CHALLENGES FACED BY VARIOUS STAKEHOLDERS IN DEVELOPMENT OF THE REQUISTE DRONE ECOSYSTEM

ORGANISED BY DIRECTORATE OF INDIGENISATION, HQ IDS IN COLLABORATION WITH CENTRE FOR JOINT WARFARE STUDIES (CENJOWS)

07 JANUARY 2026

SEMINAR ON CHALLENGES FACED IN DEFENCE DRONE AND COUNTER DRONE MANUFACTURING ECOSYSTEM

PROGRAMME: 07 JAN 2026

0930-0955 hrs	Registration & welcome Tea
1000-1010 hrs	Opening Address Maj Gen (Dr) Ashok Kumar, VSM (Retd), DG CENJOWS
1010-1020 hrs	Keynote Address by Vice Admiral Vineet McCarty, AVSM, DCIDS (PP&FD)
1020-1040 hrs	Talk cum Demonstration by Brig P Rajasekhar, HQ TG GP EME (Incl Q & A)

1040-1110 hrs   High Tea

1110-1255 hrs Session 1: OPERATIONAL REALITIES AND USER NEEDS IN DRONE WARFARE

Moderator: Gp Capt Shobhit Misra, VM		
1110-1155 hrs	Overview of Operational Requirements Needs and User Challenges	• Army – (6 offrs- ADG ADB, CD&S, SP Dte, AAD Dte, Sigs Dte, HQTG GP EME) • Navy – (4 Offrs – 2 from Naval HQ, 1 x WESEE, 1 x Procurement Sec) • Air Force – (3 Offrs – 2 from Air HQ, 1 x Procurement Sec) • DG QA – 3 (Army, Navy and Air Force) • CEMILAC - 1 • Rep ACAS (ops)
1155-1255 hrs	Integration Challenges: Navigating Beyond Development Success in Drones Overview of Regulatory Compliances and Procedures for Evaluation (emphasis on risks and perils of proliferation of Chinese components)	Reps- DDP, DIP, Aerospace Wing, Naval Systems Wing, Land Systems Wing Rep ACAS (Remote) Reps Indigenisation Dtes from service HQs

1255-1345 hrs   Lunch

1345-1515 hrs Session 2: DEVELOPER'S CHALLENGES- DESIGN, MANUFACTURING AND INNOVATION

Part 1 Moderator: Dr Parimal Kumar, OS & SA to CISC		
1345-1445 hrs	DRDO's perspectives	DRDO reps from PC & SI, IRDE, HALE UAV Program and 2 x from PSUs

Part 2 Moderator: Maj Gen M Indrabalan (Retd), Technology Advisor, Amber Wings		
1445-1600 hrs	Problem Areas involved in Certification, Testing, Integration and Manufacturing R&D in progress in the field of UAS & CUAS and expectations from Industry Overview of Technology Gaps	20 x Industry Reps
1600-1615 hrs	Summarisation of the proceedings, closing address and Vote of Thanks	Maj Gen (Dr) Ashok Kumar, VSM (Retd), DG CENJOWS
1615 hrs	Tea and dispersal	

GENERAL

1.   The seminar on the Drone Ecosystem was organised on 07 Jan 26 with the initiative of Indigenisation Directorate of HQIDS. This served as a vital platform for handholding and catalysing inclusive technology innovation by bringing together the Armed Forces, DRDO, CEMILAC, connected Industries and other stake holders. The primary aim was to move beyond theoretical discourse to a meaningful and a frank dialogue, ensuring that the **pain points** of all the stake holders are addressed through a collaborative and whole-of-nation approach.

2.   Drone platforms are proving their importance the world over in all type of conflicts whether between states or between states and non-state actors. Closer home, during **Operation Sindoor,** the capability of these platforms was a validation of their indispensability. It is also an assertion of India's defence indigenisation capabilities. Still, the reliance on imports from foreign OEMs for crucial/critical components, many of which are essential for drone manufacturing, is an issue of concern due to security and related reasons.

3.   The event was organised specifically to look at the issues faced in the ecosystem, ensuring a focus on problems and challenges rather than company presentations. DG CENJOWS emphasised the undeniable strategic imperative of drones, counter-drones, and swarm technologies, drawing critical parallels to recent global conflicts like Russia-Ukraine and Operation Sindoor**.**

4.   Vice Admiral Vineet McCarty, AVSM, DCIDS (PP&FD), in his keynote address, characterised the rise of drone technology as an explosive phenomenon that has fundamentally altered the security landscape faster than anticipated. He identified a critical vulnerability in India's current indigenisation efforts. While domestic manufacturing capability exists, the heart of the drone, its critical components and technologies are often imported, frequently from the very adversaries India may face. He warned that this reliance on external sources for core technology creates severe risks of denial, tampering, and degradation during conflict, urging the industry to move beyond assembly and focus on mastering the manufacturing of these critical sub-systems to ensure true operational sovereignty.

5.   Addressing the policy framework, Admiral McCarty acknowledged the need to reform procurement strategies to distinguish between traditional, enduring assets like ships and new age technologies like drones, which are attritable, cost-effective, and rely on commercial off-the-shelf (COTS) cycles. He confirmed that the administration is working to differentiate these categories to speed up acquisition. Concluding with a call for sustained dialogue between the user and the industry, he invoked the wisdom of Kabir Das to urge stakeholders to dive deep for solutions rather than settling for the easy path of importation, emphasising that solving the hard problems of component availability is essential for national security.

AIM

6.   The seminar aimed to foster a transparent dialogue between the Armed Forces, DRDO, industry and all other stakeholders to diagnose pain points of ecosystem and bridge the gap between operational expectations and manufacturing capabilities. It focused on accelerating component sovereignty and harmonising fragmented regulatory architectures to reduce reliance on foreign supply chains. Ultimately, the goal was to formulate a strategic roadmap that aligns technology and policy to build a resilient, future-ready, and indigenous drone capability for India. Major aims include:-

6.1   To conduct a structured, cross-stakeholder analysis that identifies and documents the critical pain points currently fracturing the drone ecosystem, facilitating transparent dialogue between the Armed Forces, DRDO, industry, and regulators.

6.2   To explicitly define and harmonise the unique operational requirements of the Tri-Services across varied domains, including extreme terrains and maritime environments.

6.3   To formulate pathways to reduce reliance on imported supply chains, addressing the strategic vulnerability posed by high dependency on foreign components such as semiconductors and flight controllers.

6.4   To scrutinise the currently fragmented regulatory landscape and propose mechanisms to harmonise the roles of various agencies, including DGCA, CEMILAC, and DGQA, to eliminate overlaps and ambiguities.

6.5   To close the existing loop between the operational expectations of the Armed Forces and the delivery capabilities of the industry by addressing structural hurdles.

6.6   To deliberate on the critical absence of a unified policy framework for Counter-Drone systems, identifying gaps in current capabilities regarding detection and neutralisation.

6.7   To create free and frank dialogue between stake holders for enhances awareness.

6.8   To synthesise the deliberations into tangible outputs by highlighting the pain points to the competent authority for resolution.

IMPORTANT ASPECTS EMERGED FROM THE MINI SEMINAR CUM DISCUSSION

7.   **Strategic Context.**

7.1   The contemporary security landscape has witnessed a revolutionary transformation where Unmanned Aerial Systems (UAS) have evolved from mere support mechanisms to indispensable assets for intelligence, precision strikes, and logistics.

7.2   The rapid proliferation of drone technology is not just a trend but a fundamental shift in warfare that has created a "flutter beyond imagination" compared to the landscape a decade ago.

7.3   A critical strategic concern is that while India is making indigenous drones, the "real heart of the drone is imported," leaving critical technologies vulnerable to denial or tampering by adversaries.

7.4   In response to the national call for 'Atmanirbharta' (Self-Reliance), strengthening the domestic drone ecosystem is viewed not just as a responsibility but as a duty.

7.5   The discussion highlighted that the adversary and the source of most critical drone technology are often the same, necessitating a shift toward component sovereignty.

CHALLENGES IDENTIFIED

8.   **Procurement, Tendering & Contracts.**

8.1   **L1: The Lowest Bidder dilemma.**

8.1.1   **The Issue.** The current procurement framework prioritizes L1 pricing. This creates a valley of death for startups that cannot sustain long development cycles without funding. It favours large incumbents or vendors rebranding cheap imports over genuine indigenous deep-tech innovators who have higher R&D costs.

8.1.2   **Issue raised by.** Industry.

8.1.3   **Suggested Solutions.**

8.1.3.1   Transition to Quality-cum-Cost Based Selection (QCBS) which assigns specific weightage to indigenous IP, upgradeability, and total lifecycle costs. This can prioritise superior technical specifications and security features rather than just the lowest price.

8.1.4   **Responsibility / Action Agency.** MoD (Acquisition Wing), Department of Defence Production (DDP).

8.2   **The NCNC Trial Troubles.**

8.2.1   **The Issue.** The No Cost No Commitment (NCNC) trial policy requires the developers to demonstrate their products at multiple wings of the armed forces, at their own expense without any guaranteed purchase orders.

8.2.2   **Issue Raised by.** Industry.

8.2.3   **Suggested Solutions.**

8.2.3.1   Restructure NCNC trials to reduce associated costs and commitments. This would ensure seriousness from both buyer and seller. These could include:-

8.2.3.1.1   Mandatory written feedback to the participants by the Trial Authority irrespective of the trial outcomes.

8.2.3.1.2   All positive trial outcomes to be held valid for at least three years avoiding the repetitive trial.

8.2.3.1.3   Provision of funding for the trial costs in the cases where the product meets 80 percent or above trial objectives.

8.2.3.1.4   Introduce a Startup-Friendly Tender Category specifically for deep-tech indigenous OEMs.

8.2.4   **Responsibility / Action Agency.** MoD (Acquisition Wing), Department of Defence Production (DDP) along with Service HQs.

8.3   Unfair Competition from Legacy & Imported Systems.

8.3.1   **The Issue.** Procurement models often favour imported subsystems that possess legacy approvals, effectively barring newer indigenous technologies. Moreover, tender specifications sometimes create an avenue for the entry of Chinese-origin components (e.g., specific motor sizes) that are mass-produced. This makes it hard for indigenous players to compete.

8.3.2   **Issue raised by.** Industry.

8.3.3   **Suggested Solution.**

8.3.3.1   Create a state-owned certification authority tasked with validating specific indigenisation levels.

8.3.3.2   Mandate a Non-Chinese Origin declaration.

8.3.3.3   Promulgate policy about Chinese components prepared by ADB.

8.3.3.4   Implement preferential procurement policies for certified indigenous technologies.

8.3.4   **Responsibility / Action Agency.** DDP, Service HQs.

8.4   Industrial Licensing Delays.

8.4.1   **The Issue.** Obtaining Industrial Licenses is often an extremely slow and cumbersome process for startups and MSMEs delaying their entry into the defence manufacturing space.

8.4.2   **Issue raised by.** Industry.

8.4.3   **Suggested Solution.** A Fast-Track Defence Procurement Window was recently created. Efforts should be made to ensure that the startups/MSMEs are able to make the best out of the same. Inclusion of simplified and expedited industrial licensing procedures needs to be looked into with stated timelines.

8.4.4   **Responsibility / Action Agency.** DPIIT, MHA, DDP.

8.5   Unrealistic Cost Expectations.

8.5.1   **The Issue.** Users often expect indigenous products to be cheaper than mass-produced foreign (often Chinese) equivalents. This ignores the lack of economies of scale in India.

8.5.2   **Issue raised by.** Industry.

8.5.3   **Suggested Solution.** If the users want indigenous technology, they must make sure to match the price paid to foreign vendors rather than demanding prices at par with the dumped goods.

8.5.4   **Responsibility / Action Agency.** MoD (Finance), Service HQs.

9.   Supply Chain Integrity & Indigenisation.

9.1   Dependence on Chinese Critical Components.

9.1.1   **The Issue.** Deep teardowns of indigenous drones have revealed that critical active components specifically Flight Controllers, Electronic Speed Controllers (ESCs), Mission Computers, and Communication Modules are often of Chinese origin (e.g., STM32 series chips, certain Wi-Fi modules). This poses severe security risks including backdoors and kill switches.

9.1.2   **Issue raised by.** Service HQs.

9.1.3   **Suggested Solution.**

9.1.3.1   Strictly define Critical vs Non-Critical components in the planned SOP on the Chinese components.

9.1.3.2   Enforce a strict ban on Chinese active components (Flight Controller, GCS, Comms).

9.1.3.3   Accept passive Chinese parts (propellers, frames) only if unavoidable.

9.1.4   **Responsibility / Action Agency.** Army Design Bureau (ADB), DDP, Cyber Agencies.

9.2   Country of Origin Ambiguity (Wafer vs. Packaging).

9.2.1   **The Issue.** Vendors frequently claim chips are non - Chinese because the silicon wafer was fabricated in Taiwan. However, the packaging and testing where backdoors can be inserted via boot files often happens in China.

9.2.2   **Issue raised by.** Service HQs.

9.2.3   **Suggested Solution.**

9.2.3.1   Define Country of Origin based on the Packaging and Testing location (indicated by chip markings) also and not just the wafer fabrication location.

9.2.3.2   Mandate full Bill of Material (BoM) disclosure, not just invoices.

9.2.4   **Responsibility / Action Agency.** MoD, DGQA, Standardisation Bodies.

9.3   False 'Made in India' Labelling.

9.3.1   **The Issue.** Companies are importing systems, relabelling them, and selling them as indigenous products.

9.3.2   **Issue raised by.** Industry, Service HQs.

9.3.3   **Suggested Solution.**

9.3.3.1   Strict Enforcement. Immediate ban or Blacklisting of any company found falsifying labels.

9.3.3.2   Physical teardown and chip-level verification must be conducted during trials. Modern technologies should be used for the analysis.

9.3.4   **Responsibility / Action Agency.** DGQA, CEMILAC, Vigilance Agencies.

9.4   Supply Chain Diffusion.

9.4.1   **The Issue.** The Gold Samples offered for testing are invariably clean, but the bulk supplies often contain different components due to supply chain variance or cost-cutting, leading to Chinese components also entering the inventory post-trial.

9.4.2   **Issue raised by.** Service HQs.

9.4.3   **Suggested Solution.**

9.4.3.1   Implement random sampling from bulk lots.

9.4.3.2   Enforce strict Freeze Configuration protocols post-trial. Any change in component source must trigger re-validation.

9.4.3.3   **Responsibility / Action Agency**. DGQA, Service HQs.

9.5   Data Leakage via Warranty Logs.

9.5.1   **The Issue.** Warranty support often requires users to share flight logs with vendors. Currently, this is done via open channels like WhatsApp or Google Drive, leading to the leakage of sensitive mission data and flight paths.

9.5.2   **Issue raised by.** Service HQs.

9.5.3   **Suggested Solution.**

9.5.3.1   Mandate offline software restoration tools.

9.5.3.2   Restrict open-source sharing of data logs for warranty claims. Establish secure, offline data transfer protocols.

9.5.4   **Responsibility / Action Agency.** Service HQs.

10.   Operational Requirements & User Interaction.

10.1   Lack of Long-Term Roadmaps.

10.1.1   **The Issue.** The industry lacks visibility into the 5 - 10 year capability needs of the Armed Forces. Without published roadmaps or problem definition statements, R&D investment becomes speculative and high-risk.

10.1.2   **Issue raised by.** Industry.

10.1.3   **Suggested Solution.**

10.1.3.1   Publish annual Capability Briefs/White Papers and a concrete 5 - 10 year technology roadmap. These should cover the adequate details for the industries to commence work.

10.1.3.2   Share Problem Definition Statements early to align industry R&D with future needs.

10.1.4   **Responsibility / Action Agency.** Service HQs.

10.2   Non-Standardised Qualitative Requirements.

10.2.1   **The Issue.** Different commands issue conflicting specifications for the same mission profile. This prevents standardisation and economies of scale.

10.2.2   **Issue raised by.** Industry.

10.2.3   **Suggested Solution.**

10.2.3.1   Promulgate command-wise Standard Specifications that remain fixed for at least 2 years, if these are needed due to geographic or other considerations.

10.2.3.2   Standardise trial protocols and scoring matrices to ensure consistency.

10.2.4   **Responsibility / Action Agency.** Service HQs.

10.3   Ambiguity in Specifications (DRI).

10.3.1   **The Issue.** Tender specifications for thermal cameras often have ambiguous Detection/Recognition/Identification (DRI) ranges, leading to confusion and disputes during validation.

10.3.2   **Issue raised by.** Industry.

10.3.3   Suggested Solution. Adopt "Johnson's Criteria" as the uniform, worldwide standard for DRI estimation to define ranges unambiguously.

10.3.4   **Responsibility / Action Agency.** Service HQs, DGQA.

10.4   Over-Specification & Lack of Flexibility.

10.4.1   **The Issue.** RFPs often contain too many rigid constraints and limiting design flexibility. The user asks for major requirements on a minor budget.

10.4.2   **Issue raised by.** Industry, Service HQs.

10.4.3   **Suggested Solution.**

10.4.3.1   Use a "Staircase Approach". Ask for minimum viable specs first, then upgrade in subsequent spirals.

10.4.3.2   Focus on functional outcomes (what it does) rather than rigid technical specs (how it is built).

10.4.4   **Responsibility / Action Agency.** Service HQs.

10.5   Interoperability & Data Standards.

10.5.1   **The Issue.** There is a lack of common data standards, making it difficult to integrate drones from different vendors into a common grid or share data between services.

10.5.2   **Issue raised by.** Service HQs.

10.5.3   **Suggested Solution.**

10.5.3.1   Define common data link and encryption standards.

10.5.3.2   Mandate standardised payload interfaces to allow for modularity (e.g., swapping explosives between drones).

10.5.4   **Responsibility / Action Agency.** HQ IDS, Standardisation Committee.

10.6   Requirement for GPS-Denied/EW Resilience.

10.6.1   **The Issue.** Post-Operation Sindoor, there is an urgent need for drones to operate in GPS-denied and RF-jammed environments. However, the industry struggles to test these capabilities due to a lack of available EW ranges.

10.6.2   **Issue raised by.** Service HQs, Industry.

10.6.3   **Suggested Solution.**

10.6.3.1   Industry must prioritise non-GNSS navigation solutions.

10.6.3.2   Services must provide EW Testing Ranges access to valid prototypes for development.

10.6.4   **Responsibility / Action Agency.** DRDO, Service HQs.

11.   Quality Assurance & Certification.

11.1   Disconnect between RFP and QA Standards.

11.1.1   **The Issue.** RFPs often miss applicable QA standards leading to voids in qualification. QA is frequently treated as an afterthought rather than a design requirement.

11.1.2   **Issue raised by.** Regulatory bodies.

11.1.3   **Suggested Solution.**

11.1.3.1   Include specific QA standards directly in the RFP.

11.1.3.2   Involve DGQA at the Pre-Bid/RFP formulation stage to define quality parameters early.

11.1.4   **Responsibility / Action Agency.** Service HQs (Procurement).

11.2   Rigid Certification for Agile Tech.

11.2.1   **The Issue.** Current certification processes (derived from manned aircraft standards) are too slow (taking years) for drones that evolve monthly. Any minor hardware change triggers a full re-certification cycle.

11.2.2   **Issue raised by.** Industry, Regulatory bodies.

11.2.3   **Suggested Solution.**

11.2.3.1   Adopt "Platform-Based Certification". Certify the core platform and allow for payload/battery variants without full re-certification.

11.2.3.2   Implement Tiered Certification. Level 1 (Environmental) for expendable drones. Full Certification only for strategic UAVs.

11.2.4   **Responsibility / Action Agency.** CEMILAC, DGQA.

11.3   Poor Quality ATP/QAP Submission.

11.3.1   **The Issue.** Vendors often submit incomplete Acceptance Test Plans (ATPs) and Bill of Materials (BoM), causing significant delays in the approval process.

11.3.2   **Issue raised by.** Regulatory bodies.

11.3.3   **Suggested Solution.**

11.3.3.1   Industry must adhere strictly to standard ATP templates.

11.3.3.2   DGQA and CEMILAC to provide "Handholding" and standardised templates via e-portals to guide vendors.

11.3.4   **Responsibility / Action Agency.** Industry OEMs (compliance), DGQA (guidance).

11.4   Fragmented Certification Agencies.

11.4.1   **The Issue.** There is confusion regarding the roles of DGCA (Civil), CEMILAC (Design), and DGQA (QA), leading to overlapping compliance steps and redundant administrative hurdles.

11.4.2   **Issue raised by.** Industry.

11.4.3   **Suggested Solution.**

11.4.3.1   Develop a "Tri-Service Unified Drone Certification Framework".

11.4.3.2   Create a single digital window for all defence drone certifications to streamline the process.

11.4.4   **Responsibility / Action Agency.** MoD, Service HQs.

11.5   Lack of Software/AI Certification.

11.5.1   **The Issue.** No unified standards exist for certifying AI decision-making or autonomy in drones, which is critical for future warfare.

11.5.2   **Issue raised by.** Industry.

11.5.3   **Suggested Solution.** Establish an AI & Autonomy Certification Cell under a joint MoD-MeitY-DRDO structure.

11.5.4   **Responsibility / Action Agency.** DRDO/CAIR.

12.   Testing Infrastructure.

12.1   Prohibitive Costs & Access to Ranges.

12.1.1   **The Issue.** Specialised test ranges are prohibitively expensive, making them often unaffordable for startups. There is also a regional scarcity of military-authorised test corridors.

12.1.2   **Issue raised by.** Industry.

12.1.3   **Suggested Solution.**

12.1.3.1   Provide Free or Subsidised Access for startups/MSMEs building technologies for national security.

12.1.3.2   Establish regional military-authorised test corridors (North, South, Desert, Coastal) with single-window access.

12.1.4   **Responsibility / Action Agency.** DRDO, MoD.

12.2   Lack of Advanced Test Environments.

12.2.1   **The Issue.** There are no accessible facilities to test "Battlefield Realism," such as GPS Spoofing, RF Jamming, Swarm resilience, or Warhead effectiveness.

12.2.2   **Issue raised by.** Industry.

12.2.3   **Suggested Solution.**

     12.2.3.1   Create "Digital Twin Simulation Centres" to simulate battlefield conditions.

     12.2.3.2   Open existing defence/institutional infrastructure for EW and Warhead testing under controlled access windows.

12.2.4   **Responsibility / Action Agency.** DRDO, Service HQs.

12.3   Indoor Flight Infrastructure.

12.3.1   **The Issue.** There is a lack of standardised indoor sandboxes for nano-drones and academic research, limiting rapid iteration cycles.

12.3.2   **Issue raised by.** Industry.

12.3.3   **Suggested Solution.** Establish indoor flight sandboxes at IITs and DRDO labs to enable safe, rapid testing.

12.3.4   **Responsibility / Action Agency.** Academia/DRDO.

13.   Policy, Research &Development and Export Control.

13.1   Export Control Opacity.

13.1.1   **The Issue.** Unclear guidelines on Export controls for nano-systems and components hinder global sales and create uncertainty for IP licensing.

13.1.2   **Issue raised by.** Industry.

13.1.3   **Suggested Solution.**

     13.1.3.1   Publish a consolidated reference document clarifying exemption boundaries and export controls.

     13.1.3.2   Simplify licensing pathways for standard communication modules.

13.1.4   **Responsibility / Action Agency.** DGFT, MoD, MEA.

13.2   The Spectrum Licensing.

13.2.1   **The Issue.** Licensing for communication modules is slow, and there is ambiguity regarding guidelines for indoor R&D telemetry.

13.2.2   **Issue raised by.** Industry.

13.2.3   **Suggested Solution.** Simplify Wireless Planning & Coordination (WPC) guidelines for R&D and standard UAV frequencies to accelerate testing.

13.2.4   **Responsibility / Action Agency.** WPC (Department of Telecommunications).

13.3   Siloed Research & Development.

13.3.1   **The Issue.** Academia, DRDO, and Startups work in isolation. Most of the higher education institutions are not actively participating in the defence ecosystem, leading to duplicated efforts.

13.3.2   **Issue raised by.** Industry.

13.3.3   **Suggested Solution.**

13.3.3.1   Adopt a "Consortium Approach". Create joint labs between DRDO, IITs, and Startups.

13.3.3.2   Appoint industry liaisons to facilitate and formalise academic-industry partnerships.

13.3.4   **Responsibility / Action Agency.** DRDO (DFT), MoD.

13.4   Taxation on R&D.

13.4.1   **The Issue.** R&D grants and investments are currently taxed as income (GST/ TDS). This inflates development costs significantly and reduces the effective capital available for research.

13.4.2   **Issue raised by.** Industry.

13.4.3   **Suggested Solution.** Provide tax subsidy or specific exemptions for funds directed towards defence R&D.

13.4.4   **Responsibility / Action Agency.** Ministry of Finance.

13.5   Advanced Procurement & Contracting Nuances.

13.5.1   **The Issue.** The current procurement policy treats drones like Enduring assets which have lifecycles of longer durations. However, drones are "New Age" products they are often attritable (expendable), have a short shelf-life, and evolve rapidly. Applying Enduring asset logic to New Age technology kills agility and leads to obsolete tech being inducted.

13.5.2   **Issue raised by.** Service HQs.

13.5.3   **Suggested Solution.** Create a separate procurement category for New Age/ Attritable assets that allows for faster refresh cycles, different depreciation norms, and easier disposal.

13.5.4   **Responsibility / Action Agency.** MoD (Acquisition/Policy).

13.6   Tweaking Leading to Non-Standardisation.

13.6.1   **The Issue.** Procurement agencies often slightly refine specifications or nomenclature for systems that are essentially similar to what is already available. This results in multiple different sellers providing the same capability, creating a logistical nightmare for maintenance and inventory management.

13.6.2   **Issue raised by.** Regulatory bodies.

13.6.3   **Suggested Solution.** Enforce strict standardisation. If a system exists for a specific role, do not issue a new RFP with minor tweaks just to bring in new vendors.

13.6.4   **Responsibility / Action Agency.** Service HQs.

13.7   Emergency Procurement (EP) Pitfalls.

13.7.1   **The Issue.** In the rush for Emergency Procurement (EP), contracts are often signed with Acceptance Test Plans (ATPs) that have not been vetted by the Quality Assurance (QA) Authority. This leads to untestable or vague quality requirements that stall delivery later when defects are found.

13.7.2   **Issue raised by.** Regulatory bodies.

13.7.3   **Suggested Solution.** Mandate that QA vetting of ATPs is compulsory even in Emergency Procurement (EP) cases before the contract is signed. Even if it is exempted, the same should be done at the earliest opportunity within operational constraints.

13.7.4   **Responsibility / Action Agency.** MoD / Service HQs.

13.8   Repeat Orders with Changed Modalities.

13.8.1   **The Issue.** "Repeat Orders" are sometimes issued based on previous contracts but with refined QA modalities or qualification requirements. This creates confusion and forces the vendor to re-qualify products that were already established, wasting time and resources.

13.8.2   **Issue raised by.** Industry.

13.8.3   **Suggested Solution.** Keep QA modalities consistent for Repeat Orders of the same equipment to ensure smooth supply.

13.8.4   **Responsibility / Action Agency.** Service HQs.

14.   Deep-Dive Technical & Operational Gaps.

14.1   Explosive Licensing & Integration Deadlock.

14.1.1   **The Issue.** Most drone OEMs do not possess an Explosive License, meaning they cannot integrate or test warheads themselves. They are dependent on explosive manufacturers, creating a deadlock where the drone is ready, but the weapon system is not.

14.1.2   **Issue raised by.** Service HQs.

14.1.3   **Suggested Solution.** Adopt a Modular Protocol. Pragmatic grouping needs to be done for faster testing and delivery.

14.1.4   **Responsibility / Action Agency.** MoD / PESO / Service HQs.

14.2   Payload-Drone Concurrent Development.

14.2.1   **The Issue.** RFPs often treat payloads as an afterthought. Drones are developed first, and payloads are specified later, leading to sub-optimal system performance.

14.2.2   **Issue raised by.** Service HQs.

14.2.3   **Suggested Solution.** Mandate Concurrent Development. The drone and its primary payload must be developed, integrated, and tested as a single system from Day one.

14.2.4   **Responsibility / Action Agency.** Service HQs / DRDO.

14.3   Real-Time Data Absorption vs Post-Flight Logs.

14.3.1   **The Issue.** Many vendors provide systems where mission data is downloaded after the flight. The Air Force requires Real-Time Data Absorption into their command network (IACCS) during the flight to maintain situational awareness, which most indigenous drones currently lack.

14.3.2   **Issue raised by.** Service HQs.

14.3.3   **Suggested Solution.** Industry must implement standard API/Data-link protocols that allow for real-time network integration, rather than just local storage.

14.3.4   **Responsibility / Action Agency.** IAF, Industry.

14.4   Maritime Landing Specifics.

14.4.1   **The Issue.** Drones often perform poorly in naval trials because they cannot handle the unique Roll, Pitch, and Yaw movements of a ship's deck at sea. Algorithms that work perfectly on land might not completely perform in a maritime environment.

14.4.2   **Issue raised by.** Service HQs.

14.4.3   **Suggested Solution.** Industry must test landing algorithms on 6-DOF (Degrees of Freedom) motion platforms that simulate sea states before presenting the drone for naval trials.

14.4.4   **Responsibility / Action Agency.** Industry, Navy.

14.5   The "CONOPS" Deficit.

14.5.1   **The Issue.** India often designs drones without a clear Concept of Operations (CONOPS). Unlike western regulations where the CONOPS is the first document created, here engineers build to technical specifications without understanding how the drone will be employed, leading to design failures in the field.

14.5.2   **Issue raised by.** Regulatory bodies, Service HQs.

14.5.3 **Suggested Solution.** Service HQs must release a CONOPS Document before the QR (Qualitative Requirements), explaining the tactical scenario, sequence of use, and operational environment.

14.5.4 **Responsibility / Action Agency.** Service HQs.

15. Quality Assurance, Certification & Life-Cycle Nuances.

15.1 COTS Items Qualification Gap.

15.1.1 **The Issue.** Vendors frequently use Commercial Off-The-Shelf (COTS) items like Battery Chargers and Gensets without qualifying them for military environments. These operational support items often fail in the field grounding the drone even if the drone itself is fine.

15.1.2 **Issue raised by.** Regulatory bodies.

15.1.3 **Suggested Solution.** COTS support equipment must undergo "Equivalent Qualification" to ensure they can survive the same environmental conditions as the drone they support.

15.1.4 **Responsibility / Action Agency.** DGQA, Industry.

15.2 PDI (Pre-Dispatch Inspection) Readiness.

15.2.1 **The Issue.** Vendors often call for Pre-Dispatch Inspection (PDI) without having completed their own internal Quality Control (QC). They effectively use the QA officer as their debugger leading to unutilised official time. Furthermore, vendors often lack the necessary Jigs and Test Facilities at their own premises to conduct the PDI.

15.2.2 **Issue raised by.** Regulatory bodies.

15.2.3 **Suggested Solution.** Make an "Internal QC Certificate" mandatory before calling for PDI. Vendors must be required to invest in factory-level test jigs.

15.2.4 **Responsibility / Action Agency.** Industry.

15.3 Confusion between QT and Bulk ATP.

15.3.1 **The Issue.** Vendors misunderstand the difference between Qualification Testing (QT) and Bulk ATP. This leads to disputes during mass production when vendors hesitate the checks that were part of the prototype phase or vice versa.

15.3.2 **Issue raised by.** Regulatory bodies.

15.3.3 **Suggested Solution.** Clearly define and separate QT parameters vs. Bulk ATP parameters in the contract language.

15.3.4 **Responsibility / Action Agency.** DGQA, MoD.

15.4 Unauthorised Post-Delivery Changes.

15.4.1   **The Issue.** Vendors sometimes insist software updates or make hardware tweaks post-delivery without informing the QA agency or the User. This invalidates the certification and introduces unknown risks.

15.4.2   **Issue raised by.** Regulatory bodies.

15.4.3   **Suggested Solution.** Enforce strict Configuration Control. Any post-delivery change must require a Supplementary Type Certificate (STC) or formal prior approval.

15.4.4   **Responsibility / Action Agency.** Industry, DGQA.

15.5 The "CEMILAC Bypass" Consequence.

15.5.1   **The Issue.** To speed up induction, small drones (<150kg) were allowed to bypass full CEMILAC certification. The unintended result is a total lack of "Lifing Data". Users don't know the shelf-life of components, leading to preventable crashes.

15.5.2   **Issue raised by.** Regulatory bodies.

15.5.3   **Suggested Solution.** Even if full certification is waived, a Life Cycle Support Document defining component lifing must be made mandatory for every drone inducted.

15.5.4   **Responsibility / Action Agency.** CEMILAC, Service HQs.

16. Supply Chain & Security Specifics.

16.1 Specific "Red Flag" Components.

16.1.1   **The Issue.** Beyond general "Chinese components," the discussion identified specific hardware that pose high risks and is ubiquitous in the ecosystem. STM32 Microcontrollers, chips, and unbranded Wi-Fi modules.

16.1.2   **Issue raised by.** Service HQs.

16.1.3   **Suggested Solution.** Create a specific "Negative List" of chip series and brands that are known to be compromised, rather than relying on a generic and hard-to-enforce "No China" rule.

16.1.4   **Responsibility / Action Agency.** Army Design Bureau (ADB), DGQA, Service HQs.

17.   Post-Delivery & Sustainment.

17.1   Blame the User Culture.

17.1.1   **The Issue.** When defects or crashes occur, vendors often default to blaming user handling rather than conducting a genuine Root Cause Analysis (RCA). There is a lack of a robust "Crash Analysis Tool" available to the user to prove whether it was a system failure or pilot error.

17.1.2   **Issue raised by.** Regulatory bodies.

17.1.3   **Suggested Solution.** Mandate "Black Box" / Flight Data Recorder analysis protocols where data is analysed by a neutral party or a joint team. This would ensure the vendor cannot simply dismiss defects as user error.

17.1.4   **Responsibility / Action Agency.** Service HQs, DGQA.

17.2   Lack of JRI (Joint Receipt Inspection) Support.

17.2.1   **The Issue.** Vendors often do not send technical representatives for Joint Receipt Inspection (JRI) at forward locations. This results in equipment lying unpacked for long periods or being rejected due to minor transit damages that could have been fixed on-site.

17.2.2   **Issue raised by.** Regulatory bodies.

17.2.3   **Suggested Solution.** The vendor contract must include a clause for mandatory technical presence during JRI at the consignee location.

17.2.4   **Responsibility / Action Agency**. MoD, Industry.

CONCLUSION

18.   In his closing address, DG CENJOWS committed to specific follow-up actions, assuring participants that inputs from the discussion will be made available. Emphasis was made on continued role of CENJOWS as a steadfast point of contact for the stakeholders, driven by the conviction that their multifaceted growth is synonymous with the nation's growth.

19.   Drawing a parallel to the session conducted with Dr Parimal Kumar, SA to CISC on July 16th, where concerns were successfully forwarded to the Ministry, he acknowledged that while systemic changes require time, the process is moving and every point raised will be sent to the decision makers.

20.   Reflecting on the discussions, he highlighted the enormity of the current situation and noted that the challenge at the national level is massive and must be reduced for the ecosystem to function efficiently. He highlighted the positive shift in the service and promised to continue the format of "free and frank" interactions.

CENJOWS

(Established : 2007)
Room No.301, B-2 Wing, 3rd Floor
Pt Deendayal Antyodaya Bhawan
CGO Complex, Lodhi Road
New Delhi – 110003 (INDIA)
Telephone Nos : 011-24364881, 24366485
Fax : 011-24366484
Website : www.cenjows.in
E-mail : cenjows@cenjows.in, cenjows@yahoo.com