

Summary
of
DRISHTI Challenges

***“DPSU-driven Research
& Innovation for Strategic and
High- impact Technology
Integration”***

S. No.	Name of Agency	Number of Problem Statement
1	Hindustan Aeronautics Limited (HAL)	25
2	Bharat Electronics Limited (BEL)	18
3	Garden Reach Shipbuilders & Engineers Limited (GRSE)	7
4	Bharat Earth Movers Limited (BEML)	7
5	Yantra India Limited (YIL)	7
6	Armoured Vehicles Nigam Limited (AVNL)	5
7	Mazagon Dock Shipbuilders Limited (MDL)	4
8	Hindustan Shipyard Limited (HSL)	4
9	Bharat Dynamics Limited (BDL)	4
10	Goa Shipyard Limited (GSL)	3
11	Mishra Dhatu Nigam Limited (MIDHANI)	3
12	Gliders India Limited (GIL)	3
13	Troop Comforts Limited (TCL)	3
14	Munitions India Limited (MIL)	3
15	India Optel Limited (IOL)	3
16	Advanced Weapons and Equipment India Limited (AWEIL)	2
Total		101

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HAL (25 Challenges)

1

Head	Description
Nodal DPSU	HAL
Problem Statement	Assistance for performing flight test plan with real time data processing and analysis
Brief Description	Flight Test Engineer (FTE) assistance tool would assist in carrying out real time data processing and analysis as per Test Plan (Test Order).
Tentative total development budget	INR 5 Cr
PoC	Shri Mohan Kumar SV,HOFG(IADS) sv[at]hal-india[dot]co[dot]in

2

Head	Description
Nodal DPSU	HAL
Problem Statement	Active Repetitive Noise Reduction Adapter (ARNA) for Helicopter Cockpit and Cabin
Brief Description	An ANC system uses adaptive algorithms and sound sources to cancel unwanted cabin and cockpit noises in real time. The system integrates microphones, loudspeakers, DSP/FPGA- based controllers, and amplifiers to reduce repetitive noises, improving communication clarity and reducing fatigue.
Tentative total development budget	INR 5 Cr
PoC	Shri Krishna Prasad HOFG(Ele) ck[dot]prasad[at]hal-india[dot]co[dot]in

3.

Head	Description
Nodal DPSU	HAL
Problem Statement	Design and Development of Floatable stretcher (litter)
Brief Description	A Floatable stretcher is used in Helicopter in-flight search and rescue operations to winch (for lifting) the casualty for treatment. Indigenous floatable stretcher for airworthy application is not available.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Mr Thangraj, HOFG (DGMS) gm[dot]rwrdc[at]hal-india[dot]co[dot]in gms[dot]rwrdc[at]hal-india[dot]co[dot]in

4.

Head	Description
Nodal DPSU	HAL
Problem Statement	Development of Controlled Reception Pattern Array
Brief Description	The challenge is to develop a CRPA GNSS antenna which is compatible with existing receivers and which can enable the user to isolate particular constellations (Chinese Beidou) in order to obtain a position fix. The system should be robust enough to operate reliably in heavy GNSS jamming and spoofing environments.
Tentative total development budget	INR 1 Cr
PoC	Shri Pathing Kiran CM(PLRUAV) kiran[dot]raghuras[at]hal-india[dot]co[dot]in

5.

Head	Description
Nodal DPSU	HAL
Problem Statement	Design, Development and Creation of a High-Fidelity Digital Twin Software Model for a Gas Turbine Starter Engine.
Brief Description	<p>A data driven modelling approach suitable with user requirements.</p> <ul style="list-style-type: none"> • Modular software architecture with analytics, prognostics and visualisation layers. • Validation and verification framework to ensure model accuracy and efficacy. • Complete deliverables including source code, technical documentation and user / training material. • Project lifecycle with phased development, risk mitigation and customer acceptance milestone
Tentative total development budget	INR 5.12 Cr
PoC	Shri H M Mallikarjunaswamy DGM (I&C) m[dot]swamy[at]hal-india[dot]co[dot]in

6.

Head	Description
Nodal DPSU	HAL
Problem Statement	Graphics Processing Board (GPB) and its Test setup.
Brief Description	<p>The project shall be done in two phases (Phase-1 & Phase-2) Phase-1 : Proof of Concept: To validate the Input/Output Video and Graphics processing capability, Innovator shall develop the Prototype or Engineering Card and prove the following functionality.</p> <ul style="list-style-type: none"> • 2D & 3D display page generation. • Generation and display of graphic, alphanumeric and symbolic data. • Internally generated graphic symbology information overlaid with external input video. <ul style="list-style-type: none"> • External video without overlays. • Automatic Gain Control (AGC) circuitry in video processing path to compensate for any loss in video signal during transmission to/and receiving from other sources. • Resizing of raster video received in the desired size and aspect ratio for rendering on display frames and overlay of symbology on it. <ul style="list-style-type: none"> • Generation of various display frames of size and display of raster video along with symbology overlaid at the specified location on the display frame and display of other stroke symbology in the remaining area of display frame. • Display video with Video Pixel format shall be aligned at the centre of display surface as per external command received. • Display symbol shape shall not be distorted on cropping / scaling function by display i.e. a circle drawn shall not be distorted and get changed to oval shape. • Display of external video image with overlay of symbols and alphanumeric data. <ul style="list-style-type: none"> • Picture In Picture (PIP) display i.e. it shall be possible to resize the external video and place inside internally generated graphics symbology video. • Generation of snapshot of the displayed page on operator command and transmit the same in compressed/raw image format. • Read the image snapshot from external LRU's and display it on the screen based on operator command. • Maintenance & health monitoring information to the user. <ul style="list-style-type: none"> • Antialiasing features to avoid jagged lines/ stair casing effect on video. Innovator shall demonstrate the functionality on Input Video:

	<p>ARINC-818 Optical (speed upto 4.25 Gbps), ARINC-818 Copper ((speed upto 1.0625 Gbps), RGB STANAG3350B Output Video :ARINC-818 Optical (speed upto 4.25 Gbps), ARINC-818 Copper ((speed upto 1.0625 Gbps), RGB STANAG3350B, LVDS & DVI Phase-2 : Development of Graphics Processing Board(GPB): a) Innovator shall develop MIL-Standard 3U Graphics Processing Board based on Graphics based System on-Chip (SoC) with APIs, Libraries and Drivers compliant to OPEN GL 2.0. Programmable shading for enabling high performance 2D and 3D graphics having following Interfaces:</p> <ul style="list-style-type: none"> • ARINC-818 Inputs: i. 2 No’s of Independent Inputs ARINC-818-2 (optical) - (speed upto 4.25 Gbps)ii. 1 No’s of Independent Inputs ARINC-818-2 (copper) - (speed upto 1.0625 Gbps) • RGB STANAG3350B Inputs: 2 No’s of Independent Inputs • ARINC-818 Output: 1 No’s of Independent Inputs ARINC-818-2 (optical) - (speed upto 4.25 Gbps) • RGB STANAG3350B Output: 1 No’s of Independent Inputs • LVDS Output: 1 No of buffered Output (JEDA or VESA configurable) • DVI Output: 1 No • XMC Slot: 1 No’s • JTAG: 1 No’s • Debug Serial Port: 1 No’s (minimum) • PCIe Gen3 interface between GPB and other modules b) Innovator shall also develop one Test Jig to test all interfaces of 3U Board. An Acceptance Test Procedure (ATP) shall be prepared by Innovator, which shall be approved by CEMILAC. Innovator shall test the developed board as per approved ATP and to be delivered to HAL as a COTS Module.
Tentative total development budget	INR 1.45 Cr
PoC	Shri Shaik KhajaVali, DGM (Design) shaik[dot]vali[at]hal-india[dot]co[dot]in

7.

Head	Description
Nodal DPSU	HAL
Problem Statement	Development of Annealed Pyrolytic Graphite (APG) material Heat shunt and chassis for effective thermal performance.
Brief Description	<p>Project shall be done in two phases (Phase-1 & Phase-2) Phase-1: Proof of Concept: To validate the process of manufacturing of APG material Heat shunt and chassis with electronics module Engineering Cards and prove the thermal performance compared with legacy design.</p> <ul style="list-style-type: none"> • Graphics, SBC & IOCM Module thermal performance improvements for following conditions: <ul style="list-style-type: none"> • 55OC ambient for continuous operation – steady state condition • 65OC ambient for continuous operation – steady state condition • 71OC ambient for 30mins operation – Transient state condition • Chassis with 6U and/or 3U modules with $\frac{3}{4}$ ATR, $\frac{1}{2}$ ATR and custom size chassis for 250w power with conduction Colling for following conditions. <ul style="list-style-type: none"> • 55OC ambient for continuous operation – steady state condition • 65OC ambient for continuous operation – steady state condition • 71OC ambient for 30mins operation – Transient state condition <p>All the above development with sample engineering Heat shunt/sink should be tested with available module and Thermal analysis to be carried out using ANSYS ICEpak Phase-2 : Development for implementation on LRU:</p> <ul style="list-style-type: none"> • Innovator shall develop MIL-Standard Heat shunts/heat sinks and chassis with APG material and test the same for a given LRU for following

	<p>conditions:</p> <ul style="list-style-type: none"> • Graphics, SBC & IOCM Module thermal performance improvements for following conditions: • 55OC ambient for continuous operation – steady state condition • 65OC ambient for continuous operation – steady state condition • 71OC ambient for 30mins operation – Transient state condition • Chassis with 6U and/or 3U modules with $\frac{3}{4}$ ATR, $\frac{1}{2}$ ATR and custom size chassis for 250w power with conduction Colling for following conditions. • 55OC ambient for continuous operation – steady state condition • 65OC ambient for continuous operation – steady state condition • 71OC ambient for 30mins operation – Transient state condition
Tentative total development budget	INR 2 Cr
PoC	Shri A Siva Pavan Kumar,CM (Design) sivapavankumar[dot]a[at]hal-india[dot]co[dot]in

8.

Head	Description
Nodal DPSU	HAL
Problem Statement	Design & Manufacturing of Low Noise Compact Axial Fan
Brief Description	<p>Development of Axial fans with reduced noise and smaller form factor for Airborne Applications. The Spec for Axial Fans is given below.</p> <ol style="list-style-type: none"> 1. Application: Communication equipment for Airborne military applications 2. Size: 60mm x 60mm x 38mm (max dimensions including projections) 3. Weight: Not more than 175gm 4. *Rated Max Flow rate: 87 CFM 5. Operating flow rate:60cfm @ 300Pa 6. Fan supply voltage: DC supply specifications: I. Nominal operating voltage: 28V DC II. Operating voltage range: 16V to 32V DC III. Current at rated voltage: 2A (max) AC supply specifications: I. Operating voltage: 115V AC II. Frequency: 400Hz III. Phase: 1 phase or 3 phase** IV. Rated power: No specific limitation 7. Installation type: Circular or Square flange (preferable mounting hole dimension: ϕ 4.5 holes) 8. Operating temperature range: -400C to +710C 9. Storage temperature range: -550C to +850C 10. Noise: not more than 65 dB(A) 11. Speed control is desirable. *Rated max flow rate specification can be relaxed to meet noise specification. However, operating flow rate at desired pressure must be met without any compromise **Line voltage for 3 Phase fan is 200V
Tentative total development budget	INR 0.6 Cr
PoC	Shri Ramakrishna SV, CM(D) ramakrishna[dot]sv[at]hal-india[dot]co[dot]in

9.

Head	Description
Nodal DPSU	HAL
Problem Statement	Augmented Reality (AR) for remote visual assistance and pre-flight check inspection, automatic defect detection, predictive maintenance tool for Do-228 aircraft.
Brief Description	AI and Augmented Reality (AR) Challenge: <ul style="list-style-type: none"> • Real time visual guidance, remote expert guidance for Aircraft maintenance personnel • Pre-flight check inspection • Automatic defect detection (Cracks, Corrosion detection) • predictive maintenance (Visual)
Tentative total development budget	INR 0.75 Cr
PoC	Smt. Meena Kumari CM-Design meena[dot]kumari[at]hal-india[dot]co[dot]in

10.

Head	Description
Nodal DPSU	HAL
Problem Statement	Development of Permanent Magnet Rotor for 400 W Hydraulic Motor Driven Generator
Brief Description	<p>Development and Realisation of Permanent Magnet Rotor</p> <p>Development of 8 pole Permanent magnet Rotor rotating at 7500 RPM max.</p> <p>Size: Length of shaft = 82.3 mm Permanent magnet Rotor: Dia 49.4 mm and length 36 mm</p> <p>Weight: 900 grams approx. Selection of material, manufacturing and assembly of Permanent Magnet Rotor of Aerospace Grade i.e. MIL Grade.</p> <p>Environmental Temperature requirement: Permanent Magnet Rotor should work -55° to 200°C</p>
Tentative total development budget	INR 4 Cr
PoC	Shri Ashish Kumar Srivastava, DGM(D) ashish[dot]srivastava1[at]hal-india[dot]co[dot]in

11.

Head	Description
Nodal DPSU	HAL
Problem Statement	Design of Silencer in the ECS distribution system of fighter aircraft.
Brief Description	The challenge revolves around managing the limited space within an aircraft designated for the installation of a silencer. Availability of airworthy dissipation materials which are qualified for use. However, the system experiences inherent pressure fluctuations due to several factors: the operation of inline valves (opening and closing), varying engine RPM conditions, and changes in ambient pressure
Tentative total development budget	INR 3.5 Cr
PoC	Shri V C Bhaskar, AGM-ECS bhaskar[dot]vc[at]hal-india[dot]co[dot]in

12.

Head	Description
Nodal DPSU	HAL
Problem Statement	Development of laser based stealth & Signature Management Technology
Brief Description	Laser based stealth & Signature technology introduces active countermeasures which can deceive laser guided sensors, reduce detection probability across electro optical (EO) /infrared (IR) bands and enhance survivability against precision guided munitions.
Tentative total development budget	INR 10 Cr
PoC	Shri S K Dwivedi, DGM (D) Design_daa[dot]nsk[at]hal-india[dot]co[dot]in

13.

Head	Description
Nodal DPSU	HAL
Problem Statement	Elimination of rivet sinking in aircraft structural components.
Brief Description	Fuselage & structural assemblies of aircraft like wings, stabilizer, airbrake, canard etc. are riveted structures in fighter aircraft. In these structural assemblies, detail parts like skin, stringers, brackets, ribs, etc. are joined together by fasteners. Riveted joints are designed depending on the type of requirement, possible method of installation of rivets in structures and desired strength. In Russian origin aircraft, rivets are manufactured mainly from aluminium and steel alloys. During exploitation of aircraft, sinking (enlargement of c'sk hole) of heads of rivets with countersunk used for making joint of external skins are reported in different zones of aircraft.
Tentative total development budget	INR 2 Cr
PoC	Shri Naveen Chaturvedi CM(D) pankaj[dot]bharambe[at]hal-india[dot]co[dot]in

14.

Head	Description
Nodal DPSU	HAL
Problem Statement	Wireless Intercom System
Brief Description	<p>a. wireless network: enable clear, real-time, full duplex voice communication among crew members (headset to headset communication of upto 5 crew members) for short range upto 200m. support reliable wireless connectivity.</p> <p>b. noise management: advanced dsp, noise-cancelling microphone, and active noise suppression. provide hearing protection to safeguard against hazardous noise levels while preserving critical situational awareness. headsets with advanced technology like boneconduction.</p> <p>c. durability and usability: rugged, waterproof, dust resistant headsets with long battery life, easy channel setup and minimal infrastructure.</p> <p>d. ensure hands-free operation.</p> <p>e. ergonomic design.</p> <p>f. ptt and adjustable volume and sidetone features.</p> <p>g. inbuilt emi/emc protection.</p> <p>h. testing and validation in simulated and real time settings.</p> <p>i. 300 hz to 3.4 khz audio band</p>
Tentative total development budget	INR 2 Cr
PoC	Shri B K Malik, DGM(D) bijendrakumar[dot]malik[at]hal-india[dot]co[dot]in

15.

Head	Description
Nodal DPSU	HAL
Problem Statement	Noise Reduction in Cockpit and Cabin of Hindustan-228 aircraft
Brief Description	Noise reduction in Hindustan-228, (which is typical for a Turbo- Prop Fixed Wing aircraft) remains a challenge because any such add-on effort is mainly constrained by limits of weight, ventilation and safety. Still, meaningful reductions are possible, if the noise paths are targeted.
Tentative total development budget	INR 5 Cr
PoC	Shri Yogendra Singh,DGM-Design designengine[dot]knp[at]hal-india[dot]co[dot]in

16.

Head	Description
Nodal DPSU	HAL
Problem Statement	Setup of Technology for Development of 05 types of Ball Bearings for Airborne application
Brief Description	<ul style="list-style-type: none"> • Non-availability of technology for precise Bearings. • Non-availability of indigenous airworthy Bearing material. • Support to potential vendors • Limited business volume
Tentative total development budget	INR 2.5 Cr
PoC	Shri Manoj Kumar Gupta, DGM(Incharge) manoj[dot]gupta[at]hal-india[dot]co[dot]in

17.

Head	Description
Nodal DPSU	HAL
Problem Statement	Automation of I-level Test bench of Inertial Navigation System (G3INS)
Brief Description	Existing I-level test bench having manual test programs, it requires continuous operator involvement to give commands & position on rate testing table. Total 07 types of test Schedule required to perform on one G3INS unit. Total Testing duration is around 150 hrs to complete ATP of one G3INS.
Tentative total development budget	INR 1 Cr
PoC	Shri RK Jain, DGM (A&T-W & STEG) rajeev[dot]jain[at]hal-india[dot]co[dot]in

18.

Head	Description
Nodal DPSU	HAL
Problem Statement	AI & AR assisted comprehensive visual inspection of TPE331-12B engine of HTT-40 trainer aircraft
Brief Description	<p>The current process of managing ECL during Induction & Dispatch is largely a manual activity. Following are key issues:-</p> <ul style="list-style-type: none"> a.) ECL is carried out manually requiring significant time & effort, leading to potential oversight of critical items & FOD. Manual identification of serial numbers of accessories. b.) Visual inspections are conducted manually ,which may result in inconsistent inspection issues, missed defects etc., c.) Coordination of tasks during Induction/ Dispatch stages lacks efficiency, risk of delays & missed deadlines
Tentative total development budget	INR 1.53 Cr
PoC	Shri Sandip Kumar Burnwal, SM-Q Test House sandipburnwal[at]gmail[dot]com

19.

Head	Description
Nodal DPSU	HAL
Problem Statement	Autonomous Robotic fettling equipment for intricate and complex castings using Robotics and non-contact vision measurement systems
Brief Description	Present manual fettling operations have issues of low productivity, skill dependancy, quality inconsistency, unsafe working conditions.Hence, Autonomous Fettling equipment with Robo and vision measurement system is required to overcome the above issues.Development of Autonomous Robotic fettling equipment to suite various types of complex geometry of castings.
Tentative total development budget	INR 3 Cr
PoC	Shri Appa Rao Chundru, CM(PMG) apparaochundru[at]hal-india[dot]co[dot]in

20.

Head	Description
Nodal DPSU	HAL
Problem Statement	Tracking of location of tools & gauges in Aircraft Industry
Brief Description	Aircraft Industry uses a variety of tools and gauges during various stages of build-up of aircraft. These are loose tools that are prone to misplacement inside the aircraft due to the nature of work being carried out in highly congested / equipped zones of aircraft bays. Since a fighter aircraft would be undergoing various manoeuvres including roll and inverted flights, these tools/ gauges can become the reason for FOD thereby affecting the safety of the aircraft.
Tentative total development budget	INR 1 Cr
PoC	Shri P K Praveen, DGM(Inspection) praveen[dot]pk[at]hal-india[dot]co[dot]in

21.

Head	Description
Nodal DPSU	HAL
Problem Statement	Remote assistance using AR (Augmented Reality) and VR (Virtual Reality) in an intranet (LAN/WAN) environment.
Brief Description	Remote assistance using AR (Augmented Reality) and VR (Virtual Reality) is revolutionizing the way technical support, training, and collaboration are conducted. AR enhances the real world by overlaying digital information, allowing experts to guide users through tasks with visual cues, instructions, or diagrams. This is especially useful in defence industries where remote experts can provide step-by-step guidance without being physically present. VR, on the other hand, creates an immersive environment for remote users to engage with complex simulations, ideal for training or troubleshooting in a controlled virtual setting. Both technologies enable real-time interaction between users and experts, bridging geographical gaps, reducing downtime, and enhancing efficiency
Tentative total development budget	INR 1.5 Cr
PoC	Shri Rajesh DGM(IT) rajesh[dot]borse[at]hal-india[dot]co[dot]in

22.

Head	Description
Nodal DPSU	HAL
Problem Statement	Indigenization of Velocimeter (sensor) used in Tail Rotor Vibration Warning System (TRVWS).
Brief Description	TRVWS (Tail rotor vibration warning system) is used to acquire tail rotor vibrations in axial and radial directions in ALH/LCH and was developed by M/s. Merlinhawk in 2007 and they selected Velocimeters P.No.8866-1 supplied by M/s Honeywell. Accordingly, the TRVWS unit has been configured and tuned for the frequencies of Honeywell velocimeters.
Tentative total development budget	INR 0.55 Cr
PoC	Shri T.S. Babu, AGM(DLE,IND&AW)-H babu[dot]ts[at]hal-india[dot]co[dot]in

23.

Head	Description
Nodal DPSU	HAL
Problem Statement	Indigenization of Static Discharger (sensor) used in Helicopter
Brief Description	Static discharger is a high resistance electrical device installed on the tail bumper and Main rotor blades of the helicopter. The static discharger controls the corona discharge into the atmosphere, isolating noise and preventing it from interfering with aircraft communication systems. Applicable Mil-STD Specification of static discharger -MIL-STD9129 G
Tentative total development budget	INR 0.45 Cr
PoC	Shri T.S. Babu,AGM(DLE,IND&AW)-H babu[dot]ts[at]hal-india[dot]co[dot]in

24.

Head	Description
Nodal DPSU	HAL
Problem Statement	Indigenous Development of Fuel Booster pump for CTH/CTK Helicopter
Brief Description	Fuel Booster pump is a very critical part of Cheetah – Chetak Helicopter, plays a critical role in optimised and rated fuel supply to the engine.
Tentative total development budget	INR 3.6 Cr
PoC	Shri Siddhartha Sarkar CM-INDG & DLE s[dot]sarkar[at]hal-india[dot]co[dot]in

25.

Head	Description
Nodal DPSU	HAL
Problem Statement	Indigenous Development of Landing Light for CTH/CTK Helicopter
Brief Description	Landing Light is a motor driven LRU which is to be developed having an LED base .
Tentative total development budget	INR 0.55 Cr
PoC	Shri Shri Ashok Kumar Majee(CM-INDG&AW) ashok[dot]majee[at]hal-india[dot]co[dot]in

BEL (18 Challenges)

26.

Head	Description
Nodal DPSU	BEL
Problem Statement	Two-Channel Hybrid Rotary Joint (WR75 + SMA) for Polarization Axis of SATCOM-on-the-Move Antenna Systems
Brief Description	<p>To design and manufacture a two-channel hybrid rotary joint consisting of:</p> <ul style="list-style-type: none"> ● Channel-1: WR75 waveguide interface operating in 13.75–14.5 GHz Ku-band with power handling capability of 100 W and insertion loss ≤ 0.2 dB. ● Channel-2: Coaxial SMA interface operating in L-band (950–2150 MHz) supporting RF, 10 MHz reference and DC supply, with insertion loss ≤ 0.5 dB. ● It must be form-compatible with the existing POL axis mounting and fit within the maximum height of 78mm. <p>The rotary joint shall support continuous 360° rotation and be compact enough to integrate within a 0.4 m SOTM antenna system.</p> <p>Application: Polarization axis of SATCOM-on-the-Move (SOTM) antenna system.</p> <p>SATCOM-on-the-Move (SOTM) antenna systems require continuous polarization rotation to maintain communication with the satellite. The RF signals must pass across the rotating interface between the stationary electronics and the rotating antenna assembly.</p> <p>Currently BEL is attempting to develop required rotary joints through imported supplier. However, working module has not yet been realised. Development of compact hybrid rotary joint capable</p>

	<p>of transmitting Ku-band RF power through waveguide and L-band signals through coaxial interface across a continuously rotating axis will enable reliable system operation.</p> <p>The rotary joint will be integrated into the polarization axis of SATCOM-on-the-Move antenna systems used for any mobile satcom application.</p> <p>Platform applications include:</p> <ul style="list-style-type: none"> • Submarine mast mounted SATCOM systems • Land mobile SATCOM systems • Rail mobile SATCOM terminals • Larger antenna systems such as 1 m and 1.5 m SATCOM antennas <p>The rotary joint enables continuous polarization rotation while maintaining RF connectivity between stationary and rotating antenna subsystems.</p> <p>Design, development and testing of a two-channel hybrid rotary joint consisting of:</p> <ul style="list-style-type: none"> • WR75 waveguide rotary joint for Ku-band transmit path • SMA coaxial rotary joint for L-band receive path <p>Scope:</p> <ul style="list-style-type: none"> • RF design • mechanical design • precision manufacturing • RF characterization • environmental testing <p>Deliverables:</p> <ul style="list-style-type: none"> • Prototype rotary joint • Test reports and methodology.
<p>Tentative total development budget</p>	<p>INR 1.20 Cr</p>
<p>PoC</p>	<p>Shri. P Satya N Reddi Additional General Manager Strategic Communication Bharat Electronics Limited, Bengaluru-560013 Email: satyareddi[at]bel[dot]co[dot]in Landline No:+91-80-22195720</p>

27.

Head	Description
Nodal DPSU	BEL
Problem Statement	Ku-Band Solid State Power Amplifier (SSPA) for RF Seeker with inhouse designed GaN based PA device
Brief Description	<p>The challenge involves designing a compact, high-efficiency pulse power amplifier operating in the Ku-Band frequency range using indigenous GaN based Power Amplifier Devices</p> <p>It is proposed to be used in a high-power transmitter section of airborne radar in missile system.</p> <p>Design Development of Ku-Band Solid State Power Amplifier (SSPA) for RF Seeker based on indigenous GaN based PA device</p> <p>Compact high efficiency SSPA module of minimum 250W power (Pk) with indigenous GaN based PA device</p>
Tentative total development budget	INR 3.00 Cr
PoC	<p>Shri. Manjunath R Additional General Manager Seekers (RF & IR) Bharat Electronics Limited, Bengaluru-560013 Email: manjunathr[at]bel[dot]co[dot]in Landline No: +91-80-22195575</p>

28.

Head	Description
Nodal DPSU	BEL
Problem Statement	Indigenous Multi-Node Electronic Deception System
Brief Description	<p>The challenge is to develop an Indigenous Multi-Node Electronic Deception System capable of performing coordinated radar deception using a network of synchronized deception nodes.</p> <p>The system aims to introduce a new electronic warfare capability based on distributed deception, where multiple deception nodes operate together to generate believable radar signatures and synthetic radar targets.</p> <p>The proposed system will consist of:</p> <ul style="list-style-type: none"> • Multiple Deception Nodes (DN) deployed around protected radar systems • Each node equipped with Digital Radio Frequency Memory (DRFM) capable of capturing radar signals and retransmitting modified signals • A central Deception Controller responsible for coordination and deception planning • High-precision GPS-based synchronization to maintain coherent timing between nodes • AI-assisted algorithms to adapt deception strategies in real time. <p>Defensive Mode – Radar Position Masking</p> <p>In this mode, the system protects friendly radar assets from anti-radiation missile attacks.</p> <p>When a radar emits, deception nodes capture the radar signal and retransmit it from different locations with controlled delays. This creates multiple apparent radar emission sources in the electromagnetic spectrum.</p> <p>Enemy ESM systems detecting these signals will perceive several radar emitters rather than the actual radar location. As a result, adversary targeting systems cannot reliably determine which emitter corresponds to the real radar.</p> <p>This deception increases the survivability of radar installations by forcing adversaries to either attack multiple false positions or risk wasting missiles on decoys.</p> <p>Offensive Mode – Ghost Target Generation</p>

	<p>In offensive electronic warfare operations, the system can generate synthetic radar targets on enemy radar systems.</p> <p>Deception nodes intercept radar pulses transmitted by adversary radar systems. Using DRFM processing, the captured radar signals are modified and retransmitted with controlled delay, Doppler shift, and signal characteristics to simulate reflections from aircraft or missile targets.</p> <p>By coordinating multiple nodes, the system can create realistic radar target formations that appear as approaching aircraft or missile groups. These ghost targets can:</p> <ul style="list-style-type: none"> • overload enemy radar tracking systems • force adversaries to deploy interceptors against non-existent threats • reveal enemy air defence positions when they respond to false targets • create operational diversion during strike missions. <p>-----</p> <p>The challenge is to develop an Indigenous Multi-Node Electronic Deception System capable of performing coordinated radar deception using a network of synchronized deception nodes.</p> <p>The system aims to introduce a new electronic warfare capability based on distributed deception, where multiple deception nodes operate together to generate believable radar signatures and synthetic radar targets.</p> <p>The proposed system will consist of:</p> <ul style="list-style-type: none"> • Multiple Deception Nodes (DN) deployed around protected radar systems • Each node equipped with Digital Radio Frequency Memory (DRFM) capable of capturing radar signals and retransmitting modified signals • A central Deception Controller responsible for coordination and deception planning • High-precision GPS-based synchronization to maintain coherent timing between nodes • AI-assisted algorithms to adapt deception strategies in real time. <p>Defensive Mode – Radar Position Masking</p> <p>In this mode, the system protects friendly radar assets from anti-radiation missile attacks.</p> <p>When a radar emits, deception nodes capture the radar signal and retransmit it from different locations with controlled delays. This creates</p>
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	<p>multiple apparent radar emission sources in the electromagnetic spectrum.</p> <p>Enemy ESM systems detecting these signals will perceive several radar emitters rather than the actual radar location. As a result, adversary targeting systems cannot reliably determine which emitter corresponds to the real radar.</p> <p>This deception increases the survivability of radar installations by forcing adversaries to either attack multiple false positions or risk wasting missiles on decoys.</p> <p>Offensive Mode – Ghost Target Generation</p> <p>In offensive electronic warfare operations, the system can generate synthetic radar targets on enemy radar systems.</p> <p>Deception nodes intercept radar pulses transmitted by adversary radar systems. Using DRFM processing, the captured radar signals are modified and retransmitted with controlled delay, Doppler shift, and signal characteristics to simulate reflections from aircraft or missile targets.</p> <p>By coordinating multiple nodes, the system can create realistic radar target formations that appear as approaching aircraft or missile groups.</p> <p>These ghost targets can:</p> <ul style="list-style-type: none">• overload enemy radar tracking systems• force adversaries to deploy interceptors against non-existent threats• reveal enemy air defence positions when they respond to false targets• create operational diversion during strike missions. <p>The proposed prototype system shall include:</p> <ul style="list-style-type: none">• multiple DRFM-based deception nodes• centralized deception controller• radar signal interception and retransmission capability• AI-assisted deception planning algorithms• communication network between nodes and controller. <p>Testing may include:</p> <ul style="list-style-type: none">• RF signal validation• Radar deception performance testing• Electromagnetic compatibility testing 461F
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	<ul style="list-style-type: none">• Environmental testing- System should comply applicable clause of JSS 55555
Tentative total development budget	INR 3.00 Cr
PoC	Shri. Arvind Kumar Senior Deputy General Manager Bharat Electronics Limited, Ghaziabad-201010 Email: arvind_kumar[at]bel[dot]co[dot]in Landline No:+91-120-2813605

29.

Head	Description
Nodal DPSU	BEL
Problem Statement	High power strip line RF Power combiner - 8 way
Brief Description	<p>Reducing RF power losses associated with N-Way power combining at Ka band frequency (29-30GHz). 8Way power combiner is required in the realization of 250W Ka Band Amplifier where eight amplifiers each 40W output will be combined. The combiner should have high combining efficiency and all input ports and output port shall be matched to 50ohms impedance.</p> <p>Realization of High-power Amplifier combining multiple low power stages. Combining losses shall be less than 1dB. Developed RF combiner shall have loads to absorb the imbalance power between the input ports.</p> <p>High-power combiners for Ka band SATCOM HUBs</p> <p>Specifications:</p> <ol style="list-style-type: none"> a. Freq range: 29.0-30.0GHz b. No of inputs:8 c. I/P port return loss: less than -20dB d. Output port return loss: less than -20dB. e. Isolation between input ports: less than -20dB f. Maximum input power: 50W CW Avg g. Output port: Wave guide h. Acceptance test
Tentative total development budget	INR 0.30 Cr
PoC	<p>Shri. P Satya N Reddi Additional General Manager Strategic Communication Bharat Electronics Limited, Bengaluru-560013 Email: satyareddi[at]bel[dot]co[dot]in Landline No:+91-80- 22195720</p>

30.

Head	Description
Nodal DPSU	BEL
Problem Statement	Frequency Difference of Arrival based Direction of Arrival for Radar Signals
Brief Description	<p>Direction Of Arrival of the radar signal is primary parameter that needs to be measured by an EW system with very good accuracy. Hardware and firmware (algorithm) for measuring the direction of arrival based on the frequency difference of the radar signals intercepted needs to be developed.</p> <p>Direction Of Arrival for the radar signals needs to be measured based on the difference in frequency of the intercepted signals. Requisite hardware for intercepting the radar signals followed by the measurement of frequency difference of the signals needs to be devised. Suitable COTS hardware can also be considered for the purpose. Suitable algorithm required for the calculation of Direction Of Arrival using the difference in frequency needs to be developed. The hardware and firmware will be integrated with the present EW systems.</p> <p>Can be used in all ELINT / ESM systems with DoA measurement, suitable for all platforms.</p> <p>Operational functionalities and capabilities expected</p> <ol style="list-style-type: none"> a. Proposed solution should compact, light weight b. Frequency range of operation 2-18 GHz. c. Direction Of Arrival accuracies to be less than 1 deg rms. d. Algorithm to be able to be deployed on a FPGA platform e. Direction Of Arrival to be calculated for radar signal with Pulse width > 50 nsec f. Algorithm developed to tolerant for errors and noise in the actual system. g. Azimuth coverage should 360 deg. h. Compact hardware i. Fast computation of direction of arrival. <p>Testing as per approved Test plan</p>
Tentative total development budget	INR 3.50 Cr
PoC	<p>Smt. Madhumurthy D Senior Deputy General Manager Bharat Electronics Limited, Hyderabad-500076 Email: madhumurthyd[at]bel[dot]co[dot]in</p>

31.

Head	Description
Nodal DPSU	BEL
Problem Statement	Development of X-band Pressure Tight Radome for radar application
Brief Description	<p>Molded Pressure Tight Radome to be developed for radar application to withstand 45 bar hydrostatic pressure</p> <p>Radome to be molded around the radar Antenna. It must withstand 45 bar hydrostatic pressure and also have insertion loss < 1.5 dB at X-band (9.1-9.5 GHz)</p> <ul style="list-style-type: none"> ● Molding to meet 45 bar hydrostatic pressure ● RF Insertion loss < 1.5 dB ● Antenna beam should not be distorted ● Size of Antenna with Radome – 1000 (W)x156 (H)x220 (D) mm <p>It will be used in underwater naval platform for navigation purpose</p> <p>Pressure Testing for 45 bar hydrostatic pressure and RF radiation pattern measurement</p>
Tentative total development budget	INR 0.40 Cr
PoC	Shri VRUSHABHENDRA SHM

32.

Head	Description
Nodal DPSU	BEL
Problem Statement	Development of Smart Battery Management System (BMS) for lithium-ion battery pack
Brief Description	<p>The high end Smart BMS required for high voltage-high power Li-ion battery applications not available readily</p> <p>To develop a smart BMS with specified protection features along with configurable Software & communication interface</p> <p>The BMS shall be integrated with the high power Li-ion batteries intended for powering AFV, Helicopter, UAV & AUV</p> <p>Product level testing at ARAI as per applicable standards System level integration & testing shall be done by BEL</p>
Tentative total development budget	INR 3.00 Cr
PoC	<p>Shri. Parvinder Singh Additional General Manager Bharat Electronics Limited, Pune-411021 Email: parvindersingh[at]bel[dot]co[dot]in Landline No:+91-20-22903910</p>

33.

Head	Description
Nodal DPSU	BEL
Problem Statement	Development of an embedded solution for real -time image analysis using AI
Brief Description	<p>Embedded solution using AI for fire threat analysis</p> <p>To read the signature of flame or smoke using AI model implemented in embedded design, module is required to be developed.</p> <p>Fire detection & control system</p> <p>Development prototype to be incorporated in fire detection & control system for future development</p> <p>To Detect the fire flame/smoke signature & generate the alarm using optimum hardware usage</p>
Tentative total development budget	INR 0.20 Cr
PoC	<p>Smt. Anurag Kukreti Senior Deputy General Manager Bharat Electronics Limited, Kotdwara-246149 Email: anuragkukreti[at]bel[dot]co[dot]in Landline No:+91-01382-228479</p>

34.

Head	Description
Nodal DPSU	BEL
Problem Statement	1-18GHz Cavity Backed Spiral Antenna with dual circular polarizations for Airborne Application
Brief Description	<p>The challenge is to have minimum -5dBi gain for a maximum size of about 75mm diameter with dual circular polarizations including Radome and conduct Qualification Tests and certification from CEMILAC</p> <p>The Dual circular Polarization Antenna has to cover a wide band frequency from 1 to 18 GHz. The critical parameters are Gain and axial ratio within the dimensions</p> <p>The product is meant for airborne EW application for various platforms The product is meant for airborne EW application for various platforms</p> <p>The product to be complied to Technical specifications and subjected to environmental tests as per MIL STD 810 H and certification from CEMILAC to be obtained</p>
Tentative total development budget	INR 0.40 Cr
PoC	<p>Shri. Sadasivaiah M Additional General Manager Electronic Warfare & Avionics Bharat Electronics Limited, Bengaluru-560013 Email: sadasivaiahm[at]bel[dot]co[dot]in Landline No:+91-80-22195028</p>

35.

Head	Description
Nodal DPSU	BEL
Problem Statement	Design and development of 0.5 to 40 GHz Front End Receiver for Airborne Application.
Brief Description	<p>Design and development of a Wide band Front End Receiver with Low noise figure less than 10 db</p> <p>The Front End Receiver has to cover wide band frequency from 0.5 to 40 GHz. The critical parameters are Gain, Noise Figure, Spurious & Harmonic Levels that need to be maintained uniform response across the frequency band with temperature variation</p> <p>The product is meant for airborne EW application for various platforms</p> <p>The product to be complied to Technical specifications and subjected to environmental tests as per MIL STD 810H, MIL STD 461F EMI/EMC and MIL STD 704D and certification from CEMILAC to be obtained.</p>
Tentative total development budget	INR 0.60 Cr
PoC	<p>Shri. Sadasivaiah M Additional General Manager Electronic Warfare & Avionics Bharat Electronics Limited, Bengaluru-560013 Email: sadasivaiahm[at]bel[dot]co[dot]in Landline No:+91-80-22195028</p>

36.

Head	Description
Nodal DPSU	BEL
Problem Statement	Design and development of system for recognition and Cyber takeover of hostile drones
Brief Description	Design and development of intelligent, counter Unmanned Aerial System(UAS) solution capable of detecting, classifying, tracking and cyber take over for navigation control in contested air space. The system should detect drones, classify by analyzing emissions and captured images, and identify the signature / source information. Based on that, the system shall enable mission denial and control takeover of hostile drones to land them at designated places.
Tentative total development budget	INR 2.50 Cr
PoC	Smt. Soumitra Bhaumik Senior Deputy General Manager Bharat Electronics limited, Navi Mumbai-410208 Email: sbhaumik[at]bel[dot]co[dot]in Landline No:+91-022-39635826

37.

Head	Description
Nodal DPSU	BEL
Problem Statement	Detection of Hypersonic Missile
Brief Description	The emerging hypersonic cruise missiles, operating at more than 5 Mach speed with high manoeuvrability, low altitude and reduced cross section cause significant challenges to the existing Multi Function Surveillance Radars .The current Radars face limitations in early detection and continuous tracking of hypersonic cruise missiles due to their unique signatures.
Tentative total development budget	INR 3.60 Cr
PoC	Smt. Vani KN Additional General Manager Advanced Defence Systems-Navy Bharat Electronics Limited, Bengaluru-560013 Email: vanikn[at]bel[dot]co[dot]in Landline No:+91-80- 22195508

38.

Head	Description
Nodal DPSU	BEL
Problem Statement	Development of Acoustic sensors to detect the drones
Brief Description	To develop a system to acquire acoustic signals from various types of Drones/UAVs and to build a library. This will be useful in identifying different types of incoming drones/UAVs to take appropriate necessary action.
Tentative total development budget	INR 4.75 Cr
PoC	Shri. P Phani Kumar Senior Deputy General Manager Bharat Electronics Limited, Machilipatnam-521001 Email: phanikumar[at]bel[dot]co[dot]in Landline No:+91-86-62527330

39.

Head	Description
Nodal DPSU	BEL
Problem Statement	Digital Identity Verification and Cyber Surveillance
Brief Description	Automated Intelligence System for Digital Identity Verification and Cyber Surveillance
Tentative total development budget	INR 2.50 Cr
PoC	Smt. Anna Peter Additional General Manager Network & Cyber Security Bharat Electronics Limited, Bengaluru-560013 Email: annapeter[at]bel[dot]co[dot]in Landline No:+91-80- 22195563

40.

Head	Description
Nodal DPSU	BEL
Problem Statement	Ethernet Slip Ring and Rotary Joint Assembly
Brief Description	<p>"Slip Ring assembly with Power channels, Ethernet channels and RF channels as an integrated single unit in compact form factor. Hollow Slip ring should have minimum 2 channels of 48VDC/15A capacity, 2 serial RS 422 channels and Ethernet channel. Slip ring is to be integrated with dual channel RF rotary joint in L band frequency.</p> <p>The slip ring assembly should meet the Low temp (-40), high temperature (+70 DegC) and high altitude (5000m) conditions."</p>
Tentative total development budget	INR 1.20 Cr
PoC	<p>Shri. Anil Kumar Singh Additional General Manager Bharat Electronics Limited, Ghaziabad-201010 Email: anilkr Singh[at]bel[dot]co[dot]in Landline No:+91-0120- 2813720</p>

41.

Head	Description
Nodal DPSU	BEL
Problem Statement	Health Monitoring System for Sonar Transducers
Brief Description	"Maintaining the expected parameters of the Sonar Transducers is very critical towards ascertaining the sonar performance. Towards this, the Rx Sensitivity, Transmit Voltage Response, Tx and Rx beam forming of the transducers are to be measured periodically and calibrated. In some of the recent platforms due to the physical constraints onboard the same have not been provisioned. Requires a customised design of the Health monitoring System for these platforms."
Tentative total development budget	INR 3.00 Cr
PoC	Smt. Mini Nair S Additional General Manager Naval Systems (Sonar & Communication System) Bharat Electronics Limited, Bengaluru-560013 Email: mininairs[at]bel[dot]co[dot]in Landline No:+91-80- 22195614

42.

Head	Description
Nodal DPSU	BEL
Problem Statement	Sonar Performance Modelling Software
Brief Description	<p>Development of an indigenous, modular and scalable, performance modelling software solution, capable of predicting the operational effectiveness of active and passive sonar systems under variable oceanographic conditions. The performance of sonars deployed on naval platforms depends on complex and dynamic under water environments such as sound speed profile, bathymetry, sea bed properties and ambient noise. Accurate prediction of sonar performance under such conditions is essential for system design evaluation, mission planning and operational decision support.</p>
Tentative total development budget	INR 4.75 Cr
PoC	<p>Smt. Mini Nair S Additional General Manager Naval Systems (Sonar & Communication System) Bharat Electronics Limited, Bengaluru-560013 Email: mininairs[at]bel[dot]co[dot]in Landline No:+91-80- 22195614</p>

43.

Head	Description
Nodal DPSU	BEL
Problem Statement	Automatic Weather Station
Brief Description	It is compact, lightweight, highly accurate meteorological observing system to be used for a military use on tracked and wheeled vehicles. It measures wind speed, wind direction, barometric pressure, ambient air temperature and relative humidity. It transmits the results in a data package every 100 milliseconds via a communication interface.
Tentative total development budget	INR 1.00 Cr
PoC	Shri. R Y Chaudhari Additional General Manager Bharat Electronics Limited, Pune-411021 Email: rychaudhari[at]bel[dot]co[dot]in Landline No:+91-20- 22903800

GRSE (7 Challenges)

44.

Head	Description
Nodal DPSU	GRSE
Problem Statement	Development of indigenous ship design Software
Brief Description	<p>Indian defence shipbuilding currently relies heavily on imported, proprietary ship design and analysis software for hull form development, stability assessment, structural design, and performance optimisation. These tools involve high licensing costs and concerns related to data security, export controls, and long-term vendor dependency. The absence of a comprehensive, indigenous ship design software ecosystem limits self-reliance in warship design, restricts integration of Indian design standards and classification rules and constrains rapid design iteration, optimisation, and lifecycle support. There is a critical need to develop a secure, modular, scalable, and indigenous ship design software platform, tailored to Indian defence shipbuilding requirements, that can support end-to-end ship design from concept to production while ensuring data sovereignty, cost efficiency, and strategic autonomy.</p>
Tentative total development budget	TBD
PoC	<p>Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in</p>

45.

Head	Description
Nodal DPSU	GRSE
Problem Statement	AI powered Hull-form optimization
Brief Description	<p>Optimal designs of ship hulls that meet technical and operational requirements has always been a major challenge for naval architects. In practice, naval architects frequently seek design guidance from existing hull forms. Relevant approaches include line distortion and standard series analysis, in which the target hull form is acquired by applying slight adjustments to the lines plans of one or multiple reference hulls. Utilizing the fact that knowledge of previous hull structure and relation between various ship design parameters can be useful in designing a Ship’s Hull. Using Software the Designer only have to provide the details of the requirement of ship such as (operational requirements ,volume estimate, weight estimate etc.),The Software(using different machine learning such as DNN, Fuzzy-logic etc.) should provide a most optimal reference hull (along with its hydrostatic performance) which will help naval architects to derive the desired hull by modifying optimal reference hull. This Software should not only provide the optimal reference hull but also provides different possible hulls (with their hydrostatic performance), so that the designer should also be able to design that type of hull which is not previously made by any one.</p>
Tentative total development budget	INR 0.2 Cr
PoC	<p>Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in</p>

46.

Head	Description
Nodal DPSU	GRSE
Problem Statement	AI-Based Detection and Classification of Protective Coating Defects in Defence Platforms as per AMPP / NACE / SSPC / ISO Standards
Brief Description	<p>Defence platforms operate in highly aggressive environments (marine, tropical, industrial), where coating performance is vital for corrosion control and asset life extension. Inspection of coating defects such as blistering, rusting, pinholes, cracking, peeling, holidays, runs, sags, and surface contamination is currently performed visually by trained inspectors in accordance with AMPP (formerly NACE/SSPC) and ISO standards. However, manual inspection suffers from:</p> <ul style="list-style-type: none"> Subjectivity and inspector-to-inspector variability Limited traceability and documentation safety concerns due to work at height/confined spaces Inefficiencies in large-area inspection Delayed defect detection, leading to costly rework or corrosion damage. <p>The challenge is to develop an AI-based system capable of detecting, classifying, and grading coating defects using image/video data, mapped directly to recognized AMPP / NACE / SSPC / ISO coating standards, enabling objective, repeatable, and auditable inspection results.</p>
Tentative total development budget	INR 0.25 Cr
PoC	Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in

47.

Head	Description
Nodal DPSU	GRSE
Problem Statement	Minimising Deformation in thin plate high strength Steel Ship Structure
Brief Description	<p>Deformation of thin plate high strength steel structures on ships is a cause for concern from the perspective of aesthetics as well as functionality in some cases. The inherent properties of high strength thin steel plates make them vulnerable to deformation when welded as grillages to form critical ship structures. While welder skill is a key factor, proper sequence of welding, controlled welding etc can significantly reduce the deformations. However, every structure is unique in and tailoring the welding requirements is needed to ensure minimising the deformations. It is therefore proposed to develop a software based system that can determine an optimised welding and fitup solution for each case. The output can be provided along with the production drawings to facilitate due care during production. A suitable solution may be proposed.</p>
Tentative total development budget	INR 0.16 Cr
PoC	<p>Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in</p>

48.

Head	Description
Nodal DPSU	GRSE
Problem Statement	Monitoring workforce working inside a ship under construction to identify: 1. Number present at a given point in time 2. Identify anyone trapped inside in an emergency situation to enable faster rescue operation
Brief Description	In the high-risk environment of a shipyard, where tasks like welding, electrical work, and operating in confined spaces are routine, ensuring worker safety is crucial. Workers face significant hazards such as electrical shocks, sudden falls, and harmful welding fumes. Prolonged exposure to these fumes, especially in poorly ventilated areas, can lead to severe health issues or even fatalities if not promptly managed. Moreover, in the tight, often unnoticed spaces within under-construction ships, incidents like unconsciousness due to fatigue may go undetected, resulting in delayed medical care and increased risk of death. Challenge should provide remedies for : 1. Tracking of personnel during emergency roll calls and identifying if someone needs to be evacuated in the smallest possible time 2. To have means to get an SoS alarm from workers 3. Tracking of personnel if they are present at their work area during scheduled shift hours..
Tentative total development budget	INR 0.5 Cr
PoC	Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in

49.

Head	Description
Nodal DPSU	GRSE
Problem Statement	Advanced Dock finder Tool for dock scheduling
Brief Description	The current Dock Finder used at GRSE is a basic tool that helps determine the suitable docks for vessels based on their dimensions (length, breadth, draft) and manually entered tide data. While functional, this version is limited in its capabilities, particularly when dealing with complex docking schedules, multiple stages of vessel docking, and fluctuating tide data. An AI based solution is envisaged to address these limitations by incorporating comprehensive tide data, vessel-specific draft requirements at various stages (such as launching, CST, and pre-delivery), and enhanced visualization features. This tool should allow the shipyard to simulate various scenarios, such as delays or advancements in docking schedules, and generate detailed reports that can be included in build plans and strategies submitted to vessel owners. The tool's advanced features should significantly enhance the accuracy and efficiency of dock scheduling, enabling better resource management and planning at shipyard.
Tentative total development budget	INR 0.1 Cr
PoC	Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in

50.

Head	Description
Nodal DPSU	GRSE
Problem Statement	AI-Driven Propulsion Shaft Alignment and Real-Time Load Diagnostics for Enhanced Shipbuilding Efficiency
Brief Description	Development of an AI powered software integrated with empirical methods to optimize shaft alignment, minimize stress concentrations and ensure reliable performance. Core technology shall include: High-fidelity Finite Element Analysis (FEA) to model shaft behaviour under operational loads. Real-time bearing load and vibration monitoring through integrated sensor systems. Utilization of dynamic alignment techniques accounting for thermal growth and hull deflection.
Tentative total development budget	INR 0.05 Cr
PoC	Mr Anandarup Bhattacharjee SM (Indigenisation) Bhattacharjee[dot]A[at]grse[dot]co[dot]in

BEML (7 Challenges)

51.

Head	Description										
Nodal DPSU	BEML										
Problem Statement	Development of Graphite Based Wet Multiple Friction Disc for an Automatic Transmission. Application: OFF-Highway Rear Dump Truck.										
Brief Description	<p>Prior versions like Paper / Elastomer based friction disc element characteristics required performance enhancement at various terrain conditions. To overcome the above technology gap, Graphite based wet multiple discs are identified and globally recognised for performance improvement during various severe operating conditions in an automatic transmission wet multiple clutch engagement mechanism.</p> <p>Characteristics:</p> <ul style="list-style-type: none"> · High load grade having great elasticity. · Superior resistance to heat and oil. · Clutch Disc which has high heat resistance co-efficient and high energy absorbing capacity. · High durability. <p>Discs Variant Requirements:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 40%;">Description</th> <th style="width: 30%;">Qty/Assy.</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="vertical-align: top;">Graphite Based Friction Discs For Dump Truck Application (100 Ton Capacity)</td> <td>DISC-1 & 2: Wet-multiple Discs assembly</td> <td style="text-align: center;">10</td> </tr> <tr> <td>DISC-H, L & 4: Wet-multiple Discs assembly</td> <td style="text-align: center;">13</td> </tr> <tr> <td>DISC-3: Wet-multiple Discs assembly</td> <td style="text-align: center;">3</td> </tr> </tbody> </table>		Description	Qty/Assy.	Graphite Based Friction Discs For Dump Truck Application (100 Ton Capacity)	DISC-1 & 2: Wet-multiple Discs assembly	10	DISC-H, L & 4: Wet-multiple Discs assembly	13	DISC-3: Wet-multiple Discs assembly	3
	Description	Qty/Assy.									
Graphite Based Friction Discs For Dump Truck Application (100 Ton Capacity)	DISC-1 & 2: Wet-multiple Discs assembly	10									
	DISC-H, L & 4: Wet-multiple Discs assembly	13									
	DISC-3: Wet-multiple Discs assembly	3									
Tentative total development budget	INR 1.64 Cr										
PoC	Shri Hanumesh hanumesh[dot]k[at]bemlltd[dot]in										

52.

Head	Description
Nodal DPSU	BEML
Problem Statement	Electro Hydraulic Steering control system for BD46W-1 Wheel dozer.
Brief Description	<p>In Wheel dozer, during travelling the steering control is achieved through steering control system comprising the steering unit with steering wheel arrangement, Flow amplifier, steering cylinder and hydraulic steering pump.</p> <p>During travelling, steering will be achieved through rotating the steering wheel to the required direction by the operator. The operator needs to manually operate the steering wheel and is not able to perform parallel operations.</p> <p>To overcome this there is a need to develop an electro hydraulic steering control system with electronic joystick that makes the steering control by joystick operation easy and fatigue free and able to perform other operations parallelly.</p>
Tentative total development budget	INR 0.25 Cr
PoC	Shri Nagendra Babu nagendrababu[dot]sk[at]bemltd[dot]in

53.

Head	Description
Nodal DPSU	BEML
Problem Statement	Remote Monitoring & control of Water Jet system in water sprinklers.
Brief Description	Water jet operation is mandatory for firefighting in water sprinkler. Presently, the operation is manual. It requires additional personnel along with operator for performing this operation.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Vittal N R vittal[dot]nr[at]bemlltd[dot]in

54.

Head	Description
Nodal DPSU	BEML
Problem Statement	Design & Development of Swing Drive (Swing motor + Gear box + Spring applied hydraulically released parking brake) suitable for closed loop swing circuit on BE1000-1 Hydraulic Excavator (100-ton class Excavator)
Brief Description	Presently, Swing brake angle is 35 to 40 deg. when the joy is returned to neutral while the upper structure of the excavator is swinging. Whereas, the requirement is Swing brake angle shall be within 10 to 15 deg. when the joy is returned to neutral while the upper structure of the excavator is swinging.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Kannan K kannan[dot]k[at]bemltd[dot]in

55.

Head	Description
Nodal DPSU	BEML
Problem Statement	Design and Development of Hydraulic Motor for BG825 Motor Grader
Brief Description	The Hydraulic Motor is used for rotating Circle reverse gear on BG825 Motor Grader. It is one of the critical part & safety feature of the equipment. The motor is having full import content and no indigenous supplier is available.
Tentative total development budget	INR 0.1 Cr
PoC	Shri Karthikeyan. S karthikeyan[dot]s[at]bemlltd[dot]in

56.

Head	Description
Nodal DPSU	BEML
Problem Statement	Design & Development of Steering Valve for BG825 Motor Grader
Brief Description	The steering control unit is used for steering the equipment. It is one of the critical parts & safety features of the equipment.
Tentative total development budget	INR 0.05 Cr
PoC	Shri Karthikeyan. S karthikeyan[dot]s[at]bemlltd[dot]in

57.

Head	Description
Nodal DPSU	BEML
Problem Statement	<p>Indigenous development of following Engine sensors for Dozer, Excavator & Grader :</p> <ol style="list-style-type: none"> 1. Boost Pressure sensor 2. Oil Pressure Sensor 3. Coolant temperature 4. Exhaust temperature sensor
Brief Description	<p>Reduce Dependency on imported sensors by developing cost-effective, high reliability indigenous alternatives for Engine Boost Pressure sensor, Oil Pressure Sensor, Coolant temperature and Exhaust temperature sensor.</p>
Tentative total development budget	INR 0.2 Cr
PoC	<p>Ms. Jayalaxmi Kumari jayalaxmi[dot]kumari[at]bemlltd[dot]in</p>

YIL (7 Challenges)

58.

Head	Description
Nodal DPSU	YIL
Problem Statement	Development of Liner Main Charge for 84 mm HEAT 751 Ammunition
Brief Description	<p>Manufacturing Challenge:</p> <p>The primary manufacturing challenges include maintaining tolerances for the following:</p> <p>Circular runout: The circular runout shall be 0.02 mm applied to the outer diameter, with respect to the cone base surface.</p> <p>Surface Profile: The surface profile shall be 0.04 mm applied to the entire inner surface of the part.</p> <p>The finished component should meet the required mechanical and metallurgical properties, which should be specified based on the application needs.- Desired penetration (\geq 525mm) is not being achieved</p>
Tentative total development budget	INR 0.3 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

59.

Head	Description
Nodal DPSU	YIL
Problem Statement	Manufacturing of seamless steel tube of Grade En-24 of size approx 32mm thick, outside dia.480mm and length 2500mm or its multiple.
Brief Description	<p>Bomb shell can be mass manufactured through forging of specified grade seamless steel tube followed by machining and heat treatment to achieve desired properties in a cost effective way.</p> <p>However, development of forged quality aerial bombs is getting delayed due to non-availability of En-24 grade seamless tube in India which is being imported now.</p>
Tentative total development budget	INR 0.75 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

60.

Head	Description
Nodal DPSU	YIL
Problem Statement	Indigenization of DOW CORNING 3140-MIL-A-46146 RTV COATING IN 90 ML TUBE FORM WITH NOZZLE’.
Brief Description	Dow Corning 3140-MIL-A-46146, being imported from OEM only. As per the Govt. of India policy of Indigenization, items being imported need to be indigenized on the priority so that dependence on import is reduced and increase the self-reliance (Atmanirbhar Bharat)
Tentative total development budget	INR 0.05 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

61.

Head	Description
Nodal DPSU	YIL
Problem Statement	CONNECTOR PIN TO OFAJ DRG. NO. FS-2802A.
Brief Description	CONNECTOR PIN TO OFAJ DRG. NO. FS-2802A used in manufacturing of WARHEAD BODY ASSY- 84MM MK-III HEAT 551. Currently being imported from supplier - M/s ITT CANNON, USA. As per the Govt. of India policy of Indigenization, items being imported need to be indigenized on the priority so that dependence on import is reduced and increase the self-reliance (Atmanirbhar Bharat).
Tentative total development budget	INR 0.05 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

62.

Head	Description
Nodal DPSU	YIL
Problem Statement	SILICONE (UNISILKON) GREASE TK M 1011 FOR BALLISITIC CAP ASSLY.
Brief Description	SILICONE (UNISILKON) GREASE TK M 1011, being imported from OEM only. As per the Govt. of India policy of Indigenization, items being imported need to be indigenized on the priority so that dependence on import is reduced and increase the self-reliance (Atmanirbhar Bharat)
Tentative total development budget	INR 0.058 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

63.

Head	Description
Nodal DPSU	YIL
Problem Statement	WIRE ASSEMBLY NO 1 AS PER DRG NO FS-2905 B (673002905).
Brief Description	<p>WIRE NO 1 ASSY TO DRG NO FS-2905 CONSISTING OF :</p> <p>(1) WIRE NO 1 TO DRG NO FS-2800 B.</p> <p>(2) CONNECTOR PIN TO DRG NO FS-2802A.</p> <p>(3) HEAT SHRINKABLE TUBING DRG NO. FS-2801 B.</p> <p>Currently being imported from suppliers - M/s TE Connectivity USA for subassembly (1) & (3). M/s ITT CANNON, USA for sub assembly (2). As per the Govt. of India policy of Indigenization, items being imported need to be indigenized on the priority so that dependence on import is reduced and increase the self-reliance (Atmanirbhar Bharat)</p>
Tentative total development budget	INR 0.05 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

64.

Head	Description
Nodal DPSU	YIL
Problem Statement	GROUND STAINLESS STEEL ROD TO SPECIFICATION SS EN 10088-3-1. 4523+A SIZE: 12 MM DIA IN STRAIGHT LENGTH OF 2 TO 3 METRES.
Brief Description	GROUND STAINLESS STEEL ROD TO SPECIFICATION SS EN 10088-3-1. 4523+A SIZE: 12 MM DIA IN STRAIGHT LENGTH OF 2 TO 3 METRES, being imported from OEM only. As per the Govt. of India policy of Indigenization, items being imported need to be indigenized on the priority so that dependence on import is reduced and increase the self-reliance (Atmanirbhar Bharat)
Tentative total development budget	INR 0.48 Cr
PoC	Shri Ratan Mathur rkmathur[at]ord[dot]gov[dot]in

AVNL (5 Challenges)

65.

Head	Description
Nodal DPSU	Armoured Vehicles Nigam Limited (AVNL)
Problem Statement	Development of Amplifier to Drg No: PB2.035.030-01 for BMP-II Gun Stabilization system.
Brief Description	The amplifier is an electronic power and control unit used in the BMP-II gun stabilization system to amplify low-level command and feedback signals from the control circuits and sensors. It provides the required drive signals to the stabilization actuators, ensuring accurate, stable, and responsive control of gun movement in both elevation and traverse.
Tentative total development budget	INR 0.2 Cr
PoC	Mr. Sreenivasa Kumar Sama Email - skumarsama[at]ord[dot]gov[dot]in

66.

Head	Description
Nodal DPSU	Armoured Vehicles Nigam Limited (AVNL)
Problem Statement	Development of Rate Gyro for T-90 Gun Stabilization System.
Brief Description	The rate gyro unit is designed to generate electric signals proportional to the absolute angular speed of the gun in elevation and azimuth, which are required for the steady operation of the weapon stabilizer and for obtaining the desired transient.
Tentative total development budget	INR 0.25 Cr
PoC	Mr. Sreenivasa Kumar Sama Email - skumarsama[at]ord[dot]gov[dot]in

67.

Head	Description
Nodal DPSU	Armoured Vehicles Nigam Limited (AVNL)
Problem Statement	Development of Power Traverse for T-72 Gun Stabilization system.
Brief Description	The Power Traverse rotates the Turret weighing 13 T to 360 ° in azimuth through Ball race assembly with an positional accuracy of 2 milliradians.
Tentative total development budget	INR 0.75 Cr
PoC	Mr. Sreenivasa Kumar Sama Email - skumarsama[at]ord[dot]gov[dot]in

68.

Head	Description
Nodal DPSU	Armoured Vehicles Nigam Limited (AVNL)
Problem Statement	Development of Automatic Gun loading (Distribution Box KP175-3C) based on Solid- State Control Logic
Brief Description	To automatically select, position, and load the required 125 mm ammunition into the gun breech, thereby ensuring a consistent rate of fire, reducing crew workload, and enabling a compact turret configuration. Reliable functioning of the autoloader is essential for maintaining the firepower, operational availability, and combat effectiveness of the tank.
Tentative total development budget	INR 0.25 Cr
PoC	Mr. Sreenivasa Kumar Sama Email - skumarsama[at]ord[dot]gov[dot]in

69.

Head	Description
Nodal DPSU	Armoured Vehicles Nigam Limited (AVNL)
Problem Statement	Development of Directional Gyro (GPK-59) using latest technology
Brief Description	The gyro direction indicator is a navigation gyroscopic course indicator designed for driving the tank in the preset course under conditions of poor visibility of the terrain and absence of reference points as well as for indicating the direction of movement when the tank is driven under water.
Tentative total development budget	INR 0.10 Cr
PoC	Mr. Sreenivasa Kumar Sama Email - skumarsama[at]ord[dot]gov[dot]in

MDL (4 Challenges)

70.

Head	Description
Nodal DPSU	MDL
Problem Statement	AI-Based System for Design Change Impact Analysis and Cost Estimation
Brief Description	<p>At present, design change assessment and costing at MDL is largely manual, experience-based, and fragmented across departments. This creates the following challenges: 1. Unclear impact visibility- A single design change often affects multiple systems such as structure, propulsion, weapons, electrical, and outfitting. These cascading effects are difficult to identify early.</p> <p>2. Delayed and uncertain cost estimates- Due to the absence of reliable historical cost intelligence and the fast-changing nature of technology, accurate cost estimation at the problem-statement stage is difficult. As a result, cost projections often vary widely. 3. Cost overruns and schedule delays- Industry and MDL project data indicate that uncontrolled or late assessment of design changes can lead to 15–35% cost escalation over baseline estimates, along with schedule slippages. 4. Heavy dependence on manual expertise- Knowledge resides with individuals rather than systems, making the process slow, inconsistent, and difficult to scale. There is a clear need for a systematic, intelligent, and data-driven solution that can:</p> <p>1. Analyse design change requests at an early stage 2. Predict how a change will propagate across various design disciplines 3. Estimate the cost and schedule impact with reasonable confidence 4. Support management in taking faster and better-informed decisions</p> <p>Currently, such an integrated capability does not exist at MDL.</p>
Tentative total development budget	INR 1.5 Cr
PoC	Mr. Kawade Mahesh Jaywantrao (mkawade[at]mazdock[dot]com)/ Mr. Pradeep kumar Modak (pkmodak[at]mazdock[dot]com)

71.

Head	Description
Nodal DPSU	MDL
Problem Statement	AI tool for optimization of design w.r.t Class rules, standards, regulations etc. and synchronize 3D models with Bill of Material (BOM) to eliminate human errors
Brief Description	<p>Design changes are inevitable in shipbuilding projects, arising from evolution of customer requirements, supplier innovations, classification society feedback, or integration discoveries. Current data from commercial projects indicate that 25% of changes occur post contract design finalisation impact likely to propagate across hull, propulsion, weapons, and concerned systems.</p> <p>These propagated impacts may comprise of :</p> <ul style="list-style-type: none"> • Structural re-analysis and weight redistribution • Re-qualification testing and trials <p>The problem statement is to develop an AI-powered system that analyzes detail design parameters with respect to class rules, standards, regulations and predicts downstream impacts across disciplines, and provides intelligent inputs towards finalisation of detail design, incorporation of the design into the basic drawings before submission to the class and incorporation of latest approved revision in the production drawings post approval of the class.</p>
Tentative total development budget	INR 0.9 Cr
PoC	Mr. Kawade Mahesh Jaywantrao (mkawade[at]mazdock[dot]com)/ Mr. Pradeep kumar Modak (pkmodak[at]mazdock[dot]com)

72.

Head	Description
Nodal DPSU	MDL
Problem Statement	Digital Twin Sync (DTS) : Design 3D model is shared with production via tablet etc, scanned work is compared by AI to flag deviations, and changes are remotely synced by Design
Brief Description	Route changes of piping system ventilation system and relocation of equipment are inevitable in shipbuilding projects, arising from customer requirements, design needs, classification society feedback, or integration discoveries. Current data from various projects indicate that there is 25% of variation from production design resulting in rework and wastages. This requirement calls for a system where human resources shall be utilised efficiently for undertaking the tasks related to as fitted installations. The problem statement is to develop an AI-powered system that analyzes the as installed system with respect to the issued production system drawing and production drawings, look up for the deviations in the installed system, report to the user and send to the design department for evaluation and incorporation in as fitted drawings.
Tentative total development budget	INR 0.75 Cr
PoC	Mr. Kawade Mahesh Jaywantrao (mkawade[at]mazdock[dot]com)/ Mr. Pradeep kumar Modak (pkmodak[at]mazdock[dot]com)

73.

Head	Description
Nodal DPSU	MDL
Problem Statement	AI enabled intelligent system for drawing verification system for ensuring revision compliance in production drawings
Brief Description	<p>There is no automated system to:</p> <ul style="list-style-type: none"> • Compare production drawings with the latest class-approved drawings. • Track all historical revisions and changes. • Ensure every revision is fully implemented. • Flag missing or incorrect modifications. • Provide a compliance report before drawing release. <p>The current manual checking process cannot guarantee 100% accuracy, especially for complex ship structures involving hundreds of drawings and frequent revisions. Develop an automated digital solution that can:</p> <ul style="list-style-type: none"> • Ingest class-approved drawings (PDF/CAD/3D models) • Track all revision histories • Compare production drawings with approved versions • Detect missing or incorrect changes • Highlight non-compliance areas • Generate verification reports • Ensure only fully compliant drawings are released for production
Tentative total development budget	INR 1.5 Cr
PoC	Mr. Kawade Mahesh Jaywantrao (mkawade[at]mazdock[dot]com)/ Mr. Pradeep kumar Modak (pkmodak[at]mazdock[dot]com)

HSL (4 Challenges)

74.

Head	Description
Nodal DPSU	HSL
Problem Statement	Design and manufacture of weight for DP system on ship
Brief Description	<p>Technology Domain: Naval systems & Marine Technology</p> <p>The Light Weight Taut Wire system provides accurate measurements of a vessel's movement relative to a fixed known point in the fore-aft (along-ship) and port-starboard (athwart-ship) directions.</p> <p>The scope involves the design and manufacture of a depressor weight suitable for naval ships equipped with a dynamic positioning system.</p>
Tentative total development budget	INR 0.05 Cr
PoC	B. Chandini, Manager (Design), (chandini[dot]f638[at]hslvizag[dot]in)

75.

Head	Description
Nodal DPSU	HSL
Problem Statement	Design and manufacture of Anodes for Bow thrusters on ships
Brief Description	<p>Technology Domain: Naval systems & Marine Technology</p> <p>The sacrificial aluminum anodes are mounted on the thruster tunnels of the ship to protect the thrusters from electrolytic corrosion.</p> <p>The scope of this work involves the design and development of equivalent anodes—matching the existing anodes in weight and fixing arrangement—to replace the currently imported anodes used on Indian Navy (IN) vessels.</p>
Tentative total development budget	INR 0.07 Cr
PoC	B. Chandini, Manager (Design), (chandini[dot]f638[at]hslvizag[dot]in)

76.

Head	Description
Nodal DPSU	HSL
Problem Statement	Design of AI based on tool for verification ship design based
Brief Description	<p>Technology Domain: Artificial Intelligence & Machine Learning</p> <p>The AI-Driven Design Validator is an intelligent assistant designed to support design engineers in shipbuilding projects. It leverages Large Language Models (LLMs) to interpret design rules, verify regulatory compliance, answer domain-specific queries, and enable automated digital validation of engineering designs.</p>
Tentative total development budget	INR 0.8 Cr
PoC	B. Chandini, Manager (Design), (chandini[dot]f638[at]hslvizag[dot]in)

77.

Head	Description
Nodal DPSU	HSL
Problem Statement	Concept design of LCM for use of LPDs
Brief Description	<p>Technology Domain: Naval systems & Marine Technology</p> <p>Landing Craft Mechanized (LCM) serves as a critical link in amphibious assault operations, transporting vehicles, personnel, and cargo from a ship's flooded well deck to the shore. The scope involves developing a concept design of an LCM to identify key design drivers that influence functional requirements and to estimate the cost, bill of materials (BOM), and performance at sea.</p>
Tentative total development budget	INR 0.4 Cr
PoC	B. Chandini, Manager (Design), (chandini[dot]f638[at]hslvizag[dot]in)

BDL (4 Challenges)

78.

Head	Description
Nodal DPSU	Bharat Dynamics Limited (BDL)
Problem Statement	Indigenization of DC-DC Converter Module with EMI Filter
Brief Description	<p>DC- DC Converter: Triple output DC/DC converters provide a wide input voltage range of 16 to 48 VDC delivering 15 watts of total output power with output voltages of +5 and ±15 VDC. The main output, +5 VDC, will supply up to 7.5 watts and the auxiliaries will supply up to 7.5 watts of combined power. Operating temperature range is -55°C to +125°C. It should provide transient protection up to 80V for up to 120ms. It should be fully isolated and should provide indefinite short circuit protection. It should have efficiency greater than 85%. Dimension of DC-DC converter should be 38x30x9 mm (LxWxH) (Approx.) and weight should be less than 35gms. The converter should be fully compliant to “883” MIL-PRF-38534 Class H screening. It will be used in Airborne system.</p> <p>EMI Filter: EMI filter and transient suppression module combines EMI filtering and transient protection. The EMI filter reduces the reflected ripple current from DC-DC switching converters. As a protection module, it suppresses input transients on the power bus to protect the converter and other downstream components. The filter’s input voltage range is 16V to 40V and 40W Power. Operating temperature range is -55°C to +125°C. Dimension of EMI Filter should be 75x30x11 mm (LxWxH) (Approx.) and weight should be less than 50gms. The filters should meet all the requirements of MIL-STD-461E/F and MIL-STD-704D. It will be used in Airborne system.</p>
Tentative total development budget	INR 1.5 Cr
PoC	<p>Avinash Kolukoori Senior Manager (Design & Engineering) Email - bdl-idex[at]bdl-india[dot]in</p>

79.

Head	Description
Nodal DPSU	Bharat Dynamics Limited (BDL)
Problem Statement	Indigenization of Multi-Section (Double T) EMI / EMC Filter
Brief Description	EMI/EMC filters suppress electromagnetic interference on power and signal lines, while allowing desired signals to pass. It should be 50VDC, 10Amp and Multi-Section double T filter. It should be “thread type hermetically sealed cylindrical EMI Filter”. Diameter should be less than 11mm and thread length should be less than 8mm. Filter frequency range is 30KHz to 10GHz. It should be qualified to MIL-F-28861 Class B. It will be used in Airborne system.
Tentative total development budget	INR 0.5 Cr
PoC	Avinash Kolukoori Senior Manager (Design & Engineering) Email - bdl-idex[at]bdl-india[dot]in

80.

Head	Description
Nodal DPSU	Bharat Dynamics Limited (BDL)
Problem Statement	Indigenization of Mil-grade Metal Transit Container with automatic pressure release valve
Brief Description	<p>This is a ruggedized metal container to store and transport defence Electro-Mechanical equipment. It should be comfortable to carry and strong enough to withstand any transportation loads/ bumps without any damage to the components inside. It should be water tight, dust proof and should have an automatic pressure relief valve to stabilize the pressure inside the container with the external environment. Provision must be provided for mounting of panel and internal lid assembly. Material is Aluminium Alloy 6061 (Deep drawn) with dimensions: $\approx 400 \times 300 \times 200$ mm (Approx.) It should comply with Mil std 108 E (or) other equivalent Mil standards for containers.</p>
Tentative total development budget	INR 0.5 Cr
PoC	<p>Avinash Kolukoori Senior Manager (Design & Engineering) Email - bdl-idex[at]bdl-india[dot]in</p>

81.

Head	Description
Nodal DPSU	Bharat Dynamics Limited (BDL)
Problem Statement	Indigenization of Long Unified Coarse Studs
Brief Description	The ‘LONG UNIFIED COARSE STUD’ is a mechanical fastening stud. It is used to clamp two airborne equipment together. It should withstand airborne loads & vibrations and hold the equipment intact. Material should be AISI SS 303 (free machining Cr-Ni Austenitic SS) as per ASTM A582 (Annealed & cold drawn). Dimensions of the stud are 200-220 mm length with diameter 8-12 mm (Approx.) and weight should be around 50 grams. It should be qualified to Mil std 810 H.
Tentative total development budget	INR 0.5 Cr
PoC	Avinash Kolukoori Senior Manager (Design & Engineering) Email - bdl-idex[at]bdl-india[dot]in

GSL (3 Challenges)

82.

Head	Description
Nodal DPSU	GSL
Problem Statement	AI-enabled Assessment platform for Technical Scrutiny of document
Brief Description	<p>Technology Domain: Artificial Intelligence & Machine Learning</p> <p>To design and deploy an on-premises, AI-enabled digital platform that assists the shipyard team in generating an initial assessment report based on responses received from OEMs/applicants, in accordance with the technical specifications, approved SOTR, and stated requirements. The platform will map these responses against the requirements and present them in prescribed formats currently used to finalize TNCs/PNCs reports.</p>
Tentative total development budget	TBD
PoC	<p>Sameer Narsapur Senior Manager sameernarasapur[at]goashipyard[dot]com</p>

83.

Head	Description
Nodal DPSU	GSL
Problem Statement	Development of AI Based Electrical Design Documentation
Brief Description	<p>Technology Domain: Artificial Intelligence & Machine Learning</p> <p>Development of AI-based system for electrical design documentation viz., main cable run of the ship along with the types of required cable glands as per the cables passing through each compartment and then generating a Bill of Material (BOM) of required cable glands, cable routing, computation & reporting of cable tray filling data, validation of routing logic, data handling, and output accuracy.</p> <p>This automates the creation, management, and verification of main cable run drawings and extracts bills of materials (BOM) specifically for cable glands, alongside generating electrical schematics, and technical documents. The system shall utilize machine learning to automate drawing creation, identify and list components, including cable glands, and ensure documentation adheres to industry standards.</p> <p>It must feature a user-friendly interface for interaction and review, which shall be provided with the general arrangement drawing of the ship to generate the required details which include cable routes, penetration details, cable tray layouts, gland specification, material quantities and associated electrical documentation, required for design review, approval and execution.</p>
Tentative total development budget	TBD
PoC	Sameer Narsapur, Senior Manager sameernarasapur[at]goashipyard[dot]com

84.

Head	Description
Nodal DPSU	GSL
Problem Statement	AI Based Optimization of Compartment Layout
Brief Description	<p>Technology Domain: Artificial Intelligence & Machine Learning:</p> <p>The optimization of ship compartment layouts is a critical task so that all the equipment sub - systems are optimally placed in the compartment considering the equipment dimensions, seating arrangements, maintenance space, cooling requirements, etc. Traditional methods often struggle with the complexity of balancing various constraints, such as structural integrity, accessibility, and compliance with safety regulations.</p> <p>This problem involves arranging compartments in a manner that maximizes space utilization, minimizes construction costs, and ensures safety and operational efficiency. An AI-based optimization system presents a promising solution, capable of handling the intricate trade-offs and vast combinatorial possibilities involved in the layout design process.</p> <p>By leveraging advanced algorithms like genetic algorithms, reinforcement learning, and neural networks, this system can generate optimal or near-optimal layouts that align with specific design criteria and constraints. This approach not only streamlines the design process but also leads to more innovative and efficient ship designs, offering significant advantages over traditional methodologies.</p>
Tentative total development budget	TBD
PoC	Sameer Narsapur, Senior Manager sameernarasapur[at]goashipyard[dot]com

MIDHANI (3 Challenges)

85.

Head	Description
Nodal DPSU	MIDHANI
Problem Statement	Var crucible cleaning equipment
Brief Description	<p>VAR furnace uses a copper crucible of different diameters and lengths. Multiple alloys are melted in this crucible. Crucible cleaning is a very important step after each melt to avoid any contamination. Multiple method / machine are already available,</p> <p>However they are not efficient and leave uncleaned patches. There is a requirement of a crucible cleaning equipment or an add-on to existing equipment, which will improve the efficiency of the cleaning.</p>
Tentative total development budget	TBD
PoC	Dr. Saurabh Dixit (dixits[at]midhani-india[dot]in)

86.

Head	Description
Nodal DPSU	MIDHANI
Problem Statement	Induction furnace lining health monitoring system
Brief Description	<p>The induction furnace (Air and Vacuum) has a refractory lining. This lining has a limited life. This refractory lining erodes during the melting process. The refractory lining needs to be changed after 1. GLD alarm trigger 2. it reaches a fixed hours of operation.</p> <p>There is a device/ equipment required that can inform about the erosion behavior of the refractory lining after the melt. It should also tell about any severe damage or cracks in the refractory lining. The whole analysis process should be fast enough so that it should not affect the production activity.</p>
Tentative total development budget	TBD
PoC	Dr. Saurabh Dixit (dixits[at]midhani-india[dot]in)

87.

Head	Description
Nodal DPSU	MIDHANI
Problem Statement	Indigenization of ALUMINIUM MOLYBDENUM TITANIUM master alloy production
Brief Description	<p>There is a regular requirement of Aluminium Molybdenum Titanium master alloy in steel making industries. Currently good quality of this master alloy is being imported. There is a need to have a reliable indigenous source for these master alloys. The specification of Al-Mo Ti master alloy is given below.</p> <p>Aluminium : (Al) - Balance (40-44 %). Molybdenum : (Mo) - 48 - 52 %. Titanium : (Ti) - 6-9 %. Oxygen : (O) - 0.15 % max. Nitrogen : (N) - 0.05 % max. Phosphorous : (P) - 0.01 % max. Sulphur : (S) - 0.01 % max, Tungsten : (W) - 0.015 % max. Iron : (Fe) - 0.60 % max, Carbon : (C) - 0.10 % max. Silicon : (Si) - 0.50 % max. Boron : (B) - 0.005 % max. Magnesium : (Mg) - 0.25 % max. Chromium : (Cr) - 0.30 % max. Copper : (Cu) - 0.12 % max All other Element each : 0.10 % max. Size : - 10 mm max.</p> <p>The percentage of fines in the alloy should be as low as possible.</p> <p>PROCESS OF MANUFACTURE: The material shall be manufactured by Aluminothermic process followed by melting in vacuum induction melting furnace (double melting), or shall be manufactured by only Aluminothermic process, or shall be manufactured in Vacuum induction Melting furnace, but shall ensure the chemical composition as above. The equipment used for manufacturing, processing and inspecting the master alloys must be exclusively for making master alloys intended for Titanium alloy production. Any other novel method may also be used subject to meeting the requirements.</p>
Tentative total development budget	TBD
PoC	Dr. Saurabh Dixit (dixits[at]midhani-india[dot]in)

GIL (3 Challenges)

88.

Head	Description
Nodal DPSU	GIL
Problem Statement	Design & Development of Altimeter for Paratrooping and Skydiving
Brief Description	<p>The challenge aims to design, develop, test, trial and certify a wrist mounted analogue altimeter for paratrooping and skydiving applications. Each parachutist needs an altimeter to determine his altitude above the ground during free fall. Altimeter is usually provided to Parajumpers for his guidance and initiation of Main/Reserve deployment.</p> <p>Design requirement of Altimeter:</p> <ul style="list-style-type: none"> (i) It should be a wrist mounted analogue altimeter. (ii) It should display altitude readings in feet. (iii) It should be shock proof, rugged and water resistant. (iv) It should have an adjustable electroluminescent backlight for night jumping. (v) Operating altitude must be 0 feet to 30,000 feet or more in terms of temperature and pressure resilience should be tolerable by the Altimeter. (vi) It should have scratch resistant display glass.
Tentative total development budget	INR 0.2 Cr
PoC	Shri Praveen Chandra, Manager praveenchandra[at]ord[dot]gov[dot]in

89.

Head	Description
Nodal DPSU	GIL
Problem Statement	Design & Development of Compass for Paratrooping and Skydiving
Brief Description	<p>The challenge aims to design, develop and certify a magnetic compass specifically suited for paratrooping and skydiving applications. Each parachutist needs a compass to determine direction in case of separation from the group or during limited visibility, such as when passing through cloud layers. Compass unaffected by pressure changes or cold weather is usually recommended for the above challenge domain. The compass must show direction regardless of its mounted attitude on the parachutist.</p> <p>Design requirement of Compass:</p> <ul style="list-style-type: none"> (i) It should be Magnetic and chest/belly/ wrist mounted. (ii) It should be luminous to enable usage during night jump. (iii) It should be able to set and indicate a predetermined direction and rotate 360 deg. (iv) It should be water resistant and shock proof. (v) It should be lightweight, total weight not to exceed 100 grams.
Tentative total development budget	INR 0.15 Cr
PoC	Shri Praveen Chandra, Manager praveenchandra[at]ord[dot]gov[dot]in

90.

Head	Description
Nodal DPSU	GIL
Problem Statement	Design and Development of a Proximity Sensor for Paratrooping and Skydiving
Brief Description	<p>The challenge aims to design and develop a compact, lightweight, rugged and reliable proximity sensor capable of providing real time alerts to paratroopers regarding proximity to ground, buildings or other hard surfaces during descent and landing, irrespective of jumper posture and environmental conditions.</p> <p>Design requirement of Altimeter:</p> <ol style="list-style-type: none"> 1. The Proximity Sensor shall be designed to assist paratroopers during descent and landing by providing advance warning of proximity to ground, buildings or other hard surfaces. 2. The sensor shall operate over an altitude range of 0 m to 300 m Above Ground Level (AGL). 3. The sensor shall be capable of real time detection of hard surfaces including land, buildings and other obstacles within a detection range from 300 m. 4. Upon detection of ground or hard surfaces, the sensor shall generate a clear, timely and unambiguous audible alert to the paratrooper. 5. The sensor shall function effectively under all operational weather and environmental conditions, including: <ul style="list-style-type: none"> • Day and night operations • Fog, dust and haze • High wind conditions • Other adverse climatic conditions 6. The sensor shall be compact, lightweight and of small form factor, suitable for use by paratroopers without restricting movement or affecting safety. 7. The sensor shall be rugged, shock-proof and water-resistant, capable of withstanding operational stresses during airborne operations and landing impact. 8. The sensor shall have low power consumption and shall be powered by an internal battery with sufficient backup to support the complete duration of a jump, including contingency margins. 9. The sensor shall reliably detect proximity to hard surfaces irrespective of the paratrooper posture or orientation during descent.
Tentative total development budget	INR 0.15 Cr
PoC	Shri Praveen Chandra, Manager (praveenchandra[at]ord[dot]gov[dot]in)

TCL (3 Challenges)

91.

Head	Description
Nodal DPSU	TCL
Problem Statement	Development of Control Valve used for regulation of fuel supply in Heater Space Oil & Gas Burner used by Indian Army, Indian Air Force, BRO, NDRF etc.
Brief Description	<p>Heater Space Oil & Gas Burner is a device for heating the tent, room and other spaces of accommodations by Indian Army, Indian Air Force, Border Road Organization, NDRF etc.</p> <p>The control valve used in the HSOB is ex-import item and widely used for regulation of fuel supply to the burner, necessitating indigenization.</p>
Tentative total development budget	INR 0.096 Cr
PoC	Shri Manish Yadav, Sr. Manager/OEF Kanpur (manishkryadav[at]ord[dot]gov[dot]in)

92.

Head	Description
Nodal DPSU	TCL
Problem Statement	Development of non-repeatable MSCN fabric across all possible spectrum.
Brief Description	<p>Modern battlefields are dominated by multi-sensor surveillance systems, AI-based pattern recognition and automated target detection operating across the visible, infrared, and radar spectrums .</p> <p>Conventional camouflage nets, which largely rely on repetitive visual patterns and limited spectral control, are increasingly vulnerable to detection by these advanced systems.</p>
Tentative total development budget	INR 0.2 Cr
PoC	Shri Rishi Babu, Dy. General Manager/OCF Shahjahanpur (rishibabu[at]ord[dot]gov[dot]in)

93.

Head	Description
Nodal DPSU	TCL
Problem Statement	Improvement of colour fastness properties of Combat Uniform Fabric used by Defence forces
Brief Description	The current challenge lies in achieving consistent and durable colour fastness in combat uniform fabrics without compromising other critical operational requirements such as durability, wearer comfort, and camouflage performance.
Tentative total development budget	INR 0.1 Cr
PoC	Shri P Senthil Kumar, General Manager/OCF Avadi (psenthilkumar[at]ord[dot]gov[dot]in)

MIL (3 Challenges)

94.

Head	Description
Nodal DPSU	MIL
Problem Statement	Electric Detonator N8T
Brief Description	Electric Detonator NBT is the main component (Silver Azide based) of Safe Arming Device (SAD) of Fuze to produce the energy, for igniting Booster Pellet of Precursor Charge of Nose Assy, of 84mm HEAT-751 and to function shell body of 84mm HEDP – 502. Due to non-availability of Silver Azide manufacturing cum facility, the item could not be developed.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Abhishek Namdeo, JWM/OFK ofkrnd[at]ord[dot]gov[dot]in

95.

Head	Description
Nodal DPSU	MIL
Problem Statement	Electric Detonator N8TP
Brief Description	Electric Detonator N8TP is the main component (Silver Azide based) of Safe Arming Device (SAD) of Fuze to produce the energy for igniting Booster Pellet of Main Charge of 84mm HEAT 751. Due to non-availability of Silver Azide manufacturing cum facility, the item could not be developed.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Abhishek Namdeo, JWM/OFK ofkrnd[at]ord[dot]gov[dot]in

96.

Head	Description
Nodal DPSU	MIL
Problem Statement	Electric Detonator 5mm No3
Brief Description	Electric Detonator 5mm No 3 is the main component (Silver Azide based) of Safe Arming Device (SAD) of Fuze to produce the energy for igniting Booster Pellet of 84mm HEDP – 502. Due to non-availability of Silver Azide manufacturing cum facility, the item could not be developed.
Tentative total development budget	INR 0.25 Cr
PoC	Shri Abhishek Namdeo, JWM/OFK ofkrnd[at]ord[dot]gov[dot]in

IOL (3 Challenges)

97.

Head	Description
Nodal DPSU	IOL
Problem Statement	Development of alternative material to replace TFS (Tritium Fluorescence Source) used in Scales of Sights for continuous illumination at night time.
Brief Description	<p>The challenge involves replacing TFS (Tritium-Based Radioluminescent Material), which is commonly used in Scales of Sights for continuous night-time illumination. Tritium excites phosphor coatings to emit visible light, enabling precise scale readings during night-time operations and providing a reliable, continuous glow in low-light conditions without any external power source.</p> <p>One of the primary challenges with TFS is its restricted production and procurement due to stringent regulatory and statutory requirements being a radioactive material. As a result, there is a need to eliminate this radioactive material and identify a suitable alternative material. The objective is therefore to replace TFS with a substitute material that maintains MIL-STD-810 durability standards (e.g., resistance to extreme temperatures, shock, vibration, humidity, and dust as per MIL-STD-810), while ensuring reliable continuous night-time illumination, zero-maintenance performance in field conditions, and seamless integration into existing systems.</p>
Tentative total development budget	INR 0.20 Cr
PoC	Ms. Divya Gautam (divyagautam[at]ord[dot]gov[dot]in)

98.

Head	Description
Nodal DPSU	IOL
Problem Statement	Induction Gyromotor GMA 4 as per Specification No. 078.00.00.000 TU
Brief Description	The item is used in the Gyroscope Assembly of the Gyro Stabilizer of the 1A43 Gunner's Fire Control System of Tank T-90. The item is not manufactured in India and has been imported from the Russian OEM till date. Gyro Stabilizer for 1A43 FCS is 2-axis stabilized assembly and is critical in nature. The Gyromotor GMA-4 rotates at a high RPM to provide mechanical stabilization to the gun in the tank.
Tentative total development budget	INR 0.5 Cr
PoC	Mr. Shubham Bijalwan (subhambijlwan[at]ord[dot]gov[dot]in)

99.

Head	Description
Nodal DPSU	IOL
Problem Statement	Motor DPM-20N3-01 as per OST 160.515.022-76
Brief Description	It is a miniature DC Motor and is used in the Controlling Mechanism Assembly of the Missile Information Block of 1A43 Gunner's Fire Control System. The motor controls the timing mechanism of the Laser Field for the missile firing from Tank T-72. The motor RPM during operations goes beyond 9000 rpm.
Tentative total development budget	INR 0.25 Cr
PoC	Mr. Shubham Bijalwan (subhambijlwan[at]ord[dot]gov[dot]in)

AWEIL (2 Challenges)

100.

Head	Description
Nodal DPSU	AWEIL
Problem Statement	DU-125 Muzzle Angle
Brief Description	<p>The DU-125 is an optical instrument that determines the muzzle angle of tank gun barrels.</p> <p>The muzzle angle is defined as the angle between: The geometrical axis of the barrel bore (straight line connecting the breech and muzzle cross-sections), and the straight tangent to the virtual axis of the bore at its muzzle end.</p> <p>This measurement is critical for assessing barrel alignment and accuracy in armored vehicle weapon systems.</p>
Tentative total development budget	INR 0.03 Cr
PoC	Shri Arun Kumar Patel. GM (akpatel[at]ord[dot]gov[dot]in)

101.

Head	Description
Nodal DPSU	AWEIL
Problem Statement	VSIT- 1M Technology Workflow
Brief Description	<p>VSIT-1M is a legacy Russian device used for measuring deviation from straightness in long cylindrical tubes.</p> <p>It employs a string alignment method combined with electromagnetic induction sensing to detect angular deviations of the inner bore axis in both horizontal and vertical plan.</p>
Tentative total development budget	INR 0.4 Cr
PoC	Shri Arun Kumar Patel, GM (akpatel[at]ord[dot]gov[dot]in)