MINISTRY OF CIVIL AVIATION & TOURISM
OFFICE OF THE AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE
3RD FLOOR CAAB HEADQUARTERS KURMITOLA DHAKA-1229

REF. NO. 30.00.0000.013.32.005.21 (CESSNA-152/S2-AFK/09 JAN 2021)-45 DATE OF ISSUE: 01 FEBRUARY 2021

# PRELIMINARY REPORT

## INVESTIGATION INTO ACCIDENT OF CESSNA-152 AIRCRAFT REG NO S2-AFK OF GALAXY FLYING ACADEMY LTD OCCURRED ON 09 JANUARY 2021 AT VGRJ AIRPORT, RAJSHAHI, BANGLADESH.


PUBLISHED BY
OFFICE OF THE AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE OF BANGLADESH

CONTACT DETAILS OF AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE (AAIC-BD)

| Head | Member (Operations) | Member (Engineering) | Member (Admin-Plan-Fin) |
|---|---|---|---|
| +8801715 027 508 | +8801617 785 671 | +8801713 125 955 | +8801711 828 321 |
| smrahmatullah2148@gmail.com | badsha7731@gmail.com | asaduzzaman57@outlook.com | mostafizur719@gmail.com |

## INTRODUCTION

**Preliminary Report of Investigation into Accident of Cessna-152 Aircraft, Reg No S2-AFK of Galaxy Flying Academy Ltd that Occurred on 09 January 2021 at VGRJ Airport, Rajshahi, Bangladesh**

This accident investigation is being conducted by the Aircraft Accident Investigation Committee-Bangladesh (AAIC-BD), in accordance with Civil Aviation Act 2017 and in conformity with Annex 13 to the Chicago Convention on International Civil Aviation.

The Head of AAIC-BD received a 'Mandatory Occurrence Report' (MOR) through an e-mail sent by the Operator, Galaxy Flying Academy Ltd, narrating about the Accident of one Cessna-152 Trainer Aircraft, Nationality and Registration Mark S2-AFK that met with an accident while landing at Runway 35 of VGRJ (Shah Makhdum Airport Rajshahi, Bangladesh) on 09 January 2021.

Following the occurrence, the Head of AAIC-BD immediately formed a 'GO-TEAM' comprising two investigators, one from Operations and the other from Engineering and, with a view to visiting to the accident site availing the fastest possible means, advised them to proceed by the first available flight to Rajshahi to inspect and protect the necessary evidences. The 'GO-TEAM' left Dhaka for Rajshahi by the first flight on 10 January 2021 as there was no flight on the day of occurrence. This has been in pursuance to Standard 3.3 of Annex 13, wherein the AAIC-BD has taken all reasonable measures to protect the evidence and to maintain safe custody of the aircraft and its contents for such a period as may be necessary for the purposes of investigation. The Head of AAIC-BD also advised the Airport/Aerodrome authority on telephone for ensuring adequate protection of all the evidences and safe custody of the aircraft and its contents until the arrival of the 'GO-TEAM' at the site of accident.

The Office of the AAIC-BD, on the same day, issued the necessary 'Notification' for the information of all concerned (National and International) as per the requirements of Annex 13. This was followed by the Head of the AAIC-BD forming two-member Aircraft Accident Investigation Team (AAIT) which was issued through a 'Memorandum' to conduct the investigation. The two-member comprised the Head himself as Investigator-in-Charge (IIC) and the Member (Engineering) of AAIC-BD as the Member of Investigation. The Head, as IIC went to Rajshahi by the next available flight on 10 January 2021 to physically initiate the investigation.

The information contained in this preliminary report has been derived from the factual information and evidences gathered so far during the ongoing investigation of the occurrence and is being published pursuant to Standard 7.4 of Annex 13.

As per the principle of AAIC-BD and that of ICAO Annex 13, the sole objective of this investigation shall be to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

Pursuant to Standard 6.5, in the interest of accident prevention, the AAIC-BD shall make the 'Final Report' and 'Safety Recommendations' publicly available as soon as practicable and, if possible, within twelve months from the date of the occurrence.

Unless otherwise indicated, recommendations in this report will be addressed to the Regulatory Authorities of the States having responsibility for the matters with which the recommendations are concerned.

Head
Aircraft Accident Investigation Committee
Bangladesh

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| smrahmatullah2148@gmail.com | badsha7731@gmail.com | asaduzzaman57@outlook.com | mostafizur719@gmail.com |

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## 1. TITLE

| | |
|---|---|
| 1.1 Name of Operator | Galaxy Aviation Ltd |
| 1.2 Name of Manufacturer | Cessna |
| 1.3 Aircraft Model | Cessna-152 |
| 1.4 Aircraft Nationality | Bangladesh |
| 1.5 Aircraft Registration Marks | S2-AFK |
| 1.6 Place of Occurrence | VGRJ (Shah Makhdum Airport Rajshahi, Bangladesh) |
| 1.7 Date of Occurrence | 09 January 2021 |

## 2. SYNOPSIS


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| 2.1 Executive Summary | (a) Galaxy Flying Academy Ltd, an approved Aviation Training Organization by CAA Bangladesh, provides academic, basic, instrument and instructor rating ground and flight trainings to the ab-initio and other students to attend the required standard for issuance of relevant licenses, such as Private Pilot license (PPL), Commercial Pilot License (CPL) and Flight Instructors License (FIR). The company operates its training flights from its operational base, located at VGRJ (Shah Makhdum Airport), Rajshahi, Bangladesh.<br><br>(b) As a part of routine flying program, the Chief Flying Instructor (CFI) of the company was scheduled on 09 January 2021 to take-up a Student Pilot (SP) for PPL- General Flying Check Flight with a Cessna-152 aircraft, Registration S2-AFK.<br><br>(c) The Instructor Pilot was occupying the right seat of the two seated trainer and the Student Pilot was in the left seat. The flight was conducted in Visual Meteorological Condition (VMC) under Visual Flight Rules (VFR).<br><br>(d) The flight took off using Runway 35 at 0843 UTC from VGRJ and proceeded to the 'North-west Training Area'. The SP was asked to demonstrate some General Flying (GF) that included a few normal turns, steep turns and stall & recovery practices.<br><br>(e) At 0902 UTC, the flight communicated with the VGRJ Air Traffic Control (ATC) to return back to VGRJ for a 'Touch-and-Go' landing using Runway 35. The attempted landing was a touch-and-go with zero flap as advised by the instructor pilot to the SP. The existing surface wind, transmitted by the ATC control, was north-westerly i.e., 300 degrees 05 knots.<br><br>(f) While flaring out to land, the aircraft started drifting to the right of centre line with its heading about 4-5 degrees off to the right in relation to the runway track, to which the instructor pilot advised the SP to go left towards the centre line. The SP replied of giving the necessary correction. Meanwhile, the right main wheel touched down the runway surface first, with about 3-4 degrees right angular heading in relation to the runway track, impacting much harder than normal touch down, on the runway surface.<br><br>(g) The right wheel tire made prominent tire-mark at the point of first touch-down. Thereafter, the wheel continued to making waggling-tire-marks for about 15-20 feet on the runway surface. Soon after the first impact of the right gear wheel, the nose wheel of the aircraft contacted the runway surface, also impacting harder than normal, and made similar waggling tire-marks on the runway surface. |

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| | (h) At this stage, the instructor pilot took over the aircraft control, added full power in an attempt to go around and applied left bank to move the aircraft towards center-line of the runway. The aircraft got airborne momentarily for about 2-5 feet height. The left-wing tip of the aircraft touched the runway making deep scratch marks on the under-surface of the left-wing tip area.<br><br>(i) Soon after airborne, the aircraft came down in a stalled condition on the runway, close to the centre-line with an angle of about 3-5 degrees into the runway centre-line. At this stage, the right main landing wheel impacted heavily on the runway surface, a second time, and sheared-off from its strut-assembly, getting detached from the aircraft.<br><br>(j) During the detachment of the right wheel, the right-wing tip as well as portion of the right elevator tip (under surface) of the aircraft also received scratch mark from the runway surface. The detached wheel, subsequently made significant damage to the aircraft right fuselage as well as the right elevator. The broken strut-edge of the right wheel made about 10-feet-long x 1-inch-deep scar mark on the runway bitumen. The dislodged right wheel finally rested about 20 feet ahead of the place where the disabled aircraft rested that pivoted around the broken strut and stopped at the western half of the runway centre-line at an angle of about 45 degrees with the runway track, facing 'North-east'.<br><br>(k) Moments after the detachment of the right wheel from the aircraft, the single nose-mounted propeller hit the runway surface which was followed by impacting the nose wheel, resulting in sheering off from the nose landing gear strut joint-clamp.<br><br>(l) Both Tips of the engine propeller were found bent to a large extent, the nose cowling area received structural damage and the detached nose wheel rested about 15-20 feet behind the disabled aircraft. The sharp edges of the exposed engine-exhaust pipe dragged the runway surface making roughly 2-feet-long x 1.5-inch-deep cut mark on the runway bitumen.<br><br>(m) When the aircraft came to a rest, the Instructor Pilot gave 'Mayday' call and both the pilots evacuated the aircraft without encountering any physical injury to themselves. |
| 2.2 Accident Investigation Authority? | Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD). |
| 2.3 Notification of accident to national and foreign authorities? | Office of the Aircraft Accident Investigation Committee-Bangladesh notified to all relevant Authorities and Agencies as per Standard 4.1 of ICAO Annex 13. |
| 2.4 Accredited Representation? | (a) Having received the Notification from the AAIC-BD, the NTSB responded immediately and confirmed that they would remain standby for any kind of support, should the AAIC-BD require;<br><br>(b) After visiting the place of incident and having seen the wreckage, the AAIT assumed that there might have been failure of right landing gear wheel spring assembly Part No 0441212-6 as a result of heavy landing by the aircraft on the runway or possible undue metal-failure.<br><br>(c) To find out the cause of failure of the right landing gear wheel spring assembly, the AAIT, might seek expert's opinion, for confirmation through lab test, for possible metal-failure or not.<br><br>(d) Accordingly, the AAIT has already requested NTSB to assign 'US Accredited Representative' (ACCREP) to provide assistance on this issue. The NTSB, has nominated an Accredited |

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| | Representative who has been included in the investigation.<br><br>(e) The AAIT has also apprised the US-ACCREP about the AAIT's intention, and accordingly, sent the related 'Photographs' of the affected gear wheel spring assembly, for NTSB's comment. |
| 2.5 Organization of the Investigation? | Aircraft Accident Investigation Committee-Bangladesh (AAIC-BD) |
| 2.6 Authority releasing the report? | Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD) |
| 2.7 Date of publication of report? | 01 February 2021. |
| 2.8 Brief resume of the circumstances leading to the accident? | (a) While at downwind of the designated 'Left-hand' circuit at 1000 feet, the Instructor Pilot asked the Student Pilot to make a 'Zero-Flap' 'Touch and Go' landing using runway 35 of VGRJ.<br><br>(b) The SP flew the aircraft through the left-base and on-final uneventfully. During flare-out for the 'Zero-Flap' 'Touch and Go' landing, the aircraft started to drift to the right while the Instructor Pilot advised the SP to apply corrective action to go back to the centre-line.<br><br>(c) Meanwhile the right main wheel touched the runway surface first, with the aircraft Heading of about 4-5 degrees right in relation to the runway track, impacting harder than normal touch down. Soon after the nose wheel of the aircraft contacted the runway surface followed the left landing gear wheel.<br><br>(d) A 'Go-round' attempt was made wherein, the aircraft got lifted momentarily by about 2-5 feet but came down on the runway in stalled condition, resulting the detachments of the right and nose wheels, ultimately causing the accident. |

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## 3. BODY (FACTUAL INFORMATION)

### 3.1 History of Flight

| | |
|---|---|
| 3.1.1 Flight number? | S2 AFK |
| 3.1.2 Type of operation? | PPL-General Flying Check Flight |
| 3.1.3 Last point of departure? | VGRJ, Rajshahi, Bangladesh. |
| 3.1.4 Time of departure (Local or UTC) | 0843 UTC |
| 3.1.5 Point of intended landing? | VGRJ, Rajshahi |
| 3.1.6 Description of the flight and events leading to the accident? | (a) The SP started his first flight with Galaxy Aviation Ltd on 05 October 2019. He has been consistently flying until 22nd March 2020. Thereafter, he had an absence of flying for about five (05) months as he flew on 22nd August 2020 and continued flying consistently until 31st August 2020. He had an absence of flying again for over four (04) months from 01 September 2020 until 05 January 2021 due to the prevailing COVIT-19 pandemic situation and consequently due to less flying activity of the Academy. During the absence-period, the SP resided in Dhaka, hence was completely out of touch with flying training and associated procedures.<br><br>(b) It may be mentioned here that, Galaxy Aviation Ltd has an 'Operations Policy' Number 18/2016 that specifies that a student pilot will be declared de-current if he/she remains absent from flying for two (02) months or more. The 'Operations Policy' provides instruction for the de-current SPs to undergo 02 hrs 'General Flying' (GF) flights to regain currency before starting scheduled training flights as per syllabus.<br><br>(c) On 05 January 2021, the SP travelled from Dhaka to Rajshahi by a Commercial Airline Flight which arrived VGRJ at 0450 UTC. Thereafter, at 0610 UTC the SP went on an Instrument flying (IF) for about 1:30 hrs which was followed by a running change for a 'Solo' Circuit Flight with a 'Safety Pilot' for 0:30 hrs. His next flight was for a 'Navigation Training Flight', which lasted for 0:55 hrs. Thus, the SP undertook three consecutive syllabus-based missions on the day of arrival to VGRJ without having followed the 'Operational Policy-18/2016, meant for regaining the flight performances of the SPs for flight-decurrent situations.<br><br>(d) Next day, on 06 January 2021, the SP flew a 'Solo-Navigation Flight'. On 07 January 2021, the SP went for the 'PPL-Navigation Check Flight' and passed the test. However, after the 'PPL-Navigation Check Flight' the Flight Instructor gave some aircraft handing to SP in view of the upcoming 'PPL-General Check Flight', to be conducted soon after. However, the 'General Flight' performance by the SP was observed as 'Unsatisfactory' by the Instructor Pilot.<br><br>(e) 08 January 2021 being an off-flying day, on 09 January 2021, the Instructor Pilot took up the SP for the 'PPL-General Flight Check'. The SP was scheduled for 'PPL-General Flight Check' as per the approved syllabus, outlined in Appendix-D of the 'Training and Procedure Manual' of the Academy. This specific 'Test, included the conduct of an Oral Examination of Emergency Procedures, Pre-flight preparation and flight checks of 'General Airmanship maneuvers en-compassing steep turns, incipient spin, forced landing practice after engine failure, re-joining circuit procedure, normal powered approach and landing, alternative landing (one or more selected from 'Zero-Flap', precautionary, crosswind), go-around from low-level and followed by basic instrument flying. |

(f) The 'PPL-General Flight Check' was planned and was being executed by ignoring the unsatisfactory performance standard of the SP's 'General Handling' part of the previous flight. The Instructor Pilot was on another training flight which landed at 0731 UTC. The aircraft S2-AFK was on another navigation training flight by another trainee which took off from VGRJ at 0656 UTC and landed at VGRJ at 0712 UTC. There was some time-involvement for the flight crew to take lunch at the Academy premises, under the arrangement of the Galaxy Aviation. The ill-fated flight was started at 0831 UTC, took off at 0843 UTC and the first attempted landing time was at 0906 UTC, when the accident occurred. The flight time was 0:23 hrs from take-off to first attempted landing.

(g) Based on the abovementioned timing, the AAIT has ascertained that the SP took off for the ill-fated flight without having received any or the bare-minimum 'Oral Examination of Emergency Procedures' or 'Pre-flight Briefing' for the 'PPL-General Flight Check'. At the same time, the Instructor Pilot also took up the SP without having conducted any 'Oral Examination of Emergency Procedures' or 'Pre-flight Briefing' with the SP.

(h) The Instructor pilot took over the aircraft control, added full power in an attempt to go around and applied left bank to move the aircraft towards center-line of the runway. The aircraft got airborne momentarily for about 2-5 feet height. The left-wing tip of the aircraft touched the runway making deep scratch marks on the under-surface of the left-wing tip area. This was followed by the aircraft to stall and drop down the runway on its right wheel, flowed by the nose wheel and hitting the propeller, thus causing the accident to occur.

*Note: The AAIT, at this stage, will continue to conduct further in-depth investigation on the following points and will include extended information on the above-mentioned points in the 'Final Report':*

(a) Recurrency practices by Instructor Pilots and Student Pilots of Galaxy Aviation Ltd;
(b) Observance of 'Pre-flight Briefing' by the Company IPs and SPs;
(c) Veracity of the right wheel mounting with the gear strut-assembly;
(d) Pilot technique for drift-recovery of aircraft after flare-out;
(e) 'Zero-Flap' 'Touch-and-go' landing by SP;
(f) 'Go-around' procedure at very low height;
(g) Aircraft bank input during low-height 'Go-around';
(h) Consideration on the use of flaps to 'Go-around' under the situation;
(i) Airmanship culture and CRM of the flight crew of the Company;
(j) Any other.

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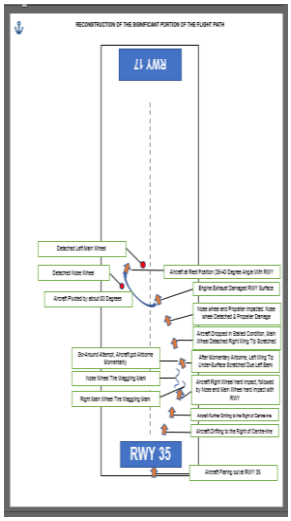
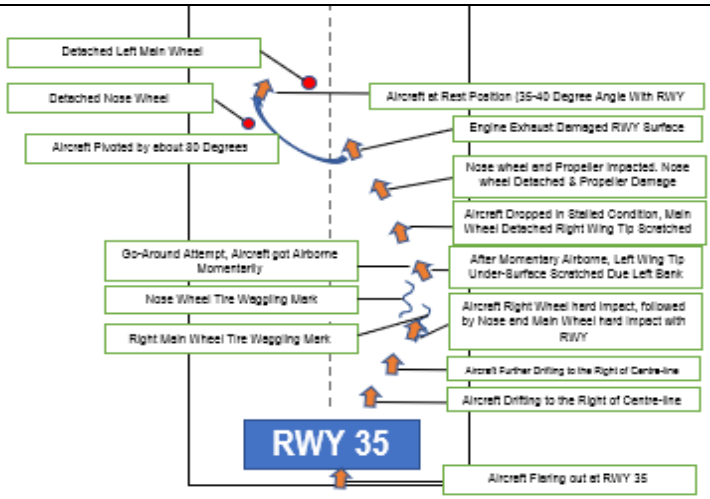
| | |
|---|---|
| 3.1.7 Reconstruction of the significant portion of the flight path? |    |
| 3.1.8 Location (latitude, longitude, elevation)? | VGRJ (Shah Makhdum Airport), Rajshahi, Bangladesh<br>(a) Latitude: N 242619.36<br>(b) Longitude: E 0883658.56<br>(c) Elevation: 55 Feet |
| 3.1.9 Time of the accident (Local or UTC)? | 0906 UTC (1506 LT) |
| 3.1.10 Whether day/night? | Day |

### 3.2 Injuries to Persons

| Injuries | Crew | Passenger | Others |
|---|---|---|---|
| 3.2.1 Fatal? | No | N/A | N/A |
| 3.2.2 Serious? | No | N/A | N/A |
| 3.2.3 Minor? | No | N/A | N/A |

### 3.3 Damage to Aircraft and Other

| | |
|---|---|
| 3.3.1 Destroyed? | No |
| 3.3.2 Substantially damaged? | Yes, as described below: |

| S/N | Nomenclature | Part No. | Figure No. from IPC | Page No. of IPC |
|---|---|---|---|---|
| 01 | Propeller Assembly (McCauley) | C16001-0501 | 60-1 | 231 |
| 02 | Lycoming Engine Type/Model: O-235-L2C | 6479 S/N: RL-15337-15 | 61-1 | 248 |
| 03 | Mount Assembly Engine | 0451003-36 | 62-6 | 248 |
| 04 | Tube-Inner (Nose Gear Shock Strut) | 0543006-5 | 34-10 | 129 |
| 05 | Nose Gear Steering Left Hand and Right Hand | 0543022-3<br>0543022-4 | 33-5 | 125 |

| | | | | | |
|---|---|---|---|---|---|
| | 06 | Exhaust Assembly | 0454011-1 | 64 | 259 |
| | 07 | Cowl Assembly Lower | 0452233-6 | 61B-27 | 239 |
| | 08 | Spring Assembly- Right Landing Gear | 0441212-6 | 38-1 | 135 |
| | 09 | Hydraulic Line Assy. Brake- R/H | 0400311-108 | 38-8 | 135 |
| | 10 | Wind Shield Assembly | 0413419-201 | 32-1 | 123 |
| | 11 | Window Rear | 0412020-10 | 30-79 | 118 |
| | 12 | Door Assy- Cabin R/H | 0417008-34 | 41-1 | 145 |
| | 13 | Stabilizer Assembly | 0432001-59 | 18 | 71 |
| | 14 | Rib Wing Center Section STA 192 (Wing Tip L/H) | 0720608-7 | 6-25 | 37 |
| | 15 | Stringer 0 AFT Outboard (Wing Tip L/H) | 0523003-40 | 6-54 | 38 |
| | 16 | Tip – Wing (Standard) L/H | 0423008-3 | 6-73 | 38 |
| | 17 | Skin Lower Center Sec. (Wing tip L/H) | 0523003-83 | 6-61 | 38 |
| | 18 | Skin Upper Section (Wing Tip L/H) | 0523993-81 | 6-56 | 38 |
| | 19 | Skin Lower – L/H & R/H | 0413004-35 & 0413004-36 | 27-10 27-11 | 105 |
| | 20 | Skin Lower (Rear Spar Bulkhead) | 0412020-7 | 30-83 | 119 |
| | 21 | Elevator (Right Hand) | 042001-52 | 21 | 83 |
| | 22 | Cover Assy – Fuel Tank (Left Hand) | 0412020-7 | 03-14 | 25 |
| | 23 | Power Supply -Strobe Light | C622008-0102 | 03-50 | 26 |
| | 24 | Stiffener- Bulkhead (Right Hand) | 0410127-2 | 25-35 | 97 |
| | 25 | Sill- Door (Lower Right Hand) | 0410132-4 | 25-22 | 97 |
| | 26 | Floorboard Assembly | 0410238-1 | 25-38 | 99 |
| | 27 | Stiffener- Belly Skin Outboard (Right Hand | 0411953-3 | 25-64 | 99 |
| | 28 | Akin Fuselage Station 27.92 to 56.69) | 041126-5 | 25-67 | 99 |
| | 29 | Wheel Assembly – Main Gear | C163001-0104 | 40 | 143 |
| | 30 | Wheel Half Assembly Male & Female | 161-04900 & 06204700 | 40-1 & 2 | 143 |
| | 31 | Wheel Assembly – Nose Gear | 1241156-12 | 36 | 132 |
| | 32 | Bulkhead – station 49.69 | 0411951-10 | 26-1 | 103 |
| | 33 | Bulkhead Lower- station 56.69 | 0411951-8 | 26-2 | 103 |
| | 34 | Support- Main Landing Gear Right Hand (Outboard) | 0441209-2 | 26-4 | 103 |
| | 35 | Line Assembly Fuel (Right Hand) | 0400343-8 | 81-10 | 319 |
| 3.3.3 Slightly damaged? | | N/A | | | |

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| 3.3.4 Other damage? (Damage to Runway) | (a) Waggling tire marks on runway surface, resulted from aircraft initial touch-down;<br>(b) About 10-feet-long x 1-inch-deep bitumen cut-mark on runway surface, resulted following the right wheel detachment;<br>(c) About 2-feet-long x 1.5-inch-deep bitumen cut mark on runway surface, resulted following the nose wheel detachment and friction by the aircraft engine's exhaust pipe;<br>(d) Several prominent bitumen cut-marks on runway surface due to propeller hits;<br>(e) Aircraft wing scratch-mark of right-wing tip area, right elevator tip area and left-wing tip area on the runway surface. |

## 3.4 Personnel information

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|---|---|---|
| 3.4.1 Pertinent information concerning each of the flight crew members regarding age, validity of licenses, ratings, mandatory checks, flying experience (total and on type) and relevant information on duty time? | **Pilot in Command**<br>(a) Date of Birth: 20 October 1985<br>(b) Age: 35+ years<br>(c) Nationality: Bangladeshi<br>(d) License: CPL NO-800<br>(e) Ratings: IR, FIR, C-152, C-172 & PA-28<br>(f) Mandatory Checks: N/A<br>(g) Flying Experience (Total): 1970:00 hours<br>(h) Flying Experience on type: 1258:20 hours<br>(i) License Validity: Valid (Non-Expiry)<br>(j) Medical Status: Valid till 30 September 2021. | **Student Pilot**<br>(a) Date of Birth: 27 July 1993<br>(b) Age: 27+ years<br>(c) Nationality: Bangladeshi<br>(d) License: SPL NO-198<br>(e) Ratings: N/A<br>(f) Flying Experience (Total): 48:30 hours<br>(g) Flying Experience on type: 48:30 hours<br>(h) License Validity: 24th September 2021<br>(i) Medical Status: Valid till 17 February 2024. |
| 3.4.2 Brief statement of qualifications and experience of other crew members? | | N/A |
| 3.4.3 Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant? | **Air Traffic Services**<br>(a) Air Traffic Controller-2;<br>(b) Aerodrome Operator-1;<br>(c) Fire Fighter-05;<br>(d) Crash Tender Serviceable (but very old, water leakage at various point);<br>(e) Fire fighter dress available 05 sets (03 good shape, but 02 poor condition);<br>(f) Walkie Talkie set for communication was available;<br>(g) Emergency drill practiced: weekly 03-days;<br>(h) Fire Observatory Tower – Available, but not manned. | **Maintenance Services**<br>(a) Wind-sock, Runway 35 side was not effective;<br>(b) Wind-sock, Runway 17 side was effective;<br>(c) A lot of pebbles in the middle portion of the Runway surface observed. |

## 3.5 Aircraft information

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| 3.5.1 Brief statement on airworthiness and maintenance of the aircraft (indication of | (a) The Aircraft Cessna Model-152 Registration No. S2-AFK has completed 11706.25 Hrs on 09 January 2021. The aircraft was manufactured in February 1979 and was registered in Bangladesh on 31 August 2010. |

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| deficiencies known prior to and during the flight to be included, if having any bearing on the accident)? | (b) The Check-I was carried out from 13-15 December 2020, vide Work Order No GFA/57/20 dated 13 December 2020;<br>(c) The Maintenance Release was issued vide No. 06/2020.<br>(d) This maintenance release is valid for 60 days up to 12 February 2021 or 100 flight hours, whichever occurs earlier.<br>(e) The next maintenance release is due on 13 December 2021 or total aircraft time (TAT) 11799:00 Hrs, whichever comes first.<br>(f) Quality assurance was carried out on 15 December 2021 by the Company Quality Assurance Manager.<br>(g) The aircraft Cessna S2-AFK carried out two missions on 09 January 2021.<br>(h) The origination (pre-flight) check was duly carried out by the licensed engineer and went for first mission for 1:25 Hrs.<br>(i) The aircraft was again prepared for next mission by carrying out transit check (through flight) and handed over for the flight crew.<br>(j) As per maintenance log, there was no known defect prior to and during the flight.<br>(k) As per the document, no airworthiness directives/service bulletins were due to this aircraft.<br>(l) The certificate of airworthiness of the aircraft Cessna-152, S2-AFK has been renewed by CAAB and is valid till 28 October 2021. |
| 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.)? | The mass and centre of gravity of the aircraft didn't have any bearing on the accident. |
| 3.5.3 Type of fuel used? | 100 LL Grade Aviation Fuel (Blue) and 100 (Formally 100/130) Grade Aviation Fuel (Green) |

### 3.6 Meteorological information

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| 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? | (a) Surface Wind: Calm;<br>(b) Vis: 2.5 Km;<br>(c) Cloud: Scattered NSC;<br>(d) QNH: 1009.8 MB;<br>(e) Temp: 26 Degree C<br>(f) Crew received the Met Information.<br>(g) Hourly weather forecast is available at weather office at VGRJ Terminal Building. |
| 3.6.2 Natural light conditions at the time of the accident (sunlight, moonlight, twilight, etc.)? | Sunlight. |

### 3.7 Aids to navigation

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|---|---|
| 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? | (a) NDB RJ 228 KHZ H24 242632.87N 0883649.35E (Serviceable);<br>(b) DVOR RAJ 114.6 MHZ H24 242621.18N 0883654.10E (Serviceable);<br>(c) VORDME RAJ 1180 MHZ H24 242621.18N 0883654.10E (Serviceable);<br>(d) VASI: Available on both RWY.<br>(e) Wind Sock: Serviceable on RWY 17 side; Unserviceable on RWY 35 side. |

### 3.8 Communications.

| | |
|---|---|
| 3.8.1 Pertinent information on aeronautical mobile and fixed service communications and their effectiveness? | Aerodrome Control Service Rajshahi Tower 128.3 MHZ – Tower communication equipment was reported to be serviceable. |

### 3.9 Aerodrome information

| | |
|---|---|
| 3.9.1 Pertinent information associated with the aerodrome, facilities and condition, or with the take-off or landing area if other than an aerodrome? | (a) VGR ARP co-ordinates AD 242619.39N 0883658.56E;<br>(b) Distance and direction from city 07 KM North of Town;<br>(c) AD elevation / reference temperature 55FT/400 C;<br>(d) MAG VAR 50' W; |

### 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? | N/A (Not installed) |

### 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 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 | (a) The aircraft made the first contact with the runwayat approximately 1500 feet down RWY 35 on to the right half of the centre-line at an angle of about 3-5 degrees with the RWY centre-line track (Figure-1).<br><br>(b) First Touch-Down Tire Marks indicated a partial dislocation of the right wheel after its heavy touch- down. There was no aircraft part or wreckage found in this area (Figure-1).<br><br>(c) The second impact of the right wheel, when ditached, made prominent cut-mart on the rnway bitumen as a result of the broken strut that scratched through the runway bitumen. However, there was no aircraft wreckage found in that area (figure-2).<br><br>(d) On impact of the nose-wheel, the aircraft engine exhaust pipe-edge cut through the runway bitumen that left prominent scar-mark on the runway surface. The detachmeent of the nose whell left a broken clamp-part resting 5-7 feet beside the impact area. The impact of the aircraft propeller also left series of cut marks on the bitumen. However, the propeller tips got bent and left no debris in that area (figure-3). |

may be included in this section or attached in the appendices?


(Figure-1)


(Figure-2)


(Figure-3)

(e) The detached right main wheel tire, after detachment, frictioned with the runway surface for about 10-15 feet, making prominent scratch-mark on the runway surface betumen. The detached part thereafter rested about 20 feet near about the centr-line of the runway on to the north (Figure-4).

(f) The detached nose wheel rested behind the disabled aircraft, about 15-20 feet, on to the west of the runway centre-line (Figure-5).

(g) The disabled aircraft, pivoted around the broken right wheel strut, stopped at the western half of the runway centre-line, at an angle of about 45 degrees with the runway track, facing 'North-east' (Figure-6).


(Figure-4)


(Figure-5)


(Figure-6)

### 3.12 Medical and pathological information

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| 3.12.1 Brief description of the results of the investigation undertaken and pertinent data available therefrom? | N/A (since no personal injury was evidenced). |

### 3.13 Fire

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|---|---|
| 3.13.1 If fire occurred, information on the nature of the occurrence, and of the firefighting equipment used and its effectiveness? | There was no evidence of fire. |

### 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? | N/A |

### 3.15 Tests and research

| | |
|---|---|
| 3.15.1 Brief statements regarding the results of tests and research? | To be provided in the final report. |

### 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) Galaxy Flying academy (GFA) is one of the CAAB approved flight training organizations in Bangladesh. It was established on 08 June 2008 as private limited company. It started its training operation from 29 October 2010.<br><br>(b) It provides the following courses:<br><br>(1) Private Pilot license- PPL<br>(2) Commercial Pilot License (CPL)<br>(3) Instrument Flying<br>(4) Flying Instructors Rating<br><br>(c) The ground classes are conducted in Dhaka while the flying training is carried out at VGRJ (Shah Makhdum Airport, Rajshahi).<br><br>(d) Until the day of the occurrence, the Academy had 02 Cessna-172 R and 03 Cessna-152 aircraft for the training of the Students. Out of the 03 Cessna-152, the subject mentioned aircraft, S2-AFK made the accident on 09 January 2021.<br><br>(e) The company is having 5 key post-holders such as, the Managing Director, Chief Executive Officer, Chief Flight Instructor, Chief Engineer (Maintenance Manager) and Quality Assurance Manager. The Chief Executive Officer is the Accountable Manager.<br><br>(f) On the day of the occurrence, the Academy had total student strength of 154 SPs that included SPs seeking for PPL, CPL FIR licenses. The academy has trained more than 200 students so far. There are 4 flying instructors, 3 Engineering executives and 05 ground instructors.<br><br>(g) Galaxy Flying Academy Limited is also a CAAB approved 'Aircraft Maintenance Organization' (AMO), which uses their own hanger, located at Rajshahi airport, for aircraft maintenances with their own man power.<br><br>(h) The main source of revenue is earned by Galaxy Flying Academy from the training of the students.<br><br>*Note: The AAIT, at this stage, will collect further information with regard to 'Management Policies and Practices', and 'Regulatory Framework' and will include extended information in the 'Final Report'.* |

## 3.17 Additional information

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|---|---|
| 3.17.1 Relevant information not already included in 3.1.1 to 3.1.16? | To be provided in the final report. |

3.17.2 Photos:









### 03.18 Useful or effective investigation techniques

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|---|---|
| 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 3.1.1 to 3.1.17? | (a) The investigation techniques used by the AAIT in conducting this investigation have been adopted as per the instructions provided in ICAO Annex-13, Appendix-1, Para-1.19 and that of Doc-9756, Part-4, Para-1.19.<br><br>(b) So far, no new useful or investigation technique has been merged at this stage of the investigation other than what is mentioned in (a). However, should the AAIT use any new useful or investigation technique, the same will be included through 3.1.1 to 3.1.18 in the investigation 'Final Report' and/or, will include as an Appendix to the 'Final Report', as specified in ICAO Doc-9756, Part-4, Para-1.19. |

## 4. ANALYSIS

The following analysis has been made based on 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 Man? | **Instructor Pilot**<br><br>The Instructor Pilot (IP),<br><br>(a) Has the responsibility as Chief Flying Instructor (CFI) of Galaxy Aviation Ltd to ensure Regulatory and Company compliance with regard to flight crew training;<br><br>(b) Had a record of consistency in flying in recent time;<br><br>(c) As CFI, he was found not conforming with the requirements outlined in the Company Operations Order 18/2016 to be fulfilled by the SP on the occasion of de-currency on flying and other procedures, mentioned in 3.1.6 (b);<br><br>(d) Was non-serious about the 'Unsatisfactory' performance in GF of the SP on the preceding flight. The SP could have been subjected to at least another flight, to improve upon GF handling performance prior to a Check flight;<br><br>(e) Was found to take up the SP for the ill-fated flight without having rendered adequate 'Pre-flight Briefing';<br><br>(f) Asked the SP to proceed for a 'Zero-Flap' touch-and-go landing' at the very first approach, which could have been given during subsequent approaches as viewed with the 'PPL-GF Check' syllabus;<br><br>(g) Could take earlier decision to 'Go-around' the aircraft no sooner it started drifting to the right;<br><br>(h) Left-banked the aircraft during 'Go-around' which could have been avoided considering the aircraft speed being low. |

(i) Could possibly took the first 'Flap' (10 degrees), which could decrease the stalling speed of the aircraft. This could possibly improve the situation.

*Note: The AAIT, at this stage, will continue to conduct further in-depth investigation on the Instructor Pilot (IP) and will include extended information in the 'Final Report'.*

**Student Pilot**

The Student Pilot:

(a) Was in-Consistent With regard to flying-currency. One of the two aspects that hindered for the currency-consistency was the prevailing COVIT-19 pandemic situation and the other was due to fulfilling the obligation of passing the Civil Aviation PPL-Examination in Dhaka;

(b) Was out of current on flying, but instead of complying with the 'Operations Policy-18/2016 of the company, undertook the syllabus-based training which was non-conformance with company instruction;

(c) Was not mindful that, after a long period of absence from flying, he undertook the majority of flights involving 'straight-and-level type' only (Instrument & Navigation flying);

(d) Could have requested the CFI to schedule for a GF mission to get back to GF flying technique, prior to accepting for the ill-fated check flight;

*Note: The AAIT, at this stage, will continue to conduct further in-depth investigation on the Student Pilot (SP) and will include extended information in the 'Final Report'.*

**Air Traffic Controller**

(a) VGRJ has two ATC Controllers. While one controller remains on-duty, the other controller remains off-duty. On the day of the accident, the duty controller gave take-off clearance to the aircraft and was on a lunch-break inside the Air Traffic Controlling room;

(b) At the time when the aircraft S2-AFK transmitted to ATC for rejoining for 'Circuit-and-landing', one 'Aerodrome Operator' was on the ATC 'Hot-seat' and was controlling the aircraft movement. This has been the regular practice being adopted by the ATC of VGRJ;

(c) An un-authorised person like the 'Aerodrome Operator' made all replies to S2-AFK from the time it intended to join the circuit until it requested to make the 'Touch-and-go' landing. The 'Touch-and-go' landing clearance to S2-AFK was also given by the 'Aerodrome Operator'. To the extent, the 'Aerodrome Operator' remained on 'Hot-seat' till the 'Mayday' call was given by the flight crew following the accident. However, specific to the replies given by the 'Aerodrome Operator', the AAIT did not find any abnormality other than 'Regulatory' violation;

(d) 'Regulatory Procedure' with regard to manning the ATC 'Hot-seat' was not followed by VGRJ ATC.

CONTACT DETAILS OF AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE (AAIC-BD)

| Head | Member (Operations) | Member (Engineering) | Member (Admin-Plan-Fin) |
|---|---|---|---|
| +8801715 027 508 | +8801617 785 671 | +8801713 125 955 | +8801711 828 321 |
| smrahmatullah2148@gmail.com | badsha7731@gmail.com | asaduzzaman57@outlook.com | mostafizur719@gmail.com |

| | |
|---|---|
| | (e) The post-accident activities by the Duty Air Traffic Controller of VGRJ with regard to 'Emergency Responses' and 'Communication Procedures' were satisfactory. |
| | **Company Maintenance Engineer**<br><br>(a) From the aircraft Logbook, it was evident that the aircraft was pre-flighted (Origination Check) by the licensed engineer and declared airworthy for flight.<br><br>(b) On 09 January 2021, following completion of the first mission, the aircraft was made ready for the subject mentioned flight by carrying out the required Transit Check. The aircraft was airworthy and there was no reported defect.<br><br>(c) The periodic inspection-I was carried out from 13-15 December 2020 and the maintenance release was done by the licensed engineer on 15 December 2020.<br><br>(d) The Airworthiness Directive (AD) No 2011-10-09 was carried out on 15 December 2020. No AD/SB was reported 'due' to this aircraft.<br><br>(e) There are 2 licensed engineers including Chief Engineer (Maintenance Manager). Only during periodic inspections or emergency situations, the Chief Engineer (CE) moves to VGRJ, otherwise he remains in Dhaka office.<br><br>(f) All maintenance activities are carried out at Rajshahi. One Quality Assurance Manager, who is a CAAB 'Approval Holder', visits VGRJ twice in a month and/or during periodic inspection. |

### 4.2 Machine

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|---|---|
| 4.2.1 Machine? | The aircraft engine, airframe including landing gears and other aircraft systems were reported to be satisfactory. |

### 4.3 Environment

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|---|---|
| 4.3.1 Environment? | Not contributary with this accident |

### 4.4 Organizational Aspect

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|---|---|
| 4.4.1 Organizational Aspect? | To be included in the 'Final Report'. |

## 5. CONCLUSIONS

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

### 5.1 Findings

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|---|---|
| 5.1.1 Findings? | (a) After flare out, the aircraft started drifting to the right, away from the runway centre-line, which was not appropriately prevented;<br><br>(b) While at a state of drifting, the right landing gear wheel made a very hard contact with the runway surface first that resulted in partial dislocation of the wheel from its adjoining strut;<br><br>(c) Following the initiation of the 'Go-around' and after a momentary airborne, the aircraft stalled and came down on the runway concrete making a second heavy-impact on the same wheel. At this, the right wheel completely detached from its strut assembly;<br><br>(d) The stalled condition of the aircraft also made the nose wheel of the aircraft to fall viciously on the runway surface resulting the wheel to detach;<br><br>(e) The eventual detachment of the nose wheel damaged the engine propeller tips and cowlings of the aircraft due to ground-impact;<br><br>(f) Faulty handling of the aircraft during landing appeared to be the significant finding in the investigation;<br><br>*Note: The AAIT, at this stage, will continue to conduct further in-depth investigation to evaluate the 'Findings' of this accident and will include 'Findings-related' information in the 'Final Report'.* |

## 5.2 Causes

| | |
|---|---|
| 5.2.1 Causes? | *Note: The 'Causes' of the accident will be provided in the 'Final Report' after in-depth investigation on the following:*<br><br>• Speed criteria of the aircraft at the time of 'Approach to Flare-out';<br>• Reason for 'One-wheel' landing of the aircraft;<br>• Reason for heavy touch-down;<br>• Right wheel spring/strut assembly intactness,<br>• Intactness of the right wheel mounting with the gear spring/strut-assembly;<br>• Pilot technique for drift-recovery of aircraft after flare-out;<br>• The decision for a 'Zero-Flap' 'Touch-and-go' first;<br>• The decision regarding time and technique to 'Go-around';<br>• Effect of banking the aircraft at low speed;<br>• Effect of banking the aircraft during 'Go-around';<br>• The use of flaps during 'Go-around';<br>• Company procedures and culture on the relevant issues;<br>• Airmanship culture and CRM of the flight crew;<br>• Any other. |

### 5.3 Contributing Factors

| | |
|---|---|
| 5.3.1 Contributing Factors? | *The AAIT, at this stage, considers the following to be a few of the Contributing Factors, but not limited to all, for the accident. However, the AAIT expects to highlight more Contributing Factors of the accident, in the 'Final Report' after in-depth investigation:*<br><br>(a) After the first impact by the right wheel of the aircraft on the runway, the Instructor Pilot took over the control of the aircraft and attempted 'Go-around'. The left-banking of the aircraft during the momentary lift-off reduced the lift-coefficient which seems to have induced the aircraft to stall;<br><br>(b) The aircraft, while in stall, came down impacting much harder on the runway surface with its right wheel, a second time, resulting to detach itself from its strut assembly;<br><br>(c) Simultaneous nose-down tendency of the aircraft due to stall, resulted the nose wheel to impact harder, a second time, and getting detached by breaking its clamp assembly;<br><br>(d) 'Zero-Flap' 'Touch-and-Go' landing on the very first approach and landing is considered to be a contributory factor for the accident. |

## 6. SAFETY RECOMMENDATIONS

### 6.1 Intermediary Safety Recommendations

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| 6.1.1 Intermediary Safety Recommendations? | *Note: The 'Intermediary Safety Recommendations' of the accident will be provided as and when emerge during the remaining part of the investigation. The AAIC-BD will do the needful, as applicable, and will also include them in the 'Final Report'.* |

### 6.2 Safety Recommendations

| | |
|---|---|
| 6.2.1 Safety Recommendations? | *Note: The 'Safety Recommendations' of the accident will be provided in the 'Final Report'.* |

## 7. APPENDICES

| |
|---|
| 7.1 All Evidences, Documents, Photographs etc., will be preserved in 'File' |

**END**