

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 357**  
ANSWERED ON 06/02/2025

**SEARCH AND RESCUE AID TOOL**

357 # **SHRI BABURAM NISHAD:**  
**SHRI NARAYANA KORAGAPPA:**  
**DR. BHIM SINGH:**  
**SHRI JAGGESH:**

Will the Minister of **Earth Sciences** be pleased to state:

- (a) the key improvements which have been made in the Search and Rescue Aid Tool (SARAT) version 2 developed by Indian National Centre for Ocean Information Services (INCOIS) and how these enhancements aid Indian Search and Rescue (SAR) agencies in their operations;
- (b) the training or support being provided to Indian Coast Guard personnel and other SAR agencies to effectively utilize the updated SARAT tool in their operations;
- (c) the manner in which the Ministry plans to further improve the capabilities of the tool for ensuring marine safety; and
- (d) if so, the details thereof?

**ANSWER**

THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR  
MINISTRY OF SCIENCE AND TECHNOLOGY  
AND EARTH SCIENCES  
(DR. JITENDRA SINGH)

- (a) Several significant improvements have been implemented in the latest version 2 of Search and Rescue Aid Tool (SARAT). The key improvements are:
  - (i) **More Accurate Search Areas:** The computation of probable search region is now directly anchored to the Last Known Position (LKP) of the object as opposed to the point with the minimum longitude in the search area in the earlier version. This enhancement ensures that the starting point for defining the search area is aligned precisely and more accurate.
  - (ii) **Exportable Search Data and Enhanced Visualization:** The tool now provides the search areas in digital format, enabling seamless integration with rescue planning maps. Additionally, SARAT version 2 features visualization of individual and mean particle trajectories, finer and distinct color-coded search regions, and a marker identifying the LKP, all improving the clarity of visual outputs and their interpretation.

With these enhancements, the tool now offers Indian search and rescue agencies improved efficiency, faster response times, and higher success rates in search-and-rescue operations within the Indian Ocean region.

- (b) To ensure the effective utilization of the updated SARAT tool, Indian National Centre for Ocean Information Services (INCOIS) has undertaken targeted training and capacity-building initiatives for personnel from the Indian Coast Guard (ICG) and other Search-and-Rescue (SAR) agencies.

INCOIS has organized online national workshop to train officers from the ICG and the Airports Authority of India (AAI) on both the theoretical concepts and practical applications of the updated SARAT tool. This workshop successfully trained over 60 officers, equipping them with the knowledge and skills required to leverage the tool effectively in SAR operations.

Additionally, INCOIS scientists regularly deliver lectures and demonstrations on the utility and operational aspects of SARAT at SAR workshops conducted by the ICG and AAI. These sessions also serve as a platform to gather valuable feedback from stakeholders, which is used to refine and enhance the tool further.

Through these efforts, INCOIS ensures that SAR agencies are well-prepared to utilize SARAT to its full potential, contributing to improved search-and-rescue outcomes in the Indian Ocean region.

- (c)&(d) Yes. The Ministry plans to increase the accuracy of the tool by enhancing the accuracies of the surface currents and winds prediction. Further, the enhancement of forecast accuracy will be achieved by assimilating a greater volume of ocean observations with wider spatial coverage into ocean circulation models. To this end, INCOIS is actively advancing ocean modeling and data assimilation techniques.

Additionally, with a particular focus on the Indian coastline, the Ministry plans to utilize High-Frequency (HF) radar measurements of coastal surface currents as they become sufficiently contiguous in space and continuous in time. These measurements will enable the application of statistical correction methods to minimize errors in model-forecasted currents. This integration of radar data will further refine SARAT outputs, ensuring greater precision in delineating probable search areas.

The improvements to the SARAT tool is an ongoing process and these continuous efforts will contribute to more effective SAR operations and enhanced marine safety in the Indian Ocean region.

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