

No.AV.13024/927/2015-AS

Government of India
Ministry of Civil Aviation

Subject:- Assessment and formulation of requirements for counter drone technologies for surveillance, detection and neutralization of Drones/UAVs in vicinity of airports – Live Demo in March, 2018 - regarding.

NOTICE

A public notice dated 09.02.2018 on the subject captioned above was uploaded on the website of Ministry of Civil Aviation (copy attached) so as to enable companies/agencies willing to conduct live demo on counter drone technology proposed to be organized in March, 2018 (date yet to be decided) on counter drone technology, to send in their willingness along with the necessary particulars in the template attached to the public notice and copies of the requisite documents, to enable this Ministry to consider their participation in the proposed live demo. The last date stipulated for submitting the willingness and the other particulars in this regard was 23rd February, 2018.

2. It has been decided to give an opportunity to companies/agencies who are willing to participate in the live demo but have not yet submitted the information/particulars/ documents sought for in this connection.

3. Accordingly, it has been decided to extend the last date for submission of the willingness along with details in the template, copies of documents (mentioned in the Public Notice), etc. till 5th March, 2018.

4. As no further extension of last date will be allowed, the companies/agencies who are interested to participate in the live demo on counter drone technology in March, 2018 may send their willingness along with all requisite details (as per the prescribed template) along with copies of documents, etc., to this Ministry on or before 5th March, 2018. The other terms and conditions specified in the public notice dated 09.02.2018 (copy attached) will remain valid. Address for sending the willingness and other details are indicated in para 12 of the Public Notice.

No. AV.13024/927/2015-AS
Government of India
Ministry of Civil Aviation

Dated 9th February, 2018

NOTICE

This supersedes the notice dated 05.02.2018 uploaded on the website earlier.

2. The operation of the drones has posed various safety related issues to aircraft operations. Accordingly, draft CAR has been developed to regulate drones in vicinity of airports in country and the stakeholders' comments have also been invited by this Ministry/DGCA.
3. This Ministry is in the process of assessing and formulating requirements for counter drone technologies for Surveillance, Detection and/or Neutralization of drones/UAVs in Civil Aviation. The related issues were discussed in a series of meetings organized by this Ministry, attended by officers from various Ministries/Departments and government organisations concerned and representatives of few agencies/companies dealing with drones/anti-drone systems.
4. It has been decided in this Ministry to have live demonstration by various agencies dealing with counter drone systems to understand various issues and aspects related to counter drone technologies/solutions.
5. The agencies/companies who had initially expressed their willingness on individual basis, have been asked to conduct a live demo on 13th February, 2018. Another live demo is proposed to be conducted in the month of March, 2018. The live demos will be organized at Rohini Heliport, Sector-36, Rohini, Delhi.
6. A copy of the minutes of the preparatory meeting held earlier on 09.01.2018 with few agencies on the subject matter is annexed (Annexure I). The decisions and requirements mentioned therein are not limited to the participants of the meeting, but will also apply in general to other agencies as well.
7. Those who are willing to participate in the demo proposed to be conducted in the month of March, 2018 can submit their willingness as per details mentioned in Para 11 below. The agencies/companies are required to indicate clearly the logistic and technical requirements required for the smooth conduct of the live demo. The agencies/companies may furnish all relevant information in the template annexed (Annexure II) and send the same along with their willingness on their letter head. The template may be duly filled in with all requisite details, including passport number, etc. of the DEMO team members (foreign nationals), and sent along with copies of ID card and other documents (such as passports). The exact dates would be communicated in due course after considering various factors like logistics, level of participation etc. Submission of application does not

necessarily bind that the demo would be held. The Government at its sole discretion reserve the right to cancel the demonstration.

8. The live demonstration is being organized by this Ministry on 'no cost' and 'no commitment' basis. The complete risk and cost for the same is to be borne by the concerned agency/company, and they shall have no claim whatsoever with Government of India or any other Government agency / PHL / AAI / DGCA / BCAS. The 'live demo' shall not result and may not be expected to result in any award of contract/work order/license/permission/approval/certificate whatsoever.

9. The details of clearances required, if any, from different departments of Government of India and Government agencies may be clearly mentioned in the Template. The agencies/companies will be required to make available at their cost, all necessary documents that may be required for obtaining such clearances.

10. For the purpose of getting Airport Entry Permit for access at Rohini Heliport for the aforesaid live demonstration, a duly filled application form of each participant can be submitted to this Ministry. The AEP application form can be downloaded from the link: <http://bcasindia.gov.in/>

11. The clarifications in respect to air space/ATC issues/availability at Rohini Heliport, New Delhi for such demonstration and other details in this regard may be sought from the following officers:-

- (i) Shri Rajeev Agnihotri, Joint General Manager, Pawan Hans Limited.
Contact No. 09828998778, Email ID: rajeev.agnihotri@pawanhans.co.in
- (ii) Shri Dilip Kumar, Joint General Manager, Airports Authority of India
Contact No.:-07042400747, Email ID: ddilipkumar@aai.aero

12. Address for sending willingness, template and other details & documents:

Under Secretary, Aviation Security Division, Ministry of Civil Aviation,
Room No.179, B-Block, Rajiv Gandhi Bhavan, New Delhi-110003.

(Soft copy may be e-mailed to: soas.moca@nic.in;
dirdn.moca@gov.in)

13. Last date for submission of willingness, filled in template & copies of documents, etc. to this Ministry will be as under:-

For those willing to conduct live demo in March, 2018
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23 rd February, 2018

No. AV-13024/927/2015-AS
Government of India
Ministry of Civil Aviation

B Block, R. G. Bhawan, Safdarjung Airport
New Delhi -110003 dated 22.01.2018.

To

1. Ministry of Home Affairs [Kind attention: Shri Dilip Kumar, Joint Secretary (IS-I)], Room No.-09, Major Dhyanchand National Stadium, 2nd Floor, New Delhi-110 001.
2. Ministry of Home Affairs [Kind attention: Shri Kumar Alok, Joint Secretary (Police-I)], Room- No. 110, North Block, New Delhi-110 001.
3. The Director General, Central Industrial Security Force Headquarters, 13, CGO Complex, Lodhi Road, New Delhi-3.
4. The Director General, Directorate General of Civil Aviation, Opposite Safdarjung Airport, New Delhi -110003.
5. The Director General, Bureau of Civil Aviation Security, Janpath Bhawan, Janpath, New Delhi -110001.
6. Indian Air Force, [Kind Attn: Gp Capt. Perminder Singh, D Ops AD (GE)], Room No. 584, Indian Air Force, Air Headquarters, Vayu Bhawan, Rafi Marg, New Delhi – 110106.
7. The Commissioner of Police, Delhi, MSO Building, Indraprashta Marg, IP Estate, New Delhi, Delhi-110095
8. The Chairman, Airport Authority of India, R.G. Bhawan, New Delhi-110003.
9. The Chairman & Managing Director, Pawan Hans Limited, C-14, Sector-1, Distt. Gautam Budh Nagar, Noida-201301.
10. The Director General, National Security Guard, Mehram Nagar, Palam, New Delhi - 110037.
11. The Secretary, Department of Defence Research & Development & DG, Defence Research & Development Organisation, DRDO Bhawan, New Delhi - 110 011.
12. Embassy of Israel Defence Section, 3 Dr. APJ Abdul Kalam Road, New Delhi – 110011.
13. IIT Kanpur [Kind Attn: Dr. G. M. Kamath, Associate Professor, Department of Aerospace Engineering], Kanpur, Uttar Pradesh – 208016.

Subject: Discussion on Surveillance, detection, and neutralization of Drones/UAVs-Reg.

Sir,

I am directed to forward herewith the Minutes of the preparatory meeting held under the chairmanship of Smt. Usha Padhee, Joint Secretary, Ministry of Civil Aviation (MoCA) on 09.01.2018 at Rohini Heliport, New Delhi to discuss the requirements and procedural formalities involved and coordinates for the proposed demonstration., for information and necessary action.

Yours faithfully,



(Satish Chander)

Under Secretary to the Government of India
Tel. No.24616025.

Enclosure: as above.

MINUTES OF THE PREPARATORY MEETING HELD ON 9TH JANUARY, 2018 UNDER CHAIRMANSHIP OF SMT. USHA PADHEE, JOINT SECRETARY (CA) AT ROHINI HELIPORT REGARDING TECHNOLOGIES RELATED TO SURVILLANCE, DETECTION & NUETRALIZAION OF DRONES.

A preparatory meeting was organized under the chairmanship of Smt. Usha Padhee, Joint Secretary, Ministry of Civil Aviation (MoCA) on 9th January, 2018 at Rohini Heliport, New Delhi to discuss the requirements and procedural formalities involved and coordinates for the proposed demonstration.

2. List of officers/officials of MoCA and other ministries/organisation/agencies who attended the meeting is enclosed (Annexure I).

3. In the meeting, relevant issues were deliberated upon in detail. On the basis of the discussion the following decision were taken:

- (i) At the beginning of the meeting, Airport Authority of India made a presentation on purpose of demonstration to be conducted, in which they specified the coordinates for the said demonstration.
- (ii) One of the participants requested that lateral length up to 500 NS may be considered. It was clarified that they may submit a proposal in this regard & PHL/AAI will explore the feasibility.
- (iii) ED (AAI) said that the main aim of the demo is to identify the unidentified UAV/drones, detect it and then neutralize it as per DGCA regulations with the available capabilities.
- (iv) DIG, CISF suggested that detection and thereafter neutralization with non-lethal solutions will be more practical. However during demo, lethal options can also be shown.
- (v) Representative of NSG mentioned that besides detection, reaction time is more relevant. It should not be more than a minute. The time of reaction and detection should be specifically mentioned. During demo, solution for multiple directional attacks may also be visualized. He emphasized that the technology should differentiate between birds and drones. The technology should have approach and control over multiple targets. Thus, time for second shoot is more relevant.
- (vi) Representatives of Air Force said that detection range should be specified. The total technology depends on the time period for detection/ neutralization. Normally, detection technology should be up to a range of 10 KM. Identification should be full-proof. Besides detection, capabilities to integrate with existing airport system are also relevant. Multiple system of detection should be there. Time line should be specified for detection & neutralization. Tracking of object is also necessary.
- (vii) One of the participants (agencies) asked as to whether they can jam the drone/object by usage of Jamming Frequency concept. JS (U) clarified that the participants may give their requirements with Jamming frequency, the same will be examined keeping in view its effects on ATC & other object. It can have effect of multiple

jamming on the other equipments. Options of Pulse to jam the drones instead of frequency jam needs to be specified in the requirements.

- (viii) JS (U) mentioned that MoCA is planning demonstration in 2nd week of February, 2018. Multiple demonstrations on a single day can be done. She requested that requirements for demonstration and logistic requirements can be projected by the firms/agencies. There after view of the companies were sought. Time sought by different agencies for demonstration is tabulated as under:

Agency	Time sought for demo & suggestion given
M2K Technologies Pvt. Ltd.	1 st week of March. The representatives mentioned that 2-3 days for the installation of equipments is required. For demonstration one day will be required. They suggested that for import of equipments one month time is required.
3S Sensors & Systems Technologies	They can do demo on 13 th February, 2018. Four hours of time will be required.
Ideaforge Technology Pvt. Ltd.	Last week of February. Time required for demo is 3 hours.
TIPL-SenseBird	1 st week of March. Time required for demo is one day.
Thales India Pvt. Ltd.	Mid of March. Three hours of time will be required.
RAFAEL India	Demo can be done on 13 th February, 2018. Time required will be 5 hours.
DroneFence	They can conduct the demo on 13 th February. They require half a day for demo.
General Energy	3 rd Week of February. 3-4 hours of time is required.
IAI	They are okay with 13 th February, 2018. They require one hour of time.

- (ix) JS (U) mentioned that for import of equipment, they may send request to MoCA, if facilitation needed.
- (x) AAI mentioned that demonstration may clearly specify the impact of demo on other objects such as T.V. tower, ATC etc. Lethal collateral impact may be given. JS (U) suggested that AAI may make template for gathering information/ requirement of agencies.
- (xi) It was clarified that in demonstration, hard killing with fire arms will not be allowed.
- (xii) In the template technology used, frequency, type of drones used, specification of equipment, specification of UAV, plan for demo may be included.
- (xvi) An undertaking to the effect that no loss to infrastructure/ assets of heliport & neutralization should be within heliport with a point to be specified, be obtained from agencies.
- (xiv) Company will provide detail of participants with foreign delegates & copy of their passports.
- (xv) No photography with the help of the drones will be permitted.

- (xix) Shri T A Dayasagar, PHL will be nodal officer and all agencies will submit their requirements to him. His mobile No. is 9560385947. Nodal officer from Ministry of Civil Aviation would be Shri Suyash Narain, Director, MoCA (Phone No. 011-24649891) & form Airport Authority of India would be Shri S Chadha, ED-ATM, AAI (No. 9810244204).
- (xx) A copy of template for inviting information is annexed herewith (Annexure II), with a request that the company / firm may provide inputs by 15.01.2018.
- (xxi) The proposed demo will be on 'no cost no commitment' basis and company/ firm will be responsible for any loss to any other agency/ human being due to the said demo.

The meeting ended with Vote of Thanks to all participants.

Preparatory meeting on technologies relating to Surveillance, Detection and Neutralization of Drones going to be held on 09.01.2018 at Rohini Heliport.

List of Participants of the meeting

A. Officials:

I. Ministry of Civil Aviation:

- (i) Smt. Usha Padhee, Joint Secretary
- (ii) Shri Suyash Narain, Director, MoCA
- (iii) Shri Satish Chander, Under Secretary, MoCA

II. Ministry of Home Affairs:

- (i) Shri R Chaturvedi, Director, MHA
- (ii) Shri Inderjeet Chawla, 2IC (Proc), MHA

III. Ministry of Defence (IAF):

- (i) Wg Cmdr P Prakash, Indian Air Force

IV National Security Guard

- (i) Major A Arun, Sqn Cdr, NSG

V. DRDO

- (i) U V V Krishnaujni, Scientist-'F'

IV. Attached Offices of MoCA:

- (i) Shri HGS Dhaliwal, Deputy Director General, BCAS
- (ii) Shri Ayush Mani Tiwari, Deputy Director General, BCAS
- (iii) A K S Billawaria, DD (Trg), BCAS
- (iv) Shri Tulasiraman, Assistant Director, DGCA
- (v) Shri Praveen Kumar Singh, Aeronautical Officer, DGCA

V. AAI:

- (i) Shri S Chadha, Executive Director (ED-ATM)
- (ii) Shri Rajiv Mehta, General Manager (GM), ATS
- (iii) Shri S Dharmaraj, GM (AS)
- (iv) Shri D Dillip Kumar, Joint GM, ASM
- (v) Shri Shibhu Robert, Joint GM, ATM
- (vi) Shri Vikas Bhalla, Joint GM, ATM
- (vii) Shri Ravi Sindhu, AM (ATM), AAI
- (viii) Shri Joven Varghese, DGM (Sec)

- VI. **CISF:**
(i) Shri Rajiv Sahay, IG, CISF
(ii) Shri Ajay Kumar, DIG/Airport Sector, CISF
(iii) Shri Shrikant Kishore, DIG, CISF

- VII. **PHL:**
(i) Dr. B P Sharma, CMD
(ii) Air Cmdr T A Dayasagar, ED (OM & Tech)
(iii) Capt. R K Singh, AGM (Ops)

- VIII. **Delhi Police:**
(i) Sunil Kumar Singh, ACP/ IGIA

B. Non-officials

- (i) Professor G.M.Kamath, IIT Kanpur

C. Defence Section of Embassy of Israel

- (i) Rachel Racheli Mulla, Deputy Defence Attache for HLS

Agencies

- a) M2K Technologies Pvt. Ltd. (Mr. Deepak Singhal, President & Mr. Anoop Kumar, Manager, Business Development)
b) 3S Sensors & Systems Technologies (OPC) Private Limited
[Wg. Cdr. VB Athmaram (Retd.), CMD & Mr. Sandeep Lahoti, VP (Business Development)]
c) Ideaforge Technology Pvt. Ltd. (Gp. Capt. (Retd.) R Mohan)
d) TIPL-SenseBird (Mr. Mrigank Singh, CEO)
e) Thales India Pvt. Ltd. (Shri Prashant Kaul, National Sales Manager)
f) RAFAEL India (Mr. Yuval Beiski, Mr. Noam Shultz, Col Manish Sarin(Retd))
g) IAI (Mr.Ofir Cohen-Joint Director, Vitaly Kakuivicki – Reginal marketing director & Uri Haim – Program Manager)
h) DroneFence (Mr. Pankaj Shrivastava, National Sales Manager)
i) General Energy Management System (Mr. Raunaq Sethi & Mr. Sukhjit)

**DEMONSTRATION OF ANTI-DRONE TECHNOLOGY
ROHINI HELIPORT – MARCH, 2018**

(TO BE GIVEN ON THE LETTER HEAD OF THE COMPANY/AGENCY)

1. DETAILS OF VENDOR

Name of the Company / Vendor participating in the Demonstration, with email address and contact telephone numbers		Details of DEMO Team	NAME	NATIONALITY	ID NO: <i>(Provide passport number and attach copy of valid VISA and passport, if foreign national)</i>	MOBILE NO:	EMAIL ADDRESS	

2. DETAILS OF TARGET DRONE (Attach Equipment Brochure, if available)

Type(s), number and technical specifications of drones to be flown during the DEMO	Type of Drone	Number of Drones Employed for Demo	Radio Frequencies Used (C2 and Video)	Weight of Drone (Including payload)	Fuel Used and Max. Endurance (HHMM)	Type of Flight (Remotely piloted or autonomous)	Maximum flight Altitude (ft.)	Maximum Cruising Speed (kmph)	Geo-fencing Capability (YES / NO)	Return Home (RH) Capability (YES / NO)	Positioning System Used (GPS / GLONASS / INS)

3. DETAILS OF ANTI-DRONE TECHNOLOGY EMPLOYED

STAGE OF DEMO	TECHNOLOGY	METHODOLOGY	COLLATERAL IMPACT ON MANNED AIRCRAFT OPERATIONS	COLLATERAL IMPACT ON OTHER RADIO DEVICES SUCH AS MOBILE PHONES	ANY OTHER COLLATERAL IMPACT FORESEEN
DETECTION	1				
	2				
	3				
IDENTIFICATION	1				
	2				
	3				
NEUTRALIZATION	1				
	2				
	3				

4. DEMO PLAN

BRIEF PLAN OF THE DEMO	AIRSPACE REQUIREMENTS (Lateral and vertical expanse of the airspace required which should include adequate safety buffer)	Duration of Usage of Airspace (Total airborne time of target drones)	FLIGHT PROFILE OF TARGET DRONES	LOGISTIC REQUIREMENTS AND OPERATIONAL APPROVALS REQUIRED	EXPECTED OUTCOME OF THE DEMO
	Between _____ track _____ and _____ degrees (Mag) from Rohini Helipad, from GND to _____ feet.				

5. DETAILS OF CLEARANCES REQUIRED FROM MINISTRIES/DEPARTMENTS OF GOVERNMENT OF INDIA AND OTHER GOVERNMENT AGENCIES:

Sr. No.	Nature of clearance required	Ministry/Department/Government Agency from where clearance is required	Documents submitted by Company/Agency for the purpose of clearance

NOTE: A duly filled AEP application form (it may be downloaded from the link <http://bcasindia.gov.in/>) can be submitted to this Ministry for the purpose to get AEP for access at Rohini Heliport for the aforesaid live demonstration.

6. UNDERTAKING:

The company certified that:-

- a) The company undertakes full responsibility for the personnel engaged in the demonstration or its associated activities irrespective of whether they are an employee of the company or not.
- b) The details furnished above are correct & true.

In addition, the company gives an undertaking to the effect that the demonstration being conducted by the company will not have any adverse effect on person and property of the heliport and surrounding areas. The neutralization of drones/ UAVs will be done within the premise of the heliport at the place identified by PHL authorities. In case of any damage to the infrastructure / assets and human being is caused by the demo, company will be fully responsible for the same and pay compensation for it. The demonstration is being conducted at no cost and no commitment from Government of India and the entire cost & risk will be borne by the company itself. No claim whatsoever would be against Government of India or any of its organisations / AAI / PHL / DGCA / BCAS. The Company also understand that submission of the application does not entitle or grant any right to hold the demonstration, which will be subject to the level of participation, feasibility, logistics and other factors. The Government at its sole discretion reserves the right not to hold the demonstrations.

SIGNATURE OF THE VENDOR / REPRESENTATIVE

Documents to be enclosed:

- 1) Copy of document of ID proof of DEMO team members
- 2) Copy of passport and VISA of DEMO team members (foreign nationals)