances will magnify the US power*". This is likely to make the US' rivals feel more vulnerable. To elucidate further, in a disarmed world, "*the US conventional power projection would likely increase a concern that it may be used to intimidate, attack or overthrow a regime.*"<sup>14</sup> Moreover, the significance of President Obama's BMD for the nuclear disarmament agenda appears to be conspicuous, as his support to BMD development with regard to funding has surpassed that of the Administrations of Ronald Reagan, George H. Bush and Bill Clinton.

The idea of effective deterrence through conventional weaponry and BMD advancement in order to convince the sceptics, according to Futter and Zala, is likely to backfire. This stands true if one evaluates the present tensions in the US-Russia nuclear dynamics. Because both the US and Russia, even today, remain at the heart of each other's security thinking when it comes to nuclear issues, any BMD development on either side is likely to trigger an equal response. In this manner, the agenda of disarmament would produce unintended consequences as it would destabilise the strategic stability between two key world powers. Moreover, it would appear less likely that states would accept a situation wherein maintenance of stability would be conditioned to the advanced conventional weaponry – in which

---

13. Andrew Futter and Benjamin Zala, "Advanced US Conventional Weapons and Nuclear Disarmament: Why The Obama Plan Won't Work," *Non-Proliferation Review*, vol.20, no.1, pp. 107-122.

14. Ibid.

only the US maintains an edge at present.

Moreover, the US' conventional strength enhanced to its optimum might appear to work in countering threats from smaller states like Iran and North Korea, but in truth is likely to shape their nuclear ambitions. Because nuclear weapons are viewed as "great equalizers" to the US conventional superiority, the asymmetric equation of military capability would likely work as an impetus towards the acquisition of nuclear weapons by the smaller countries.<sup>15</sup>

However, in this manner, the US might not been able to deliver on its special responsibility to promote disarmament. As the first country to build and drop the nuclear bomb, the US' leadership role has often been cited in creating a nuclear weapon free world. While President Obama may have tried to initiate the leadership through his Prague Agenda, it has not won the hearts of sceptics worldwide, resulting in mistrust of his disarmament agenda. This disenchantment of states outside the NPT and even the member states has become counter-productive to the 'double bargain' of the treaty.

One of the members of the P-5 itself has been more vocal in conveying its disillusionment with the US agenda. While China in principle views the possession of nuclear weapons as immoral in human society, it nevertheless aspires to match the nuclear capability of the US, as it seeks to prevent any nuclear blackmail by its enemies. China has often cited the incidents of intimidation by President Truman and President Eisenhower in 1950 and 1953 as the rationale for its possession of nuclear weapons. Furthermore, many Chinese experts have argued that in the present time, the US BMD system is without a doubt, the single most important factor in influencing China's need to maintain a nuclear balance by strengthening its nuclear deterrence capability.

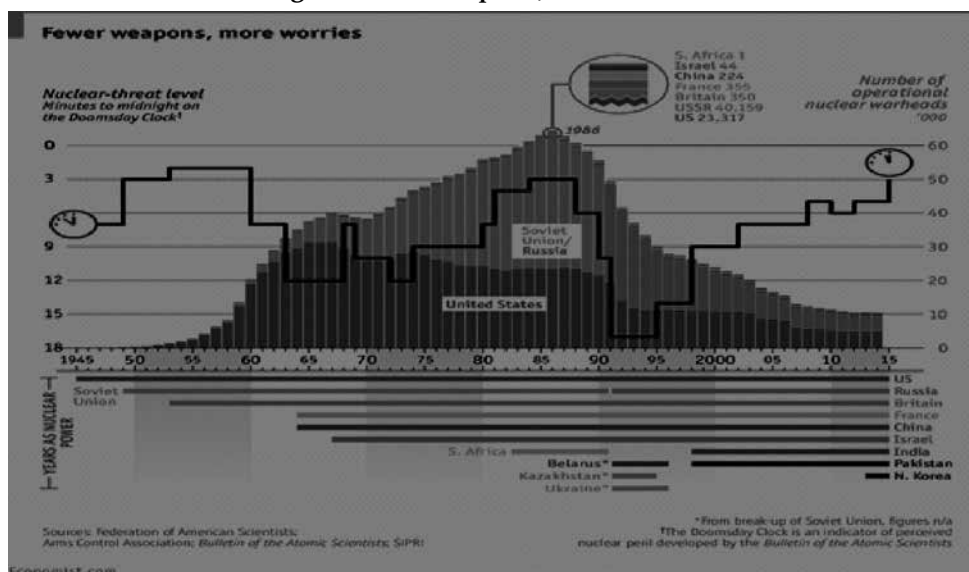
On the other hand, China itself is a cause of concern due to its rising nuclear arsenal and its lack of contribution to the multilateral forum promoting disarmament. China has taken no steps in support of any initiative in nuclear disarmament. A diagram published in *The Economist* magazine

---

15. Ibid.

presents a comprehensive picture of the current nuclear capability possessed by all the states, within and outside the NPT (see Fig 1). The diagram clearly illustrates the P-5 leading the race in possessing the highest number of nuclear weapons. In this context, the Revlon outcome only replicated the previous calls of nuclear arsenal reduction measures for the NWS.

Fig 1: Fewer Weapons, More Worries



## NUCLEAR ENERGY PROMOTION VS NON-PROLIFERATION: THE CASE OF IRAN

In order to facilitate safe promotion of nuclear energy without the risk of clandestine diversion into a weapons programme, the acceptance by all the NNWS of an *Additional Protocol* since the 2005 Revcon has been viewed as a prerequisite for the supply of nuclear material, equipment and technologies. Over the years, initiatives such as the Global Threat Reduction Initiative (GTRI) along with the national and international export control mechanisms for nuclear materials have been added as mandatory. This is an important issue as the protection of the inalienable right of the member states ( NNWS) to develop their nuclear energy programmes for peaceful purposes not only gets reaffirmed with every

Revcon, but also because it bears direct linkages to the three main important Articles of the NPT .

On matters relating to nuclear energy, the Action Plan of the NPT-2010 reminded the state parties about their obligation to ensure that their nuclear-related exports do not directly or indirectly assist the development of nuclear weapons. The parties were also reminded to ensure nuclear export transparency. The NPT RevCon took place on the sidelines of the P5+1 – Iranian nuclear talks.

It was expected that the issues of granting of enrichment rights to Iran vis-a-vis nuclear energy promotion and the risk of diversion would be debated at the RevCon. However, Iran's presence at the RevCon did not amount to much. It did not even deliver a national statement at the general debate, and focussed more upon the P5+1 talks, as the deadline for a comprehensive agreement approached. The issue of nuclear energy promotion with non-proliferation guarantees was reduced to an affirmation on strengthening transparency in export control policies.

#### **NPT WITHDRAWAL ISSUE: NORTH KOREA**

According to Article 10 of the NPT, a state has the sovereign right to withdraw from the treaty. It can withdraw from it after giving a three months notice to the UN Security Council (UNSC), with a condition stating that "*extraordinary events*" may jeopardise its supreme national interest. To preserve the treaty's universality, the depositories of the NPT (Russia, the UK and the US) are supposed to undertake diplomatic efforts to prevent the withdrawal.

However, when North Korea gave advance notification on its withdrawal from the NPT in the year 1993, the P-5, the legal guardians of the treaty, did little to prevent the treaty from losing its member. While there was pressure on North Korea to accept with immediate effect the IAEA safeguards/verification, the P-5 could not go beyond a minor reprimand. It became clear later that China could not be persuaded to join the other P-5 members of the



**In fact, the NWFZ issue garnered the most interest and raised the most controversy at the 2015 NPT Review Conference. On the final day of the conference, consensus for the full draft of the RevCon final document was not secured due to the dispute over the Weapons of Mass Destruction Free Zone (WMDFZ).**

UNSC in taking action against North Korea.<sup>16</sup>

One may argue that these negotiations led to the Agreed Framework of 1994 between the two countries. However, the North Korean proliferation problem still haunts the efficacy of the nuclear non-proliferation regime. Once again, in 2003, the North Korean notice to the UNSC did not invite any concrete action on the withdrawal issue. What exactly delayed the response of the P-5 in taking up appropriate measures cannot be known with certainty as the US-China discussions were not made public. No amount of counter-factuals can actually provide an insight on why the UNSC did not intervene on the basis of its “... *threat to peace...*” from the UN Charter to prevent North Korea’s withdrawal from the NPT as this could have been read as having security implications. The problem lies in the very fact that the NPT itself gives the right to withdraw under exceptional circumstances which are not defined.

It has been more than a decade since the first time (2003) a country withdrew from the NPT. While in the immediate PrepCom for the RevCon (2015), the issue was avoided, in the 2004 PrepCom, France and Germany proposed that a withdrawing country ought to give up its nuclear materials and its right to their use, and should still be accountable for the breaches and acts of non-compliance. The issue of withdrawal from the NPT remains a debatable point as the North Korean issue has only become more difficult to resolve over time. The final draft document remained silent on the issue of north Korean withdrawal.

---

16. George Bunn and John Rhinelander, “The Right to Withdraw from the NPT: Article X is Not Unconditional”, *Acronym Institute*, May 1, 2005, at [www.acronym.org.uk/dd/dd79/79gbjr.htm](http://www.acronym.org.uk/dd/dd79/79gbjr.htm). Accessed on March 30, 2015.

### THE MIDDLE EAST NWFZ

The last RevCon had put emphasis on the negotiations over the establishment of the NWFZ in the Middle East by delivering the “practical steps” towards the implementation of the 1995 UN Resolution on the Middle East NWFZ.<sup>17</sup> However, progress on the agenda in the subsequent years has remained low. The subject of an NWFZ was expected to invite discussions in the RevCon, 2015. Since 1995, a conference on the Resolution on the Middle East NWFZ had been planned for 2012. Prior to the RevCon, it was anticipated that this issue would generate a lot of focussed attention as Egypt’s disappointment with the process was revealed when it boycotted it in 2012. Pessimism has surrounded this process from the outset.

The RevCon revealed exactly that. In fact, the NWFZ issue garnered the most interest and raised the most controversy at the 2015 NPT Review Conference. On the final day of the conference, consensus for the full draft of the RevCon final document was not secured due to the dispute over the Weapons of Mass Destruction Free Zone (WMDFZ) Conference: it was on this basis that the US, joined by Britain and Canada, withheld support for the document.<sup>18</sup> All the three countries opposed an agreement that enjoyed the support of 188 member states. The US specifically opposed Egypt’s suggestion of holding a regional conference on banning nuclear weapons by 2016 – with or without Israel. The RevCon finally concluded without any clearly defined path to the issue of an NWFZ in the Middle East.

---

17. 2014 NPT PrepCom: Day 10, Recommendations to the 2015 NPT Review Conference”. Available at <http://www.sipri.org/research/disarmament/2014-npt-prepcom/day-10>, Accessed on March 19, 2015; and “2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons”, NPT/CONF.2010/50 (Vol. I), 2010). Accessed on March 22, 2015 at <http://www.un.org/en/conf/npt/2010/>; and “NPT Action Plan Monitoring Report March 2014”, section on “Developments Regarding a Potential Weapon of Mass Destruction Free Zone in the Middle East (MEWMDZF)”. Available at: [www.gcsp.ch/content/download/8886/105587/download](http://www.gcsp.ch/content/download/8886/105587/download). Accessed on March 23, 2015,

18. Emily B. Landau and Shimon Stein, “2015 NPT RevCon: WMDFZ Conference Off the Table, for Now”, *INSS Insight* no. 705, June 3, 2015, available at <http://www.inss.org.il/index.aspx?id=4538&articleid=9716>. Accessed on June 25, 2015

**Simply put, the HINW views nuclear weapons possession as catastrophic to humanity. The HINW approach is an effort from civil society to bridge the rift between the P-5 and NPT parties on the lack of progress on disarmament.**

#### **“SOFTER ISSUES” IN THE NPT**

##### *Humanitarian Impact of Nuclear Weapons*

Although a relatively new issue, the scope for debating the impact of nuclear weapons on humanitarian grounds could be linked partly with the Preamble of the treaty text that states “...undertake effective measures in the direction of nuclear disarmament...” Furthermore, disarmament as an objective has been made mandatory as agreed to by the P-5 under Article 6, that directs each state party to have “good faith negotiations” towards the termination of an arms race and also take measures towards “general and complete disarmament”. The Humanitarian Impact of Nuclear Weapons (HINW) as a concept argues for delegitimising the possession of nuclear weapons by any country on the basis that nuclear weapons severely impact all humankind. Simply put, the HINW views nuclear weapons possession as catastrophic to humanity. The HINW approach is an effort from civil society [the International Campaign to Abolish Nuclear Weapons (ICAN), International Physicians to Prevent Nuclear War (IPPNW), etc] to bridge the rift between the P-5 and NPT parties on the lack of progress on disarmament.

Two years ago (2013), representatives from 127 countries gathered at Oslo to discuss the HINW by exploring three key issues: (a) the immediate humanitarian impact of a nuclear weapon detonation; (b) the wider impact and longer-term consequences; and, finally, (c) the humanitarian preparedness and response capacity. The Oslo Conference was joined by representatives from political offices and international Non-Governmental Organisations (NGOs) such as the Norwegian foreign minister, the president of the International Committee of the Red Cross (ICRC) and the UN High Commissioner for Refugees (UNHCR). Since 2013, the follow up on the HINW approach was conducted by a conference in Mexico (2014) and Vienna (2014). Within two years, the HINW approach has been able to motivate a

number of countries on the urgent need towards action on banning nuclear weapons. While the first HINW conference was boycotted by the P-5, the subsequent conferences have been able to put pressure by way of, at least, having initiated a discussion on the humanitarian approach.

**What has HINW Achieved?:** The recent HINW conference in Vienna (2014) was again attended by 158 state representatives. Significant endorsements of the HINW approach were put forward by Pope Francis and the UN general secretary. The HINW conference addressed the humanitarian consequences of nuclear weapons on a range of issues such as human health, environment, agriculture and food security, migration and the economy, as well as the risks and likelihood of the authorised or unauthorised use of nuclear weapons, international response capabilities, etc.<sup>19</sup>

Interestingly, two Ambassadors, Libran Cabactulan (permanent representative of the Philippines to the UN) and Axel Marschik (Austrian ambassador to the EU Political and Security Committee), who had participated in the previous (2010) NPT RevCon, expressed the urgent need for all states at all times to comply with the applicable international law, including international humanitarian law. The HINW approach has indeed initiated the discourse on the subject of disarmament through the lens of humanity. At the Vienna Conference (2014), 45 governments explicitly called for further multilateral negotiations to prohibit nuclear weapons and even called for “the commitment of states and civil society to reach new international standards and norms, through a legally binding instrument”.<sup>20</sup>

As 2015 also marks the 70th anniversary of the use of nuclear weapons in Hiroshima and Nagasaki, the NPT RevCon, 2015, was expected to have major deliberations on this issue. It was expected that this RevCon

---

19. “Report and Summary of Findings of the Conference, Vienna Conference on the Humanitarian Impact of Nuclear Weapons, Europe Integration Foreign Affairs”, Federal Ministry Republic of Austria, December 8-9, 2014, available at [http://www.bmeia.gv.at/fileadmin/user\\_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/HINW14\\_Chair\\_s\\_Summary.pdf](http://www.bmeia.gv.at/fileadmin/user_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/HINW14_Chair_s_Summary.pdf), Accessed on March 31, 2015.

20. Rebecca Johnson “The Austrian Pledge To Ban Nuclear Weapons”, *Open Democracy*, December 15, 2014 available at <https://www.opendemocracy.net/5050/rebecca-johnson/austrian-pledge-to-ban-nuclear-weapons>. Accessed on April 24, 2015.

would deliberate upon the next steps towards nuclear disarmament, by incorporating the HINW approach.

In fact, the three consequent HINW conferences had resulted in the 'Austrian Pledge.' As an outcome of the Vienna HINW Conference, the Austrian pledge was supposed to be put forward as an input to the NPT RevCon 2015. In this context, Austria was expected to initiate and put pressure on the NPT state parties to renew their commitments towards Article 6 of the NPT in relation to the human security aspect. Specific action on the identification of effective measures in order to legally promote the elimination of nuclear weapons were expected.<sup>21</sup>

It is worth mentioning that by March 2015, two months before the Review Conference, 61 countries had already signed the Austrian Pledge.<sup>22</sup> Clearly a consensus of some sort was gained outside of the P-5 on key issues: (a) the approach concerning the total elimination of nuclear weapons is the most effective way to prevent their use; (b) the scope, scale and interrelationship of the humanitarian consequences caused by a nuclear weapon detonation are catastrophic and more complex than commonly understood; thus, an urgent framework is required; (c) all the NWS must take concrete interim measures to reduce the risk of nuclear weapon detonations, including reducing the operational status of nuclear weapons and moving nuclear weapons away from deployment into storage, including the effort towards the diminishing the role of nuclear weapons in military doctrines.<sup>23</sup>

Additionally, the HINW approach had generated a widely accepted certainty that there is no state/ international body / mechanism that can adequately address the immediate humanitarian emergency caused by nuclear weapons. The least that the HINW approach had achieved was the initiation of an urgent policy-based discourse on the elimination of nuclear

---

21. Austrian Pledge, Federal Ministry of the Republic of Austria, December 8-9, 2014, available at [http://www.bmeia.gv.at/fileadmin/user\\_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/HINW14\\_Austrian\\_Pledge.pdf](http://www.bmeia.gv.at/fileadmin/user_upload/Zentrale/Aussenpolitik/Abruestung/HINW14/HINW14_Austrian_Pledge.pdf). Accessed on March 31, 2015.

22. For a detailed list of the countries that have signed the Austrian Pledge, see <http://www.icanw.org/pledge/>

23. Parliamentary Debate on the NPT, "Nuclear Non-Proliferation Treaty Review Conference", March 9, 2015, ICAN- UK, available at <http://Uk.Icanw.Org/Action/Parliamentary-Debate-On-The-Npt-March-9-2015/>. Accessed on July, 28 2015.

weapons. While in the last RevCon, 2010, the humanitarian approach was only mentioned in the final document and the working paper to the RevCon submitted by the Non-Aligned Movement (NAM) countries, a momentum in support of the treaty to ban and eliminate nuclear weapons had begun. However, the issue of disarmament was not even discussed through the HINW approach at the RevCon, which had garnered a lot of attention in the run-up to the NPT.

### *Nuclear Safety and Security: Renewed Attention*

Since the 2011 Fukushima accident, the issue of nuclear safety once again invited renewed attention in the current NPT discourse. Newer mechanisms such as the Convention on the Physical Protection of Nuclear Material (CPPNM) have evolved in the recent years that promote the objective of nuclear safety. As continuation of the 2005 agenda, once again, the NPT was expected to urge for stronger compliance to the CPPNM. More so, because the agenda of nuclear security had already been carried forward by President Obama's nuclear security summit. As the last National Security Strategy (NSS) is also scheduled to take place next year (2016), nuclear safety under the aegis of maintenance of nuclear security was expected to be deliberated at the RevCon, 2015. A discussion on the Convention on the Physical Protection of Nuclear Materials (1979), International Convention on the Suppression of Acts of Nuclear Terrorism (2005), and Global Initiative on Combating Nuclear Terrorism (GICNT) was viewed by the NPT RevCon, 2015, as an important element for the nuclear security architecture. The RevCon reiterated the state's responsibility for the maintenance of nuclear security and called upon all states to achieve highest standards of nuclear safety in accordance with IAEA goals. It reiterated the actions adopted in the previous nuclear security summits.

### **CONCLUSION**

This year too, the RevCon remained a continuation of the last RevCon's agenda such as reaffirmations on actualising the CTBT's entry into force, promotion of the NPT's universal adherence, strengthening of the IAEA's competency and universalisation of the Additional Protocol, etc. The

**Nuclear weapons capability has been viewed as a way to elevate prestige in international politics, influence geo-political equations and also as an instrument to counter power symmetry. All this lends support to the notion that nuclear weapons capability has utility in international politics.**

incomplete goal of an NWFZ in the Middle East is likely to haunt the discussions post the RevCon. Similarly, issues concerning North Korea's ballistic missile testing that needed urgent attention were also evaded. Despite a general consensus during the 2012 PrepCom, the P-5 had not been able to prevent North Korea from progressing on the path to acquiring nuclear weapons. In 2013, the North Korean crisis revealed the NPT's vulnerability. The vulnerability continues today as a solution to withdrawal is still pending.

In the earlier PrepComs and RevCons, new approaches to disarmament were added. As many as 80 countries, including the Vienna Group of 10 supported South Africa's call on the humanitarian impact of nuclear weapons that emphasised on an approach to negate the indiscriminate, unacceptable harm caused by nuclear weapons to socio-economic development. However, the continuous weapons modernisation programmes by the NWS and the stalemate in the FMCT reflect unfulfilled disarmament obligations. While the New START could be seen as a step towards the objective of disarmament by the most nuclear loaded P-5, it is also inadequate, as it allows modernisation and still provides scope for undeployed strategic or tactical nuclear weapons. This hinders the universal and unconditional progress of disarmament.<sup>24</sup>

Twenty-five years after the NPT became a norm building institution, the NPT Conference in (1995) extended the treaty for an indefinite period along with a once in five years review on the working of the NPT. The idea of a five-year report card was supposed to take forward in 'practice' the objectives of the NPT. While the treaty has been able to sustain itself over the last four and half decades as the only legal blueprint for comprehensive,

---

24. "Hina Pandey, "In-Between the Prepcoms & Recons: Expectations from the Upcoming NPT Revcon 2015", *In-Focus*, 2014, CAPS, available at [http://capsindia.org/files/documents/CAPS\\_Infocus\\_HP\\_4.pdf](http://capsindia.org/files/documents/CAPS_Infocus_HP_4.pdf). Accessed on July 28, 2015.

peaceful nuclear energy promotion under international verification, some exceptional cases, such as North Korea and Iran, etc (as NPT members) have haunted the efficacy of the treaty. Sceptics have also questioned whether the treaty actually prevents the diversion of dual use technology.

Over a period of time, the gaps in the treaty have also been exposed as significant weaknesses. The incorrigible dilemma over the withdrawal issues, the lack in the treaty's mechanism to fight nuclear terrorism, the NPT's lack of innovation and mandate in dealing with the challenges outside the treaty, all cast a shadow on every RevCon's consensus. This is significant as the Revcon is the only conference that is supposed to produce a final document based on unanimous agreement upon critical non-proliferation issues. It appears that the NPT Revcons have moved from 13 practical steps to 64 steps of the "Action Plan" but without much progress. Every five years, more layers and approaches get added to the NPT Revcons, which only generate discussions

The usefulness of the atomic bomb to the strategic thinkers and practitioners in international politics is manifold. Nuclear weapons capability has been viewed as a way to elevate prestige in international politics, influence geo-political equations and also as an instrument to counter power symmetry. All this lends support to the notion that nuclear weapons capability has utility in international politics. It is because of this use of nuclear weapons in influencing power politics that the P-5 insist on retaining nuclear weapons. This understanding of the P-5 contradicts

**India has recently signed the Additional Protocol of the IAEA safeguards, furthering its non-proliferation commitment a step ahead; however, this does not seem to have registered in the current non-proliferation debate. In fact, in recent years, the nuclear non-proliferation literature has closely observed the nuclear weapons related developments in South Asia and remarked that the two nuclear tests in South Asia (1998) initiated a proliferation chain reaction from countries such as North Korea and Iran.**



the dual bargain of the NPT. Furthermore, since the RevCon took place at a time when there was more awareness and urgency to resolve pending issues, it should have been viewed as an opportunity towards a fresh start on older issues; but it failed to do so.

In recent times, especially since the US-India civilian nuclear cooperation deal was concluded, the Indian non-proliferation commitments has raised many eyebrows. The doubts of the sceptics have given rise to a generic disappointment that prevails among many supporters of nuclear non-proliferation. It has been often argued that the US' opening up of international civilian nuclear commerce trade to India has done serious damage to the non-proliferation regime. It has resulted in Pakistan asking for a similar exception from the US and China and, thus, has catapulted a disappointment among the NPT.

India has recently signed the Additional Protocol of the IAEA safeguards, furthering its non-proliferation commitment a step ahead; however, this does not seem to have registered in the current non-proliferation debate. In fact, in recent years, the nuclear non-proliferation literature has closely observed the nuclear weapons related developments in South Asia and remarked that the two nuclear tests in South Asia (1998) initiated a proliferation chain reaction from countries such as North Korea and Iran. The lessons from the South Asian nuclear tests of 1998 have been understood by the would-be proliferators such as North Korea that withdrew from the NPT in 2006 that gaining nuclear status is a *fait accompli* and that the international community is bound to accept that status once it is acquired.

In the run-up to the NPT, a strong discourse on the disarmament agenda, especially relating to the humanitarian consequences and expressions such as a ban on the bomb were gaining momentum. A strong voice from the NPT NNWS was also audible. The NNWS claimed that their frustration with the pace of nuclear disarmament was increasing and were critical of the NWS' pursuit of a nuclear weapon free world. While these views made a start in the beginning of the NPT RevCon, with joint statements being released, the release of the first drafts of the Main Committee and Subsidiary Body-1 toned down these narratives.

As argued earlier, the desirability of nuclear disarmament has been shaping the nuclear security discourse since the year 2010; this was accentuated especially after the three conferences on the Humanitarian Impact of Nuclear Weapons (HINW) held in Oslo, Nayarit and Vienna. Furthermore, in the months leading to the NPT RevCon, 2015, the Austrian Pledge has further raised the profile of HINW as a strong rationale for achieving nuclear disarmament. On December 9, 2014, Austria called upon the state parties to the NPT to renew their commitment and take urgent action towards nuclear disarmament. At the Vienna Conference (2014), Austria pledged to facilitate cooperation among the state parties and relevant international stakeholders, including international NGOs in order to “stigmatize, prohibit and eliminate” nuclear weapons. The Austrian Pledge views nuclear weapons as being the “only weapons of mass destruction not yet explicitly prohibited under international law”, and for this purpose, the “Austrian Pledge” was put forward as a commitment by states to fill the unacceptable “legal gap” in order to ban nuclear weapons.<sup>25</sup>

The Austrian Pledge remains significant as of January 2015, a few months before the RevCon; Austria had sent a ‘*note verbale*’ to the state parties, inviting them to get associated with the pledge. At the time the pledge was announced, Austria already had the support of 158 nations. Significantly, at the beginning of the NPT RevCon, countries such as South Africa and Australia, along with 26 other nations, explicitly supported the Austrian Pledge and the idea of HINW. As a member of the NAM state parties, South Africa reiterated its commitment to attainment of a world free of nuclear weapons; in this context, it fully endorsed the HINW approach to nuclear disarmament and expressed great concerns about the role of the NWS.

More specifically, South Africa explicitly stated that the success of this NPT RevCon would be measured by the extent to which the concerns

---

25. Austrian Pledge, “The Austrian Pledge: Stigmatize, Prohibit and Eliminate Nuclear Weapons”, ICAN available at <http://www.icanw.org/wp-content/uploads/2015/04/AustrianPledge-ICAN.pdf>. Accessed on July, 28, 2015.

about disarmament are implemented.<sup>26</sup> South Africa associated itself with the Austrian Pledge and strongly expressed its opinion against the NWS' possession of nuclear weapons, a sentiment that demanded progress in the reduction and elimination of nuclear weapons, even those stationed outside the NWS' territories.

While the South African voice appeared to be more direct and assertive, the HINW approach towards disarmament was also supported by Belgium along with other European Union (EU) member states.<sup>27</sup> The Belgium-EU discourse was more focussed upon supporting nuclear disarmament through the accession of states outside the regime, such as India, Pakistan and Israel. The European view on HINW revolved mainly around its significance and that it needs to be debated upon. No scope of further action was debated at any great length. Additionally, this narrow perspective called for commitment to Article 6 of the NPT by achieving progress on the CTBT and FMCT.

Furthermore, Australia, along with 26 other countries, applauded the Austrian Pledge and stressed on the gravity of risks posed by nuclear accidents. In terms of actions, Australia supported the idea of spreading awareness on HINW and also asked the NWS to make further cuts and de-alert nuclear warheads. Australia insisted that the NWS must further reduce the salience of nuclear weapons in their security strategy. It specifically welcomed a multilateral framework or treaty governing complete disarmament.

In the first joint statement released by the P-5, the objective of nuclear disarmament figured as a part of the package of the three pillars of the NPT, implying that nuclear energy promotion, prevention of non-proliferation and complete disarmament go hand in hand. For the attainment of these

---

26. South Africa's National Statement on the General Debate at the NPT 2015, [http://www.reachingcriticalwill.org/images/documents/Disarmamentfora/npt/revcon2015/statements/29April\\_SouthAfrica.pdf](http://www.reachingcriticalwill.org/images/documents/Disarmamentfora/npt/revcon2015/statements/29April_SouthAfrica.pdf), and "The Ninth Review of the Parties to The Treaty on the Non-Proliferation of Nuclear Weapons", April 30, 2015, Statement on the Humanitarian Consequences of Nuclear Weapons, Statement by , H.E. Gillian Bird, ambassador and permanent representative of Australia to the United Nations. Accessed on July 28, 2015.

27. 2015 Review Conference of the Parties to the Treaty, on the Non-Proliferation of Nuclear Weapons [http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2015/statements/28April\\_Belgium.pdf](http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2015/statements/28April_Belgium.pdf). Accessed on July 28, 2015.

objectives, the P-5 viewed an incremental step by step approach as the only available option. Contradictory to other countries, the P-5 viewed that there was substantial progress on Article 6 of the NPT. Clearly the indication was that more effort towards nuclear disarmament was, thus, expected from the NNWS. Though, the P-5 did not categorically mention the status of India, Pakistan and Israel, an effective disarmament measure was viewed through the ratification of the CTBT and FMCT. The P-5, in their support to nuclear disarmament, reaffirmed their moratoria on nuclear testing and encouraged the implementation of Nuclear Weapon Free Zones in Southeast Asia, the Middle East and Central Asia.

While the NWS' expectations towards achievement of nuclear disarmament relied on the NNWS and non- NPT members, the P-5 states made it a point to express their conformity with their nuclear forces' commitment towards their security requirements.<sup>28</sup>

A few days before the closing of the NPT (May 8, 2015), the chairs of the committees and subsidiary bodies at the ongoing NPT Review Conference released the first draft of the outcome document. On the theme of nuclear disarmament, two draft documents have been put forward from the Main Committee-I, and Subsidiary Body-I. It must be recognised that Main Committee-I looks at the review of the implementation of the

**The new draft released from Subsidiary Body-1 significantly weakened the ongoing debate over the RevCon's outcome on nuclear disarmament. It eliminated the demand, made by 159 NPT states parties. It instead focussed on the nearly 70-year-old record of non-use of nuclear weapons. The new draft also cynically removed the reference to the importance of recognising the voices of survivors of nuclear weapons.**

---

28. "Statement by the People's Republic of China, France, The Russian Federation, The United Kingdom of Great Britain And Northern Ireland, and the United States of America to the 2015 Treaty on the Non-Proliferation of Nuclear Weapons Review Conference", Available at [http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2015/statements/30April\\_UKJoint.pdf](http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2015/statements/30April_UKJoint.pdf). Accessed on July 28, 2015.

NPT and Subsidiary Body-I is responsible for taking a view on forward looking action.

The new draft released from Subsidiary Body-1 significantly weakened the ongoing debate over the RevCon's outcome on nuclear disarmament. It eliminated the demand, made by 159 NPT states parties that "it is in the interest of the very survival of humanity that nuclear weapons never be used again under any circumstances." It instead focussed on the nearly 70-year-old record of non-use of nuclear weapons. The new draft also cynically removed the reference to the importance of recognising the voices of survivors of nuclear weapons. Overall, the new draft continued to frame the legal framework for a nuclear weapon free world as a longer-term goal but did not contain any serious or concrete commitments to move towards it.<sup>29</sup>

Creating conditions for disarmament requires communication between the most significant nuclear actors (US, Russia) and their bilateral efforts; however, the new draft also weakened the calls on Russia and the US for further reductions. It weakened the language against modernisation. The call on states to abandon first use policies in security doctrines has also been removed. This would further upset any progress ever going to be made on nuclear disarmament in the future. It is an indication that the NWS will not amend their nuclear doctrines or policies in the pursuit of nuclear disarmament. Hence, before any substantial progress can take place, the pending issues need to be sorted. The dilemma over the right to enrichment under the NPT and the stalemate on nuclear disarmament as tied to only vertical non-proliferation commitments by the P-5 have to be resolved. And, finally, even as the agenda almost seemed to be set, the NPT 2015 RevCon was not able to adopt a final document with consensus.

---

29. Editorial: The global injustice of nuclear weapons, Ray Acheson, *Reaching Critical Will*, May 13, 2015, vol. 13, no. 9. Available at <http://www.reachingcriticalwill.org/disarmament-fora/npt/2015/nir/9905-13-may-2015-vol-13-no-9>. Accessed on May 15, 2015.

# EXTRA-REGIONAL POWERS IN IOR: IMPERATIVES FOR INDIA

YOGESH V ATHAWALE

The rise and fall of maritime powers in the Indian Ocean Region (IOR) has been a recurring theme throughout history. In the age of globalisation, a number of states of the Global South have gained economic clout, and have pursued a larger, dominant role, regionally and internationally. China, the foremost power to have risen to prominence in this process, has demonstrated spectacular economic resurgence, which has influenced and accentuated other dynamics of its national power, including maritime capabilities. This article posits that the steady ingress of Chinese maritime power into the Indian Ocean poses a challenge to the extant geo-political order, led by the United States. In the discussion, the article attempts to bring out the complex interplay of geo-politics and geo-economics that circumscribes the evolving contest between established and rising maritime powers, a phenomenon that has not been earlier seen in history on such a large scale. The article, therefore, identifies the implications for India, which has a natural, ancient association with the ocean named after it. It suggests a five-pronged approach for India to demonstrate its regional leadership and play the role of a responsible actor in promoting security and stability in the IOR.

---

Commander **Yogesh V. Athawale** is a serving officer of the Indian Navy, currently posted at IHQ of MoD (Ministry of Defence), New Delhi. Views express are personal.

**The Sanskrit phrase *Vasudhaiva Kutumbakam*, meaning ‘the world is one family’, aptly describes India’s philosophical approach to geo-politics.**

## INTRODUCTION

The Indian Ocean has, through centuries, attracted sea-farers from its rim and distant regions, for commercial and political reasons. With technological advancements, industrial needs grew and communities began to seek new sources of raw materials, and explore new markets, across the seas. Historian Milo Kearney, in his masterly work *Indian Ocean in World History* has described how the trading and imperial expansionist possibilities offered by the Indian Ocean were exploited by leading powers from the third millennium BC to the very recent past<sup>1</sup>. A number of sea-faring communities, including the Sumerians, Egyptians, Chinese, Indians, Arabs and, later, the Europeans, held sway over the Indian Ocean trade at different periods in history. The economic destinies and wealth of contesting political entities invariably corresponded with their ability to exploit the seas advantageously.

India’s geographical and geo-political identity is intrinsically connected with the Indian Ocean. *La péninsule de l’Inde* extends into the Indian Ocean like a dagger, lending it cartographical prominence, and the privilege of having an ocean named after it. Civilisations in India had close contact with the seas surrounding the peninsula and exploited the oceanic medium for trade and cultural expansion. Therefore, geographically, politically as well as culturally, India’s engagement with the world and its transactions with its immediate neighbourhood have an intrinsic maritime dimension. The Sanskrit phrase *Vasudhaiva Kutumbakam*, meaning ‘the world is one family’, aptly describes India’s philosophical approach to geo-politics. However, a more realist, and less metaphysical, exploration is needed to understand India’s geo-political outlook towards the oceanic space around it.

---

1. Kearney has covered four periods in his work, namely the first assertion of Mediterranean European and Chinese influence, the Arab Golden Age, the first assertion of North Atlantic influence and the Cold War period. It has been stated that “which land has been in the lead in world wealth, power and creativity at any particular time has been determined to a significant extent by, or been correlated with, control of significant participation in the trade of the Indian Ocean and the lands of its periphery”. Milo Kearney, *The Indian Ocean in World History*, (London: Routledge, Taylor and Francis Group, 2004).

**SUPERPOWER RIVALRY IN THE INDIAN OCEAN: A BACKGROUND**

Superpower politics is not new in the Indian Ocean. During the colonial era, the European powers competed with each other for dominating the strategic trade routes to their colonies in Asia and Africa, for control of their holdings<sup>2</sup>. Following the Napoleonic Wars, the long rivalry between the British and the French culminated in the Treaty of Paris of 1814<sup>3</sup>, ushering in a period of relative peace till World War I. Due to Britain's maritime preeminence, the Indian Ocean came to be described as a 'British Lake'. During World War II, the region witnessed a fierce contest between the Britain-led Allied powers on one side and the tripartite Axis powers on the other, with the navies of Japan and Germany pitted against their Allied counterparts. In the aftermath of World War II, the strategic space in the Indian Ocean was retained by Britain. However, war fatigue and economic constraints curtailed the strategic reach of the waning British Empire, which yielded space 'East of Suez' to the United States of America in the late 1960s<sup>4</sup>, marking yet another transition in great power politics. This period corresponded with rapid strides by the American economy, which had by then capitalised upon the strength it had gained during the inter-war period. Rapid industrialisation in the post-war economies of Europe, North America and Japan demanded a variety of resources, which brought prospectors to the Indian Ocean Region (IOR), where rich sources of energy and mineral resources were established. During the decades of the Sixties and Seventies, the Indian Ocean remained a playground of superpower rivalry, between the Western Alliance and Soviet Union, though the

---

2. AT Mahan, *The Problem of Asia and its Effect Upon International Politics* (Boston: Forgotten Books 2012, originally Little, Brown and Company, 1900), pp 60-62.

3. "The Napoleon Series, Government and Politics, The Treaty of Paris, 1814", [http://www.napoleon-series.org/research/government/diplomatic/c\\_paris1.html](http://www.napoleon-series.org/research/government/diplomatic/c_paris1.html). Accessed on June 9, 2015.

4. The British decision to withdraw from bases 'East of Suez', in 1964-68, under Harold Wilson's Labour government, was widely recognised as the most significant step in Britain's retreat from a global role, as a first rank world power, yielding space to American power. The decision to withdraw from military bases East of Suez – Singapore, Malaysia, and the Persian Gulf – was taken in the midst of a severe economic crisis. P.L. Pham, *Ending 'East of Suez': The British Decision to Withdraw from Malaysia and Singapore, 1964–1968* (Oxford: Oxford University Press, 2010).



primary focus remained on the control of the Eurasian landmass.<sup>5</sup> The period saw the gradual emergence of the 'Third World', or the Global South, mostly consisting of the former colonies and formerly occupied territories. Following decolonisation, a number of Third World countries preferred to remain 'non-aligned' during the Cold War, though they were invariably affected by superpower politics in one way or the other. The wariness of IOR nations countries against militarisation in the region manifested in the form of the "Declaration of the Indian Ocean as a Zone of Peace" resolution, adopted by the United Nations in 1971<sup>6</sup>. Given the harsh realities of superpower rivalry, the initiative remained mostly stillborn and could not deliver on its conceptual expectations. Through the Cold War, a number of military bases and facilities were developed in the IOR by extra-regional contestants. Decades since the Cold War ended, a number of these bases continue to be retained and maintained by the concerned nations, and have been actively utilised for operational purposes, including during conflicts and wars in the region.

### **INDIA AND SUPERPOWER RIVALRY**

After independence in 1947, India found itself grappling with a multitude of problems and challenges, both internal and external, which were exacerbated by the trauma of Partition. In this backdrop, India's strategic approach to power politics in the Indian Ocean was characterised by a cautious reluctance to align itself with either of the partisan 'blocs', yet carving a moderate leadership role by lending support to African independence movements and promotion of Asian solidarity. India emerged as a prominent voice of the decolonised nations, characterised by its active role in the Bandung Conference and the Non-Aligned Movement (NAM). Through this period, India endeavoured to maintain a balance in its relations with major powers such as the USA, USSR, UK, France, etc. However, the pressing need for defence modernisation following the Sino-Indian conflict of 1962 and Indo-

---

5. Selig S Harrison and K Subrahmanyam, eds., *Superpower Rivalry in the Indian Ocean – Indian and American Perspectives* (New York: Oxford University Press, 1989).

6. United Nations, "Implementation of Declaration of Indian Ocean as Zone of Peace", December 16, 1971, <http://www.un.org/documents/ga/res/34/a34res80.pdf>. Accessed on June 2, 2015.

Pak War of 1965 took India closer to the Soviet Union. By then, Pakistan had joined the Southeast Asia Treaty Organisation (SEATO) (1954) and Central Treaty Organisation (CENTO) (1955), and as a consequence, had become a beneficiary of military aid from the Western powers. By the mid-Sixties, it had acquired formidable military capabilities directed against India. Banking upon US and Chinese support, Pakistan adopted an overtly hostile attitude towards India, resulting in tensions over Kashmir. In 1971, India was faced with an unprecedented humanitarian situation on its borders, following military action against the civilian population in East Pakistan. India sought, and received, Soviet diplomatic support in internationalising the issue, while Pakistan relied heavily on American backing to avert adverse scrutiny over the Bengali genocide by its troops.<sup>7</sup> As the crisis blew into a full scale war between India and Pakistan, the Nixon Administration put its weight behind Pakistan. The denouement came in the form of 'gunboat diplomacy', when the USS *Enterprise*-led task force was despatched against India, from the South China Sea to the Bay of Bengal.<sup>8</sup> This development, popularly remembered in India as the "*Enterprise* episode", further aggravated Indian insecurities regarding extra-regional interventions.<sup>9</sup> All through the Indo-Pak crisis of 1971, India received Soviet support at international forums. This helped further deepen Indo-Soviet ties; however, it did not result in *quid pro quo* to the Soviets, in the form of basing rights or permission to establish military facilities.<sup>10</sup> Essentially, even as India was perceived as being close to the USSR, its endeavour was to balance its interests on both sides, exemplified through sustained contacts with the West, through its diaspora, industrial and commercial linkages, educational scholarships, participation in the Commonwealth, military purchases and receipt of developmental assistance.

---

7. Gary Jonathan Bass, *Blood Telegram: Nixon, Kissinger and a Forgotten Genocide*(New York: Alfred A. Knopf,2013).

8. Raghavendra Mishra, "Revisiting the 1971 'USS Enterprise Incident': Rhetoric, Reality and Pointers for the Contemporary Era", *Journal of Defence Studies*, vol. 9, no. 2, April-June 2015, pp. 49-80.

9. Bass, n.7.

10. Vice Admiral Mihir Roy (Retd), *War in the Indian Ocean*(New Delhi: Lancer Publishers, 1995) pp. 115-117.

## INDIAN OCEAN IN THE AGE OF GLOBALISATION

The dissolution of the Soviet Union was an epochal event in Indian Ocean politics. Under President Gorbachev's policies of *glasnost* and *perestroika*, Soviet power structures were steadily dismantled during 1985-91, and as a result, Soviet military presence in the Indian Ocean rapidly diminished. The United States remained the world's only superpower. The American model of international free trade gained currency among a number of developing nations. This syncretised the process of free market access to multinational corporations, lowering of tariff barriers, erosion of state controls, spreading of cultural influences and flow of political ideas, that came to be described under the omnibus term "globalisation". A number of Third World nations, mainly in Asia, sought to embrace the prescriptions of the Washington Consensus, stressing upon the primacy of market fundamentalism. As a consequence, flow of global capital steadily diffused and the centre of gravity of the world economy began to shift from the West towards Asia. The economic success achieved by some states, in turn, enabled them to aspire and prepare for a larger role, regionally as well as globally, thus, creating a category of nations called the "emerging powers".

The changing dynamics of knowledge creation, manufacturing and international trade, resulted in perceptible economic changes in the Global South. The world order has since veered increasingly towards multipolarity, accompanied by signs of a decline of the established powers and the rise of new ones. In 2001, Jim O'Neill, an economist at Goldman Sachs, coined the acronym 'BRIC' to describe the rising economic importance of Brazil, Russia, India and China<sup>11</sup>. The metaphor of 'BRIC', hinting at something concrete, connoted the potential of these countries to cumulatively surpass the economic indicators of the leading economies. BRIC was thereafter modified to BRICS, providing for the inclusion of South Africa, even as the grouping was formalised. The role of BRICS as an emerging collective voice in shaping international developments has gained significant momentum since the advent of the grouping. The group's advantageous economic position

11. Jim O'Neill, "Building Better Global Economic BRICs", in Goldman Sachs Global Economics Paper No 66, November 30, 2011, <http://www.goldmansachs.com/our-thinking/topics/brics/brics-reports-pdfs/build-better-brics.pdf>. Accessed on June 1, 2015.

has lent credibility to the demand for reforming international financial institutions and strengthening global governance. The BRICS, which have held six summits since 2009, have enhanced cooperation on a number of issues, including formation of a new developmental bank<sup>12</sup>, establishment of a Contingent Reserve Arrangement<sup>13</sup> and formation of a Business Council.<sup>14</sup> Members of BRICS have growing economic interests in the IOR, with India and South Africa being littoral countries of the region.

### EXTRA-REGIONAL PRESENCE IN THE INDIAN OCEAN AND THE CHINA FACTOR

Extra-regional presence in the IOR is a manifestation of the enduring interests of the concerned nations in the geo-political landscape circumscribed by the Indian Ocean. The drivers behind the extra-regional interest are varied and difficult to explain generically. However, broadly, they span the domains of geo-economics, geo-politics and political sociology, and need to be further delineated.

**Geo-economics:** Edward Luttwak called the rise of geo-economics a contest defined by the “grammar of commerce but the logic of war”.<sup>15</sup> The race for resources, claims over maritime entitlements, disputes involving extra-regional powers and the growing interest of private, semi-private and non-governmental organisations exemplify the geo-economic importance of the IOR.<sup>16</sup> The advent of the Trans-Pacific Partnership and Trans-Atlantic Trade and Investment Partnership, though focussed in the Pacific and Atlantic rims, could have long-term economic implications

12. PTI, “Next BRICS Summit to be Held in Russia”, *The Indian Express* July 16, 2014, <http://indianexpress.com/article/world/world-others/next-brics-summit-to-be-held-in-russia/>. Accessed on May 31, 2015.

13. Brazil Ministry of External Relations, VI BRICS Summit, Press Release, “Treaty for the Establishment of a BRICS Contingent Reserve Arrangement – Fortazela, July 14”, [www.brics6.itaraty.gov.br/media2/press-releases/220-treaty-for-the-establishment-of-a-brics-contingent-reserve-arrangement-fortazela-july-15](http://www.brics6.itaraty.gov.br/media2/press-releases/220-treaty-for-the-establishment-of-a-brics-contingent-reserve-arrangement-fortazela-july-15). Accessed on June 7, 2015.

14. Federation of Indian Chambers of Commerce Industry, “BRICS Business Council”, [www.bricsbusinesscouncil.in](http://www.bricsbusinesscouncil.in). Accessed on June 12, 2015.

15. Mark Leonard, “An Uneasy Peace That Will Tear the Global Economy Asunder”, *Financial Times*, March 23, 2015, <http://www.ft.com/cms/s/0/182f36ba-d151-11e4-86c8-00144feab7de.html#axzz3c5mONY7k>. Accessed on June 9, 2015.

16. Report, “Global Trends 2030: Alternative Worlds, the National Intelligence Council of US”, <http://gt2030.com/>. Accessed on June 8, 2015.

**Control of numerous islands and territories in the southern Indian Ocean offers resource ownership and maritime primacy to extra-regional states.**

for the IOR. A similar geo-economic rationale also underpins China's ambitious Maritime Silk Road proposition, which covers a number of ports in the Indian Ocean.<sup>17</sup> The growing economic focus of the leading powers is rooted in the fact that the IOR is home to half of the world's proven oil reserves, and two-thirds of its oil shipments, whilst one-third of bulk cargo and half of container traffic pass through its waterways.<sup>18</sup> The Indian Ocean is a hub of global connectivity, with a number of submarine cables criss-crossing its depths.<sup>19</sup> Its rich fishing grounds attract a growing number of foreign fishing fleets.<sup>20</sup> Economic considerations also underpin territorial and maritime issues in the region. Control of numerous islands and territories in the southern Indian Ocean offers resource ownership and maritime primacy to extra-regional states. For instance, the Chagos archipelago is primarily of political importance to the UK, which has leased the island of Diego Garcia to the USA until 2016 and declared a Marine Protected Area (MPA) around the archipelago. The territory is disputed between the UK and Mauritius over sovereignty and the related issue of displaced Chagossians. Mauritius, which has successfully challenged the MPA in the Permanent Court of Arbitration<sup>21</sup>, also attaches importance to the issue from the resource perspective (in addition to the

17. Xinhuanet, "China Unveils Action Plan on Belt and Road Initiative", March 28, 2015, [www.news.xinhuanet.com/english/2015-03/28/c\\_134105372.htm](http://www.news.xinhuanet.com/english/2015-03/28/c_134105372.htm). Accessed on June 6, 2015.

18. BP Statistical Review, of World Energy, June 2014, [bp.com/statisticalreview](http://bp.com/statisticalreview) and US EIA World Oil Transit Chokepoints, November 10, 2014, <http://www.eia.gov/beta/international/>. Accessed on June 9, 2015.

19. Telegeography, Submarine Cable Map, <http://www.submarinecablemap.com/>. Accessed on June 8, 2015.

20. Frédéric Le Manach, Pascal Bach, LéaBoistol, Jan Robinson and Daniel Pauly, "Artisanal Fisheries in the World's Second Largest Tuna Fishing Ground — Reconstruction of the Seychelles Marine Fisheries Catch, 1950–2010", [https://sau-technical-reports.s3.amazonaws.com/690\\_La%20Manach%20et%20al\\_2015\\_Seychelles\\_FCRR.pdf](https://sau-technical-reports.s3.amazonaws.com/690_La%20Manach%20et%20al_2015_Seychelles_FCRR.pdf)? Accessed on June 7, 2015.

21. RT, "British, US Defense Interests Put Above Mauritius Rights in Chagos Is. – UN", March 20, 2015, <http://rt.com/uk/242529-uk-chagos-un-ruling/>. Accessed on June 7, 2015. Also see Maggie Ybarra, "Navy Base on the Line as Mauritius Tries to Pit U.S., U.K. in Island's Sovereignty Bid", *The Washington Times*, Wednesday, April 9, 2014, <http://www.washingtontimes.com/news/2014/apr/9/navy-base-on-the-line-as-mauritius-tries-to-pit-us/?page=all>. Accessed on June 7, 2015.

humanitarian angle), as it could gain control over an additional Exclusive Economic Zone (EEZ) of nearly 638,556 sq km around the archipelago<sup>22</sup>. The US' Freedom of Navigation Programme<sup>23</sup> and Britain's close monitoring of waters around Chagos archipelago<sup>24</sup> are reflective of their concerns over safeguarding maritime resource and security rights. Likewise, resource considerations also underpin regional disputes involving France.<sup>25</sup> The *Terres Australes et Antarctiques Françaises* (France's Indian Ocean Territories) are of high economic value to France, as they add about 2.7 million sq km to its EEZ, making it the world's second largest.<sup>26</sup>

**The US' Freedom of Navigation Programme and Britain's close monitoring of waters around Chagos archipelago are reflective of their concerns over safeguarding maritime resource and security rights.**

**Geo-political:** The IOR has witnessed increasing engagement of extra-regional powers in the regional geo-politics. Building upon the Cold War legacy, the extra-regional powers have established strong security relationships with a number of countries in the region, including through arms sales. US military installations and facilities are known to be present across the region, including in Australia<sup>27</sup>, Bahrain, Diego Garcia (Chagos

22 "Seas Around Us, Catches by Taxon in the Waters of Chagos Archipelago (UK)", <http://www.searoundus.org/data/#/eez/86?chart=catch-chart&dimension=taxon&measure=tonnage>. Accessed June 7, 2015.

23. US Department of State, "Maritime Security and Navigation: Freedom of Navigation Program", <http://www.state.gov/e/oes/ocns/opa/maritimesecurity/>. Accessed on June 9, 2015.

24. J Arockiaraj, "British Navy Apprehends Indian Fishermen", *The Times of India*, December 12, 2014, <http://timesofindia.indiatimes.com/india/British-navy-apprehends-Indian-fish>. Accessed June 9, 2015.

25. The French controlled island of Tromelin is disputed by Mauritius. Mayotte is claimed by Comoros, and Bassas da India, Europa Island, Juan de Nova Island and Glorioso Islands are claimed by Madagascar. "Field Listing Disputes International: France, The World Factbook", [www.cia.gov/library/publications/the-world-factbook/fields/2070.html](http://www.cia.gov/library/publications/the-world-factbook/fields/2070.html). Accessed June 11, 2015.

26 Beau Doherty, Johanna Herfaut, Frédéric Le Manach, Sarah Harper and Dirk Zeller, "Reconstructing Domestic Marine Fisheries in Mayotte from 1950–2010", [https://saut-technical-reports.s3.amazonaws.com/175\\_Doherty%20et%20al\\_2015\\_Mayotte\\_FCRR.pdf](https://saut-technical-reports.s3.amazonaws.com/175_Doherty%20et%20al_2015_Mayotte_FCRR.pdf) <http://www.seararoundus.org>. Accessed June 10, 2015.

27. "US Navy Ships Look to Establish Darwin Military Base, but China Won't be Happy, Warns Expert", ABC News, February 13, 2015, <http://www.abc.net.au/news/2015-02-13/us-considering-permanent-naval-base-darwin-china-not-happy/6090884>. Accessed June 9, 2015.

archipelago), Djibouti<sup>28</sup>, Egypt, Iraq, Jordan, Kenya, Kuwait, Oman, Pakistan<sup>29</sup>, Qatar, Seychelles, Saudi Arabia, the United Arab Emirates, and Yemen.<sup>30</sup> A number of these have proven critical during military operations and wars post the Cold War, including during the Gulf Wars, under the “Global War on Terror” and more recently, for drone operations in a number of countries in the littoral<sup>31</sup>. Through the fledgling Africa Command (AFRICOM), the US has undertaken a series of initiatives to engage the African nations in security relationships, including in the East African littoral. The UK, which has a military presence in the British Indian Ocean Territory (BIOT), and is a member of the Five Power Defence Arrangement<sup>32</sup>, has recently announced its intention to reestablish a military base in Bahrain<sup>33</sup>. France has a dominant military presence in the southwestern Indian Ocean<sup>34</sup> and maintains a sizeable number of military assets at Reunion Island under the command of FAZSOI (*Commandant Supérieur des Forces Armées en Zone Sud de l’océan Indien*), a joint Services commander.<sup>35</sup> It also operates a small maritime base and a Foreign Legion Detachment at Mayotte.<sup>36</sup> In the north Indian Ocean, it operates

- 
- 28 Tick Nurse, “Uncovering the Military’s Secret Military”, August 3, 2011, <http://www.tomdispatch.com/blog/175426/>. Accessed on June 6, 2015.
29. Mark Mazzetti, Nicholas Kulish, Christopher Drew, Serge F. Kovaleski, Sean D. Naylor and John Ismay, “SEAL Team 6: A Secret History of Quiet Killings and Blurred Lines”, June 6, 2015, [http://www.nytimes.com/2015/06/07/world/asia/the-secret-history-of-seal-team-6.html?emc=edit\\_th\\_20150607&nl=todaysheadlines&nlid=50568392&r=0](http://www.nytimes.com/2015/06/07/world/asia/the-secret-history-of-seal-team-6.html?emc=edit_th_20150607&nl=todaysheadlines&nlid=50568392&r=0). Accessed on June 10, 2015.
30. “U.S. Evacuates Key Drone Base as Storm Brews in Yemen”, *The Japan Times, AP News*, March 22, 2015, <http://www.japantimes.co.jp/news/2015/03/22/world/u-s-evacuates-key-drone-base-as-storm-brews-in-yemen/#.VXRuHM-qkqk>. Accessed on June 9, 2015.
31. Tick Nurse, “Secret Wars and Black Ops Blowback”, January 16, 2014, [http://www.tomdispatch.com/blog/175794/tomgram%3A\\_nick\\_turse,\\_secret\\_wars\\_and\\_black\\_ops\\_blowback/](http://www.tomdispatch.com/blog/175794/tomgram%3A_nick_turse,_secret_wars_and_black_ops_blowback/). Accessed on June 6, 2015.
32. Globalsecurity, “Five Power Defence Arrangement”, <http://www.globalsecurity.org/military/world/int/fpda.htm>. Accessed on June 9, 2015.
33. “Britain to Build First Permanent Middle East Military Base in Four Decades”, *The Guardian*, December 6, 2014, <http://www.theguardian.com/uk-news/2014/dec/06/britain-first-middle-eastern-military-base-bahrain>. Accessed on June 10, 2015.
34. Isabelle Saint-Mezard, “The French Strategy in the Indian Ocean and the Potential for Indo-French Cooperation”, *Policy Report 2015*, S Rajaratnam School of International Studies, Nanyang Technological University, March 2015.
35. “Code of Defence - French Law”, Code de la défense-Attributions des commandants supérieurs”, at <http://www.codes-et-lois.fr/code-de-la-defense/toc-principes-generaux-defense-dispositions-relatives-outr-mer-e96166c-texte-integral>. Accessed on June 9, 2015.
36. “History of the Foreign Legion Detachment in Mayotte”, at <http://foreignlegion.info/history/dlem/>. Accessed on June 9, 2015.

military bases in Djibouti<sup>37</sup> and Abu Dhabi (UAE).<sup>38</sup> Japan is also reported to have established military facilities at Djibouti.<sup>39</sup> Overall, militarisation in the region, including the presence of nuclear weapon platforms, has seen a rise in recent decades<sup>40</sup>. Concerns over the spurt in Somali piracy in the later part of the last decade led to increase in naval deployments by multinational forces, including extra-regional navies, notably by the US led Combined Task Force 151, the North Atlantic Treaty Organisation's Operation Allied Protector and Ocean Shield, the European Union's Naval Force Operation Atlanta, and by 'independent deployers' such as Russia, China, Japan and South Korea.<sup>41</sup> The activities of extra-regional non-state actors include illegal arms trade and privatisation of maritime security.<sup>42</sup>

**Socio-Political:** Sociological factors play a catalysing role in the politics of extra-regional actors. The influence of language, culture, race and religion tends to buttress political and economic motives. In the IOR, extra-regional socio-political linkages are exemplified in the presence of foundations and institutions supporting social and political causes, the activities of non-governmental groups promoting culture and religion, and the educational scholarships proffered by governments. Former colonial states have long nurtured their unique strengths in this respect. The UK has supported the institution of the Commonwealth for over six decades, of which a large

37. Aly Verjee, "Forward Operating Base Djibouti: Africa's Leading Host for Western Military Operating", July 27, 2011, <http://www.ssresourcecentre.org/2011/07/27/forward-operating-base-djibouti/>. Accessed on June 8, 2015.

38. Angeliqe Chrisafis, "France Opens Military Base in UAE Despite Iranian Concerns", May 26, 2009, <http://www.theguardian.com/world/2009/may/26/france-military-base-uae>. Accessed on June 7, 2015.

39. Alex Martin, News, "First Overseas Military Base Since WWII to Open in Djibouti", *The Japan Times*, July 2, 2011, <http://www.japantimes.co.jp/news/2011/07/02/national/first-overseas-military-base-since-wwii-to-open-in-djibouti/#.VXRvH8-qqkp>. Accessed on June 9, 2015.

40. Iskander Rehman, "Murky Waters: Naval Nuclear Dynamics in the Indian Ocean", Carnegie Endowment for International Peace 2015, <http://carnegieendowment.org/2015/03/09/murky-waters-naval-nuclear-dynamics-in-indian-ocean>. Accessed on June 7, 2015).

41. United Nations Documents on Piracy, Security Council Resolutions on Piracy off the Coast of Somalia, United Nations Security Council Resolution 2020(2011), November 22, 2011, [http://www.un.org/depts/los/piracy/piracy\\_documents.htm](http://www.un.org/depts/los/piracy/piracy_documents.htm). Accessed on June 7, 2015.

42. Caroline Liss, "Privatising Anti-Piracy Services in Strategically Important Waterways: Risks, Challenges and Benefits", paper presented at "International Workshop on Maritime Piracy" organised by Graduate School of Public Policy, University of Tokyo, Ocean Policy Education and Research Unit, <http://www.pp.u-tokyo.ac.jp/>. Accessed on June 10, 2015.



number of members come from the IOR. The Commonwealth has helped Britain maintain political and cultural relations with the region, building on historical links, the appeal of its English language media and the popularity of the British educational system. Most island states of the southwestern Indian Ocean form a part of Francophone Africa. French culture is pervasive and popular in these countries, as reflected in the *lingua franca*, Creole, which is based on French. More recently, the forces of globalisation have helped to spread American culture across the globe, including in the IOR. Arguably, the popularity of American cultural attractions such as pop music, digital consumer durables, social media platforms, fashion apparel and fast food, also described putatively as “soft power”<sup>43</sup>, help countervail and temper anti-Americanism in the world. Taking a cue from the *status quo* Western powers, China has steadily increased its cultural outreach in the IOR, through Chinese cultural centres, Confucius Institutes<sup>44</sup> and broadcast of China Central Television (CCTV), catering to the regional tastes<sup>45</sup>.

**The China Factor:** As the *status quo* powers endeavour to preserve and protect their clout, China seeks to carve a niche and occupy space in the region, covering the political, economic and cultural arenas. Over the last few decades, China has demonstrated spectacular economic resurgence, riding on the back of a robust manufacturing and export oriented economy. Its growing economic prowess has also translated into steadily strengthening military capabilities, of which the naval dimension has received focussed attention. As China’s economic interests in the Indian Ocean have expanded rapidly, its profile in the maritime space of the Indian Ocean littoral has steadily diversified. It is along the key maritime routes of the Indian Ocean that the overwhelming majority of China’s foreign trade, over 90 percent by volume and more than 65 percent by value, is transported. The Sea Lines of Communication (SLOCs) are essential to China for the export of finished

---

43. Joseph S. Nye, Jr., *Soft Power: The Means to Success in World Politics* (New York: Public Affairs, 2004).

44. University of Nebraska-Lincoln, “Confucius Institutes Around the Globe”, <http://confuciusinstitute.unl.edu/institutes.shtml>. Accessed on June 9, 2015.

45. “CCTV has Dedicated Channel in French”, see <http://cctvfrench.cntv.cn/> and an area specific channel for Africa, see [www.iloveafrica.com](http://www.iloveafrica.com). Accessed on June 8, 2015.

goods and the import of raw materials, including crude oil. China imports 60 percent of its crude oil requirements from the Persian Gulf and Africa.<sup>46</sup> China considers protection of these SLOCs as an imperative and is taking steps to enhance its ability to undertake security missions in the region. It has nurtured commercial linkages and cultural ties in the IOR for centuries, evidenced by the presence of the sizeable Chinese diaspora in the region. With its gradual rise to global prominence, this engagement has further intensified and diversified, including military relationships with a number of littoral countries. This is evident in the growing Chinese naval presence in the Indian Ocean Region, which includes the uninterrupted anti-piracy missions, entailing deployment of a total of 20 task forces till mid-2015<sup>47</sup>, regular visits of warships for bilateral military exercises with the IOR littorals, operational turnaround of naval platforms at various ports in the littoral<sup>48</sup>, deployment of conventional and nuclear submarines<sup>49</sup>, presence and deployment of research and survey vessels for deep-sea exploration in the southwest Indian Ocean<sup>50</sup>, humanitarian assistance missions involving a hospital ship<sup>51</sup>, deployment of naval and maritime assets for search and rescue<sup>52</sup>, etc.

46. United States Department of Defence, Annual Report to Congress – Military and Security Developments involving the People’s Republic of China 2015’, April 7, 2015. Accessed June 11, 2015.

47. Andrew S. Erickson, Austin Strange, The Jamestown Foundation, “China’s Global Maritime Presence: Hard and Soft Dimensions of PLAN Antipiracy Operations”, *China Brief*, vol 15, issue 9, May 1, 2015, [http://www.jamestown.org/programs/chinabrief/single/?tx\\_ttnews\[tt\\_news\]=43868&cHash=41e27d4081351e4e8e357eb95cce0294](http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews[tt_news]=43868&cHash=41e27d4081351e4e8e357eb95cce0294). Accessed on June 5, 2015.

48. “Chinese Naval Escort Ships Visit Seychelles”, Ministry of National Defence, People’s Republic of China, News Channels-Defence News, April 18, 2011 [http://eng.mod.gov.cn/MilitaryExchanges/2011-04/18/content\\_4237668.htm](http://eng.mod.gov.cn/MilitaryExchanges/2011-04/18/content_4237668.htm). Accessed on June 6, 2015.

49. Vishnu Som, “Navy Alert to Chinese Nuclear Submarine Threat in the Indian Ocean”, June 2, 2015, <http://www.ndtv.com/india-news/navy-alert-to-chinese-nuclear-submarine-threat-in-indian-ocean-767781>. Accessed on June 7, 2015.

50. “China’s Deep-Sea Sub Jiaolong Dives in Indian Ocean”, Xinhua, December 23, 2014, [http://english.gov.cn/news/top\\_news/2014/12/23/content\\_281475028485708.htm](http://english.gov.cn/news/top_news/2014/12/23/content_281475028485708.htm). Accessed on June 7, 2015.

51. “Chinese Navy Hospital Ship Finishes Visit to Tanzania”, *The People’s Daily*, October 25, 2010, <http://english.peopledaily.com.cn/90001/90776/90883/7175618.html>. Accessed on June 8, 2015.

52. “Chinese Ship to Map Seabed in ‘New Phase’ of MH 370 Search”, *The Hindu*, PTI, May 20, 2014, <http://www.thehindu.com/todays-paper/tp-in-school/chinese-ship-to-map-seabed-in-new-phase-of-mh370-search/article6026567.ece>. Accessed on June 8, 2015.

**The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests.**

Further, reports concerning China's interest in military basing rights and arrangements in the region, notably at Maldives<sup>53</sup> and Djibouti<sup>54</sup>, give credence to speculation that it seeks a permanent and lasting military presence in the IOR. The takeover of the strategic Gwadar port in Pakistan by a Chinese company has strengthened the conjecture that the development paves the way for China's future naval presence in India's immediate neighbourhood<sup>55</sup>. The proposed One Belt One Road (OBOR) initiative, of which the Maritime Silk Route is an integral part, also incorporates elements of China's energy strategy, as it seeks to reduce its dependence on sea routes for import of oil and natural gas, by developing overland pipelines for transportation of energy resources.

**China's Evolving Oceanic Strategy:** China's strategic thinking has long considered maritime outreach to distant regions as a natural requirement for achieving global prominence, a fact also obtained from the 'historic missions' delineated in its Defence White Papers. China's 2015 White Paper on Defence, the tenth in the series since 1998, highlights the evolution in China's strategic thinking. "The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests", it states<sup>56</sup>. The 2015 White Paper signals a shift to a more maritime-oriented approach

---

53. Rajat Pandit, "Chinese Moves in Maldives Worry India", *Economic Times*, October 10, 2011, [http://articles.economictimes.indiatimes.com/2011-10-10/news/30263293\\_1\\_indian-military-surveillance-systems-ins-tillanchang-maldives](http://articles.economictimes.indiatimes.com/2011-10-10/news/30263293_1_indian-military-surveillance-systems-ins-tillanchang-maldives). Accessed on June 9, 2015.

54. Rob Edens, "China's Naval Plans for Djibouti: A Road, a Belt, or a String of Pearls?" *The Diplomat*, <http://thediplomat.com/2015/05/chinas-naval-plans-for-djibouti-a-road-a-belt-or-a-string-of-pearls/> May 14, 2015. Accessed on June 7, 2015.

55. Abhijit Singh, "Centre for Strategic and International Studies, PacNet #7 - A 'PLA-N' for Chinese Maritime Bases in the Indian Ocean", January 26, 2015, <http://csis.org/publication/pacnet-7-pla-n-chinese-maritime-bases-indian-ocean>. Accessed on June 9, 2015.

56. Dennis Blasko, "The 2015 Chinese Defense White Paper on Strategy in Perspective: Maritime Missions Require a Change in the PLA Mindset", *China Brief*, vol. 15, issue 12, May 29, 2015, [http://www.jamestown.org/programs/chinabrief/single/?tx\\_ttnews\[tt\\_news\]=43974&cHash=d67db88687507367b668f71cd4199603#.VWuhwyjSSfk](http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews[tt_news]=43974&cHash=d67db88687507367b668f71cd4199603#.VWuhwyjSSfk). Accessed on June 10, 2015.

and provides justification for the force structure as an evolutionary step necessitated by the growth in all aspects of China's comprehensive national power. The White Paper also states, "In response to the new requirements coming from the country's growing strategic interests, the armed forces will actively participate in both regional and international security cooperation and effectively secure China's overseas interests<sup>57</sup>." Notably, the discussion on the national security situation concludes that "it is, thus, a long-standing task for China to safeguard its maritime rights and interests"<sup>58</sup>. China, however, tends to play down concerns over its military outreach and has repeatedly emphasised that its rise will be peaceful<sup>59</sup>.

Despite its assertions of a peaceful rise, there is an apparent gap in China's theory and practice, as evident in its defiant approach to various territorial disputes in the South China Sea. More recently, China's land reclamation activities at various reefs and rocks in the Spratly and Paracel Island groups, whose ownership is disputed, have sparked tensions with the United States, the Philippines, Vietnam, and even Japan, which has a separate, outstanding dispute with China over the sovereignty of Senkaku (Diaoyu) Islands<sup>60</sup>. China looks determined to press ahead with its territorial consolidation plans and resist attempts to contain its activities in the South China Sea.<sup>61,62</sup> Given China's rising assertiveness and brinkmanship in its neighbourhood, and

**China looks determined to press ahead with its territorial consolidation plans and resist attempts to contain its activities in the South China Sea.**

57. *China Daily*, Xinhua, Full Text: China's Military Strategy, "Missions and Tasks of China's Armed Forces", [www.chinadaily.com.cn/china/2015-05/26/content\\_20820628\\_2.htm](http://www.chinadaily.com.cn/china/2015-05/26/content_20820628_2.htm). Accessed on June 9, 2015.

58. *China Daily*, Xinhua, Full Text: China's Military Strategy, "National Security Situation", [www.chinadaily.com.cn/china/2015-05/26/content\\_20820628\\_2.htm](http://www.chinadaily.com.cn/china/2015-05/26/content_20820628_2.htm). Accessed June 8, 2015.

59. Blasko, n. 56.

60. "How Uninhabited Islands Soured China-Japan Ties", *BBC News*, Asia, November 10, 2014, <http://www.bbc.com/news/world-asia-pacific-11341139>. Accessed on June 6, 2015.

61. In May 2015, US surveillance aircraft which flew outside the 12 nautical mile limit from Fiery Reef were repeatedly instructed by Chinese military forces to leave the region. *Washington Post*, Editorial, "China's Dangerous Provocation Demands a Response from the U.S.", May 26, 2015, [http://www.washingtonpost.com/opinions/chinas-dangerous-provocation/2015/05/26/cd1c5de0-03c5-11e5-a428-c984eb077d4e\\_story.html](http://www.washingtonpost.com/opinions/chinas-dangerous-provocation/2015/05/26/cd1c5de0-03c5-11e5-a428-c984eb077d4e_story.html). Accessed on June 6, 2015.

62. Chen Heying, "Experts Warn of Military Conflicts in S.China Sea", *Global Times*, May 25, 2015, <http://www.globaltimes.cn/content/923367.shtml>. Accessed on June 8, 2015.

gradual shift of the People's Liberation Army's (PLA's) focus from "offshore waters defence" to the combination of "offshore waters defence" with "open seas protection," it can be expected that Chinese military presence in the Indian Ocean will further increase in the coming years. Chinese power could be expected to fill voids and follow the pattern of economic, political and social consolidation, typified in the examples of *status quo* Western powers in the IOR. On the roulette of history it would mark another turn of the wheel in the saga of great power rivalry in the region.

### THE NEW TURN OF THE WHEEL

The ingress of China in the Indian Ocean power politics has served to substantively complicate the medley of power equations in the region. In effect, China's geo-strategic focus on the Indian Ocean has challenged the extant United States led order, which has enjoyed sustained dominance since the end of the Cold War. Russia, which has been subjected to US and European sanctions over the Ukraine crisis, has fostered closer ties with China. In 2014, China and Russia sealed a 30-year agreement for supply of gas to China via two separate pipeline routes, making China the largest consumer of Russian gas. In May 2015, the two countries signed a joint declaration on the "new stage of comprehensive partnership and strategic cooperation"<sup>63</sup>. The emerging geo-political polarisation, with the US and Western Europe alliance on one side and Russia-China entente on the other, raises the spectre of a new Cold War. Influential Western voices have advised moderation and better understanding in dealing with China's rise. To the question, "*Is China still a partner or primarily a rival*"?, in an interview given to a German magazine in 2008, Henry Kissinger, former national security adviser in the Nixon Administration and later secretary of state, replied, "China has to be treated as a potential partner. We must use all ingenuity to create a system in which the great states of Asia -- which really are not nation-states in the European sense but large conglomerates of cultures -- can participate. We

---

63. Raymond Johnston, "Russia China Reach 'New Level' of Strategic Cooperation", *Prague Post*, May 20, 2014, [www.praguepost.com/world-news/39155-russia-and-china-reach-new-level-of-strategic-cooperation](http://www.praguepost.com/world-news/39155-russia-and-china-reach-new-level-of-strategic-cooperation). Accessed on June 29, 2015.

have no choice"<sup>64</sup>. Four years later, addressing the Third Annual US-China Track-II dialogue in 2012, he emphasised, "The 21st century's most significant issues are global in nature...these are not issues in the resolution of which one country wins and another loses. They can be addressed successfully only through US-China consultation and cooperation. And it is in this context that the United States and China have an opportunity to explore a new direction together, beyond traditional forms of great power rivalry"<sup>65</sup>. The jury is still out on whether Kissinger's wise counsel has a fair chance of being heard in Washington and Beijing, but there are some signs of accommodation. At the 14th Shangri-La Dialogue conducted at Singapore in May 2015, Deputy Chief of General Staff, People's Liberation Army, Adm Sun Jianguo, declared that there were "no changes in China's will to safeguard the freedom and safety of navigation in the South China Sea, and no changes in China's goal to uphold peace and stability in the South China Sea"<sup>66</sup>. He also delineated China's efforts to work out a "maritime and air liaison mechanism" with Japan and "Rules of Behaviour for Safety of Air and Maritime Encounters" with the US. On his part, US Defence Secretary Ashton Carter, who also spoke at the Dialogue, emphasised upon peaceful resolution of disputes and the importance of diplomacy, even as he strongly articulated US concerns over land reclamation and militarisation of disputed features in the South China Sea.<sup>67</sup>

### IMPERATIVES FOR INDIA

In the contestation between the dominant superpower, the USA and the emerging one, China, India is seen by some as a 'swing state', with the

---

64. Interview with Henry Kissinger, *Spiegel*, February 18, 2008, <http://www.spiegel.de/international/world/spiegel-interview-with-henry-kissinger-europeans-hide-behind-the-unpopularity-of-president-bush-a-535964.html>. Accessed on June 6, 2015.

65. Henry Kissinger, "Remarks on Behalf of the American Delegation to the Third Annual U.S. - China Track II Dialogue", January 16, 2012, <http://www.henrykissinger.com/speeches/011612.html>. Accessed on June 7, 2015.

66. Xinhuanet, "China Committed to Upholding Peace, Stability in South China Sea", June 1, 2015, [www.xinhuanet.com/english/2015-16/01/c\\_134285794.htm](http://www.xinhuanet.com/english/2015-16/01/c_134285794.htm). Accessed on June 9, 2015.

67. Voice of America, "US Defense Secretary Gives Keynote Address at Shangri-La Dialogue", May, 30, 2015, <http://www.voanews.com/content/us-defense-secretary-gives-keynote-address-at-shangri-la-dialogue/2800510.html>. Accessed on June 7, 2015.

potential to alter the balance of power<sup>68</sup>. The US perceives India as an important partner in its pivot or “Rebalance to Asia” strategy, and this characterisation has strengthened over a period of time<sup>69</sup>. Chinese voices, on the other hand, urge India to join hands to build “an Asian century of prosperity and renewal”<sup>70</sup>. India’s strategic behaviour indicates that it would continue to desist from the politics of military alliances and will instead seek selective, closer engagement with multiple players, on mutually beneficial and supportive terms. India’s focus appears to be on strategic balancing and hedging against containment. In India’s traditionally defensive orientation, the self-preserving political instinct of ‘non-alignment’ was rooted in a preference to remain detached from superpower politics. In the era of globalisation, the desire for exercising “strategic autonomy” and freedom of making sovereign choices on geo-political issues, including neutrality, circumscribes India’s strategic approach<sup>71</sup>. New Delhi has steadily diversified its sources of military imports and import dependency for energy resources. Its endeavour has been to balance the influences of external actors on its domestic policies, so as to maximise the benefits of multipolarity in the world order. There is no reason to believe that this expedient approach has failed to serve India’s interests. India’s bilateral relations with all the major powers appear to be on an upswing, including with the main strategic contestants in the Asia-Pacific. The multifaceted relationship with the USA has further diversified, including growing military sales and a

---

68. Rajeev Srinivasan, “After the Obama Visit: India, the Swing State”, Rediff, <http://www.rediff.com/news/column/obama-india-after-the-obama-visit-india-the-swing-state/20150128.htm> January 28, 2015, Also see Sonia Luthra, “India as a ‘Global Swing State’: A New Framework For U.S. Engagement with India: An Interview with Richard Fontaine and Daniel Kliman,” July 22, 2013, <http://nbr.org/research/activity.aspx?id=354#Ue6exNKovzy>. Accessed on June 8, 2015.

69. “Leon Panetta in Delhi, Says India ‘Lynchpin’ for American Strategy in Asia”, *The Times of India*, June 6, 2012, <http://timesofindia.indiatimes.com/india/Leon-Panetta-in-Delhi-says-India-lynchpin-for-American-strategy-in-Asia/articleshow/13871933.cms>. Accessed on June 9, 2015.

70. “China, India Usher in Asian Century: Xi” , September 17, 2014, <http://thebricspost.com/china-india-must-usher-in-asian-century-xi/>. Accessed on June 9, 2015.

71. Sunil Khilnani et al, Preface, *Non Alignment 2.0: A Foreign and Strategic Policy for India in the 21st Century* (Gurgaon: Penguin Books, 2014).

fledging Defence Trade and Technology Initiative<sup>72</sup>. Sino-Indian ties have also been improving following recent high-level visits. While deep divisions and divergences remain between the two Asian neighbours, including the intractable boundary dispute, support to Pakistan's stance on terrorist groups and nuclear issues, and periodic opposition to Indian initiatives and aspirations in various fora, there are many areas of convergence between the two, which have led the two sides to seek closer engagement, including more balanced economic ties and cooperation on defence matters<sup>73</sup>. In dealing with China, a number of influential Indian voices advocate a more substantive engagement, based on issues of mutual interest<sup>74</sup>. Overall, India has preferred to walk a tightrope act in diplomacy, with simultaneous emphasis on strengthening neighbourhood ties and fostering relations with the major powers.

**Towards a Leadership Role in the Indian Ocean:** Historically, the Indian Ocean has been central to India's world view. Ancient Indian literature bears testimony to the fact that, since the era of the Indus Valley Civilisation, there was considerable maritime interaction between India and other parts of the world, particularly Africa, Western Asia, the Mediterranean region and the Far East<sup>75</sup>. The maritime ascendancy gained by India in the early period, however, fell into complacency during the medieval period, when the outlook turned more continental. Most continentally oriented kingdoms of India displayed a rueful 'sea blindness', resulting in neglect of maritime power, that ultimately facilitated the economic and political subjugation

---

72. "Strengthening India-US Defence Ties Top Priority: Ashton Carter", *The Economic Times*, Press Trust of India, February 4, 2015, [http://articles.economictimes.indiatimes.com/2015-02-04/news/58795799\\_1\\_defence-technology-dtti-us-india-defence-relationship](http://articles.economictimes.indiatimes.com/2015-02-04/news/58795799_1_defence-technology-dtti-us-india-defence-relationship). Accessed on June 7, 2015.

73. Ministry of External Affairs, Joint Statement Between the India and China During Prime Minister's Visit to China, May 15, 2015, [http://mea.gov.in/bilateral-documents.htm?dtl/25240/Joint\\_Statement\\_between\\_the\\_India\\_and\\_China\\_during\\_Prime\\_Ministers\\_visit\\_to\\_China](http://mea.gov.in/bilateral-documents.htm?dtl/25240/Joint_Statement_between_the_India_and_China_during_Prime_Ministers_visit_to_China). Accessed on June 9, 2015.

74. Ravi Bhootlingam, "Can the Chinese Connection Speed India's Development?" *Economic and Political Weekly*, vol - L, no. 19, May 9, 2015. Also see Shyam Saran, "On Foreign Policy, Modi Must Walk the Talk", May 20, 2015, <http://www.hindustantimes.com/analysis/on-foreign-policy-modi-must-walk-the-talk/article1-1348916.aspx>. Accessed on May 30, 2015.

75. Rear Admiral K. Sridharan (Retd) "Introduction", in *A Maritime History of India* (New Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1982).



**In recent decades, the IOR has received a renewed focus in India's foreign policy discourse and the importance of maritime linkages has been rekindled in the national outlook, as also reflected in the 'Look East' policy of the early Nineties.**

of the Indian subcontinent by extra-regional colonial powers<sup>76</sup>.

In recent decades, the IOR has received a renewed focus in India's foreign policy discourse and the importance of maritime linkages has been rekindled in the national outlook, as also reflected in the 'Look East' policy of the early Nineties. The nationalist thought in India believes that India's civilisational legacy, demographics, economic strength and geographical attributes lend it the potential to become a great power in its own right<sup>77</sup>. Indian strategists see a natural leadership role for India in the region, given the numerous

favourable factors. The contours of India's evolving Indian Ocean policy were outlined by Indian Prime Minister Narendra Modi during his three nation tour covering the Indian Ocean island states of Sri Lanka, Seychelles and Mauritius, in March 2015.<sup>78</sup> Speaking at Port Louis, Mauritius, at the ceremony to mark the commissioning of the Coast Guard ship *Barracuda* (constructed at an Indian shipyard), he outlined the strategic importance of the ocean for the littoral states and its centrality in the progress and prosperity of the regional states. He highlighted India's historic connections with the IOR and its willingness to assume responsibility in shaping the region's future, jointly with others.<sup>79</sup> The apex-level focus on the maritime dimensions of regional security underlines India's resolve to play the role of a responsible actor in promoting security and stability in the IOR.

---

76. Vice Admiral Mihir Roy (Retd), "The Seas Around Us", in *War in the Indian Ocean* (New Delhi: Lancer Publishers, 1995), ch. 1, pp. 19-39.

77. "India as a Great Power : Know Your Own Strength", *The Economist* March 30, 2013, <http://www.economist.com/news/briefing/21574458-india-poised-become-one-four-largest-military-powers-world-en>. Accessed on June 8, 2015.

78. "SAGAR YATRA, Hon'ble Prime Minister Narendra Modi's Visit to Seychelles, Mauritius and Sri Lanka", <http://sagaryatra.narendramodi.in/#sagar-yatra-13>. Accessed on June 7, 2015.

79. Text of the PM's Remarks on the Commissioning of Coast Ship *Barracuda*, March 12, 2015, <http://www.narendramodi.in/text-of-the-pms-remarks-on-the-commissioning-of-coast-ship-barracuda>. Accessed on June 6, 2015.

It is apparent that India's existing vision of the Indian Ocean is of an accommodative, cooperative order, essentially based in an inclusive, collaborative approach. India's interests would be served by marshalling its unique strengths in crafting a leadership role for itself, to realise this vision. To that end, a five-pronged, multi-vector effort becomes imperative.

- **Contributions to Regional Security:** India has a strong track record in promoting regional security, with prominent contributions of its armed forces. This foundation could be built upon by steadily increasing defence engagement with the littoral nations, to counter threats and challenges such as terrorism, piracy and armed robbery, gun running, smuggling, human trafficking, poaching, illegal fishing, natural disasters, safety of mariners, etc. Sharing of expertise to build the security related capabilities of the littoral states, and assistance in human resource development, would be essential to strengthen India's contributions in its role as a "net security provider" in the region.<sup>80</sup>
- **Cooperation and Collaboration with Partners:** India could play a constructive role in shaping an open and transparent security architecture in the IOR, by promoting meaningful cooperation among regional as well as extra-regional actors. To this end, harnessing the latent potential of existing forums such as the Indian Ocean Regional Association, Indian Ocean Naval Symposium, Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), and the nascent India-Sri Lanka-Maldives trilateral maritime security cooperation initiative<sup>81</sup>, merit closer attention. The resolution of the

**India could play a constructive role in shaping an open and transparent security architecture in the IOR, by promoting meaningful cooperation among regional as well as extra-regional actors.**

80. "Indian Navy: Net Security Provider to Island Nations in IOR: Antony", Press Information Bureau, Government of India, Ministry of Defence, October 12, 2011, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=76590>. Accessed on June 8, 2015.

81. Ministry of External Affairs, Government of India, Documents, "NSA Level Meeting on Trilateral Maritime Security Cooperation Between India, Sri Lanka and Maldives", March 6, 2014, <http://www.mea.gov.in/in-focus-article.htm?23037/NSA+level+meeting+on+trilatera+l+Maritime+Security+Cooperation+between+India+Sri+Lanka+and+Maldives>. Accessed on June 9, 2015.

maritime boundary delimitation issue between India and Bangladesh, by recourse to diplomacy and international maritime law<sup>82</sup>, has underscored India's credentials as a responsible regional actor<sup>83</sup>. The positive precedent needs to be built upon by promoting mechanisms for strengthening maritime governance in the region, including freedom of navigation, and other rights enshrined in the UN Convention for the Law of the Sea.<sup>84</sup>

- **Capitalisation on 'Soft Power':** The cultural factor endures in India's linkages with the IOR, for the earlier generations of the Indian diaspora arrived in the region as immigrants, many as indentured labour, during the colonial period. The strong appeal of Indian customs, religious beliefs, languages, culinary preparations, fashion wear, Bollywood movies, etc in the region bears testimony to the '*aprawasi*' links between India and a number of littoral states. The Indian diaspora in some countries has strong economic and political influence. This aspect needs to be capitalised upon to diversify the level of engagement between India and the concerned countries.
- **Increasing Maritime Equity in the IOR:** There is a growing realisation that India's maritime strength can be optimally realised when its 'blue economy' develops in tandem with the land-based economy<sup>85</sup>. In recent years, a thrust is visible towards harnessing the country's huge maritime potential, through development of ports, shipbuilding and boatbuilding

---

82. The Permanent Court of Arbitration (PCA), in its judgement of July 7, 2014, awarded New Moore Island to India and 19,493 sq km of the 25,602 sq km disputed maritime zone to Bangladesh. Permanent Court of Arbitration, "Bay of Bengal Maritime Boundary Arbitration between Bangladesh and India", [www.pca-cpa.org/showpage.asp?pag\\_id=1376](http://www.pca-cpa.org/showpage.asp?pag_id=1376). Accessed on June 11, 2015.

83. Statement of the official spokesperson, Ministry of External Affairs, Government of India, of July 8, 2014, "...we believe that the settlement of the maritime boundary will further enhance mutual understanding and goodwill between India and Bangladesh by bringing to closure a long pending issue. This paves the way for the economic development of this part of Bay of Bengal, which will be beneficial to both countries". <http://mea.gov.in/media-advisory.htm?dtl/23575>. Accessed on June 11, 2015.

84. Division for Ocean Affairs and Law of the Sea, United Nations Convention on the Law of the Sea, December 10, 1982, Table of Contents, [www.un.org/depts/los/convention\\_agreements/texts/unclos/closindx.htm](http://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm). Accessed on June 10, 2015.

85. "India and Seychelles to Establish Joint Working Group to Expand Cooperation on Blue Economy", March 11, 2015, [www.articles.economicstimes.indiatimes.com/2015-3-11/news/60008460\\_1\\_india-seychelles-india-seychelles-pm-modi](http://www.articles.economicstimes.indiatimes.com/2015-3-11/news/60008460_1_india-seychelles-india-seychelles-pm-modi). Accessed on June 12, 2015.

industry, fisheries, shipping, and inland waterways. Maritime capacity building is a potential area of cooperation in deepening India's engagement with the IOR nations. Cooperation on maritime issues such as shipbuilding, ship-design, buoyage, lighthouses, vessel traffic services, hydrographic surveying, cartography, communications, marine information services, search and rescue, administration, regulation, training etc., including sharing expertise and human resource development, could be actualised through avenues such as the Indian Technical and Economic Cooperation (ITEC) scheme, Special Commonwealth African Assistance Programme, Technical Cooperation Programme (Colombo Plan)<sup>86</sup> and scholarships under the Africa-India Forum Summit<sup>87</sup> and other technical and financial programmes.

- **Deterrence Against Belligerence and Containment:** Development of deterrent capabilities to respond to the full spectrum of threats and challenges would remain a vital consideration for defending India against external aggression and containment. Further, induction of force multiplier capabilities would be essential, with emphasis on strategic delivery platforms, long range air power, and development of amphibious forces, including marines. To deter Kargil-like adventurism and covert support to Mumbai '26/11' like terror strikes from Pakistani soil, maintaining a convincing conventional military capability becomes imperative, given that Pakistan continues to progress its India-focussed nuclear weapons programme and receives substantial military aid from extra-regional actors<sup>88</sup>.

## CONCLUSION

The rising multipolarity in IOR geo-politics demands a proactive and sophisticated approach on India's part, aimed at promoting an open,

---

86. Ministry of External Affairs, India, Technical Cooperation Division, Indian Technical and Economic Cooperation (ITEC) Programme, <http://www.itec.mea.gov.in/>. Accessed on June 9, 2015.

87. Ministry of Commerce and Industry India, India Africa Business Partnership Summit, 'E-Brochure', October 12-13, 2011, <http://www.indiaafricapartnership.com/>. Accessed on June 6, 2015.

88. Rehman, n. 40.

inclusive and transparent order in the region. The acronym of SAGAR, denoting 'Security and Growth for All in the Region', which figured in Prime Minister Narendra Modi's speech at Mauritius<sup>89</sup>, aptly captures the spirit behind India's evolving outlook to the IOR. In the backdrop of the precipitating power contestation, India must weigh regional responsibilities with due regard to its strengths, limitations and larger national priorities. The overwhelming challenge in front of the Indian leadership today is socio-economic emancipation of an incredibly large number of citizens, who remain excluded from the benefits of the Indian 'growth story'. The country faces unique developmental challenges, epitomised by repeated lower rankings on the Human Development Index<sup>90</sup> and the dubious distinction of being home to the world's largest number of hungry people<sup>91</sup>. Given these sobering realities, a sustained peace dividend, assuring internal stability and external peace, becomes a *sine qua non* for realising the aspirations of 'inclusive growth'. In the evolving power-play of regional and extra-regional interests in the IOR, India can lead the path to peace and development by synthesising a new compact, a trans-regional consensus, based on the pillars of stronger bilateral ties, enhanced multilateral cooperation, respect for sovereign rights and closer regional economic integration.

---

89. n. 79.

90. India is ranked 135 out of 187 countries in the 2014 Human Development Report, the lowest among the BRICS countries, and only slightly ahead of Bangladesh and Pakistan. See Prashant Jha, "Poverty Dips, but India Lags Behind on HDI: Economic Survey", *Hindustan Times*, February 27, 2015. <http://www.hindustantimes.com/business-news/poverty-dips-but-india-lags-behind-on-hdi-economic-survey/article1-1321308.aspx>. Accessed on June 9, 2015.

91. "Dubious Distinction: India Leads World Hunger List - State of Food Security in the World 2015, UN's Food and Agricultural Organization", *The Times of India*, May 28, 2015. <http://timesofindia.indiatimes.com/india/Dubious-distinction-India-leads-world-hunger-list/articleshow/47451219.cms>. Accessed on June 9, 2015.

# THE PROBLEMS WITH CHINA'S XINJIANG POLICY: LINKAGES BETWEEN DOMESTIC AND EXTERNAL BEHAVIOUR

SWATI ARUN

China's foreign policy over the years has taken on an assertive attitude, but so far, it has been cautious of just how aggressive it can get. Its foreign and economic policies reflect an ambition of settling territorial disputes on its (China's) own terms and luring the neighbours into economic cooperation. But looking closely at the Chinese government's actions, inside and outside, gives a picture of an awakening leviathan. Instinctively removing what threatens it and maintaining a social appearance of minimising the counter-productive consequences. An extensive study of the internal management of the crisis in the Xinjiang region (also Tibet) paints a grey picture where China is abusing its capabilities to 'solve' problems in its favour without any regard to the root of the problem and damage done by the government. In its bid to sustain a high economic growth rate, China is ready to march on the ethnic Uighurs, forcing them to either assimilate or perish. The pattern in China's foreign and economic policies is similar, leading to a repressive domestic policy.

---

Ms **Swati Arun** is an Associate Fellow at the Centre for Air Power Studies, New Delhi.

**Due to their disconnect with the Chinese ideology and structure of government, China began to see the regional states as potentially destabilising for its own ethnic problem in the Xinjiang Uighur Autonomous Region (XUAR). It continues to regard the western neighbourhood as deeply Islamised and fears that religious sentiments travelling from the Central Asia would be a catalyst for radicalisation in XUAR.**

China has an intriguing geography, surrounded by 14 land neighbours and four maritime ones. It is argued to have the geographical characteristics of both an insular state and a landlocked one. Most of China's land neighbours are smaller, developing, relatively poor, and militarily weak. While two of the maritime neighbours are developed and wealthy, almost all of them are militarily strong.<sup>1</sup> After the end of the Cold War (dissolution of the USSR) when several new Central Asian Republics took birth, a wave of fear went up among the Chinese leadership about the unpredictability of multi-ethnic internal politics. At that time, the Chinese land borders were vulnerable and valuable<sup>2</sup>, thus, securing them was a primary and challenging task for the

government.

At the level of the state, China practises atheism and remains authoritarian (non-democratic), but the neighbours that emerged were democratic (the Russian model of democracy) republics and had a religious dimension attached at the societal level. Due to their disconnect with the Chinese ideology and structure of government, China began to see the regional states as potentially destabilising for its own ethnic problem in the

- 
1. The US is a major stakeholder in East Asia. Owing to the alliances forged in the region, the countries in the region rely upon the US for military security—Korea, Japan, Taiwan (also Philippines). This reflects on the strength of the region as more muscular compared with China's military power.
  2. A land border is the primary challenge for a nation to protect and manage. In international relations, land borders become valuable because stirring instability comes easier for the neighbouring nations, and detrimental for internal security, like terrorism. Today, where China has solved all its land border disputes, except with India, the value has been dissolved as no neighbouring nation has the might or reason to disturb the peaceful borders (US model of artificial insularity).

Xinjiang Uighur Autonomous Region (XUAR). It continues to regard the western neighbourhood as deeply Islamised and fears that religious sentiments travelling from Central Asia would be a catalyst for radicalisation in XUAR.<sup>3</sup>

XUAR is one of the five autonomous regions of China and is home to the Uighurs, one of the 56 ethnic minorities residing in the country. XUAR, has only a nominal 'autonomous' status and holds a strategic place in China's domestic as well as foreign policy manoeuvres. The past efforts by the government of maintaining *influence* and upgrading industrialisation in this resource rich region reflect its importance for the economy. Xinjiang also shares borders with eight neighbours, thereby becoming the lynchpin for all bilateral talks and foreign trade and policies towards these nations. But the ethnic unrest, due to several reasons, including dissatisfaction with the authorities, has led to a spiral of political mismanagement and repressive policies imposed on the province. In the strategy of 'preemptive defence', China has already undertaken 'last-measure policies' to contain and sustain Xinjiang. The geography of the region has also not permitted the government to feel secure about its frontiers. The possibility of external interference and spillover of extremism from Pakistan and Afghanistan into Xinjiang has led to an obsessive degree of control from Beijing.

A nation's geography controls its external ambitions and dictates expansion or submission. It is the neighbour's size, capability and rate of growth that decide a country's external policies: offensive or defensive/cooperative or hostile. The location of a country exposes it to the nuances involved in structuring its external/internal policies to eliminate possible threats it might face in the future. Countries like Great Britain could

**A nation's geography controls its external ambitions and dictates expansion or submission. It is the neighbour's size, capability and rate of growth that decide a country's external policies: offensive or defensive/cooperative or hostile.**

---

3. Andrew Scobell, Ely Ratner, Michael Beckley, "China's Strategy Towards South and Central Asia: An Empty Fortress", *RAND*, 2014, [http://www.rand.org/content/dam/rand/pubs/research\\_reports/RR500/RR525/RAND\\_RR525.pdf](http://www.rand.org/content/dam/rand/pubs/research_reports/RR500/RR525/RAND_RR525.pdf). Accessed on June 12, 2015.



have a vast and expanding military and economy primarily due to the geographical bonus—sea power—coming from the absolute insularity and relative proximity. Such countries had the luxury of interacting with their far neighbours with an upper hand, resulting in offshore balancing. At that time, naval power was what gave extended arms to a country, and restricted the reach of landlocked ones like Hungary or Prussia, allowing them to concentrate only on the neighbouring state. To maintain the balance of power or tip the balance in one's favour, policies projecting self-interest remained the priority. Not to forget, the liberal structure of navigation of the seas also brought in changes in culture and a higher standard of living in society, whereas a landlocked country could only influence, and get influenced by, neighbours maintaining a 'similar' civilisational advance (for good or bad). China suffers from the insecurity of a landlocked unit much more than the security of an insular one. This insecurity reflects in its obsession with national unity and regime security.<sup>4</sup> It believes that 'a weak China will attract external hostility'. Besides, this hypothesis, being validated by the structure of the international system, also reflects the dimension that in order to survive, a nation has to accumulate the utmost power. The historical evidence would ratify China's paranoia that a weak rule at the centre brought the humiliation (from the West and Japan) on the glory of China.

China continues to project its economic might in Asia and beyond. Its struggle with the maintenance of a benign image of peaceful development and a reliable economic partner led it into compensating for the lack of trust (or gaining trust) through economic integration, viz. Shanghai Cooperation Organisation, Asian Infrastructural Investment Bank, New Development Bank, Silk Road Economic Belt and Maritime Silk Road. The number of projects under the leadership of China and in the shadow of Chinese primary capital investment reflect a desperate need by it to improve its hierarchy in the international system and project influence in the neighborhood.

For China, as mentioned above, there is no compromise on national unity, territorial integrity and sovereignty of the People's Republic of China

---

4. Ibid.

(PRC), in order to maximise the survival of the Party. Xinjiang represents a problem to which the Chinese Communist Party (CCP) attaches a lot of significance, mainly on account of the persistent anti-government stand of the Uighurs. This in turn, provokes instability in the Tibet Autonomous Region (TAR). The actions taken by the government indicate the strength and will with which it wants to assimilate and/or eliminate the separatist elements from the region. As the government has put it, “the three evils: terrorism, separatism, extremism” mirror the general tendency of Beijing asserting its interest at the cost of society and culture. What has come out of the harsh clampdown on the Uighur community is dissatisfaction, loss of trust, collapse of justice, law and order, religious discrimination and loss of life.

Beijing practised assertion (violence and violation of the International Law of the Sea) and coercion in its foreign policy for the disputed areas of the South China Sea and East China Sea. The sensitive issue of Xinjiang has been dealt with using similar brute strength, avoiding diplomacy, dismantling religious structures, prohibiting religious education and practices, blind arrests and capital punishment of Uighurs, rapid industrialisation and urbanisation at the cost of the historical heritage, influx of Han Chinese, social unrest, and rise in paramilitary and police presence. The PRC’s authoritarian government finds it rather easy to silence the opposition and march ahead with its policies despite protests.

The ideology behind the policies—domestic or foreign—brings into focus the pattern, that is, use of strength and assertion. The external policies have the primordial goal of ‘survival’. The state needs to make sure that the defence is strong and that territorial sovereignty is maintained. To confuse it with the security of the regime or a party is counter-intuitive. The domestic policies require a social understanding of the state. Different people, cultures and languages add up to the complexity of making a successful policy. As external policies can be harsh and brutal, domestic policies need to be progressive, adhering to the prescribed law and order for all, without discrimination. What the Chinese government has deduced wrong is the connection between national security and the security of the Communist Party—achieved through

tightening the law randomly for only certain groups of people, religions, ethnicity and different political ideas. Brutal domestic policies have been a sign of authoritarian and dictatorial rule. China's approach towards Xinjiang and Tibet has not been less than dictatorial. The results achieved at the external level where one nation can flex its muscle to enhance national interest, might not do justice to the results of similar policies internally. Xinjiang, being a region like Tibet, with hopes for freedom and a separate state since the beginning of the New China, has reacted with extremism and protests. The mounting dissatisfaction has led the youth into revolt. Now being treated as a terrorist organisation, the East Turkestan Islamic Movement has become much more hostile to the authorities, according to reports of incidents in the last decade. Moreover, the international community has seen the recent show trials by the authorities as devoid of a judicial structure, the spine of any functional community. Has China made assertion and coercion a tool to implement its will inside and outside its territory? It is quite evident that China will do anything to maintain sovereignty over its occupied territory, but how far will it go to do so?

### **HISTORY OF XINJIANG AND PROBLEMS WITH CHINA AT PRESENT**

Xinjiang or East Turkestan has experienced independence as well as invasions. The Qing Dynasty completed the annexation of what is now Xinjiang in 1759 and the demand for freedom was first documented in 1865 by Yakub Beg, a local leader.<sup>5</sup> The Uighurs enjoyed a brief period of statehood in 1931-34, declaring the East Turkestan Republic, extending from the Tian Shah mountains to the Kunlun mountains. And then again, in 1944-49, when China grew weaker owing to its involvement in its civil war. It was six years after the establishment of the People's Republic of China, under Chairman Mao Tsetung, that the Xinjiang Uighur Autonomous Region was created, with ethnic Uighur Muslims comprising the majority.<sup>6</sup>

---

5. Chien-peng Chung, "China's 'War on Terror': September 11 and Uighur Separatism", *Foreign Affairs*, July/August 2002, <http://www.cfr.org/china/chinas-war-terror-september-11-uighur-separatism/p4765>. Accessed on June 12, 2015.

6. Joshua Hammer, "Demolishing Kashgar's History", *Smithsonian Magazine*, March 2010.

The PRC had declared itself a “multi-ethnic state founded jointly by the people of all ethnic groups.”<sup>7</sup> But the Anti-Rightist Policy of 1957 not only opposed local nationalism but also took harsh steps to clamp down on religious activities. Later, in Mao’s regime, religion was prohibited in totality, including the ethnic language, culture and attire, in an attempt to bring ‘equality’ among the people, one among the several crises faced by China during the Cultural Revolution (1966-76).<sup>8</sup> In the past two decades, the region has witnessed its ancestral homes, mosques and religious texts being destroyed. At present, religious gathering are prohibited in the region for fear of these being construed as disguised terrorist meetings.

Xinjiang has suffered political assassinations, bombings and riots, resulting in the death of hundreds of Uighurs and Han Chinese. According to news reports, there were approximately 200 attacks between 1990 and 2001, causing over 500 casualties (380 in 1998 alone). From 2008-14, there were over 100 incidents of violence, claiming more than 500 lives (Uighurs and Han Chinese; policemen and locals). The worst of the events include the 1997 pro-independence uprising, in which 100 people were killed in the town of Yili; the January 2007 Chinese raid on a training camp in Xinjiang that killed 18 terrorists and one policeman; the 2009 Shaoguan toy factory incident, that left 100 dead and 400 injured, leading to the shutdown of the internet in the entire Xinjiang Uighur Autonomous Region, the Kunming knife incident, and the 2013 Tiananmen Square attack. It can be debated whether the attacks have decreased after the “strike hard” campaign by China, but the protests and violence seem to be a daily occurrence in the region and the violence by the Uighurs outside the region has also increased, resulting in more strident policies from the government. The statistics might be flawed due to the lack of communication with the outside world but the problems seem to have grown another dimension where the government has decided to “contain the situation by threat, coercion and lawlessness.” There has been an increase in mass shootdowns and public

---

7. Office of State Council, *National Minorities Policy and Its Practice in China*, September 1999, Part 1 A. Also see Elizabeth Van Wie, “Uyghur Muslim Ethnic Separatism in Xinjiang, China”, Asia Pacific Centre for Security Studies, January 2008.

8. Van Wie, *Ibid.*

**The belief that economic development would undermine the nationalistic uproar and help Beijing find a solution to its Xinjiang problem led to further destruction of the Uighur legacy.**

executions in the region. In May 2014, the Chinese government reined in another episode of 'terror' among the Muslim community by having a mass 'show trial' in a football stadium with about 7,000 spectators. About 55 Uighurs were sentenced for separatism, extremism and terrorism—the three evils. The sentencing took place in Yili, a city bordering Kazakhstan.

The belief that economic development would undermine the nationalistic uproar and help Beijing find a solution to its Xinjiang problem led to further destruction of the Uighur legacy. The

*hutong* (traditional courtyard residences), the cultural property and heritage of the city of Beijing, were destroyed one after the other, to construct modern apartments, leaving only a few for viewing by tourists. The old city of Kashgar is facing a similar fate where centuries old houses and mosques have been brought down to dust and the government plans to "reform" about 85 percent of the city under the "Kashgar Dangerous House Reform" programme for which it has allocated US\$ 500 million.<sup>9</sup> In the wake of expanding China's economic power, the current president has launched the "Silk Road Economic Belt" programme. But in the disguise of progress, the government has been destroying the ancient Silk Road city of Kashgar. The Uighur population which already suffers from the ongoing human rights violations and denial of appropriate political representation, has been undergoing the trauma of dislocation from their homes. Even after several requests from the United Nations Human Rights Council, and United Nations Educational, Scientific and Cultural Organisation (UNESCO), the Chinese government continues with its plan.

The region, historically, was crucial for merchants, travellers, writers and conquerors. For example, Kashgar, 'an oasis', is a key city of Xinjiang,

---

9. European Parliament resolution of March 10, 2011, on the situation and cultural heritage in Kashgar (Xinjiang Uighur Autonomous Region, China) <http://www.europarl.europa.eu/document/activities/cont/201103/20110322ATT16076/20110322ATT16076EN.pdf> Accessed on June 12, 2015.

bordering Tajikistan and Kyrgyzstan and is the westernmost part of China. In the ancient times, the trade along the Silk Road went through the city and connected China's Yellow river valley with India and the Mediterranean. Today, the region presents the same geo-political and strategic advantage for China. It has borders with eight countries: Russia, India, Mongolia, Kyrgyzstan, Tajikistan, Pakistan, Afghanistan, and Kazakhstan. Naturally, the region is the way for China to tap into the Central Asian countries for resources, political influence and power.

In the initial years of the Chinese economic reforms, the focus remained on trade, and because the eastern region already had established systems of trade and navigation, further investment fast tracked the growth and development. But the west stayed unreachable, backward, poor and detached from China proper. It was only a few decades ago, when China had exhausted the available resources, plus, the growing unrest in the region prickled its ambition of political stability, that Xinjiang presented a golden opportunity to revive the (falling) growth rates and continue strong action against any anti-establishment activities which might disturb the precarious balance between the people of China and their trust in the CCP.

**“Our principle [*sic*] goal is to achieve independence for East Turkestan by peaceful means. But to show our enemies and friends our determination on the East Turkestan issue, we view a military wing as inevitable.”**

### **CHINA'S XINJIANG POLICY: THE THREE EVILS**

China's land border disputes on the western front have been resolved over time and with due efforts. Just like the US managed to dilute the threat from the land borders, China has also adopted a similar approach for its western region, which has been 'wild', and historically unstable. This is not to say that the borders are free from national security challenges but territorial disputes which hamper external affairs and partnerships between nations, have been done away with.

China has conceptualised the evils of its society as terrorism, separatism, and extremism, calling them "the three evils". The tendency of the Chinese

government is to come out with catch phrases to get popular support and give a benevolent yet firm face to the actions of the government to remedy the shortcomings. Terrorism can be defined as an act of “the unofficial or unauthorized use of violence and intimidation in the pursuit of political aims”, as opposed to separatism, “the advocacy or practice of separation of a certain group of people from a larger body on the basis of ethnicity, religion, or gender” and extremism, “the holding of extreme political or religious views”. Firstly, the Uighurs’ violence stems from their desire for a separate state, which might also be defined as an ‘independence struggle’ or ‘revolution’. Secondly, extremism is dangerous in nature as it calls for extreme measures like ‘*jihad*’. Contrary to this, the social stability of the region is tipped in favour of the Han Chinese (foreigners) against the Uighur majority. The people who have been residents of the place for centuries, are now being denied their basic right to practise their faith, as per the government orders. There is obviously a grey area here, wherein people are using violence to achieve a political goal—independence – which is being denoted as terrorism by the Chinese government. However, it is also called a fight for freedom. In order to make the distinction, the government should investigate deeper into the roots of the problem which might lie in dissatisfaction due to improper governance. In a Radio Free Asia interview, the leader of the East Turkestan Liberation Organisation (ETLO), Menmet Emin Hazret stated, “Our principle [*sic*] goal is to achieve independence for East Turkestan by peaceful means. But to the show our enemies and friends our determination on the East Turkestan issue, we view a military wing as inevitable.”<sup>10</sup>

The Uighur community, once in an independent state, still struggles to find its resolution with the government. More importantly, it strives for a non-interventionist government which honours its promise of an ‘autonomous’ region. Falling short of such claims, China has taken quite a dramatic stand to include Xinjiang in the mainland’s spectrum of growth, industrialisation and wealth. The three evils have brought the three aspects of the government together—diplomatic, economic, military. The

---

10. “Separatist Leader Vows to Target Chinese Government”, *RFA*, January 29, 2003.

connection among the three often can be observed as lost, due to the lack of understanding of the region. In the new administration, Xinjiang had exploded with protests against the new policies that labelled Uighurs as terrorists, and the imposition of several discriminating religious and social laws against them. As a result, this has instigated social unrest between the Hans and Uighurs in the region.

Xinjiang is one of the most valuable territories for its natural resources and strategic location. But the defence structure is lax due to the concentration in the eastern region—the wealthiest and most heavily populated—making it the heart of the Chinese economy. In the growing environment of violence in the region, China has adopted certain policies to fix the lack of governance and law and order in the region. First, the economic boost: in the backdrop of growing dissatisfaction among the people of the region, the government has decided to bring in economic growth through industrialisation which, in turn, will provide employment, stability and a higher standard of living. But the officials have opted for hiring the Han Chinese as workers, once again increasing the gap with, and dissatisfaction among, the ethnic groups. The high influx of Han Chinese is only making the situation worse as most of the jobs are given/taken by the Han Chinese; this is one of the reasons why the Uighurs feel invaded in their own land. In an attempt to minimise the ethnic dimension of the Uighurs and assimilate them with the Chinese mainland, the authorities have also banned their language, imposing instead English and Mandarin. As a result, the Uighurs are losing out on employment, tradition and culture. According to the British journalist Christen Tyler, author of the *Wild West China: The Taming of Xinjiang*, “The people in charge are Han, and they recruit Han. Natural resources—oil and gas, precious metals—are being siphoned off for the benefit of the Han”.<sup>11</sup>

Second, economic incentives comprise the largest, and a tried and tested tool in the hands of the central government—the Western Development policies. The rapid industrialisation has forced the people to move from their centuries old homes. There has been wanton destruction of old houses, which represented the cultural heritage and history of the Uighurs, for

---

11. Hammer, n.6.



constructing industrial complexes or apartments. The lack of reasoning for this and lack of involvement of the locals encouraged rebellion and protest. The belief that people want a prosperous life, although true, has not been conveyed in the process.

Third, China has connoted religion (Islam) with terrorism, like several other nations before it. Due to its proximity to Afghanistan—"the epicentre of terrorism"—and Central Asia, China sought to clamp down on all religious activities, from praying and education to dressing and physical appearance. Not allowing the majority living in the region to practise their faith has also forced the Uighurs to fight for the independence which they now regard as the only way to survive. In the most recent event, China banned the locals from observing fasts during *Ramadan* in Xinjiang<sup>12</sup>. When the Foreign Minister of the PRC, Tang Jiaxuan, claimed in a telephone conversation with his Russian counterpart Igor Ivanov on October 10, 2011, that China was also the victim of terrorism by Uighur separatists..., he fused the meaning of terrorism with separatism. By defining all separatist activity in Xinjiang as terrorism, the government of the PRC is hoping to obtain *carte blanche* from the international community to take whatever action it sees fit in the region.<sup>13</sup>

As is clear, the policies have not yet yielded the result that was hoped for. There has been an increase in police raids and arrests, and in violence by the rebels. Now, as China has started to bring much more money into the region, it also wants assimilation and 'national integration'.

### WAR ON TERROR: CHINA'S THREAT PERCEPTION

China has been rocked by protests and demonstrations for larger political involvement, democracy, independence and autonomy from all sides in the past few decades in Xinjiang, Tibet, Hong Kong and in the mainland, for the policies of the centre deemed to be against the people. It was after 9/11,

---

12. "China Bans *Ramadan* Fasting in Mainly Muslim Region", *Al Jazeera*, June 18, 2015, <http://www.aljazeera.com/news/2015/06/china-bans-ramadan-fasting-muslim-region-150618070016245.html>. Accessed on June 12, 2015.

13. Michael Dillon, "Xinjiang and the 'War against Terror': We Have Terrorists Too," *The World Today* 58:1 (2002), quoted in McMillen, "China, Xinjiang, and Central Asia," [http://connections-qj.org/article/xinjiang-chinas-foreign-policy-toward-central-asia#\\_edn26](http://connections-qj.org/article/xinjiang-chinas-foreign-policy-toward-central-asia#_edn26). Accessed on June 13, 2015.

when the US launched its War on Terror, seemingly the largest national security threat in decades that shook the nation and the world alike, that many nations came aboard in the fight against terrorist organisations largely operating from Afghanistan and areas nearby. As China had looked upon the pro-independence movement by the Uighurs in Xinjiang as an act of terror, it immediately persuaded the US to declare the East Turkestan Islamic Movement a terrorist organisation. China acknowledged this step as permission by the international order to “crack down” on the Uighur separatists. The number of protests and violent attacks have increased as have the arrests and killings by the government. Urumqi and Kashgar became the centre for the violence. Since 2008, several attacks have been conducted on buses, police stations and local markets, killing the locals. The worst attack took place in July 2009, in a toy factory in Guangzhou, where the workers (Han Chinese) attacked other workers (Uighurs) in response to a fake video, killing about 132 Uighurs. This event had a trickle-down effect, with riots breaking out all over Xinjiang, resulting in the government shutting down the internet in the region in an attempt to contain, and disconnect it from the outside world. Countless police raids, clamping down on religious gatherings, teaching schools and houses were organised, to harden the grip on ‘illegal’ practices.

China has tried to equate its battle with the separatists in Xinjiang with the US’ fight against Al Qaeda. As some Uighurs have chosen to express their dissatisfaction with the regime in a violent manner—burning police stations and attacking policemen—China feels it has the moral authority for eliminating the unwanted elements, which is also made officially reasonable. Maintaining the order of the state is one of the primary tasks of the government, but in practice, policy-makers seemed to have missed the point—striking down on ‘own people’ (not an organisation or individuals or groups), without distinction between innocent and culprit, is not going to legitimise the concerns of ‘national security’. The threat perception by China has often led policies astray, ignored, and at the mercy of local officers often affected by the ethnic stereotypes.

Terrorism is a real threat for the world and the Chinese do not want to let it become real in their sphere. The Islamic militant rhetoric is feared to have

**As argued above, the root of the problem lies in the geographical, cultural and historical distinction between China and XUAR.**

found its way in Xinjiang through the connection with Afghanistan and the funding for militancy. But how live is the threat? As argued above, the root of the problem lies in the geographical, cultural and historical distinction between China and XUAR. But today, as it has transformed into a civil-political movement, unaccepted by China, the three evils can be perceived as a fabricated phenomenon to force assimilation and justify the coercion in the international view. Soon after outlining generous and open policies towards the minorities in 1999, China undertook a large scale exercise of parading military artillery and hardware on the streets of Kashgar in 2001.<sup>14</sup> The parade was a symbol of strength and force, demonstrated to deter the people from protesting against the government or the Party. It was also at this time that the diplomatic, military and economic influence of China increased exponentially. China's economic agenda is clear – to keep Xinjiang engaged in economic prosperity and eliminate the elements of terrorism. But how is the region detrimental for the foreign policy? Keeping in mind the huge investment by China in terms of both finance and diplomacy, Central Asia has much more to offer than just security in the western part of China.

### **GEOGRAPHICAL DILEMMA AND GEO-POLITICAL STRATAGEM**

The western part of China has had geographical issues, contrary to what one might deduce as its natural advantages—it is blessed with vast deserts, plateaus, untamed mountains in the north and west, and a vast sea in the east. But for most part of its history, China has suffered from constant attacks from the north, west, and east in major events – thrice being defeated and occupied [13th and 17th centuries – Yuan (1271-1368) and Qing (1644-1911) dynasties, Japan in 1894-85 occupied Taiwan, and in 1937-45, it occupied Shanghai, Beijing and Nanjing]. The warriors and nomads from Tibet and Mongolia constantly threatened the Chinese regimes, resulting in the most

---

14. Van Wie, n.7.

visible remedy—the Great Wall—for such threats.

The region is a resource paradise and provides geo-strategic depth to China. In 2009, Xinjiang ranked third in oil production and is estimated to have 30 percent of the country's oil reserves. The region has about 34 percent of the country's natural gas reserves, and 40 percent of its coal reserves. There are significant reserves of non-ferrous metals—copper and nickel. In addition to the above, Xinjiang can also tap vast amounts of wind and solar energy.<sup>15</sup>

Gen Liu Yazhou, the political commissar in 2010, wrote<sup>16</sup>:

Western China is a vast empty expanse [*yi ge weida de kongjian*]. Moreover, our strategic direction should be westward... With an excellent geographic location (close to the center of the world), the western region can provide us with the driving force to build our strength. We should regard western China as our hinterland rather than as our frontier.

Even though China is the second largest economy in the world and a powerful military, it still remains insecure due the disturbances in Xinjiang. China's foremost objective since independence has been to maintain the *legitimacy of the (Communist) Party* (which then transcends into the authority of the government) and then *national security*. The conflation of the two derails the understanding of national security in general. For the Chinese government and the Party, it is of utmost importance to not let the regime

**China's foremost objective since independence has been to maintain the legitimacy of the (Communist) Party (which then transcends into the authority of the government) and then national security. For the Chinese government and the Party, it is of utmost importance to not let the regime be questioned, stained, doubted or even become part of public debate.**

---

15. Scobell, et al., n.3.

16. Liu Yazhou, "Xibu lun Theory on the Western Region," *Fenghuang Zhoukan Phoenix Weekly* (Hong Kong), August 5, 2010, p. 36.

be questioned, stained, doubted or even become part of public debate. Because an act of protest or disagreement with the government or the Party might dilute the authenticity of the regime and cause unrest in the heartland, China is determined to quash any political dissent. Secondary to this is the problem of *national unity* which is the core of the domestic policy towards the autonomous regions (Tibet and Xinjiang). The fight for greater autonomy and a separate homeland by the Tibetans and Uighurs represents the weak link between the centre and the periphery.<sup>17</sup> Here, a prominent threat to China is the link-up between the internal challenges and the external threats.<sup>18</sup> For China, its periphery represented “an unpredictable zone from which Turkic nationalism and Islamic ideologies could radiate into Xinjiang.”<sup>19</sup>

But today's China is stronger, wealthier and much more peaceful than it has ever been in centuries. Although a contingency is still hampering its objective to achieve overall economic growth and political stability—Xinjiang—China has maintained tough control and surveillance.<sup>20</sup> This strength has not helped China in solving the dispute in a mature manner. In fact, the government has relied upon violence, political and judicial injustice and strongly repressing the people. The numerous episodes of arrests and disappearances of Uighur men, lack of transparency in the judicial procedures, show trials and strict surveillance and raids on the people have created a wide gap. This gap can become a geo-political burden for China. The militants in the nearby region have tried to consort with the smaller and less threatening outfits of Xinjiang by training them and providing them arms. It is obvious that China wants to maintain influence in the region. To dilute the sense of national boundary in order to expand

---

17. Besides both regions' separate history and the deeper sense of nationality, the problem technically represents the lack of capability by China to solve these issues, peacefully and completely.

18. Scobell, et. al., n.3.

19. Lena Jonson, “Russia and Central Asia,” in Roy Allison and Lena Jonson, eds., *Central Asian Security: The New International Context*, Brookings Institution and Royal Institute for International Affairs (2001), p. 17. See also Scobell et. al., n.3.

20. \* The Tibet Autonomous Region has been deliberately left out in the study. It does add up to the economic and political troubles faced by China but this paper looks precisely at the Uighur problem and threat of terrorism.

cooperation and alliances, it is essential to reduce the tension not only for the stability of the region but also for the future national security or foreign policy advancement. China needs to measure its power in order to maintain a favourable position in the region. The units affecting the policies of China are: Central Asia, India, Pakistan, Afghanistan and the US.

## **EXTERNAL CHALLENGES AND IMPLICATIONS ON FOREIGN POLICY**

### *Central Asia*

After the end of the Cold War and disintegration of the Soviet Union, a number of small and new states came into existence. The impact of this change threatened China's already distant west to further relate with the newer and unstable states as they shared the religion, culture and language. Due to the close proximity of Central Asia and Xinjiang, China did take a proactive stand in maintaining strong relations with these governments. But the dissatisfaction among the Uighur community with China's Communist Party and the government ran deep as the Uighurs never gave up the demand for a sovereign nation established on the basis of different ethnicity, culture and language from those of proper China. Today, Beijing's Xinjiang policy is equivalent to its Central Asia policy, viz. to maintain peace and influence, promote economic interests and energy security. China, as of 2010, surpassed Russia as Central Asia's top trading partner. The Shanghai Cooperation Organisation (SCO) founded to address non-traditional security threats, has proved fruitful in only promoting economic interests without devising a concrete method of tackling the problem of terrorism. The SCO reduced the importance of Russia in favour of China. With the large amount of financial aid provided to the countries, China has found its way to wave off the other powers from the scene.

### *Pakistan*

In December 2000, the Chinese ambassador to Pakistan met with Taliban leader Mullah Omar, to insist that the Taliban not support the Uighur militants in Xinjiang in exchange for Chinese support for Afghanistan in the United Nations. The attempt was unsuccessful, but Xinjiang

has created a dent in the 'all-weather' friendship. Pakistan has irked Beijing over the most pressing domestic security concern—terrorism—stemming from the grievances of China's Uyghurs. Pakistan has failed to contain the problem emanating due to the lack of policing. A few dozen Uighur militants have been reported to dwell around the tribal areas of Pakistan, forcing the Chinese government to wonder "why the Army has not simply eliminated them"<sup>21</sup>, although in 2003, the Pakistani forces had killed Hasan Mahsum, the founder of the Uighur East Turkestan Islamic Movement (ETIM). A closer look at the friendship of China and Pakistan suggests that the balance of power strategy is at play to contain India. The threat of terrorism for China has led it into maintaining a strong presence but as a trickle-down effect, China has engaged actively, stretching its soft power <sup>22</sup> and directly or indirectly, expanding into the subcontinent region, too close to India—the only country capable of absorbing the China threat: its economic potential, population, landmass and military power.

### *The US*

Beijing feels vulnerable in western China in part because of the threat of terrorism. But it also feels extremely vulnerable on its western flank because of the US military forces that are engaged in battling this common threat. As and when the US moves out, there is going to be an inevitable gap, and as China's strategy so far suggests, '*first economic cooperation, second military assertion*', it is likely that Beijing would want to fill the gap. In the backdrop of the policy of 'rebalancing to Asia', Afghanistan can become a pivot for radiating China's power. The US, in view of the ambition to leave behind a peaceful and democratic Afghanistan, would ignore the dramatic presence of China in Central Asia, much more than Russia, and the geo-political importance of the country. China, as it eyes Afghanistan, would need to pursue this objectively and without the inhibition of terror in Xinjiang.

---

21. "Corridor of Power", *Economics Times*, April 20, 2015.

220 Soft power here essentially means economic and cultural power as opposed to traditional military capability resonating in hard power.

### **A MIXED STORY AND THE WAY AHEAD**

It is evident from the functioning of the current administration that President Xi Jinping believes in the projection of power both outside and inside the country. His recent moves of anti-corruption, assertion in the South and East China Seas, and actions against people spreading awareness and political dissidents alike throw light on the universal strategy of governing and government.

- **Peaceful Development:** China's doctrine of peaceful development revolves around non-violence, with the exception to the 'threat to its core interests' namely Tibet, Taiwan, South China Sea and East China Sea. Xinjiang has not yet found its place in the list but the internal development of Xinjiang has yielded neither peace nor development.
- **Xi Jinping** stated, "Always put people's life first", and recommended a "holistic view of national security" when internal security is damaged by strenuous actions taken by the government itself. The rhetoric of the rule of law fails every time China arrests and tries Uighurs without a proper judiciary and adhering to judicial practices. The whimsical vacillation in law and order has put China's integrity towards its own people at stake. It seems like China considers its responsibility to be towards the mainland and the economic belt on the east coast only.
- **Chinese Dream:** To replay the American success story, China would need to mend its economic ideology – from state capitalism (crony capitalism) to a free market (even if not absolute). The Chinese dream falls short of a realistic vision wherein people can benefit equally from the market and hope for the government to protect 'individual rights'—a concept alien to the Chinese but the fundamental on which America was built.

In the recent events, it has become apparent that the current regime of President Xi Jinping follows hardline policies in every aspect of policy making: domestic, economic, defence and foreign. The Chinese society model was defended as providing all that a society needs: societal freedom, economic freedom, et al. However, it has been noticed from time to time that civil society is getting crushed under this regime. As many as a thousand



protestors were detained last year. Any kind of political debate or discussion in the society has always troubled China. But for a while now, it has been observed that the 'law' is gripping the civil society harder than is legitimate or necessary, e.g. a couple of female activists were arrested for spreading awareness about the rights of women as independent individuals and against sexual harassment. They were arrested on the basis of disrupting public order. Such belligerent policies have made their way into the lives of the Chinese that are devoid of any kind of freedom that was assumed to be present, a reason due to which political freedom could not become a priority.

China would not want the Uighur community outside of China to get attention and act like to the Tibetan government-in-exile, maligning its reputation, forcing debates over violations of humanitarian rights, and interference by the world's other governments. It is important to contain the matter with the use of comprehensive tools of diplomacy. The urge for an independent nation can be curbed by economic prosperity and better living standards but these concepts are not the same for every culture. Preservation of its heritage and maintenance of its legacy are important to a community which is part of an alien community. In this battle for recognition, China must adhere to the promises made at the time of proclaiming Xinjiang an autonomous region.