

Uttar Pradesh Defence Industrial Corridor (UPDIC) - Centre of Excellences (CoEs)

MILESTONES

(Details highlighting achievements in the R&D)

In line with various initiatives undertaken in the Aerospace and Defence sector envisioned by Hon'ble PM Gol, Hon'ble Defence Minister Gol, and concrete steps like the establishment of Uttar Pradesh Defence Industrial Corridor (UPDIC) taken under the able leadership of Hon'ble CM, GoUP, the nation is taking long strides in the direction of Aatmnirbharta in Defence.

Being sanguine to the requirement and taking transparency and hand holding by the Government to the next level, 4 Positive Indigenization Lists (PILs) announced by the Government along with the list of items of the Line Replacement Units (LRUs), which have been made available on our website for quick reference (as ready reckoner) allowing the investors, both existing and prospective, to select those as their product of choice for establishing the manufacturing unit in the UPDIC. Furthermore, the environment is made aware that the GoUP sanctioned the creation of two CoEs in the state for providing R&D and domain expertise related advice. And as a result, UPDIC-UPEIDA has signed MoUs with IIT Kanpur and IIT (BHU) Varanasi.

These CoEs are being provided funds to carry out R&D for the identified gaps in the D&A related areas and provide them to the environment for commercialisation.

The update related to the latest developments in respective areas carried out by CoEs are mentioned in herein as under. Various Technology Readiness Levels (TRLs) achieved in these fields have been listed with the technologies that are available for transfer and commercialization.

Interested investors may like to explore acquiring these from CoEs.

(Note : Any communication with CoE should be routed through UPDIC.)

Details of the development by both CoEs (IITK & IIT BHU) in defence domain are mentioned below -

- **IIT Kanpur:**

- (a) IIT Kanpur has developed products as listed below in the areas of defense application:

- (i) 5 Kg class VTOL capable high altitude Unmanned Aerial Vehicle for Tactical surveillance. TRL – 3
 - (ii) 25 Kg class VTOL capable high altitude Unmanned Aerial Vehicle for payload delivery and Tactical Surveillance. TRL – 7
 - (iii) Malware analysis Framework. TRL - 6
 - (iv) Cyber Surveillance System for Real-Time Threat Intelligence. TRL – 8
 - (v) Secure Cyber Asset Patch Management System:C3I SIM. TRL – 6
 - (vi) GaN based high power amplifier for defense applications and Communication System for Unmanned Aerial Vehicles

respectively which have partially developed and reached up to TRL – 4.

- (vii) A ready to use haemostatic bandage for military combat and civilian trauma. TRL – 2
- (viii) Development of Indigenous High-Performance Ultra High Molecular Weight Polyethylene (UHMw-PE) fibers / Shields for Bullet Proof applications. TRL – 3

(b) Transfer of Technologies (ToT): Certain technologies have already been deployed for commercialization by the startups and these are as under:

- (i) Transfer of technology of 25 Kg class VTOL capable high altitude Unmanned Aerial Vehicle for payload delivery and Tactical Surveillance; TRL – 7 to ASTROROBO Technologies Pvt. Ltd
- (ii) Transfer of technology of Malware analysis Framework; TRL – 6 to C3iHub IIT Kanpur
- (iii) Transfer of technology of Cyber Surveillance System for Real-Time Threat Intelligence; TRL – 8 to Treacle Ltd, also deployed in C3iHub IIT Kanpur and BIT Mesra.
- (iv) Transfer of technology of Secure Cyber Asset Patch Management System:C3I SIM; TRL – 6 not transferred. It has been deployed in C3iHub IIT Kanpur.

• **IIT (BHU) Varanasi:**

(a) IIT (BHU) Varanasi has also developed products for defense application like these are as under:

Low-cost hybrid additive manufacturing, Biomedical Healthcare, Drone Technology, Portable electrical energy storage, Measurement set-up for investigating thermoelectric materials, Composite coatings for smart electronics and electromagnetic devices, Composites for Radome (Radar Antenna enclosure), Aluminum alloys for ground vehicle and aerospace structure, Additive Manufacturing based W-Ni-Co alloys for war Tanks, Numerical studies on the deformation behavior of different FCC-BCC alloys subjected to ballistic impact, Advanced Materials Development, Polymer Composites and Processing, High temperature Ceramics and Refractory, Radar Design and Materials, Advance Characterization of Defense Materials, Additive Manufacturing and Injection Molding, Characterization of ammunition/explosives and Impact assessment, Chemical weapon testing and characterization, 3D Mapping using UAVs are getting developed. These are the list of items which may be extended to the investors for commercialization.

(b) Transfer of Technologies (ToT):

- (i) Ultra-wideband Vivaldi Antenna Array with enhanced gain for available physical dimension of the Antenna Array Unit (AAU) in the fighter aircraft, technology has been transferred to Defence Avionics Research Establishment (DARE), DRDO, Bengaluru.

(c) Patents: IIT (BHU) Varanasi has been granted 2 patents and applied for 5 patents which are as follows:

- (i) "Superabsorbent Soy-based Cryogel and a Method of Preparation Thereof" Application No.: 202311023611 March 30, 2023, India Patent.
- (ii) "A Superabsorbent Biocompatible Soy-based Hydrogel Scaffold and Method of Preparation Thereof" Application No.: 202111050848 November 05, 2021, India Patent.
- (iii) "Soy-Based Electrospun Nanofibrous Sheet and Method of Electrospinning Thereof." Application No: 202011018560 April 30, 2020, Indian Patent.
- (iv) "A Method for Preparing Three Dimensional Nanofibrous Composite Scaffold and a Product Thereof". Application No. 202011006354 February 13, 2020, Indian Patent.
- (v) "A novel suspension for three-dimensional bioprinting and a method of preparation thereof". Application No. 201911030419 July 27, 2019, Indian Patent.
- (vi) "A Syringe with Controlled Volume Dispensing System". Application No. 201811030441. Date of filing: August 14, 2018. Indian Patent. **(Granted)**
- (vii) "A Process of Preparation of Ordered Cell Metal Foam", Patent No. 347561. **(Granted)**

The above information is being disseminated for the benefit of all.