Final Report

Investigation into the Accident of Robinson R-66 Helicopter, Nationality and Registration Mark S2-AIB of Meghna Aviation Ltd (MAL) on 16 September 2016 At Inani Beach, Cox's Bazar, Bangladesh

This accident investigation has been performed in accordance with Civil Aviation Act 2017, pursuant to Part 13 of CAR 1984 and in conformity with Annex 13 to the Chicago Convention on International Civil Aviation. The delegation of investigating authority was accorded to the Head of Aircraft Accident Investigation Group of Bangladesh (AAIG-BD); vide Office Order CAAB/CS/32/AAIG-BD/01/MASTER, Dated 22 June 2016.

The Head of AAIG-BD received a Mandatory Occurrence Report (MOR) from Meghna Aviation Limited narrating about the accident at Inani Beach, Cox's Bazar, Bangladesh on 16 September 2016 involving an R-66 Helicopter, Registration Mark S2-AIB. The report indicated that there were 1 Flight crew and 04 passengers on board. The report further indicated that one of the four passengers succumbed to death due injury.

Aircraft Accident Investigation Group of Bangladesh (AAIG-BD) initiated the investigation through appointment of an Aircraft Accident Investigation Team (AAIT). The AAIT completed the Investigation and submitted this report to the AAIG-BD.

Earlier, the AAIG-BD circulated to appropriate States/Administrations/Organizations the 'Preliminary Investigation Report' of this accident on 15-10-2016, as per the requirement of ICAO Annex 13 Chapter 7.2.

This final investigation report has been issued following the accident in order to present the final status of the investigation on the aforementioned accident. This report has been compiled in accordance with the requirements of ICAO Annex 13 and the Compendium on Aircraft Accident Investigation Group, Bangladesh (AAIG-BD).

The sole objective of this investigation is to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

The information contained in this report has been derived from the factual information and evidences gathered during the ongoing investigation of the occurrence.

The AAIG-BD reiterates that, in the event new evidence appears in future that requires changes to the information depicted in this report, the investigation will be reopened as per Standard 5.3 of ICAO Annex 13. However, this final report represents the complete investigation, which has been made public on 24 June 2019, in conformity with ICAO Annex 13.

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A. Progression of Events

SN	Events	Date
1.	Date of the Occurrence	16 September 2016
2.	Memorandum & Formation of Accident Investigation Team (AAIT) as per Standard 5.1 of ICAO Annex 13.	16 September 2016
3.	Circulation of Notification to relevant States and others as per Standard 4.1 of ICAO Annex 13.	18 September 2016
4.	Circulation and Publication of 'Preliminary Report' as per Standard 7.1 of ICAO Annex 13.	15 October 2016
5.	Circulation of 'Draft Final Report' with the 'Format' for Comments as per Standard 6.3 of ICAO Annex 13.	15 April 2019
6.	Circulation of 'Final Report' as per Standard 6.4 of ICAO Annex 13.	23 June 2019
7.	Circulation of 'Final Report' together with the 'Format' on the preventive action taken or under consideration, or the reasons why no action will be taken, on the 'Safety Recommendations' as per Standard 6.8 of ICAO Annex 13.	23 June 2019
8.	Publication of 'Final Report' in (http://caab.portal.gov.bd/) as per Standard 6.5 of ICAO Annex 13.	23 June 2019
9.	Deadline on the reception of States' feedbacks on the preventive action taken or under consideration, or the reasons why no action will be taken, on the 'Safety Recommendations' as per Standard 6.11 of ICAO Annex 13.	28 September 2019
10.	Estimated Closure of the Investigation following compilation of 'Actions' on the 'Safety Recommendations'	30 September 2019
11.	Publication of 'Final Report' in (http://caab.portal.gov.bd/) which will contain States' feedbacks on the 'Safety Recommendations'.	30 September 2019
12.	AAIG-BD Action on Reopening of investigation as per Standard 13 of ICAO Annex 13 (If required).	

B. Comments from States and Action by AAIG-BD on 'Draft Final Report'

SN	Comment from State	Action by AAIG-BD
1.	Meghna Aviation Ltd	Comments on Section 10.1.2 of the Draft Report have been incorporated in this 'Final Report'. (Please refer to Section 11.1).
2.	No further comments received from any State	N/A

C. Feedback from States and Actions by AAIG-BD on 'Safety Recommendations'

SN	Comment from State	Action by AAIG-BD
1.	To be included when received, but not later than 28 September 2019	To be incorporated upon receipt of feedback. (Please refer to Section 12.2).

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1. TITLE

Investigation into the Accident of Robinson R-66 Helicopter, Nationality and Registration Mark S2-AIB of Meghna Aviation Ltd. (MAL) Occurred on 16 September 2016 at Inani Beach, Cox's Bazar, Bangladesh

1.1 Name of Operator	Meghna Aviation Ltd. (MAL)
1.2 Name of Manufacturer	Robinson Helicopter Company
1.3 Aircraft Model	R-66
1.4 Aircraft Nationality	Bangladesh
1.5 Aircraft Registration Marks	S2-AIB
1.6 Place of Occurrence	Inani Beach, Cox's Bazar, Bangladesh
1.7 Date of Occurrence	16 September 2016

2. SYNOPSIS

2.1 Notification of accident to national and foreign authorities	Notified to the following: a) CAA Bangladesh (State of Registry); b) NTSB, USA (State of Manufacturer); c) ICAO; d) Meghna Aviation Ltd. (Operator).
2.2 Accident investigation authority	Aircraft Accident Investigation Group of Bangladesh (AAIG-BD)
2.3 Accredited representation	None
2.4 Organization of the investigation	Aircraft Accident Investigation Group of Bangladesh (AAIG-BD)
2.5 Authority releasing the report	AAIG-BD
2.6 Date of publication of report	To be mentioned later (following receipt of comments from States/Administrations/ Organizations)
2.7 Brief résumé of the circumstances leading to the accident	a) Meghna Aviation Ltd. is a commercial helicopter operator in Bangladesh. Its main base is located at Hazrat Shah Jalal International Airport (HSIA), Dhaka. All its engineering and operational establishments are also located at Dhaka. b) On the day of the accident, the 16 September 2016, MAL, R-66 helicopter, Registration Mark S2-AIB, in order to operate a nonscheduled commercial domestic passenger flight, took-off from VGHS (Dhaka, Bangladesh) at 0130 UTC for Inani Helipad. The helicopter landed at Inani, near Cox's Bazar in Bangladesh at about 0315 UTC. The passengers from Dhaka disembarked and 04 new passengers were onboard in-bound for Dhaka with planned refueling stop at VGEG. c) At 0320 UTC, S2-AIB crashed at Inani Beach sea shore about 09 NM south of Cox's Bazar Airport (VGCB) with 01 Pilot and 04 Passengers. d) The Captain of the helicopter was in communication with Dhaka Control Tower while departure from Dhaka and Chittagong Control Tower during the flight to Inani.

The control tower Cox's Bazar (VGCB) was not on watch during the flight as such there was no communication with the Cox's Bazar Tower with the helicopter. The watch hour for VGCB was from 0400 UTC which was before the time of occurrence.

e) Just after take-off from Inani Helipad en-route VGEG with the new set of 04 passengers, the Captain noticed, when about 10-15 above the ground after lift-off, the front-left cockpit (front passenger) door was open and held by the front left-seat passenger. The Captain instantly decided to land on the sea beach to close the door.

f) During approach for landing at 10-15 ft height, the passenger seated on the front-left seat opened the door again and was trying to take some photograph. The captain told him to shut the door immediately. The said passenger closed the door with a bang by his left hand and his camera fall down in the cockpit from his right hand. At this stage, the passenger pulled the cyclic control with his right hand towards left side un-knowingly the consequence that might happen to the helicopter's flight performance. The scenario happened fast and the captain, eventually, couldn't control the helicopter went uncontrolled within second it crashed at the sea shore. The surrounding people rushed near the wreckage for rescue and the captain soon after came out of the wreckage and rescued all passengers with the help of local people.

g) The helicopter was damaged extensively including its engine, rotating blades, structure, landing gear etc. The right skid tube was broken, the right forward strut twisted from the fuselage joint, right nose section of the fuselage damaged, transmission along with mast & the main-rotor blades separated from the fuselage, main-rotor blades bended upward and tail-boom broken. The impact on the sea beach was very hard as such the whole helicopter disintegrated. The helicopter was found to be beyond economic repair.

h) The Pilot and all four (4) passengers were taken to hospital. The passenger on the front seat sustained fatal injuries during crash. The pilot and three (3) passengers of the rear seat sustained minor injuries and were released from hospital after first aid. The autopsy of the deceased passenger, age 32 years was held in District Government Hospital at Cox's Bazar (Autopsy no 165, date 16 Sep 2016). There were triangular shaped wounds 05 inches X 05 inches X 02 inches over the right side of the face and ante-mortem blood clot in the base of the brain. The death was due to hemorrhage, shock resulted from head injury.

i) The AAIT was formed on the same day, 16 September 2016 to investigate the cause of the accident.

3 FACTUAL INFORMATION

3.1 History of the flight

3.1.1 Flight number	N/A (Non-scheduled)
3.1.2 Type of operation	Chartered domestic commercial passenger operation
3.1.3 Last point of departure	Inani Helipad, Cox's Bazar, Bangladesh
3.1.4 Time of departure (local time or UTC)	0315 UTC
3.1.5 Point of intended landing	Shah Amanat International Airport (VGEG), Chittagong, Bangladesh
3.1.6 Description of the flight and events leading to the accident	The helicopter flight was to return from Inani beach to Chittagong. This time there were 04 passengers on board. The front seat passenger unknowingly interfered with the control and the pilot could not recover the helicopter due to low height.
3.1.7 Reconstruction of the significant portion of the flight path	 Inani, Cox's Bazar and Crash Site Area
3.1.8 Location (latitude, longitude, elevation),	N21º13.601' E092 º 2.875'; Elevation: 03 Feet
3.1.9 Time of the accident (local time or UTC),	0320 UTC
3.1.10 Whether day or night.	Day

3.2 Injuries to persons:

Injuries	Crew	Passenger	Others
3.2.1 Fatal	None	One	None
3.2.2 Serious	None	None	None
3.2.3 Minor/None	One	Three	None

3.3 Damage to aircraft (Brief description)

3.3.1 Destroyed	The helicopter was destroyed beyond repair	
	 Left front View	 Tail side View

3.3.2 Substantially damaged	No
3.3.3 Slightly damaged	No
3.3.4 No damage	No
3.3.5 Other damage	None

3.4 Personnel information

3.4.1 Pertinent information concerning each of the flight crew members regarding age, validity of licences, ratings, mandatory checks, flying experience (total and on type) and relevant information on duty time	Pilot in Command: a) Age: 54 years; CPL: Valid; b) Ratings: Current on R66; c) Mandatory Checks: Done; d) Flying Experience (Total): 5,653.15 Hrs; e) Flying Experience (On type): 94.50 Hrs; f) Duty time: Rested more than 24 hours.
3.4.2 Brief statement of qualifications and experience of other crew members	Not applicable
3.4.3 Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant.	Not relevant

3.5 Aircraft information

3.5.1 Brief statement on airworthiness and maintenance of the aircraft (indication of deficiencies known prior to and during the flight to be included, if having any bearing on the accident)	Aircraft was airworthy; No deficiency was detected prior to release.
3.5.2 Brief statement on performance, if relevant, and whether the mass and centre of gravity were within the prescribed limits during the phase of operation related to the accident. (If not and if of any bearing on the accident give details.)	a) Performance status: Satisfactory; b) Mass & Centre of gravity: Within limit;
3.5.3 Type of fuel used.	JET A-1

3.6 Meteorological information

3.6.1 Brief statement on the meteorological conditions appropriate to the circumstances including both forecast and actual conditions, and the availability of meteorological information to the crew.	There is no meteorological observatory at Inani beach area of Cox's Bazar district. The weather report of the nearest station Cox's Bazar on September 16, 2016 between 0300 to 0400 UTC specify the weather condition as 'Haze' with visibility 3 km and calm wind, no rain. The weather was suitable for helicopter operation and no evidence was found that, weather adversely affected the circumstances of the accident and the pilot's decision making.
3.6.2 Natural light conditions at the time of the accident (sunlight, moonlight, twilight, etc.)	Sunlight (Haze)

3.7 Aids to navigation

3.7.1 Pertinent information on navigation aids available, including landing aids such as ILS, MLS, NDB, PAR, VOR, visual ground aids, etc., and their effectiveness at the time.	Sufficient Navigation Aids were available for operation of the helicopter. The GPS/ COM/ NAV X'CVR, Model GNS430W with related equipment was available in duplicate. There was no evidence that non-availability of Navigation Aids adversely affected the circumstances of the accident and the pilot's decision making.

3.8 Communications

3.8.1 Pertinent information on aeronautical mobile and fixed service communications and their effectiveness.	Communication between S2-AIB and the air traffic control of Chittagong International Airport (VGEG) were normal. The Cox's Bazar Airport (VGCB) watch hour was from 0400 UTC. There was no communication with VGCB before the accident. No evidence was found to suggest that any aspect of the communications between the flight crew and ATC adversely affected the circumstances of the accident and the pilots' decision making.

3.9 Aerodrome information

3.9.1 Pertinent information associated with the aerodrome, facilities and condition, or with the takeoff or landing area if other than an aerodrome.	The watch hour of Cox's Bazar Airport (VGCB), starts from 1000 AM (LT). However, accident time was 0920 AM (LT). It is confirmed that the flight was operated before start of watch hour of the airport (VGCB).

3.10 Flight recorders

3.10.1 Location of the flight recorder installations in the aircraft, their condition on recovery and pertinent data available therefrom.	No flight recorder was installed with this helicopter. The helicopter was equipped with an Engine Monitoring Unit (EMU) that is a digital recording device mounted behind the right rear seat back panel. The EMU records and retains data consisting of total engine run time, an engine start counter (whenever N1 exceeds 30% and MGT is at least 343 degrees C, and exceedances for N1, N1 run limit, N2 transient, N2 run limit, Torque Meter Oil Pressure (TMOP) transient, TMOP exceedance, TMOP run limit, MGT transient run mode, MGT run mode, MGT run limit run mode, and torque. The EMU also records and retains data consisting of flight history (date, engine start time and duration), and in 1 second increments N1 and N2 speeds in percent, TMOP psi, and MGT in Fahrenheit. The data downloaded from the EMU revealed no exceedance and no errors reported during the accident flight. The engine was found to operate normally and there was no evidence of pre impact failure or malfunction.

3.11 Wreckage and impact information

3.11.1 General information on the site of the accident and the distribution pattern of the wreckage, detected material failures or component	The helicopter was damaged extensively including its engine, rotating blades, structure, landing gear etc. The right skid tube was broken, the right forward strut twisted from the fuselage joint, right nose section of the fuselage damaged, transmission along with mast & the main-rotor blades

malfunctions. Details concerning the location and state of the different pieces of the wreckage are not normally required unless it is necessary to indicate a break-up of the aircraft prior to impact. Diagrams, charts and photographs may be included in this section or attached in the appendices.	separated from the fuselage, main-rotor blades bended upward and tail-boom broken. The impact on the sea beach was very hard as such the whole helicopter disintegrated. The helicopter was found to be beyond economic repair.

Damaged View of S2-AIB

Damaged View of S2-AIB

3.12 Medical and pathological information

3.12.1 Brief description of the results of the investigation undertaken and pertinent data available therefrom.	The Pilot and all four (4) passengers were taken to hospital. The passenger on the front seat sustained fatal injuries during crash. The pilot and three (3) passengers of the rear seat sustained minor unremarkable injuries and they were all allowed to leave the hospital immediately. The autopsy of the deceased passenger, age 32 years was held in District Government Hospital, Cox's Bazar (Autopsy no 165, date 16 Sep 2016). There was triangular shaped wound 05 inches X 05 inches X 2 inches over the right side of the face and ante-mortem blood clot in the base of the brain. The death was due to hemorrhage, shock resulted from head injury.

3.13 Fire

3.13.1 If fire occurred, information on the nature of the occurrence, and of the fire-fighting equipment used and its effectiveness.	There was no pre or post impact fire to the helicopter and its engine.

3.14 Survival aspects

3.14.1 Brief description of search, evacuation and rescue, location of crew and passengers in relation to injuries sustained, and failure of structures such as seats and seat-belt attachments.	All passengers and crew were immediately evacuated to the nearby government hospital. The helicopter crashed in a populated area. Therefore, immediate communication was possible. Helicopter company and ATS were immediately notified. The damage of the helicopter due to the impact force on the left front side rendered the left front seat passenger exposed to severe injury resulting fatality.

3.15 Tests and research

3.15.1 Brief statements regarding the results of tests and research.	No technical test was carried out as the cause of the accident was mishandling of the controls. The two major causes of R-66 helicopter crashes, i.e. Mast Bumping and Dynamic Rollover did not happen in this crash. In case of Mast Bumping, the main rotor blade was supposed to stick the fuselage, causing the helicopter to break up in flight. A Dynamic Rollover was ruled out as the impact observed on the right nose. In case of Dynamic Rollover, the main rotor would have hit the ground first.

3.16 Organizational and Management Information

3.16.1 Pertinent information concerning the organizations and their management involved in influencing the operation of the aircraft. The organizations include, for example: the operator; the air traffic services; airway, aerodrome and weather service agencies; and the regulatory authority. The information could include, but not be limited to, organizational structure and functions, resources, economic status, management policies and practices, and regulatory framework.	a) The Operator's Bell 407, S2-AIA was cleared by CAAB for Cox's Bazar Airport (VGCB) with all unrealistic timings for 22 destinations and for everyday from September 13 to 18, 2016. Similarly, the R-66, Registration, S2-AIB clearance was obtained for 24 destinations for the same block dates. There was no clearance for S2-AIB to fly to VGCB. The operator changed the helicopter type from Bell-407 (S2-AIA) to R-66 (S2-AIB) on their own as the number of passengers was four only. The operator submitted the flight plan for S2-AIB for VGCB but the helicopter landed at Inani Helipad which was the actual destination planned for the chartered flight and not mentioned in the flight plan. b) It is observed that the present requirement of Regulatory Authority of Bangladesh for submitting the route and landing clearance documents is three (03) days in advance, which, according to the operator is difficult to comply since most of the helicopters are operated on charter basis, mostly on short-calls due to emergency requirements.

3.17 Additional information

3.17.1 Relevant information not already included in 3.1 to 3.16.	From the statement of Pilot, it is revealed that the passengers were not briefed properly on safety aspects onboard the helicopter. The front seat passenger did not know about the Cyclic Control of the helicopter which is just beside him. He was not briefed about the sensitivity of the Cyclic Control.

3.18 Useful or effective investigation techniques

3.18.1 When useful or effective investigation techniques have been used during the investigation, briefly indicate the reason for using these techniques and refer here to the main features as well as describing the results under the appropriate subheadings 6.1 to 6.17.	Investigation has been carried out, as far as possible, following the contents of the relevant portion of the Compendium of AAIG-BD, the ICAO Annex 13, associated Docs 9756 Part I, II and III. Part IV of 9756 has been used meticulously as much as practicable to develop the final report. Human factor Doc 9683 has also been used for the analysis purposes.

4 ANALYSIS

[Analyzed below, as appropriate, only the information documented in 'Factual information' and which is relevant to the 'Determination of conclusions' and 'Causes and/or contributing factors']

4.1 Man

4.1.1 The pilot was engaged in commercial passenger flight when the accident occurred. The flight was in VFR with good visibility. The pilot had 99:00 hours on the helicopter type and more than 5000 hours on

helicopters. The pilot was on regular flying practice and instructor on the type. The pilot's decision to land at the sea beach was not logical as Cox's Bazar Airport (VGCB) was only 09 NM away from the accident site and there was no urgency to land immediately. The helicopter crashed in shallow water on the sandy sea beach. The selection of landing place seems inappropriate and improper commensurate with the experience of the Pilot.

4.1.2 From the statement of Pilot, it is revealed that the passengers were not briefed properly on safety aspects onboard the helicopter. The front seat passenger didn't know about the Cyclic Control lying just beside him. He was not briefed about the sensitivity of the Cyclic Control (stick) near his right hand. A sudden jerk on Cyclic Control (stick) by the front seat passenger at a very low height would be considered as one of the main causes of the accident. As per the statement of the pilot, the passenger sitting at the front (co-pilot) seat obstructed the cyclic control on the helicopter by which the pilot failed to control and the helicopter and ended up in crash.

4.1.3 Human Factors (Operational Related): On 16-09-2011, pilot successfully flew from VGHS to Inani Helipad and logged 1:50 hours. The pilot couldn't communicate to Cox's Bazar Control Tower as the time of landing was before the watch hour. He took-off again without switch-off for VGEG (about 0:45 hour flight time). There was no autopilot, and the pilot was likely to be tired. To close the door the pilot decided to land at the nearby sea beach. Before deciding to land, the pilot didn't communicate to ATC. There was no 'May Day' call given. The decision of the pilot to land at the sea beach to close the door could be avoided. This helicopter is not pressurized and is able to fly with door/doors open at a lower than cruise speed. The VGCB was only 09 NM away. There was no requirement of immediate landing at a public place. The passengers were not briefed properly. The front seat passenger did not know about the cyclic control close to his right hand.

4.2 Machine

4.2.1 The helicopter was maintained as per the existing regulations and there were no defects reported prior to or during the accident. The helicopter had only flown 425:37 hours TSN.

4.2.2 The helicopter had sufficient fuel to fly to VGEG and VGCB which was only 09 NM. The helicopter could fly normal with any or all doors removed/opened with some speed limitations. There was no fuel shortage for an immediate landing on the sea beach.

4.3 Environment

4.3.1 The weather conditions were fine for VFR flight. The visibility at the time of occurrence at 0315 UTC was 03 Km and the accident occurred approximately at about 0320 UTC. Weather was not a factor for the accident.

4.3.2 The helicopter had air-conditioning systems. Therefore, the flight was comfortable for both pilot ad passengers.

4.4 Organizational Aspect

4.4.1 The whole process of clearance and flight planning were ambiguous. In accordance with the statement of Flight Operation Officer of the operator, the helicopter was not cleared by the Regulatory Authority for conduction of the flight for VGHS-VGCB route by this helicopter (R-66, S2-AIB). From the statement of

responsible officers of Regulatory Authority, it was evident that the Regulatory Authority had permitted to conduct the flight by Bell-407 helicopter for 'Medical Evacuation' (MEDEVAC) requirements using the Bell-407 helicopter. But the operator conducted the flight on their own, violating the approval of the Regulatory Authority, using the R-66 helicopter. Such activity indicates an attitude of non-compliance by the operator.

4.4.2 From the statement of responsible officer of the Regulatory Authority, it is revealed that the Regulatory Authority had cleared the ill-fated helicopter with non-fixed timings for 24 destinations and for everyday from 13 to 18 Sep 2016.

4.4.3 It is observed that, the present requirements for helicopter flight clearance on non-schedule chartered operation requires submission of route and landing clearance from the Regulatory Authority at least 03 days in advance which is rather difficult to comply. Mostly, helicopters are chartered on emergency requirements and three days lead time is impractical. The helicopter operators allege that, it is a big hassle to get the non-scheduled flight clearance from Regulatory Authority giving a lead time of 03 days. To keep their business running, they prefer to get block clearance for everyday for all probable destinations and submit the flight plans required.

5. CONCLUSIONS

[Listed below the findings, causes and/or contributing factors established in the investigation. The list of causes and/or contributing factors should include the immediate and the deeper systemic causes and/or contributing factors]

6. FINDINGS

6.1 The a/c was certified, equipped and maintained in accordance with existing regulations and approved procedures.

6.2 The a/c had a valid certificate of airworthiness and had been maintained in compliance with the regulations.

6.3 The aircraft was airworthy when dispatched for the flight.

6.4 The maintenance records and the recent analysis revealed no defect existed prior to the dispatch of the aircraft.

6.5 The load and balance was within the limit and had no relevance with the occurrence.

6.6 There was no known defect or malfunction in the aircraft that could have contributed to the occurrence.

6.7 The pilot was a holder of a valid commercial pilot license and had the aircraft type endorsed in his license.

6.8 The pilot was in possession of a valid medical certificate.

6.9 The helicopter crashed on the sea beach on approach to land.

6.10 As per the statement of the pilot, the passenger sitting at the front (co-pilot) seat obstructed the cyclic control on the helicopter by which the pilot failed to control resulting in crash.

6.11 The left front seated passenger had opened the left front door of the helicopter during flight for taking photograph/video.

6.12 A sudden jerk by the front seat passenger to the helicopter control at a very low height was the probable cause of the accident.

6.13 The onboard passengers of the accidental helicopter were not properly briefed by the operator/pilot regarding the emergency procedure as well as location and sensitivity of the helicopter controls.
6.14 The passengers and eyewitnesses saw the helicopter flying low before the crash on the shallow waters on the sandy beach.
6.15 The accidental flight was conducted without having proper flight permission from the Regulatory Authority.
6.16 Non-compliance attitude of operation division of the Operator.
6.17 The existing Regulatory Authority's procedure for obtaining flight clearance is impracticable and needs to resolve the issue.

7. CAUSES:

7.1 The front seat passenger interfered with the helicopter Cyclic Control endangering the flight performance.
7.2 A sudden jerk by the front seated passenger to the helicopter Cyclic Control while the helicopter was at a very low altitude just before landing attributed the accident.

8. Contributing Factors

8.1 The passenger was not briefed about the sensitivity and position of helicopter controls and safety procedures.
8.2 The pilot's decision to land at the sea beach hurriedly might not have been the best option prior to the accident.

9. Intermediary Safety Recommendations

9.1 Actions by AAIG-BD

9.1.1 Following an advice by the IIC of the AAIT, CAAB issued Circulars immediately after the accident to stop recurrence of such accidents in future. The Circular 1/2016 is on 'Prohibition of use of cell phones in flight in selfie, photograph, video etc. modes' was issued on September 19, 2016 and duly displayed in CAAB website http://caab.portal.gov.bd/; and,

9.1.2 A follow-up Circular 2/2016 on "Helicopter Operations" was issued on September 20, 2016 which has also been displayed in CAAB website http://caab.portal.gov.bd/.

10. Safety Recommendations

10.1 Safety Recommendations to CAA, Bangladesh

10.1.1 More compliance with procedures of OM, SOP and Safety Circulars of the operator should be ensured by the Regulatory Authority through enhancement of conduct of ramp inspection and required enforcement action; and,

10.1.2 The existing procedure/requirements of the Regulatory Authority for helicopter flight clearance on non-schedule operation may immediately be reviewed.

10.2 Safety Recommendations to the Operator of S2-AIB.

10.2.1 Operator should review the company procedures as a whole and ensure the effectiveness and implementation of the procedures;

10.2.2 Passenger safety briefings must be done by pilots more religiously; and,

10.2.3 The Operator shall ensure that the CAAB Circular 1/2016 and Circular 2/2016 must be known and implemented for all flights.

10.3 Safety Recommendations to all other Helicopter Operators:

10.3.1 All helicopter operators of Bangladesh may be informed about the details of the accident to avoid recurrence of such incidents;

10.3.2 All helicopter operators of Bangladesh shall ensure to implement the Regulatory Authority Circulars 'CAAB 1/2016' dated September 19, 2016 and 'CAAB 2/2016' dated September 20, 2016.

11. Comments on 'Draft Final Report'

11.1 Comments Received on the 'Draft Final Report' of Robinson R-66 Helicopter Accident in Bangladesh and Action Taken by AAIG-BD:

Section & Para	Commented by	Comments	Reason for Change	Action by AAIG-BD
10.1.2	Chief Operating Officer Meghna Aviation Ltd Bangladesh	The existing procedure/requirements of the Regulatory Authority for helicopter flight clearance on	To have better understanding about destination and avoid ambiguity.	Comments inserted in Section 10.1.2.

		non-schedule operation may immediately be reviewed.		

12. Safety Recommendations

12.1 Important Instruction to all Concerned with Regard to Action on 'Safety Recommendations' as Below:

(a) This document contains 'Privileged/Confidential' information. If you are not the intended addressee, please do not copy, distribute or take any action in reliance thereon. Please notify the originator as mentioned in 'Foreword' immediately if you receive this document by mistake.

(b) The State receiving the 'Safety Recommendations', outlined in Section 10, is required to inform the Head of AAIG-BD, within ninety (90) days of the date of the transmittal correspondence, of the preventive action taken or under consideration, or the reasons why no action will be taken. This is as per Standard 6.10 of Annex 13;

(c) As a State conducting investigation, the AAIG-BD has included proposals for preventive action which have been mentioned in the 'Intermediary Safety Recommendations' (Section-9). The rest have been accommodated within the 'Safety Recommendations' outlined;

(d) The AAIG-BD has implemented procedures to record the responses received to the safety recommendation issued, which is as per Standard 6.11 of Annex 13; and,

(e) The Head of AAIG-BD will be obliged if the State that receives the 'Safety Recommendation' implements procedures to monitor the progress of the action taken in response to that safety recommendation, as per 6.12 of Annex 13, and provide feedback in the table below:

12.2 Table for Action on Safety Recommendations by State/Organization:

Section & Para	Action by	Preventive Action Taken	Action Under Consideration	Reasons Why No Action Will Be Taken

13. Appendices

[Included, as appropriate, any other pertinent information considered necessary for the understanding of the Final Report]

13.1 Systematically documented in file.

14. Reopening of Investigation

Reserved

END