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INDIA METEOROLOGICAL DEPARTMENT, NEW DELHI – 110003

INVITATION TO INDUSTRY/ACADEMIA TO JOIN IMD IN DEMONSTRATION OF EXPERIMENTAL DRONE BASED RADIO-SOUNDING ON NO COST NO COMMITMENT (NCNC) BASIS

प्रायोगिक ड्रोन आधारित रेडियो-साउंडिंग के प्रदर्शन में आईएमडी में शामिल होने के लिए उद्योग/शिक्षाविदों को निमंत्रण (नो कॉस्ट नो कमिटमेंट बेसिस)

भारत सरकार, पृथ्वी विज्ञान मंत्रालय, भारत मौसम विज्ञान विभाग मौसम विज्ञान महानिदेशालय, लोधी रोड, नई दिल्ली-110003

Government of India, Ministry of Earth Sciences, India Meteorological Department O/o Director General of Meteorology, Lodhi Road, New Delhi-110003

MAY, 2022

1. Background

India Meteorological Department (IMD) functions under Ministry of Earth Sciences (MoES) since formation of the ministry. It has been in the service of the nation for more than 135 years with forecasting and weather information and supporting the global data exchange as main commitment. Weather forecasting in India commenced with the establishment of India Meteorological Department (IMD) in 1875 and over a period of time, a network of forecasting organizations have been developed in IMD. Various input sensors and data augmentation systems at various stages and levels are deployed by IMD to get parameters to act as a feeder stock to weather prediction models. Few of these parameters are captured through upper air observations and Satellites.

Currently, the meteorological sounding is the measurement of the vertical distribution of physical properties of the atmospheric column, for example, pressure, temperature, wind speed, and wind direction. The more widespread method of conducting the sounding is: through sending sensors aloft balloons that measure atmospheric state parameters directly, such as temperature, pressure, wind and humidity. Usually, these sensors are embedded in a radiosonde, a battery-powered telemetry instrument carried into the atmosphere, usually by a weather balloon that measures various atmospheric parameters and transmits them by radio to a ground receiver.

While weather balloons carry radiosonde which are indispensable and cannot be retrieved after launching it. The weather balloons are unmanned, lighter than air/aircraft that do not have control surfaces or propulsion systems to control the path of flight. Therefore, the winds aloft play a vital role in the horizontal displacement of the weather balloons. A typical weather balloons flight lasts about 2 hours, and the landing positions of the payloads can be extremely far from the take-off location.

2 The Need

IMD is exploring the possibility of using modern technology for upper air meteorological observations using radiosonde devices with Drones. Drones can reach 10 km altitude and it can be merged with radio sonde ballonet to reach at least 34 KM on average. It can be fully remote controlled, and can take observations both horizontally and vertically and can be used repeatedly

3 Proposed methodology

a) Drone will be operated up to 5 km altitude in selected site with arround 200 grams transmitter (Radiosonde) as a passive payload. During this experiment Balloon with the similar radiosounde (Conventional method in operation from yore) will also be launched for the comparison of data generated.

b) Post experiment data Inter-comparison exercise will be carried on.

c) Data Reception station will be established by IMD

d) It is expected two Drones of suitable capacity with one spare drone fully

equipped with batteries are expected to reach site

e) Drone stability aspects without affecting measurements are to be discussed in advance

f) There will be video conference meeting with selected participating organizations with IMD

g) Any other recant additional requirements would be proved day IMD

h) FAQ will be made available in IMD web site was when made available\Overall this exercise will be done as a joint activity to demonstrate national capability for such a modern technology for atmospheric upper air meteorological studies

i) IMD would publish this results in reputed journals with due acknowledgements to all the support extend by the participating originations

j) After quality control data sets would be made available as per IMD national data policy

3 Scope of Work

IMD is inviting industries/academia in India to join us in this demonstration to showcase of capability of Drone technology. This will be purely on no cost no commitment (NCNC) basis. IMD would provide technical support (sensors etc.) and help in obtaining the statutory permission.

3 Broad Features Expected

a) It is expected that Drone should be capable, economically feasible, easily deployable & recoverable and should be technically comparable or superior to currently deployed radiosoundes for Upper Air observations up to boundary layer of upper air atmosphere (5 Km AGL or above).

b) Expected drone endurance is around more than 40 minutes and Fixed wing / hybrid configuration is preferable.

c) Drone should preferably be QCI certified, with capability of handling emergency modes including but not restricted to C2 link failure, GPS fencing and autonomous capabilities, emergency recovery/ RTH features, wind deviation recovery and crash recovery capabilities etc.

4 Participation of Industry/ Academia

a. For the purpose of this this demonstration is to explore the capabilities of drones to be used as a carrier for radio sounding transmitter and analyze safety, recovery and repeatability of the system. Proposals in the attached format along documents should be sent to dronesforenvironment@gmail.com within two weeks of release of this advertisement on the IMDs website.

b. The participants shall adhere to the Drone Rules, 2021 or notifications released by MoCA/DGCA/QCI and should have well established service/support center.

c. The participant should have experience in complete end-to-end setup, installation, integration, and testing the equipment's for setup of UAS system; should be able to install all required software with security features. Duly certified documents authenticating this aspect should be enclosed in the bid document without which the proposal shall not be considered.

5 Participation process

Step 1: Interested participants may submit their proposal by responding to all the points mentioned in Section **4 above** with documentary evidence in response to this invitation for the experimental flight.

Step 2: Empowered committee shall review the proposal and will accept/reject the proposal after receiving the same. Evaluation of will be uploaded on IMD website/ informed to the individual. For those selected potential participants IMD shall call for a presentation or clarification if required.

Step 3: IMD will short list the participants based on their profile and presentation.

Step 4: The short-listed participants will only be allowed to participate in the experimentation/demonstration process at a mutually agreed upon green or yellow zone site as approved by MoCA and AAI.

Step5: All approvals for conducting the said experiment will be assisted by the committee members and Ministry of Civil Aviation However, it shall be the duty of participant(s) to apply for the same as per the existing rules and central government instructions. Participants have to ensure that trained manpower is deployed to conduct the experiment and Drone used should have third party insurance. The participants should fill the proforma as attached and sign on all pages.

Benefits

IMD would provide certificate to successful Drone technology demonstrated for this application as mentioned in part 3 under scope of work.

6 Documents to be enclosed along with the proforma

a. Company/Academia profiles including organizational structure with details of ownership and evidence of incorporation;

b. Evidence of technical capability and certifications including airworthiness and safety of drone used.

c. Detailed information on overall architecture and functionalities of different components and highlighting the elements of scalability and customization of different components and operating software/Hardware of proposed solution.

d. Suggestions and views, if any for Drone deployment requirements of IMD.

7 **Submission of proposal:**

All prospective participants shall submit their proposal in response to this invitation for experimental drone based radio sounding on **no cost no commitment basis** only through email to dronesforenvironment@gmail.com on or before 12 June 2022.

8. Post experimentation:

Post experimentation participants shall submit a SOP, flight logs, telemetry data and technical details as an outcome of the experimentation along with details for further enhancement prospects, design changes and a feasibility analysis to enhance the service and absolute ceiling of drone up to at least 12 Kms AGL for the intended purpose.

PROFOMA

Office of Director General of Meteorology
India Meteorological Department
New Delhi-110003
(MINISTRY OF EARTH SCIENCES, GOVERNMENT OF INDIA)

File No .

1. Particulars of Applicant Company							
Name of the Company							
Registration No.							
Address					STD Code Tel. No.1		
					Tel. No.2		
					Fax No.		
	City				Pin		
	State		E-mail *				
Website Address							
Type of company	Government		Public Sector Undertaking		Private Limited		
	Partnership		Public Limited		Proprietorship		

* Email sent on this address will be treated as valid communication. Add a separate sheet, if necessary

2. Particulars of Managing Director/CEO/Proprietor/Managing Partner					
Name & Designation	Address			STD Code	
				Tel. No.1	
				Tel. No.2	
				Fax No.	
	City			Mobile	
	State		Pin	E-mail	

3. Particulars of Contact Persons				
S No.	Name & Designation	Address	Numbers	
1.			STD Code	
			Tel. No.	
			Fax No.	
		City:	Mobile	
		Pin Code:	E-mail	
2.			STD Code	
			Tel. No.	
			Fax No.	
		City:	Mobile	
		Pin Code:	E-mail	

3.			STD Code	
			Tel. No.	
			Fax No.	
		City: Pin Code:	Mobile E-mail	

4. Location of Offices in India				
S No.	Name of Head	Address	Numbers	
1.			STD Code	
			Tel. No.	
			Fax No.	
		City:	Mobile	
		Pin Code:	E-mail	
2.			STD Code	
			Tel. No.	
			Fax No.	
		City:	Mobile	
		Pin Code:	E-mail	
3.			STD Code	
			Tel. No.	
			Fax No.	
		City:	Mobile	
		Pin Code:	E-mail	

5.			
Year	**Period (Month/Year) From To**	**Total Turnover of the Company**	**Turnover from Drone based Projects.**

6. Certifications	**Yes/No (Indicate the level wherever it is applicable)**	**Valid up to**
Type certification		
Certified Models (if any)		
Unique Identification number (UIN) of the proposed drone(s) (shall be mandatory)		
Third party insurance details for the proposed drone		
Any other (Please specify)		

7. Experience in deploying Drone Solutions	Site	Details &Date of Installation

Add a separate sheet, if necessary

8. Details of sites/customers where similar solutions deployed						
Sr. no	Name & Address of Customer	Contact Person & Tel.No	Virtual Classroom details	Value in crores(optional)	Applications being used (optional)	Date of Installation
8.1 Projects completed during last 3 years						
1.						
2.						
3.						
8.2 Projects completed prior to last 3 years						
1.						
2.						
3.						
Add a separate sheet, if necessary Note: Attach explanatory note for each project in not more than two pages.						

9. Any other information that Applicant Company wants to give

Add a separate sheet, if necessary

10. Company Background

11. Profiles of Engineers and trainers/Drone Pilots

12. List of Enclosures	
(i)	
(ii)	
(iii)	
(iv)	
(v)	
(vi)	

Undertaking

This is to certify that I have gone through all the pages of the document. The applicant company undertakes to abide by all the terms & conditions mentioned in the advertisement no_____ dated_____. It is further certified that the information furnished in the document is true and correct.

In the Event of any of above information found to be false, we understand that own proposal can be rejected and not considered.

Date: Signatures:

Place: Name:

Seal Designation: