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WHY PREVENTING “TECH-DRAIN” OF AEROSPACE TECHNOLOGIES MAKES MILITARY SENSE

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The “IMPRINT” Initiative

On November 05, 2015 the President Shri Pranab Mukherjee and Prime Minister Shri Narendra Modi had launched the IMPRINT initiative.¹ IMPRINT, an acronym for IMPacting Research Innovation and Technology, is a Rupees 1000 Crore Pan-Indian, Indian Institute of Technology (IIT) and Indian Institute of Sciences (IISc) joint project, spread across 17 institutions and 10 domains under the Ministry of Human Resource and Development (MHRD). The project aims at initiating original multi-pronged research into areas where country is dependent on foreign technology. In addition, it will also provide a roadmap to various engineering institutes to develop their education policies and align their efforts with the needs of the country.² Under this project, research proposals were invited in February, 2016. As on date 2612 research

proposals have been received from various Indian citizens engaged in research and technology development in academic institutions and various organisations. The Defence Research & Development organisation (DRDO) is likely to support 43 projects with a funding of over Rs 51.03 crore.³

Earlier, on August 18, 2015 DRDO had also signed a memorandum of collaboration with IIT-Kharagpur to undertake collaborative research in areas of cyber physical systems, information security, energy storage devices and materials and underwater vehicles.⁴

However, this roadmap and policy which intends to accelerate research and innovation along with building the necessary human resource capability must also initiate steps to prevent dual use technology being drained from the country.



“Brain-Drain Vs “Tech-Drain”

The Prime Minister while inaugurating the Pravasi Bhartiya Kendra on October 02, 2016 remarked on the need to convert “brain drain” to “brain gain” by inviting the Indian diaspora to respond to the call of the nation.⁵ This was both an acknowledgement of the issue facing the country today and at the same time it was a statement of intent. The intent is to prevent “brain-drain” or flight/emigration of highly trained or qualified human capital from the country while building up indigenous technological expertise.

On the similar lines of “brain-drain”, “tech-drain” can be defined as flight of technology which has been developed indigenously and has been traded without approval or has been taken out from the country due to lack of filing of an appropriate patent. This aspect needs adequate attention as loss or unavailability of indigenously developed technology would have a direct impact on development of military capability to ensure a decisive outcome of any military conflict.

Achieving Technology Asymmetry- A Perspective

Traditional approach of achieving technology asymmetry has been to buy Commercial Off the Shelf (COTS) equipment, as has been the case in most aircraft acquisitions by India. Although indigenous capability did receive some fillip with

the establishment of manufacturing and assembly lines, the task has now been accelerated with the multipronged approach being undertaken, which commenced with the issuance of Technological Perspective and Capability Roadmap 2013 (TPCR-2013)⁶ in April 2013.

However, the possibility of “state of the art” or key technologies which are intended to be acquired through the process of indigenous manufacturing or by incorporating offset clauses in various defence procurements need a careful examination. A recent example is that of South Korea trying to acquire key technologies for their indigenous fighter programme. The programme is being overseen by the Korean Defence Acquisition Program Administration (DAPA). South Korea had decided to purchase 40 F-35As from Lockheed-Martin, linking it with the development of its indigenous \$15 billion KF-X fighter aircraft programme. Under an offset clause, Lockheed Martin had offered to provide 21 technologies. In addition, the DAPA had requested for transfer of four more technologies relating to active electronically scanned radar (AESA), electro-optical targeting pod, infrared search-and-rescue systems, and radio frequency jammers. However, understandably, this transfer of technology has been blocked by the US government. This was done after the contract of F-35s had been signed.⁷ The same was highlighted by a politician of the ruling Saenuri party of South Korea who was quoted as saying:

“This case should serve as an opportunity for us to look back on the way we treat the US. We decided to buy fifth-generation fighter jets with the expectation of sophisticated tech transfer, but now we have nothing”⁸—Kim Jung-hoon

This example highlights the impediments faced by any country in its efforts to acquire crucial technologies to give the decisive military edge to own forces. Ownership of such a technology is crucial and thus no country would allow these to be transferred, despite having the best inter-governmental relationship and/or the economics of such a deal.

However on the other hand countries do manage to acquire deficient technologies through bilateral agreements and acquisitions. The recent case of China acquiring the license to produce the D-18T (23Ton thrust) turbofan engines powering the massive AN-225 aircraft from Ukraine is a case in point.⁹

The Indian Context & Need for Regulatory Mechanism

In Indian context, international defence equipment manufacturing companies have been scouting and sourcing key components from the mushrooming Indian startups. One such startup- Verdant Telemetry limited, Cochin (established in 1997) is a ISO:9001:2008 and AS9100 Rev C (American Systems Registrar) certified company, which manufactures antennas and radomes for airborne systems.¹⁰ Over the years, it has

recorded visits by various firms namely Chelton Ltd UK (2005), Lockheed Martin (2007), Raytheon USA (2008), Thales Communications France (2009) and Sierra Nevada Corporation (2010), among many other global concerns who manufacture airborne military systems.¹¹ Since 2009, it has been supplying the V/UHF Blade Antenna to Israel Aircraft Industries (IAI) for its Heron Unmanned Aerial Vehicle (UAV), which is also operated by Indian Armed forces.¹² With the necessary stimulus given to the industry under the Make in India programme, many such companies have been undertaking research work in defence related sectors producing innovative solutions and cutting edge technologies. It is advisable from a pure military stand-point, that these be regulated, channelled and protected to achieve and maintain crucial technological advantage especially in case of systems used in military equipment.

A Way Forward

The IMPRINT initiative is a part of a multipronged approach to promote indigenous development of cutting edge technology. It is also an indisputable fact that the outcome of future battles will be decided by the available technological prowess and knowhow. Hence, preventing “Tech-Drain” of the indigenously developed technology is crucial to maintain this edge and thus it also makes sound military sense.

For a start, dual use technologies must be identified and regulated through a policy

mechanism wherein export of the finished product/sub-system is regulated. Subsequently, the policy while catering to the Intellectual Property Rights (IPR) issues, must also address the “tech-drain” concerns which may happen through outright acquisition of technologies, which are under development or have already been developed, by foreign concerns for seemingly huge sums of money. Indian Air Force being one of the primary stakeholders along with having the necessary expertise in airborne systems must form a part of such a governing mechanism which needs to be implemented on priority.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

Notes

¹ TNN, “PM Modi Launches research project-Imprint India”, *The Times of India*, Nov 5, 2015, <http://timesofindia.indiatime.com/india/PM-Modi-launches-research-project-Imprint-India/articleshow/49669069.cms> accessed on September 29,2016

² Ministry of Science & Technology, GoI, “Impacting Research Innovation and Technology (IMPRINT)”, www.dst.gov.in/scientific-programmes/impacting-research-innovation-and-technology-imprint accessed on September 29,2016

³ Anubhuti Vishnoi, “Single-Window Funding Makes Imprint on Campus R&D”, *The Economic Times*, September 28, 2016, Pure Politics,p.4, New Delhi Edition

⁴ PTI, “DRDO to Conduct Joint Research in Defence with IIT-Kharagpur”, *The Economic Times*, August 18,2015, www.economictimes.indiatimes.com/news/defence/drdo-to-conduct-joint-research-in-defence-with-iit-kharagpur/articleshow/48527612.cms accessed on October 03,2016

⁵ PIB GoI, “PM Inaugurates Pravasi Bhartiya Kendra:October 02,2016,” www.pib.nic.in/newite/erelease.aspx accessed October 03,2016

⁶ HQ IDS MOD GoI, “Technology Perspective and Capability Roadmap (TPCR): Apr 2013”, www.mod.gov.in/writeraddata/TPCR2013.pdf, accessed on October 04,2016

⁷ Jung Sung-Ki, “ Tech Transfer Hobbles South Korea’s Fighter Program,” www.defencenews.com/story/defence/air-space/strike/2015/09/27/tech-transfer-hobbles-south-koreas-fighter-program/72808800 accessed on October 05,2016

⁸ *ibid.*

⁹ Jeffrey Lin, PW Singer, “ China will Resurrect the World’s Largest Plane,” *Popular Science*, September 07,2016, www.popsci.com/china-will-resurrect-worlds-largest-plane accessed on October 04,2016

¹⁰ Verdant, “Awards and Certification,” www.verdanttelemetry.com/awards_certifications.php accessed on October 05,2016

¹¹ Verdant, “Milestones,” www.verdanttelemetry.com/milestones.php accessed on October 05,2016

¹² Verdant, “New & Media,” www.verdanttelemetry.com/News-Details.php accessed on October 05,2016