



DRONE INNOVATION 2019 & CONTEMPORARY CHALLENGES June 7, 2019 (Friday)

BPR&D Hqrs, Ministry of Home Affairs, NH-8, Mahipalpur, New Delhi

Time	Session
1000 – 1007 hrs 1007 – 1015 hrs	Introductory & Welcome Address by : Shri Sanjay Sharma, PSO (Weapons) BPR&D Opening Remarks by : Shri V. H. Deshmukh, ADG, BPR&D
1015 – 1045 hrs	Tea Break
1045 – 1200 hrs	<p style="text-align: center;">Session I : Regulations for operation of Remotely Piloted Aircraft Systems (RPAS) & Question Answer</p> <p>Chair: Shri S.K. Mishra, Joint Secretary, M/o Civil Aviation, New Delhi</p> <p>Distinguished Panellists:</p> <ul style="list-style-type: none"> • Shri Hilol Biswas, Director (Aircraft Engineering), DGCA Topic – Introduction to CAR 1.0 and latest inputs about CAR 2.0. • Shri Mukesh Chand Dangi, Executive Director (Airspace Management) Topic – Roadmap for Airspace Management in backdrop of RPAS. • Capt. Anil Gill, Deputy Director (Flying Training), DGCA Topic – Roadmap for capacity building for RPAS Operators in Law Enforcement Agencies.
1200 – 1330 hrs	<p style="text-align: center;">Session II : Digital Sky Platform for Airspace Management & related Legal Issues & Question Answer</p> <p>Chair: Mr. Ankit Mehta, Co- Chair, FICCI Committee on Drones and Co-Founder & CEO idea Forge Technology Pvt. Ltd. Mumbai</p> <p>Distinguished Panellists:</p> <ul style="list-style-type: none"> • Mr. Tanuj Bhojwani, Fellow, iSPIRT Topic – Digi-Sky Platform for Air Space Management • Lt. Col Pawan Kr. Pandey, Dy. Surveyor General Topic – High Resolution Mapping: Roadmap and Regulatory Concerns • Mr. Prasant Prakhar & Mr. Moazzam Khan from Desai Associates Topic – Drone Regulations & Legal Risks • Mr. Tarun Krishnakumar, Legal Policy Consultant Topic – Privacy, Liability & Regulatory Concerns
1330 – 1430 hrs	Lunch

1430 – 1515 hrs	<p style="text-align: center;">Session III : Understandings of LEAs about - Emerging UAV Threats and Counter UAV Solution & Question Answer</p> <p>Chair: Shri V H Deshmukh, ADG, BPR&D</p> <p>Distinguished Panellists:</p> <ul style="list-style-type: none"> • Shri SK Gautam, Spl CP Delhi Police Topic – Challenges in Acquisition and countering the Threats from UAVs/Drones • Shri Ajay Dhaiya, Sr. Commandant (IGI Airport, CISF) Topic – Wish-list to counter the Threats from Sub-Conventional Aerial Platforms (UAVs, RPAS, Drone) • Shri Virender Singh, Chief Manager (Security), from ONGC Ms. Anjali Bala, Security Officer, from ONGC Topic – Wish-list to counter the Threats from Sub-Conventional Aerial Platforms (UAVs, RPAS, Drone) • Ms Sonali Mishra, IG(G) FHQ BSF Topic – Best Practices on Usage of UAVs/Drones for Security & Surveillance • Major Surender Singh, NSG Topic – Anti – Drone Technologies
1515 – 1645 hrs	<p style="text-align: center;">Session IV : Industry Solutions & Best Practices & Question Answer</p> <p>Chair: Shri S. V. Satish, ED (IT), AAI</p> <p>Distinguished Panellists:</p> <ul style="list-style-type: none"> • Mr. David Devasahayam, Head Technical Solutions and operations from Cyient Solutions & Systems, Hyderabad Topic – ISTAR RPA Solutions for the Modern Age Police and Training Needs for Enhancing Exploitation Efficiencies • Mr. Mitul Arora, Policy Head, India, DJI , Topic – UAS in Public Safety • Mr. Neel Mehta, Asteria Aerospace, Bengaluru Topic – The Challenges & Opportunities for Indian Drone Manufacturers • Mr. Sunny Sharma, IIO Technologies, Bengaluru Topic – UAV Threats & Counter UAV Technologies & Solutions • Mr. Gunavantha Mate, Manager D&E/EW&A, BEL, Bengaluru Topic – Tethered UAV - a new approach in 24X7 surveillance
1645 – 1700 hrs	<p>Closing Address By : Shri Karuna Sagar, IG/Director (Modernization), BPR&D</p>

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PROCEEDINGS

1. Bureau of Police & Research Development has organized a One Day Workshop / Conference on “Drone Innovation 2019 & Contemporary Challenges” on June 7, 2019 at BPR&D HQrs. The Workshop cum Conference was organized in such a manner that senior officers from Regulatory Bodies like DGCA, AAI, legal consultants, expert created DigiSky Platform, representative from Survey General of India, leading industry players and technocrats from Bharat Electrical Limited have been invited to share their views / inputs and expertise on latest development /Growth on Drone / UAVs in India. Approximately above 125 participants from States, UT, CAPFs, CPOs and other Govt. Departments and technical experts from Industries etc attended the Workshop cum Conference.

2. Following resource persons / panellists / guest speakers have given Presentations / Talk during the Conference: -

- Shri V H Deshmukh, ADG BPR&D
- Shri S.K. Mishra, Joint Secretary, M/o Civil Aviation, New Delhi
- Shri David Devasahayam, Head Technical Solutions and operations from Cyient Solutions & Systems, Hyderabad
- Shri Ankit Mehta, Co-Founder & CEO idea Forge Technology Pvt. Ltd. Mumbai
- Shri S. V. Satish, ED (IT), AAI
- Shri Hillol Biswas, Director (Aircraft Engineering), DGCA
- Shri Mukesh Chand Dangi, ED (Airspace Management)
- Capt. Anil Gill, Deputy Director (Flying Training), DGCA
- Shri Tanuj Bhojwani, Fellow, iSPIRT
- Lt. Col Pawan Kr. Pandey, Dy. Surveyor General
- Shri. Prasant Prakhara & Mr. Moazzam Khan from Desai Associates
- Shri Tarun Krishnakumar, Legal Policy Consultant
- Shri S K Gautam, Spl CP Delhi Police

- Shri Ajay Dhaiya, Sr. Commandant (IGI Airport, CISF)
- Shri Virender Singh, Chief Manager (Security), from ONGC
- Shri Aloke Chakraborty, Comdt., BSF
- Major Surender Singh, NSG
- Shri Mitul Arora, Policy Head, India, DJI ,
- Shri Neel Mehta, Asteria Aerospace, Bengaluru
- Shri Sunny Shama, IIO Technologies, Bengaluru
- Shri Gunavantha Mate, Manager D&E/EW&A, BEL, Bengaluru
- Shri Sanjay Shama, PSO (Weapons), BPR&D – Member Secretary

3. Following session wise topics were selected: -

- Session I** - Regulations for operation of Remotely Piloted Aircraft Systems (RPAS)
- Session II** - Digital Sky Platform for Airspace Management & related Legal Issues
- Session III** - Understandings of LEAs about - Emerging UAV Threats and Counter UAV Solution
- Session IV** - Industry Solutions & Best Practices

4. At the outset, on behalf of DG, BPR&D, **Shri Sanjay Sharma, Principal Scientific Officer (Weapons), BPR&D (Member Secy.)** welcomed all the participants in Workshop cum Conference “**Drone Innovation 2019 & Contemporary Challenges**”.

5. He has informed the house that Bureau of Police Research and Development (BPR&D), under the Ministry of Home Affairs has now emerged as a National Think-Tank on Policing. Bureau is working towards attaining the goal of Public Centric Policing and Safe India. He has further conveyed that BPR&D is working towards attaining the goal of Public Centric Policing and Safe India.

6. Since, DGCA has launched the Civil Aviation Requirements (CAR-1.0) for operation of the Remotely Piloted Aircraft System (RPAS) in the month of August, 2018 which took effect from December 1, 2018. This will invite the considerable growth of Drones/UAVs in the days to come.

7. In view of above, the above Conference cum Workshop was planned to create an interface between technology developers (from Industry, Academia, Govt. Technical Institutions etc) and representatives of law enforcement agencies.



8. Remotely Piloted Aircraft System (RPAS) has got the potential which can be tapped by law enforcement agencies in maintaining law and order, anti-insurgency operations, traffic management, internal security, cordon & search operations, etc. In the days to come, acquisition and capacity building in operating RPAS/Drones will become quintessential.

9. Subsequently, **Shri V.H. Deshmukh, ADG, BPR&D** in his opening remarks had emphasised that the topic of the Conference cum Workshop on **Drone Innovation 2019 & Contemporary Challenges** is quite relevant for Law Enforcement Agencies and Public Sectors manning critical infrastructures. The drone ecosystem has grown rapidly across the globe and India is no exception. He has further conveyed, “though the constructive applications for Drones is enormous, we need to be wary of its destructive capabilities as well”. There have been so many instances in various parts of the world like Venezuela, Yemen, etc. where attacks have been carried out using cheap off-the-shelf drones that have been modified to engage the target by using explosive/munition.

10. He has further stated that it is not far-fetched, saying that anybody including us could be the next target. We must be prepared to tackle this menace and the earlier we do, the better. There is a need to have a comprehensive anti-drone policy in place. The DGCA has already implemented the regulations for RPA or drone operations in India. This would make it easier to identify authorised drones and all other drones flying without permission can be treated as illegal/rogue.

11. He viewed that with the growth of Drone especially of the categories of nano, micro, mini and small, the challenges for Police will be increased manifold.



12. He focussed that Drone technology would be quite useful for law enforcement agencies for various lawful purposes like **security and surveillance, law and order situation, cordon and search operations, search and rescue operation, event monitoring, traffic management, disaster assessment, crimes scene mapping etc.**

13. Hence, there would be a dire need to equip States and UTs to deal with rogue drones. There are two aspects while dealing with the rogue drones, first is to identify it as a rogue and then take action to neutralize it. Depending on the criticality of the asset or installation, type of anti-drone system to be installed can be decided ranging from a manual observation post to a sophisticated high power radar. Similarly, the interdiction system can be selected.

14. Worldwide multiple options are available for anti-drone solutions but it would be inescapable to engage private players, experts and academia working and having expertise in this field, to understand the technologies and there optimum utilization. The threat related to Drone can be tackled when the user organizations, industry, expert and academia work together. BPR&D can play a vital role to bring all these entities under single roof to prepare a robust SOP/Guidelines towards a safer sky.

15. The most important issue touched by **Shri V.H. Deshmukh, ADG, BPR&D** was the capacity building for the personnel of various stakeholders for utilization of drone technologies for lawful purposes and for effective policing. Training to the Police personnel for the Anti Drone measures is quintessential. He has suggested that there is a need to identify the training institutes and have a roadmap with regular training sessions on the subject. Similarly we may also consider introducing anti drone measures as a topic during ab initio training.

16. He gave the caution to all the stakeholders to take this threat seriously and adopt all possible precautions in keeping our assets safe from this small but lethal enemy in the form of a drone.

17. **The first session** on Regulations for operation of Remotely Piloted Aircraft Systems (RPA) commenced under the Chairmanship of

Shri SK Mishra, Joint Secretary, Ministry of Civil Aviation. He brought out that development is necessary but it has its security concerns as well. Drones can be of immense help for various operations and Ministry of Civil Aviation (MoCA) is actively pursuing development of this ecosystem. Shri S.K. Mishra has informed the house that MoCA in association with DGCA, AAI, BCAS and other experts is working to introduce regulation and guidelines regarding operation of Drone Beyond Visual Line of Sight (BVLOS). Challenges are inevitable but we have to grow and maintain the pace with latest technologies. He has further desired that above law enforcement agencies must acquire the emerging technologies and ensure to use them optimally.



18. Shri Hillol Biswas Director DGCA has given a brief introduction to Civil Aviation Requirement 1.0 (Regulations for operation of Remotely Piloted Aircraft Systems). Following are the salient key points: -

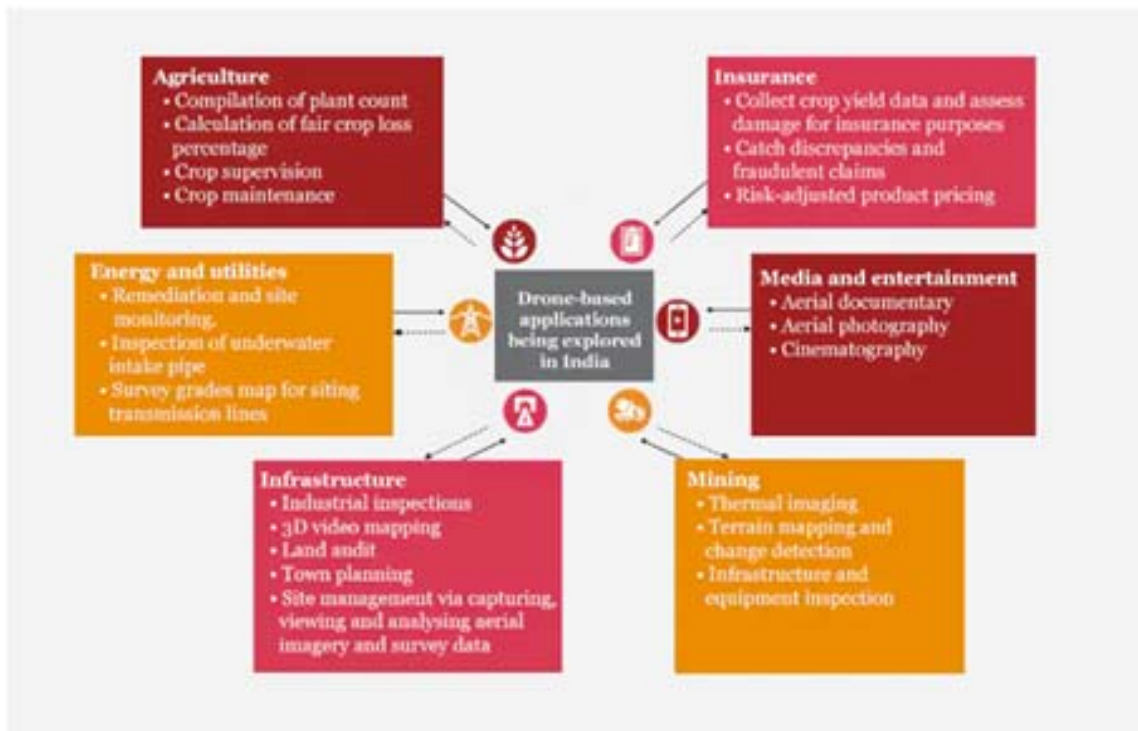
- Use of RPAS (commonly known as drones) was restricted for non-govt. agencies, private organisations, individuals since October, 2014.
- Ministry of Civil Aviation inserted Rule 15A in ‘the Aircraft Rules’ to enable proviso for regulating civil RPAS.
- Operations of RPAS to be enabled through Digital Sky Platform
- The regulation and related guidelines are available in DGCA website <http://dgca.nic.in/rpas/RPAS-ind.htm>
- Civil RPA is categorized in accordance with Max. All-Up-Weight (including payload)

- | | | |
|-----------|---|-----------------------------|
| 1) Nano | : | ≤ 250 gm |
| 2) Micro | : | > 250 gm and ≤ 2 kg |
| 3) Small | : | > 2 kg and ≤ 25 kg |
| 4) Medium | : | > 25 kg and ≤ 150 kg |
| 5) Large | : | > 150 kg |

- RPA weighing above 250 gm (i.e. nano category RPA exempted from Import Clearance from DGCA.
- All drones should be NPNT compliant for issuing import clearance. Suspension/ Cancellation of UIN/ UAOP in case of violation of regulatory provisions.
- Penalties as per applicable IPCs (such as 287, 336, 337, 338 or any relevant section of IPC). IPC 121, 121A have been added in the MHA SOP which is yet to be included in the CAR.
- Relevant Sections of the Aircraft Act 1934 or Aircraft Rules 1937 or any statutory provisions.
- Future Roadmap CAR 2.0
 - Testing of RPAS for certification purpose
 - Operations of RPAS Beyond VLOS/ Drone Corridors
 - Operations during night
 - Carriage of Package Delivery/ Variable Payload
 - Operation of Autonomous RPA
 - Approval of Drone Training Organisation/ Design & Manufacturing Organisation
 - Examination and licensing of remote pilots
 - UAS Traffic Management Systems

19. Shri Mukesh Chand Dangi, Executive Director (ASM) the second speaker spoke on the challenges involved in airspace management. He has informed the house that various zones (Red, Amber & Green) will be created through DigiSky Platform. This categorization will help the various stakeholders in effective regulation of RPAS. He has also shared the inputs on the futuristic Roadmap for Air Space Management (ASM) and the efforts of various stakeholders which are under process.

20. Capt. Anil Gill, Dy Director DGCA has expressed concerns about uneducated pilots. Training is a very important and the FTO's have not been very effective till now as regards to RPAS is concerned. He mentioned that the Training mechanism will mature with time and in future, agencies other than FTOs may also be authorized to conduct drone training. He has explained the few usage of Drones / UAVs in different fields: -



21. Based on data available, he has apprised the house about the usage of drone in global market in the next financial year (2020-21): -

- Construction - \$11,164 mn
- Agriculture - \$5,922 mn
- Insurance Claims - \$1,418 mn
- Offshore Oil/Gas and Refining - \$1,110 mn
- Journalism - \$480 mn
- Real Estate - \$265 mn
- Utilities - \$93 mn
- Pipelines - \$41 mn
- Mining - \$40 mn
- Clean Energy - \$25 mn
- Cinematography - \$21mn

22. He has emphasized that Improper training of drones may result into serious incidents/accidents and improper handling of RPAS may cause damage, threat to safety, injury or may lead to death. Capt. Anil Gill has given inputs about the Flying Training Organizations (FTOs) are in existence in PAN India and what all basic infrastructure are required at these FTOs.



23. The **Second session** was on Digital Sky Platform for Airspace Management & related Legal Issues. **Shri Ankit Mehta, Co-chair, FICCI Committee on Drones and Co-Founder & CEO Idea Forge Technology Pvt. Ltd** Mumbai had chaired the session. He welcomed all panellists and put light on the various reasons for having such strict regulations in place regarding RPAS. He has also informed the house about the utility and legal complications related to RPAS.



24. **Shri Tanuj Bhojwani, Fellow, ISPIRT** spoke about the DigiSky Platform and its nitty-gritty. He has informed that real time tracking during flight cannot be ensured 100 %. All available technologies have major problems.

- ADS-B: bouncing back of message will potentially overload the system and make it unreliable.
- RFID: requires close proximity of operator to the RPAS.
- GSM-ID: cellular coverage is not present in all parts of the country, thus leaving potential loopholes.

25. Following challenges were flagged by Shri Tanuj: -

- How will the system differentiate between Legal and Illegal drones?
- How can we be sure each drone has a unique fireproof plate?

- If the drone collides with a manned aircraft, how will the operator be traced?
- How will the airspace be managed to avoid such collisions?

26. He has suggested that we must have a completely digital regulatory system with authentication, self-enforcement and traceability while increasing the ease of doing business. Subsequently, he has explained how the drone stack will create a digital sky, Layer 1-online Registration and furnish the details who is flying the drone. It will easily distinguish compliant users from illegal ones and ensure traceability by uniquely identifying all participating entities (UAV / drone, operator, pilot etc.) in a digital format. Layer 2 will facilitate the Automated permissions, digitally enforce no-fly zones, No Permission No Take-Off (NPNT) and also define the approved flight path. Layer 3 will give stakeholders the granular data as well as complete control over air space use. It will generate verifiable audit trails Crowd sourced enforcement Blacklist malicious operators increase risk of non-compliance for malicious operators.



27. Shri Tanuj has intimated the house that dashboard for security agency and regulators will be created which will provide the facilities of geofencing, ground all UINs of owner / pilot, ground all UINs of manufacturers, Granular permissions etc.

28. **Lt Col Pavan Kr Pandey, Dy Surveyor General** spoke on the Organisation & Mandate of Survey of India. He said that Limitation of other mapping technologies has necessitated use of UAV for mapping purpose. Case Study on various mapping projects were covered in his Presentation.



29. **Mr Prashant Prakhari of Desai Associates** spoke about the Legal risks concerning usage of drones, Laws related to Safety of persons and Damage of Property, negligence & trespass, privacy & data protection, hacking of drone, lack of counter drone equipment's & local police training.

30. He has explained the following risk mitigating laws under the heading of Safety of Persons: -

- No discharge or dropping substances, unless specially approved by DGCA. (*CAR Regulation 12.18*)
- No transportation of any hazardous material such as explosives or animal or human payload. (*CAR Regulation 12.19*)
- Mandatory insurance requirement for RPA Operators against any damage to third party resulting from an accident. (*CAR Regulation 17.1*)
- Penalty for flying so as to cause danger to any person (*Section 11 - Aircraft Act, 1934*)
- Actions endangering life or personal safety of others (Section 336 – IPC)
- Causing hurt by endangering life or personal safety of others (Section 337 - IPC)
- Causing grievous hurt by act endangering life or personal safety of others (Section 338 - IPC)

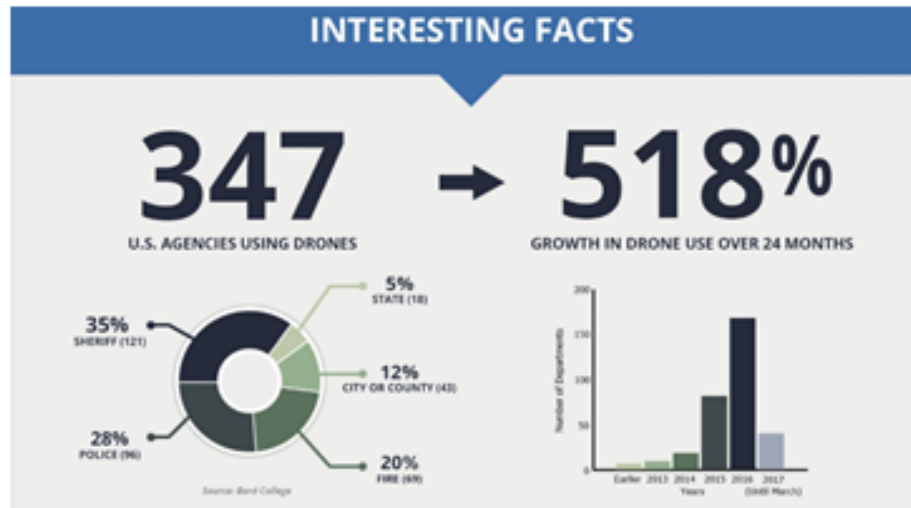
31. Risk mitigating laws under the Damage of Property: -

- RPA operator is responsible for ensuring that the RPA is operated safely and remains clear of all manned/ unmanned air traffic, terrain and obstacles. (*CAR Regulation 12.16*)
- RPA shall not discharge or drop substances unless specially cleared and mentioned in UAOP. (*CAR Regulation 12.18*)

- Mandatory insurance requirement for RPA Operators against any damage to third party resulting from an accident. (*CAR Regulation 17.1*)
 - Penalty for flying so as to cause danger to any property. (*Section 11, Aircraft Act, 1934*)
32. Risk mitigating laws under the Negligence & Trespass: -
- Responsibility of the safe functioning of the RPAS is of the operator. (*CAR Regulation 12.21*)
 - Negligent conduct with respect to machinery (Section 287 - IPC)
 - Whoever enters into or upon property in the possession of another with intent to commit an offence or to intimidate, insult or annoy any person in possession of such property is said to commit “criminal trespass”. (Section 441 - IPC)
33. Risk mitigating laws under the Privacy and Data Protection
- RPA operator/ remote pilot shall be liable to ensure that privacy norms of any entity are not compromised. (*CAR Regulation 12.21*)
 - Regulation on the collection, use, storage, transfer and disclosure of personal data / sensitive personal data in India. (*Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011*)
 - The right to privacy is recognized by the Supreme Court of India as a fundamental right. (*Justice K. S. Puttaswamy vs Union of India And Ors.*)
34. Risk mitigating laws under the head of Hacking
- Civil liability for cyber offenders (*Section 43A - Information Technology Act, 2000*)
 - Criminal liability for receiving stolen computer resource or information (*Section 66 - Information Technology Act, 2000*)
35. The last presenter of Session II was **Shri Tarun Krishnakumar, Legal Policy Consultant**. In his presentation, initially he has mentioned that the discourse and discussion surrounding UAVs/Drones largely centred around: -
- Use by civilians – issue of regulation and domestic law;
 - Use by military – issue of international law and rules of war;
 - Commercialisation and R&D;

36. But no discussion regarding the legal and policy concern that arise for law enforcement, security and intelligence agencies (Collectively LEAs) in relation to their UAV use of official purposes.

37. Following interesting facts he has shared with the participants: -



38. He has further flagged following key legal issues: -

- **Use by LEA of UAVs raise several potential legal concerns:**
 - Procurement
 - Deployment Purpose and Lawfulness
 - Compliance / interface with DGCA regulatory framework
 - Privacy
 - Liability in case of damage or injury to third-parties
- **Prosecution of misuse and Charging decisions:**
 - Sufficiency of existing framework;
 - Need for new offences;
 - Need for new powers and immunities;

39. He has categorically emphasised on shielding LEA from liability, the key concern he has flagged are as under: -

- Potential liability for mistakenly causing damage to UAV (for e.g. shoot down);
- Potential liability for damage to third-party property during UAV or anti-UAV operations;

- Potential liability for harm to individuals during UAV or anti-UAV operations;

40. He has concluded with followings: -

- Several legal issues also arise **for LEAs** in the deployment of UAVs for investigative / operational purposes;
- Need for formulation of internal rules, procedures, and guidelines based on legal analysis to ensure smooth operations;
- Need for reforms in the fields of immunity for good faith LEA actions which may violate existing frameworks for UAS and counter-UAS operations.



41. The **Third Session** on understandings of LEAs about UAVs threat and counter UAV solutions was chaired by **Shri V.H. Deshmukh, ADG, BPR&D**. He has explained that the utility of Drone technology for LEAs is immense. As first responder, Police can use the Drones to transmit the first hand information about the incident to control room within no time. This will help the decision making authority to take the appropriate decision without losing any time. Drone can also be used extensively for crime scene mapping security and surveillance of area, disaster assessment, law and order situation, mass agitation etc.

42. He emphasised that the aspect of capacity building for the Police personnel should be addressed in a mission mode. Secondly, the standards of various categories of drones to be formulated on priority so that law enforcement agencies able to procure the drones / UAVs in accordance to their functional requirements.

43. He has also shown his concern on threat that can emanate from non-state actors, terrorists, elements, inimical to India by using sub-conventional aerial

platforms. Hence, he suggested to raise the awareness amongst security agencies about sub-conventional aerial threats and the approach to tackle it. He further stated that it is high time when we should look for various technologies for countering the sub-conventional aerial threats.



44. Shri S.K. Gautam, Spl. CP, Delhi Police has explained about the challenges being faced by law enforcement agencies for acquisition and countering the threats from UAVs /Drones. He has emphasized to put the SOPs in place which will facilitate the Police forces to acquire this technology without any difficulty and unwarranted legalities. He has also shared the efforts put in by a Committee constituted by Ministry of Home under his chairmanship to develop Roadmap to equip the States and UTs Police to deal with rogue drones. In his presentation, he has also touched upon various technologies being used worldwide to counter the threats from UAVs / Drones.



45. Shri Ajay Dahiya, Sr. Comdt. CISF covered drone threats and different Anti Drone Systems available. In the beginning, he has explained the type and complexities level of drones.



46. He has classified the threats (weaponised, payload, commercial off the Shelf) corresponding to different categories of drones. He has also explained the various critical sectors being protected by CISF and these sectors require the customized technology to mitigate the emanating threats from drones. Based on the situation, he has submitted the wishlist (Passive and Active measures) to counter the threats from sub-conventional aerial platform (UAVs, RPAS & Drones).

47. He has also shown his serious concerns on likely potential harm to be amplified in the near future:

- Operation of a swarm of drones to perform any devastating attack.
- Turning a targeted cyber-attack against an organization into cyber warfare
- A targeted assassination into a massive terror attack .

48. **Shri Virender Singh, Chief Manager Security from ONGC** spoke about concerns with respect to Drone threats to vital oil installations. His presentation has covered about ONGC Infrastructure – Uniqueness & Complexity, Why ONGC can be a target, Benefits of usage of Drone in Security & Surveillance, Threats from Drone and Wish-list. On behalf of ONGC he has submitted the following wish-list under various heads: -

Regulatory Framework:

- Night Flying Permission to be granted.
- Fly zone to be BVLOS
- All VIs to be declared “No Drone Zone”.
- Power of declaration of “No Drone Zone” to be vested with the District Administration concerned.

- Special Police Wing on the lines of Marine Police to be created and Police Station on the similar lines to be established.
- Detection / Identification mechanism to be simplified – Hostile / Friendly.
- District Administration to have a data of all drones / their owners in its AOR
- Vetting of Drone Technology of Foreign Origin – IB/MHA

Legal & Policy Framework:

- Penal Provisions to be on the line of OSA 1923.
- Special Courts for Prosecution of offences related to violation of drone regulation to be established.
- Sensitization of Police Officers on Aircraft Act by organizing Special sessions at State Police Academies / NPA – DGCA to provide Resource Personnel.
- Formulation of Drone Act on the lines of PMP Act – existing provision not comprehensive.

Drone Technology:

- Require Intrinsically Safe Drones.
- Long duration Flight.
- Should be Able to operate high wind / Rough Weather.
- Vendors to Offer Drones / Anti-Drone Technologies to Industry.

Way Forward:

- IAF to train & provide resource personnel to District Administration for capacity building.
- IAF to explore the possibility of having Unique Single Toll Free Number.
- MHA to equip State Police Control Rooms with State of the Art Equipment for Detection / Identification / Neutralization of Hostile Drones.
- Formulation of a National Coordination Committee involving Stakeholders concerned under the Chairmanship of Secretary, MoCA.
- A panel of authenticated vendors to be created, duly vetted by MHA/DGCA/State Police for use by Industry.
- Technology to be vetted by BPR&D / NTRO.
- Separate Licenses to be given for Free to Fly Zone – Others to follow Geo-fencing.

- Mock Drills – rehearsal of SOP on the patterns of Sea Vigil, Sagar Kawach and Prasthan etc., - also to gauge the coordination and level of preparedness.

49. **Shri Alok Kumar Chakraborty, Comdt. BSF** apprised the house about the best practices being explored by BSF on usage of UAVs /Drones for security surveillance. He has further emphasized that accurate and speedy information can be gathered with the help of Drone technology.



50. **Major Surender Singh of NSG** gave detailed inputs on Counter-UAV approach. He also covered various types of anti-drone technologies being used worldwide.



51. The **Forth Session** was chaired by **Shri S.V. Satish, ED (IT), AAI**. He emphasized the importance of managing operations of Drones along with the manned aircrafts. He suggested that law enforcement agencies in association with experts and industry must explore safety measures by deploying the suitable anti-Drone systems.

52. All panelists for session IV (Last session) were from industry including Bharat Electronics Ltd. Bengaluru



53. Shri David Devasahayam from Cyient Solution and Systems Hyderabad elaborated on ISTAR RPA Solutions for the Modern Age Police and Training Needs for enhancing exploitation efficiencies. He has emphasized on the various suggested training requirements, training subjects and training policies. He has further apprised the house about the initiative taken by Cyient Solution and Systems with Telangana Police for imparting necessary training to the Telangana Police personnel on effective use of Drone technologies.

54. Shri Mitul Arora, Policy Head, India, DJI has suggested that govt. department specially the law enforcement agencies should be exempted from obtaining NPNT/UIN for their drone being used for lawful purposes and dept. head should be the nodal and responsible person for the same. Besides, he has given inputs on various policies regarding public safety (geo fencing, flight hub, aero scope etc.) in regards to UAS.



55. Shri Neel Mehta of Asteria Aerospace spoke on the Capabilities, Opportunities & Challenges in the Indian Drone Manufacturing Ecosystem. Following typical capabilities available in the Indian made small drones for surveillance & security have been apprised to the house:

- Weight: < 6 kg with vertical take-off and landing
- Endurance: 60 mins
- Range: 5-10 km

- Ceiling: up to 5000m AMSL
- Automated operations from take-off to landing, with point and click user interface
- Secure, encrypted communication links
- Military rugged for operating in range of temperature (-20 to +50 C), humidity, dust/drizzle conditions

56. As regards to the opportunities available to the Indian manufacturers, they are supposed to provide Regulation Compliant Drones, Secure Drone Solutions and Software Solutions around Drone Data etc. to the stakeholders. He has also emphasised on the various challenges being faced by the manufacturers, few are: Lack of Electronics Manufacturing Ecosystem, Lack of Test Sites for Drone Development Testing, Industrial License for Drone Manufacturing, Export Regulations on Drones etc.



57. **Shri Sunny Sharma, CEO, IIO Technologies Pvt Ltd** said that the threat from rogue UAV is very real and there is an urgent need to put strategies to counter it in place. He spoke about the Anti Drone Technologies being used world wide and recommended for a comprehensive Anti Drone Policy with more Industry engagement.

58. **Shri Gunavantha Mate, Manager, BEL, Bengaluru** gave an overview on use of tethered drones for 24X7 surveillance.



59. In the end, **Shri Karuna Sagar, Director / IG (Mod), BPR&D** in his closing address has listed out the following Resolutions drawn, based on the discussion and deliberation during the Conference cum Workshop, for further necessary action:-

Resolutions of Conference cum Workshop

a) The Training Institutions of BPR&D are spread all over India:

- Central Detective Training Institute Chandigarh,
- Central Detective Training Institute Kolkata,
- Central Detective Training Institute, Hyderabad,
- Central Detective Training Institute Ghaziabad,
- Central Detective Training Institute Jaipur
- Central Academy for Police Training, Bhopal

These training institutes may be utilized for two pronged training (Indoor and outdoor) on operating Remote Pilot Training to Central and State Police Forces in association with experts, industry and DGCA. Initially, the indoor training can be planned at the above training institutes and for outdoor training the existing Flying Training Organizations (FTOs) of DGCA may be associated. This mechanism shall be economical and cost-effective for the law enforcement agencies. Bureau may approach Ministry of Home Affairs and obtain necessary approval accordingly.

- b) Bureau may plan to organize a demonstration of anti-Drone technologies wherein senior Police officers from States / UTs / CAPFs / CPOs and other stakeholders may be called.
- c) Bureau may plan to formulate the standards for various categories of Drones and anti-Drone technologies after seeking approval from MHA.
- d) BPR&D after observing all codal formalities, explore the feasibility of providing consultancy services in association with experts / industries to various stakeholders as and when required.

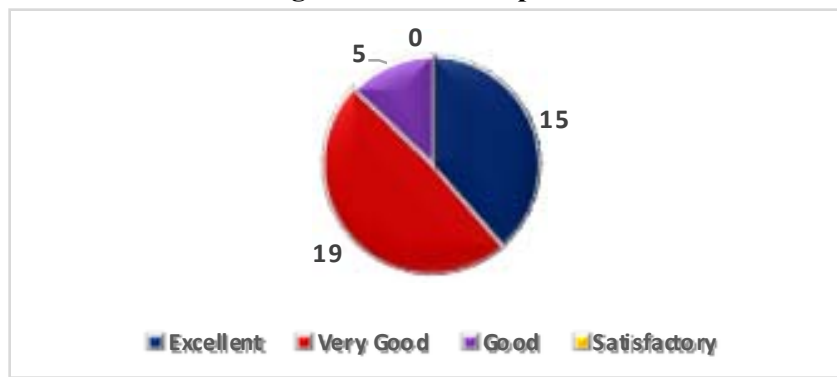
- e) Bureau may also engage technical institute, and industries to develop customized anti-Drone technologies, subject to approval from the concerned authorities. Bureau may seek the approval of the concerned authorities to this effect.
- f) A technical group consisting of representatives from academia, industry, LEAs, DGCA, AAI, BCAS, experts to be constituted which will act as a standing committee to compile and disseminate the latest inputs / guidelines to various stakeholders regarding RPAS and anti-Drone technologies.

60. Finally, **Shri Karuna Sagar, Director (Modernization), BPR&D** gave his sincere thanks to all the chairpersons, distinguished panelists and participants for taking part in the Conference and making it a grand success.

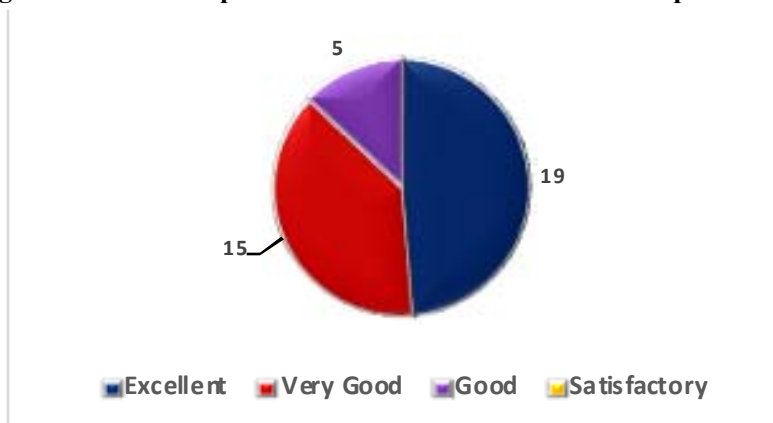
End of Proceedings

FEEDBACK REPORT

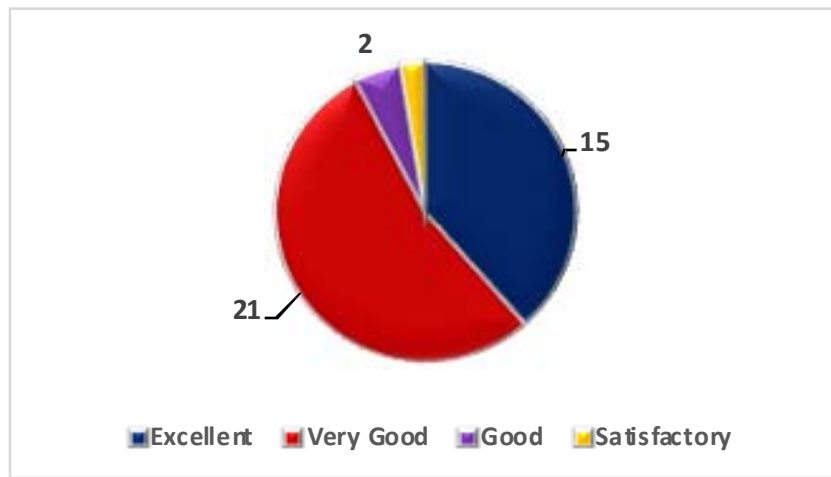
Overall Rating of the Workshop cum Conference?



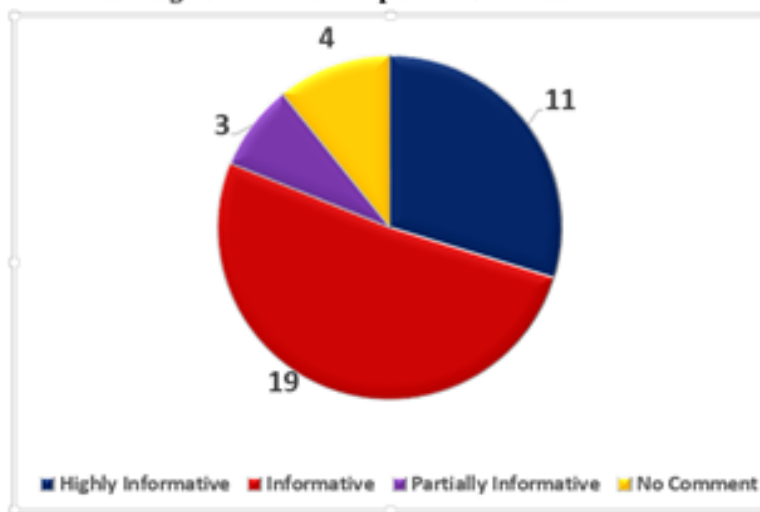
Rating on selection of topics of various sessions of the Workshop cum Conference?



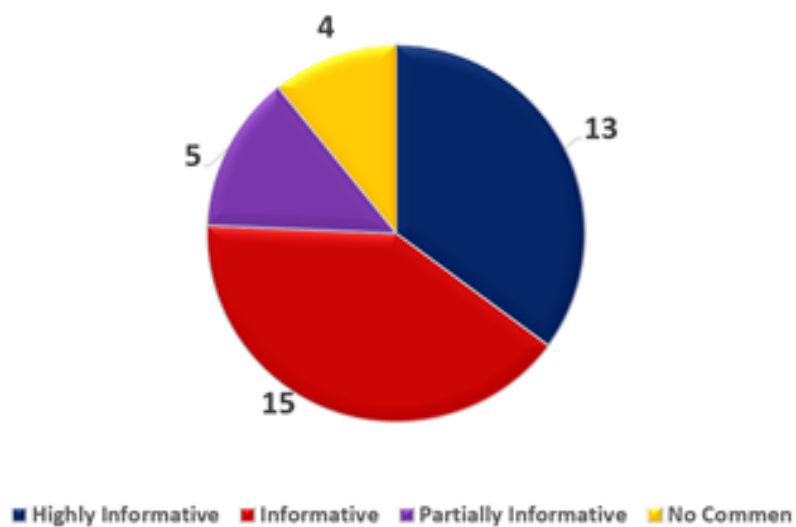
Rating on contents covered by the panelists in the various sessions



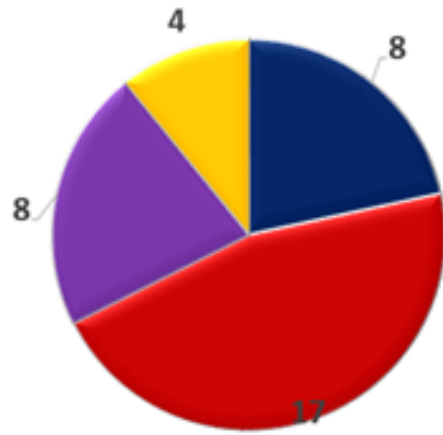
Rating on selection of topics for Session I



Rating on selection of topics for Session II



Rating on selection of topics for Session III



■ Highly Informative ■ Informative ■ Partially Informative ■ No Comment

Rating on selection of topics for Session IV

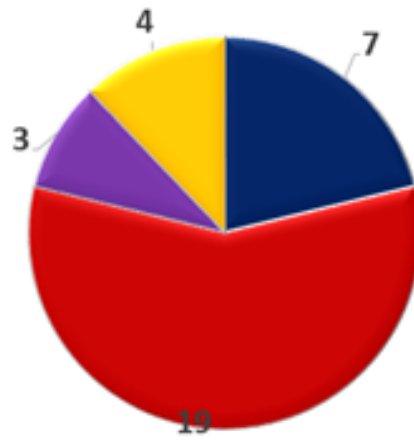


Chart Area

■ Highly Informative ■ Informative ■ Partially Informative ■ No Comment

End of Report
