

ABRIDGED VERSION OF THE REPORT

OF

JOINT INVESTIGATION TEAM

ON

SERIOUS INCIDENT

BETWEEN HELICOPTER FORMATION

& SCHEDULED AIRLINE

AT MUMBAI AIRPORT ON 09.02.2009.

Abbreviations used in this Report

ABBREVIATION	MEANING
MoCA	Ministry of Civil Aviation
DGCA	Directorate General of Civil Aviation
IAF	Indian Air force
AAI	Airports Authority of India
ETA	Estimated time of arrival
ETD	Estimated time of departure
DOT	Door opening time
UTC	Co-ordinated universal time
IST	Indian Standard time
ATC	Air Traffic Control TWR- Tower APP- Approach ACC- Control ASR-Area surveillance radar
TCAS	Traffic collision and avoidance system
FOQA	Flight operations quality assurance
GPWS	Ground proximity warning system
CVR	Cockpit voice recorder
DFDR	Digital flight data recorder
VFR	Visual flight rule
AIP, India	Aeronautical Information Publication- A legal document, Published by AAI on behalf of DGCA
CAR	Civil Aviation requirement
MIAL	Mumbai International Airport Private limited

SUMMARY

Schedule airline flight was operating with A-321 aircraft from Mumbai to Delhi, Helicopter formation (three helicopters) was operating flight from INS Shikra (Kunjali) to Mumbai Airport on 09/02/2009.

Helicopter Formation took off from INS Shikra (Kunjali) at 0340 UTC and was scheduled to arrive at Mumbai Airport at 0350 UTC & 0355 UTC was DOT (Door opening time). The formation was on direct routing to Mumbai. Schedule Airline aircraft after taxi reported at holding point and thereafter was given take off clearance by Mumbai Tower at 034657 UTC. Helicopter formation No. 1 reported final at 034844 UTC.

When Tower controller observed one helicopter (No.2) landing in front of rolling schedule airline, he immediately instructed SCHEDULE AIRLINE AIRCRAFT to stop. SCHEDULE AIRLINE AIRCRAFT rejected take off at 034754 UTC at very high speed approx 120 Knots and vacated via taxi track 'W' to avoid collision with helicopter. There was no injury to any persons on board of helicopter formation and Scheduled Flight.

1. FACTUAL INFORMATION

1.1 History of the flight:

On 8th Feb. 2009 a VFR flight plan was filed with Mumbai ATC for three helicopters formation. The flight was from INS Shikra (Kunjali) to Mumbai. The location of INS Shikra (Kunjali) heliport as given in the flight plan is 10NM from Mumbai VOR on a radial of 191°.

On 9th Feb. 2009, at 0335 Mumbai tower received request from INS Shikra (Kunjali) for startup clearance for Helicopter Formation (three helicopters) operating from INS Shikra (Kunjali) to Mumbai Airport and also for direct routing to Mumbai.

The Helicopter Formation was scheduled to arrive at Mumbai Airport at 0350 UTC & 0355 UTC as DOT (Door opening time). The helicopter No.1 came in contact with Mumbai Approach at 0343 UTC.

SCHEDULE AIRLINE aircraft was operating schedule flight from Mumbai to Delhi on 09/02/2009 & was advised by Tower to taxi holding point runway 27. Thereafter SCHEDULE AIRLINE aircraft flight was given takeoff clearance. SCHEDULE AIRLINE aircraft rejected take off at 034754 UTC at very high speed and vacated via taxi track 'W' to avoid collision with helicopter

1.2 Injuries to Persons: NIL

1.3 Damage to aircraft & Helicopter:

There was no damage to Helicopter Formation. However, due to high Speed Rejected Take-off by SCHEDULE AIRLINE aircraft its number 03 Main wheel tyre got deflated & brakes of No. 03 wheel suffered damage due to overheat.

1.4 Other damage: NIL

1.5 Personnel Information:

1.5.1 Pilot-in Command: Helicopter Formation

All the Pilots have appropriate rating to operate the Helicopter Formation.

1.5.2 Pilot-in Command: Schedule Airline

PIC : Senior Commander
License No. : ALTP Holder
PIC Endorsement :

A-319	20/04/2006
A-320	18/12/1997
A-321	09/10/2007

Total Approx. flying hrs : 20,000 hrs

Co - Pilot : Co-Pilot having rating
License No. : CPL Holder
Endorsement :

A-320	10/2006
A-321	16/04/2008

Total Approx. flying hrs : 2,000 hrs

1.5.3 Air Traffic Controllers:

Approach Controller:

Senior Manager (ATM), CSI Airport Mumbai:

Experience : 16 Years ATC Experience.
Ratings : SMC, Tower, Approach, Area Control, Radar (ASR/RSR)

Tower Controller:

Senior Manager (ATM), CSI Airport Mumbai.

Experience : 20 Years ATC experience
Ratings held at Mumbai : SMC, Tower

1.6 Helicopter & Aircraft Information:

Indian Air Force:

Helicopters from Indian Air Force were used for Helicopter Formation. The helicopters were serviceable at the time of incident.

Schedule Airlines:

Airbus A-321 was manufactured by EADS, France in 2007. The aircraft was fitted with 2 CFM-56-5 B3 engines. The aircraft Serial No. is 3340 & C of A was issued on 17/12/2007 valid up to 16/12/2012.

1.7 Meteorological Information:

As per METAR issued by Metrological department at 0340 UTC, weather conditions prevailing at Mumbai were

Winds	030° / 05 kts
Visibility	2500 meters
Temperature	26 ° C
Dew Point	11 ° C
Clouds	No significant clouds
Weather	FU
QNH	1014 hpa
QFE	1013 hpa

1.8 Aids to Navigation:

All Navigational aids VOR, ILS, NDB Radar were serviceable at Mumbai airport. As flight was operated under VFR condition, navigational aids were not used by Helicopters. Helicopters coming from South do not get painted at Mumbai Radar even as primary target.

1.9 Communications:

Helicopter Formation was fitted with 2 VHF communication sets and these were working normal. All communication and navigation equipment of SCHEDULE AIRLINE were serviceable. All the conversations between Helicopter Formation and ATC were on VHF.

1.10 Aerodrome Information:

Mumbai airport has two intersecting runway designated 09/27 and 14/32. At the time of incident runway 09/27 was in use which is 3,448 m (11,312 ft) long and 45m wide. Runway 14/32 crosses it at 1370 meters from beginning of runway 27. "W" taxi track is 2182 meters from beginning of runway 27 whereas taxi track "C" is another 500 meters ahead. Mumbai Airport has Cat IX fire fighting & rescue facilities.

Mumbai Airport is one of the busiest airports in country & handles around 800 movements per day.

1.11 Flight Recorders:

Schedule Airline aircraft A 321 aircraft is equipped with CVR & DFDR which were removed after the incident and necessary read-out were taken. Helicopter are equipped with CVR which was removed after the incident and necessary readout was taken. These Helicopters are not equipped with FDR/DFDR. However it is fitted with Health and Usage Monitoring Systems (HUMS), data of which could not be downloaded and was not available for Investigation.

1.12 Wreckage and Impact Information:

Not applicable.

1.13 Medical and pathological information:

Not applicable.

1.14 Fire:

There was no fire reported by SCHEDULE AIRLINE after reject take off. However due to high Speed Rejected Take-off, smoke appeared from number 03 Main wheel. There was no Fire on Ground or to Helicopter Formation MI-8 & MI-17 Helicopters.

1.15 Survival aspects:

There was no injury to any passenger. Survival of occupants was never threatened.

1.16 Tests and research:

Not applicable.

1.17. Organization and Management Information:

Air Traffic Services in Mumbai are provided by Airports Authority of India and Mumbai airport is managed by Mumbai International Airport Limited (MIAL).

1.18 Additional information: NIL

1.19 Useful or effective investigation techniques: NIL

2. Analysis:

Based on the transcript of CVR and ATC tape, readouts of FDR and statements of various personnel including crew, ATCOs, MIAL officials and by going through various documents and written submissions made by AAI, IAF and MIAL, Committee identified a number of issues which have been analyzed & arrived at the conclusion.

3. Conclusion

3.1 Findings:

- 1) Pilot of scheduled airline were appropriately licensed and aircraft was airworthy and maintained as per the Regulations of DGCA.
- 2) Pilots of Helicopter were authorized as per Indian Air Force Regulations and Helicopter was maintained as per Regulations and was airworthy.
- 3) ATCOs on duty had proper expertise and rating of their units.
- 4) Weather at Mumbai airport at the time of incident was not suitable for VFR Operations but it is not considered as a contributory factor.
- 5) The coordination among various agencies was unsatisfactory and coordination meeting was not carried out as per the existing instructions.
- 6) There is no common SOP between Indian Air Force and Airports Authority of India for VVIP operations.
- 7) RT reporting procedure for formation is not satisfactorily documented. There was a difference of opinion between Airports Authority of India and Indian Air Force on procedure to be followed.
- 8) Transfer of control from approach to Tower should have been earlier.
- 9) Helicopter was given direct routing from INS Shikra (Kunjali) to Mumbai which was as per the Regulations.
- 10) There was a difference of opinion and understanding about the VFR circuit to be followed especially for Helicopters between Indian Air Force and Airports Authority of India.
- 11) No closure of airport is required for VVIP flights at present as per the instructions of Home Ministry. VVIP flights are however to be given priority landing. There was a lack of common understanding on the concept of priority landing between AAI and IAF.
- 12) Scheduled airline aircraft rejected take off at high speed after sighting Helicopter on the side of Runway and turned to taxi track 'W' to avoid direct collision with the Helicopter which was in front of him at distance of 30-40 meters.

- 13) Helicopter Formation Helicopters are not equipped with FDR and other safety equipments which are installed on civil version of these Helicopters.
- 14) Helicopter Formation (all three helicopters) landed without landing clearance from ATC.

3.2 Factors attributable to serious incident.

As per ICAO guideline on format of investigation, the report must give probable cause and contributory factors. However in the present case, MOCA has set up a Joint Investigation Team and has also laid down terms of reference of the Team. Therefore the Committee is of the view that all factors attributable to serious incident can be mentioned under the above title.

In the light of the analysis, conclusions& findings, the Team is of the view that following factors can be attributed to the serious incident. These factors are listed according to sequence of events and not in terms of gravity.

- Unsatisfactory coordination among various agencies, involved in the incident.
- The late transfer of control of aircraft from approach to tower.
- Landing of Helicopter Formation 2 directly at the place of landing on Runway 27 by making a very short circuit.
- Landing of Helicopter Formation 2 without landing clearance from ATC even before Helicopter Formation reported the finals.
- Landing Helicopter Formation 1 and Helicopter Formation 3 without landing clearance.

4. Recommendations :

- 1) The instructions given in the Home Ministry's Bluebook for coordination procedure should be strictly followed and all Members be invited for Coordination Meetings. The minutes of meeting should be documented and circulated to all concerned for compliance.
- 2) Last Minute local changes, if required, can be carried out after consultations among Aerodrome Operator, ATC, IAF and Security Agencies which should be documented and should be duly informed to Protocol Department of State Government.
- 3) Airport Level coordination Meeting should be conducted to discuss the operational issues between AAI, IAF, DGCA and Security agencies.

- 4) Ministry of Home Affairs should send a copy of Bluebook to AAI in case it is not done at present. Based on the same, AAI will make internal confidential circulars for use of their own officers.
- 5) AAI and Indian Air Force shall designate senior level officers for effective coordination for VVIP movements.
- 6) AAI shall issue a Standard Operating Procedure for handling of VVIP flights incorporating all instructions already issued, to make a comprehensive document. IAF & AAI will mutually share SOP's.
- 7) An Airport specific Standard Operating Procedure for VVIP movement in case of AAI managed airports be prepared by AAI and will be approved by AAI Hqrs. In respect of IAF airfields, the Standard Operating Procedure shall be prepared and approved by IAF. For private airports; the Standard Operating procedure for VVIP movement will be prepared by aerodrome Operator and shall be approved by DGCA. The standard operating procedure so prepared will be used by Indian Air Force, Airports Authority of India and Aerodrome operator jointly, covering all phases of operations. This task may be accomplished at the earliest.
- 8) The two organizations namely IAF and AAI should exchange, documents in connection with VVIP flights whenever required.
- 9) Priority landing and privileges attached with it may be defined and documented.
- 10) Issue regarding routing, special VFR, position reporting etc. should be discussed and resolved at Airport Level Committee 24-48 hrs. before commencement of VVIP flights.
- 11) The formation shall report position of lead Helicopter even during entering the aerodrome circuit or for asking permission for landing. However, vacation report of runway etc. will be that of last Helicopter. This procedure should be documented by Indian Air Force and Airports Authority of India in respective Standard Operating Procedures and in common Standard Operating Procedure, for correct understanding of procedure.
- 12) Helicopters and aircraft used for VVIP flights must have a DFDR, CVR with multi channels, GPWS, TCAS and other safety equipments used on similar civil aircraft/Helicopters, once these equipments are installed, regular monitoring of these flights be carried out on the lines of FOQA (Flight operations quality assurance), by other airlines for safety oversight.
- 13) The Helicopter Committee set up by MOCA/DGCA should expedite identification of landing places for Helicopter at Delhi and Mumbai and to work out the traffic circuit for Helicopters.
- 14) Till the time the recommendation N0.13 is implemented, all Helicopters will report finals at the beginning of Runway and thereafter land at desired spot on the runway. This should be immediately documented and circulated by both Indian Air Force and Airports Authority of India.

- 15) Three minutes before and after ETA/ETD of VVIP operations, airspace should be closed. This closure should be informed by issuing a NOTAM.
- 16) Existing Regulations of aircraft landing only after obtaining permission from ATC units should be strictly enforced and circulated to all concerned including pilots of VVIP flights.
- 17) The Airport Committee comprising AAI, IAF and Aerodrome Operator should work out airport specific operational issues. 24-48 hrs before actual operations of VVIP flights.
- 18) The existing laid down procedure for missed approach will remain in-force. However the consequences of missed approach on the security, health and other aspect of VVIP on board need separate examination. In this regard MOCA in consultation with MHA may examine this aspect to asses whether any other procedure can be evolved in such an eventuality of missed approach.
- 19) The committee reemphasizes that Transfer of control from Approach to Tower and vice versa, should be followed strictly as per ICAO DOC 4444.
- 20) Visual surveillance before landing, especially for VFR flights should be reemphasized on all air crew members and ATCO

Signed by the Committee

19.06.2009

Place: New Delhi