



**Seventh ATS Coordination Meeting of Bay of Bengal, Arabian Sea
and Indian Ocean Region (BOBASIO/7)
New Delhi, India, 18 - 19 September 2017**

AGENDA ITEM 5: Airspace Safety

**MANAGEMENT OF AIRSPACE DURING AIRSPACE CLOSURES OVER BAY OF
BENGAL**

(Presented by India)

SUMMARY:

This paper specifies the procedures followed prior to and during airspace closures over Bay of Bengal to avoid blocking of ATS routes and ensure safe and efficient flow of air traffic.

1. INTRODUCTION

1.1 The civil aviation sector in India has experienced phenomenal growth in air traffic over the last decade. Airports Authority of India and Defence Authorities are working on the concept of Flexible Use of Airspace (FUA), which would allow both military and commercial flights to use such designated airspace with prior permissions. To meet the requirement of a faster growing aviation market, efficient and effective airspace management is imperative from both a national as well as economic perspective.

1.2 India has mastered modern space technology and its various applications for the benefit of society. New space technology is being utilised for telecommunications, television broadcasts, weather watch and for providing information relating to agriculture, forests, water resources and minerals to mention a few.

1.3 In order to further the advancement of space science, there has been a requirement to launch satellites from the eastern coast of India. Defence Research and Development Organisation (DRDO), India, carries out most of its Experimental Flight Vehicle (EFV) launching in Bay of Bengal (BOB) region, which sometimes extends to Indian Ocean also. Such launching activities engage large volumes of airspace which predominantly comes under the jurisdiction of Kolkata FIR.

1.4 Each of such airspace closure poses a challenge for the concerned ANSP to maintain flow of the air traffic with minimum closure of ATS routes and ensuring safety at the same time.

1.5 The purpose of this paper is to highlight the procedures followed by AAI:

- a) To study and minimize the effect on ATS routes due to rocket / EFV launching activities over Bay of Bengal
- b) To carry out coordination with Defense Organizations for flexible use of airspace during airspace closures over BOB
- c) To avoid complete closure of ATS Routes by publishing alternate routes
- d) To assign direct routings and thereby compensate for the extra distances required to be flown on alternate routes

2. DISCUSSION

2.1 Activities like Experimental Flight Vehicle Launching and defence exercises in Bay of Bengal Region often require closure of airspace for aircraft, resulting in non-availability of ATS

routes. As a result, international and domestic operators will be required to reschedule their flights beyond the hours of closure or reroute aircraft via significantly longer alternate routes. Consequently, there will be a congestion of such rescheduled flights when the airspace is available, following the closure. This will lead to delays, non-availability of economic flight levels and increased controller workload.

2.2 It is perceived that while the activities leading to airspace closure are of India's national and humanitarian interest, the resultant closure of international routes will affect the operator's interest all over the world.

2.3 AAI, which is responsible for Temporary Airspace Allocation in Indian FIRs, has developed procedures so that impact on air traffic is minimum during such airspace closure and at the same time safety is ensured:

- a) Airspace Users requiring temporary airspace allocation should submit their application to AAI at least 15 days in advance. This helps to ensure NOTAM action 7 days in advance, in addition to allowing processing time at regional offices and CHQ of AAI.
- b) More than one activity is not permitted in the same airspace. Two or more activities which affect the same ATS route are not permitted simultaneously, even if the activities require separate airspaces.
- c) Studies are conducted to find out lean traffic periods and areas affecting least number of routes and such areas and timings are proposed to the above agencies.
- d) While processing the airspace closure applications, highest importance given to prevent closure of international ATS routes. Alternate routes are devised for the affected portion of the routes after keeping a buffer of 20 NM all around the danger area over Bay of Bengal and 10 NM over continental airspace.
- e) Since the alternate routes mentioned above are created within truncated airspace, they may cross or converge with other existing/ alternate routes giving rise to traffic conflicts. In such cases level restriction is assigned to such routes wherever aircraft transit from one control to another.
- f) The NOTAM is published at least 7 days prior to the commencement of the activity. Such NOTAMs contain alternate routes for the affected ATS route segments.

2.4 Several meetings have been conducted with agencies conducting activities like EFV launching and defence exercises and SOPs have been formulated to maintain the above procedures.

2.5 A summary of the activities affecting ATS routes over Bay of Bengal for six months from 1st October 2016 to 31st March 2017 is given below in Table-1 along with effect on international routes in Kolkata FIR:

NUMBER AND SIZE OF LAUNCHING ACTIVITY	NUMBER OF INTERNATIONAL ROUTES AFFECTED PER CLOSURE	NUMBER OF INTERNATIONAL ROUTES SUSPENDED PER CLOSURE
5 activities involving short range EFV firing	1-2	0
14 activities involving medium range EFV firing	3-6	0-1
5 activities involving long & very long range EFV firing	4-8	0-3 (normally 0-1 international route is closed. 3 international route was closed in one case only)

Table-1

2.6 During the experimental flight vehicle launching by DRDO, AAI also coordinates with defence agencies to make the Restricted Area VER-81 available for civil flights so that affected aircraft may be radar-vectored through this area instead of following a longer distance on alternate routes. Aircraft are accorded direct routing by controllers, as soon as they come under radar coverage.

2.7 A sample study of impact on airspace, alternate routes and direct routings used by Kolkata ATC during an experimental flight vehicle launching by DRDO on 26th and 27th December 2017 is given in Figure 1.

2.8 During the above-mentioned activity, AAI had coordinated with Defense Authorities of VER-81 and had obtained the airspace over VER-81 at or above FL 260. This dynamic coordination and direct routing had reduced the track mileage of aircraft on ATS route A465 overflying CEA by about 189 NM and that of arrivals/ departure by about 167 NM. Similarly about 71 NM per aircraft could be saved on route L759.

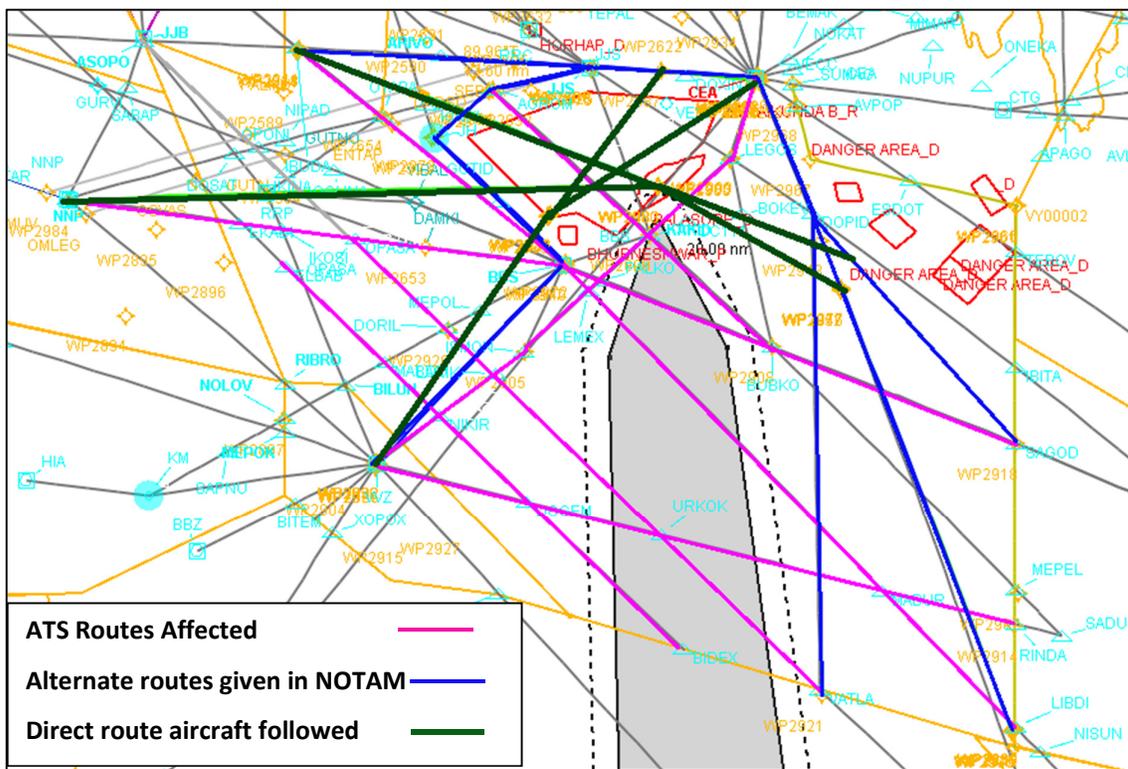


Figure 1: Picture depicting ATS Routes affected in Kolkata FIR during EFLV, alternate routes mentioned in NOTAM and **direct routes through VER-81**, actually followed by affected aircraft.

2.9 Comparison of track mileage of aircraft on the original ATS Routes, alternate routes in the NOTAM and route actually followed by aircraft is given below in Table-2:

ROUTE	ROUTE SEGMENT AFFECTED	DISTANCE (NM)			TRACK MILES SAVED BY DIRECT ROUTING (NM)	ACTUAL EXTRA DISTANCE COVERED DURING CLOSURE (NM)
		ORIGINAL ROUTE (NM)	ALTERNATE ROUTES IN THE NOTAM (NM)	ACTUALLY FOLLOWED BY AIRCRAFT (NM)		
A465	VVZ and CEA	427	616	449 (overflying) / 424 (ARR/DEP VECC)	167/ 189	22 / -3
L759	LIBDI and IBUDA	766	892	821	71	55

Table-2

3. ACTION BY THE MEETING

3.1 The meeting is requested to:

- a) Note the information contained in this paper regarding management of International ATS routes during airspace closure over Bay of Bengal.
- b) Discuss and present queries on the matter
