

**GOVERNMENT OF INDIA  
CIVIL AVIATION  
LOK SABHA**

UNSTARRED QUESTION NO:1164  
ANSWERED ON:17.08.2012  
MODERN NAVIGATION SYSTEM OVER INDIAN AIRSPACE  
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**Will the Minister of CIVIL AVIATION be pleased to state:**

- (a) whether the Airports Authority of India (AAI) in collaboration with the Ministry of Space is developing / proposes to develop a modern navigation system over the Indian air space;
- (b) if so, the details thereof and the manner in which it is likely to be different / helpful from the existing system;
- (c) whether the proposed system is likely to be a satellite based or on the lines of CAT-III ILS;
- (d) if so, the details thereof along with the manner in which the modern navigation system is likely to help aircrafts to land in zero visibility condition; and
- (e) the details of the amount / funds spent by the Government on research and innovation during each of the last three years and the current year, State-wise including Karnataka?

**Answer**

MINISTER OF CIVIL AVIATION ( SHRI AJIT SINGH )

(a) & (b): Airports Authority of India (AAI) is implementing state-of-the-art satellite based navigation system named as GPS Aided GEO Augmented Navigation (GAGAN) in collaboration with Indian Space Research Organization (ISRO) for improving Civil Air Navigation over Indian Air Space.

GAGAN Project is being implemented in phased manner. The first phase, the Technical Demonstration (TDS) Phase was successfully completed in August 2007. The Final Operation Phase (FOP) has commenced from June 2009.

GAGAN will provide seamless navigation across Indian skies for aircrafts with high level of position accuracy, Integrity, Availability & Continuity with appropriate warnings/ alarms when position accuracy is beyond tolerance limits for specific periods of time as per standard laid down by ICAO (International Civil Aviation Organisation).

When operational, the system will provide navigation assistance to all phases of flight operations including enroute, approach and landing.

As it is a wide area augmentation system, GAGAN services will be available all over Indian air space, and enhance navigational capabilities at airports where it is not practicable to install ground based system due to terrain constraints and coverage limitations.

(c): Presently GAGAN, which is satellite based, is intended to provide approach for landing category APV 1.0 (Approach Procedure with Vertical Guidance) which is different from the ground based ILS system. In future, GAGAN will support similar to Cat-I precision approach services when GPS L-5 signals are available.

d) GAGAN is presently aimed to provide APV 1.0 level of service which provides vertical guidance upto 50 mtr and horizontal guidance upto 40 mtr as per ICAO standards. However, it will improve airport and airspace access in all weather conditions, and the ability to meet the environmental and obstacle clearance constraints due hillocks, etc where conventional ground based equipments (like ILS) do not give required signal coverage.

(e): Details of expenditure of GAGAN are as follows - In the year 2009-10 (Rs. 158.97 cr), 2010-11 (Rs. 115.72 cr), 2011-12 (Rs. 71.64 cr), 2012-13 upto July 12 (Rs. 25.71 cr).