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

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FINAL REPORT

SERIOUS INCIDENT OF CESSNA-152 AIRCRAFT, REG S2-ADQ OCCURRED ON 08 OCTOBER 2020 AT RAJSHAHI AIRPORT (VGRJ), BANGLADESH

OFFICE OF THE AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE OF BANGLADESH

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

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FINAL REPORT

Investigation into 'Serious Incident' following 'Runway Excursion' of Cessna-152 Aircraft, Reg. No. S2-ADQ of Bangladesh Flying Academy and General Aviation Ltd, Occurred on 08 October 2020, at VGRJ, Shah Makhdum Airport, Rajshahi, Bangladesh

This serious incident investigation has been conducted by the Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD) pursuant to Section 19 (1) of Civil Aviation Act 2017. The occurrence has been categorized as a serious incident as per the definition of Annex 13.

The Head of AAIC-BD formed an Aircraft Accident Investigation Team (AAIT) comprising the investigators of AAIC-BD to investigate into the 'Serious Incident' vide a Memorandum No. 30.00.0000.013.31.002.20 (INV/S2-ADQ/08 OCT 2020)-02, dated 09 October 2020. Member Operations of AAIC-BD was designated as the Investigator-in-Charge (IIC) of the investigation. The AAIT started investigating into the serious incident immediately following the occurrence on 08 October 2020.

This Final Report has been prepared following the 'Preliminary Report' which was published on 06 November 2020 and the 'Draft Final Report' which was sent on m19 June 2021 to relevant authorities, organizations and agencies for comments. This report has been compiled in accordance with the requirements of Standard 6.4 of ICAO Annex 13 and is being distributed to all concerned and public for accidents and incidents prevention.

The AAIC-BD conceives that any Aircraft Accident Investigation and Analysis thereof, should focus on identifying the true underlying causes and/or contributing factors rather than specifically indicating some human responsibility for the occurrence.

According to ICAO and that of the AAIC-BD, the sole objective of this investigation is to prevent aircraft accidents and incidents and it is not the purpose of this investigation activity to apportion blame or liability.

The information contained in this Report has been derived from the factual information and evidences so far gathered during the ongoing investigation of the occurrence. This Final Report contains nine (9) 'Safety Recommendations'

The AAIC-BD has identified some safety-gaps with regard to 'Incoming notification to AAIC-BD' and 'Measures to be taken for the protection of evidences' for the designated investigators. Accordingly, the AAIC-BD issued an 'Interim Safety Bulletin', vide Reference Number 30.00.0000.013.31.005.20 (CESSNA-152/S2-ADQ/08 OCT)-35, dated: 29 October 2020, for the distribution and compliance, as far as practicable, by all concerned.

The Final Report represents the complete investigation together with additional **Intermediary Safety Recommendations.** To comply with Standard 6.5 of ICAO Annex 13 and also in the interest of accident prevention, this 'Final Report' will now be available publicly on the internet.

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Abbreviations

REG	-	Registration
Ltd	-	Limited
AAIC	-	Aircraft Accident Investigation Committee
BFA & GA	-	Bangladesh Flying Academy and General Aviation
AAIT	-	Aircraft Accident Investigation Team
ATC	-	Air traffic Control
ATPL	-	Airline Transport Pilots License
SP	-	Student Pilot
IP	-	Instructor Pilot
ILS	-	Instrument Landing System
MLS	-	Microwave Landing System
NDB	-	Non-Directional Beacon
PAR	-	Precision Approach Radar
VOR	-	VHF Omnidirectional Radio Range
N/A	-	Not Applicable
SPL	-	Student Pilot License
Km	-	Kilometre
MAG VAR	-	Magnetic Variation
MB	-	Mega Byte
ATO	-	Approved Training Organization
CAAB	-	Civil Aviation Authority of Bangladesh
FSO	-	Flight Safety Officer
CAA	-	Civil Aviation Authority
SOP	-	Standard Operating Procedure
TPM	-	Training and Procedures Manual
ERP	-	Emergency Response Plan
IT	-	Instructional Technique
CFI	-	Chief Flying Instructor
AME	-	Aircraft Maintenance Engineer
FSR	-	Flight Standard and Regulations

1. TITLE

1.1 Composition of Title

1.1.1 Name of the Operator	Bangladesh Flying Academy and General Aviation Ltd (BFA & GA)
1.1.2 Name of the Manufacturer	Cessna
1.1.3 Aircraft Model	Cessna-152
1.1.4 Aircraft Nationality	Bangladesh
1.1.5 Aircraft Registration Marks	S2-ADQ
1.1.6 Place of Occurrence	VGRJ - Shah Makhdum Airport, Rajshahi, Bangladesh
1.1.7 Date of Occurrence	08 October 2020

2. SYNOPSIS

2.1 Details of Synopsis

2.1.1 Notification of accident to national and foreign authorities	Office of the Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD) notified to all relevant Authorities and Agencies as per Standard 4.1 of ICAO Annex 13.
2.1.2 Identification of the Accident Investigation Authority	Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD).
2.1.3 Accredited Representation	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 AAIC-BD require. The AAIC-BD subsequently did not require any assistance from the ACCREP from NTSB.
2.1.4 Organization of the Investigation?	Aircraft Accident Investigation Team (AAIT), designated by the Head of the AAIC-BD through a 'Memorandum'.
2.1.5 Authority releasing the report	Aircraft Accident Investigation Committee of Bangladesh (AAIC-BD)
2.1.6 Date of publication or dispatch of report	The date of dispatch is 16 April 2021. This final report is being sent to 'Specific Addressees' conforming the requirements of Standard 6.3 of ICAO Annex 13.
2.1.7 Brief resume of the circumstances leading to the accident	One Student Pilot (SP) of Bangladesh Flying Academy and General Aviation Ltd (BFA & GA), after completing the pre-solo training and 'Solo-Check', took off from VGRJ, Shah Makhdum Airport, Rajshahi, Bangladesh, using runway 17 at 0630 UTC to carry out 'Circuit and Landing' for first solo flight. The SP completed one circuit and approached on finals for full stop landing, and thereafter landed at 0636 UTC. After touch down, the aircraft continued to roll down the runway and entered the first dumbbell for turning around to taxi back track and to proceed to the parking (bay) area. During turning around inside the dumbbell, the aircraft overshot the concrete area of the dumbbell and went into the grassy area. Once the aircraft stopped on the grassy area, the nose wheel of the aircraft went inside the soft ground. Propeller tips and the left-wing tip were found marred with mud. Seemingly, the propeller tip and the left-wing tip of the aircraft hit the ground.

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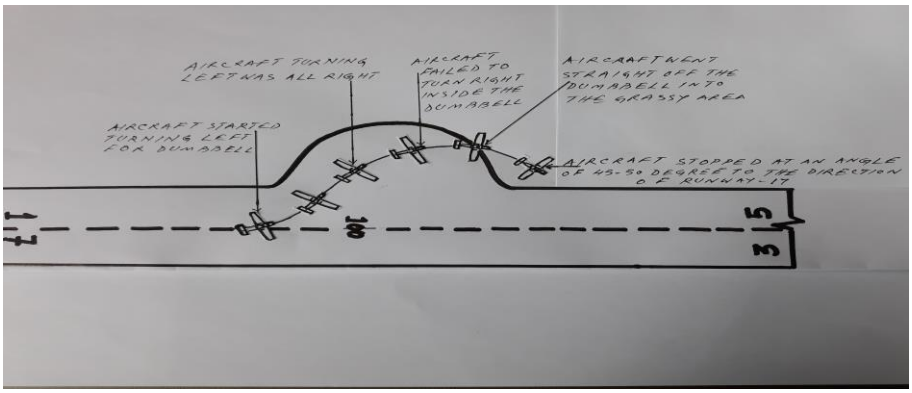
3. BODY

3.1 FACTUAL INFORMATION

3.1.1 History of the flight:

3.1.1.1 Flight number	S2 ADQ
3.1.1.2 Type of operation	First solo flight by a Student Pilot (SP)
3.1.1.3 Last point of departure	VGRJ, Rajshahi.
3.1.1.4 Time of departure (Local time or UTC)	0630 UTC
3.1.1.5 Point of intended landing	VGRJ, Rajshahi
3.1.1.6 'Flight preparation'	Flight preparation was good
3.1.1.7 Description of the flight and events leading to the accident, including reconstruction of the significant portion of the flight path, if appropriate.	(a)The Student Pilot (SP) was scheduled for 'Solo-Flight' after having cleared for the flight by the Company Instructor Pilot (IP). Before the solo flight, the SP completed the required flying training and was cleared for this 'First Solo' Flight. (b)The SP took off from VGRJ, Shah Makhdum Airport, Rajshahi, Bangladesh, using Runway 17 at 0630 UTC. The SP completed one circuit and approached on finals for full stop landing. The SP landed the aircraft at 0636 UTC. After touch down and following landing roll, the SP entered the first dumbbell for turning around the aircraft inside the dumbbell to taxi back track to the parking (bay) area. (c) Before entering into the dumbbell, the SP requested the tower for back-track. Rajshahi tower cleared the aircraft to back track and proceed to parking (bay) area. According to the SP, the aircraft was slowed down before entering the dumbbell. (d) The left entry-turn by the SP from the runway to the dumbbell was assumed to be normal. While making right turn inside the dumbbell to turn around, the SP added power and applied right rudder pedal to continue to turn right but the aircraft did not attain the required radius of turn for completing the right U-turn inside the dumbbell. Instead, the aircraft over speeded, went straight off the dumbbell into the grassy area. Sketch of the Serious Incident of Cessna-152 is shown herewith: 

	(e) At the point of stoppage, the nose wheel of the aircraft got stuck in the mud leaving about 6-9 inches deep hole in the soft grassy surface (rain). The propeller tip of the aircraft hit the ground by making an approximately 3-inch-deep & 27-inch-wide cut. The left-wing also hit the ground and received mud-splash onto left-wing tip leading edge area by making a mark of 5-inch deep & 14-inch-wide. However, the hit of propeller tip and left-wing tip did not show any visible damage to the propeller-tip or wing surface/tip. (f) According to the SP, the aircraft engine was quickly switched off and when stopped, 'Emergency' was announced to Air Traffic Control tower at 0638 UTC. The SP thereafter, evacuated the aircraft normally by opening the aircraft door. (g) Reconstruction of the significant portion of the flight path was not applicable for this incident.
3.1.1.8 Location (latitude, longitude, elevation)	VGRJ Shah Makhdum Airport, Rajshahi, Bangladesh (a) Latitude: N 242619.39 (b) Longitude: E0883658.56 (c) Elevation: 55 Feet
3.1.1.9 Time of the accident/serious incident (Local or UTC)	0638 UTC (Serious Incident)
3.1.1.10 Whether day or night	Day

3.1.2 Injuries to Persons

Injuries	Crew	Passengers	Others
3.1.2.1 Fatal	No	N/A	N/A
3.1.2.2 Serious	No	N/A	N/A
3.1.2.3 Minor	No	N/A	N/A

3.1.3 Damage to Aircraft (Brief description)

3.1.3.1 Destroyed	No
3.1.3.2 Substantially damaged	No
3.1.3.3 Slightly damaged	One tip of the propeller and the left-wing tip of the aircraft hit the ground. All these hits did not show any visible damage to the propeller-tip or wing surface/tip.

3.1.4 Other Damage:

3.1.4.1 Other Damage	NIL

3.1.5 Personnel information

3.1.5.1 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:** ❖ Age: 21 ❖ Nationality: Bangladeshi ❖ ATPL: N/A ❖ Ratings: N/A ❖ Mandatory Checks: Solo Check, Qualified	❖ Flying Experience (Total): 15:30 hours. ❖ Flying Experience (On type): 15:30 hours ❖ License: Valid SPL ❖ Medical Status: Valid Medical Certificate.
3.1.5.2 Brief statement of qualifications and experience of other crew members		N/A
3.1.5.3 Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant		Nil

3.1.6 Aircraft information

3.1.6.1 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)	(a) The aircraft was airworthy as per aircraft maintenance log book prior to and during the flight. (b) Further details regarding the airworthiness and maintenance of the aircraft are considered not relevant for the serious incident.
3.1.6.2 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.)	N/A
3.1.6.3 Type of fuel used	(a) 100 LL Grade Aviation Fuel (Blue); (b) 100 (Formally 100/130) Grade Aviation Fuel (Green)

3.1.7 Meteorological information of VGRJ

3.1.7.1 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	❖ Surface Wind: Calm; ❖ Vis: 5 Km; ❖ Cloud: Scattered 1200 Feet; ❖ QNH: 1009.1 MB; ❖ Temp: 31 Degree C ❖ The meteorological information was available with crew (both forecast and actual). ❖ In addition, hourly weather forecast is received from weather office at Rajshahi Airport Terminal Building.
3.1.7.2 Natural light conditions at the time of the accident (sunlight, moonlight, twilight, etc.)?	Natural Sunlight condition during day.

3.1.8 Aids to Navigation of VGRJ

3.1.8.1 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	VGRJ AD 2.19 RADIO NAVIGATION AND LANDING AIDS: ❖ NDB RJ 228 KHZ H24 242632.87N 0883649.35E ❖ EM: A0/A2 ❖ DVOR RAJ 114.6 MHZ H24 242621.18N 0883654.10E ❖ DME RAJ 1180 MHZ H24 242621.18N 0883654.10E Co-located with VOR ❖ Visual ground aids - available ❖ ILS, MLS, PAR not available at VGRJ

3.1.9 Communications.

3.1.9.1 Pertinent information on aeronautical mobile and fixed service communications and their effectiveness	Aerodrome Control Service Rajshahi Tower 128.3 MHZ, EM: A3

3.1.10 Aerodrome information

3.1.10.1 Pertinent information associated with the aerodrome, facilities and condition, or with the take-off or landing area if other than an aerodrome	VGRJ AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATION DATA- ❖ ARP co-ordinates a site AD: 242619.39N 0883658.56E ❖ Distance and direction from city: 07 KM North of Town. ❖ AD elevation / reference temperature: 55FT/400 C ❖ MAG VAR: 50' W

3.1.11 Flight recorders

3.1.11.1 Location of the flight recorder installations in the aircraft, their condition on recovery and pertinent data available therefrom	No Flight recorder was installed in this aircraft.

3.1.12 Wreckage and impact information

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

(a) Prominent right wheel tyre-mark of the aircraft, indicating heavy braking action on the dumbbell, as shown in the picture:

(b) The aircraft went into the grass and stopped at a distance of 25 feet from the dumbbell edge and the nose wheel of the aircraft got stuck in the mud leaving about 6-9 inches deep hole in the soft grassy earth surface. The photo is enclosed herewith.

(c) The aircraft rested at an angle of 45-50 degrees to the direction of runway 17 (photo sketch of the aircraft is enclosed), right main wheel resting about 15 feet from the edge of the dumbbell. Left main and nose wheels found dug in to the soft soil. Left wing tip and a blade of the propeller were marred with mud, might have touched the ground.

(d) While in the grassy area, the aircraft sustained a propeller strike (splash of mud was found on the propeller) and left-wing tip leading edge area (splash of mud was found on the wing tip leading edge). Although no visible damage to either the propeller tip or on the surface of wing tip could be detected. The photo is enclosed herewith.

Hit mark of the propeller tip

Aircraft into the grassy area and stopped at a distance of 25 feet from the dumbbell edge

Suspected hit of elevator tip on grassy field:

Actual suspected hit of Elevator tip

Blow up photo Suspected hit of Elevator tip

3.1.13 Medical and pathological information

3.1.13.1 Brief description of the results of the investigation undertaken and pertinent data available therefrom	No medical and pathological tests were carried out. However, Medical Status is included in para 3.5 of Personnel Information.

3.1.14 Fire

3.1.14.1 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 having occurred.

3.1.15 Survival aspects

3.1.15.1 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	NIL

3.1.16 Tests and research

3.1.16.1 Brief statements regarding the results of tests and research	(a) Inspection of propeller blades - Inspection of propeller blades revealed very small nicks and scratches set up particularly on the leading edge of each blade from the tip inboard. This is a matter of concern for stress concentration which may lead to structural failures. Propeller strike can be a precursor to a catastrophic failure later in the engine's life as the full extent of any damage may not become immediately apparent. (b) Inspection of Wing-Centre & Empennage Section - Visual inspection of fixed surfaces of wing-centre section as well as empennage was carried out. All inspection plate & fairings were removed for internal inspection. Wing LE, TE, skin, stringer, spar, ribs, compression members were visually checked. A wing & empennage movable surface; that is aileron, flap, elevator, and rudder also checked for proper operation & freedom of movement. Skin was found free from tears, cuts and any other visual defects. No signs of deterioration, distortion, lose or missing rivets and screws. All fittings attached to spar; ribs & skin were secured. Wing movable surface along with other control surface operation was normal without any hinderance. (c) Inspection of Landing Gear & Braking System - Visual inspection of all three landing gears were performed. During inspection, fixed nose gear checkpoints, nose wheel assembly, shock-strut extension operation, torque legs fuselage attachment bracket, undercarriage legs, tyre condition were inspected. Aircraft was pushed forward (hand-held) and braking was applied. (1) No sign of tyre cut, wear, side wall crack or misalignment was detected; (2) Braking function was found satisfactory; (3) No evidence of crack or failure observed at the wheel assembly; (4) Relative motion & resistance between dampener shaft & housing was obvious at an acceptable level.

3.1.17 Organizational and Management Information

3.1.17.1 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) Bangladesh Flying Academy and General Aviation Ltd (BFA & GA), which was previously known as Flying Club, has been operating since 1948. (b) In Bangladesh, it is the first Approved Training Organization (ATO) of Civil Aviation Authority of Bangladesh (CAAB). (c) BFA & GA is run by an elected body, Secretary General being the key person to run the training affairs along with others (d) The operational management system is found suitable for an ATO as per the annual audit report. (e) It conducts seamless flying training at Shah Makhdum Airport, Rajshahi. (f) The Quality Control System appears to be weak and Safety Management System is absent. (g) The Head of Training, on behalf of the "Governing Body", is directly involved in influencing the operation of aircraft. (h) BFA & GA maintains just an average control of the day-to-day operations. It is inadequate for an academy which conducts seamless flying training. The academy also lacks long term safety awareness. (i) The Flight Safety Officer (FSO) is detailed from honorary Flying Instructor (Part-time). FSO has hardly any commitment towards the duty. During this incident FSO was not available at the site of incident. No designated FSO was also found after the incident. (j) Financial aspect of BFA & GA is maintained by the management of this organization. It is checked and inspected by a team of CAA Bangladesh annually and as and when required. (k) Resources are primarily the revenue earned in exchange of ground and flying training provided to the cadets of BFA.

3.1.18 Additional information

3.1.18.1 Relevant information not already included in 3.1.1 to 3.17.1	(a) The training technique that IPs follow is to call out actions repeatedly from memory and then carry out the actions of an exercise.

3.1.19 Useful or effective investigation techniques

3.1.19.1 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 3.18.1?	(a) This investigation has been carried out in-depth following the format of Annex 13, as far as possible. (b) All estimated sizes are quoted.

3.2 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']**

The 'Analysis' of this Serious Incident' has been compiled through the assessment of the following subject areas:

(a) 3.2.1 Flying Assessment Forms;
(b) 3.2.2 Brake and Rudder system;
(c) 3.2.3 Conditions under which aircraft left the Dumbbell;
(d) 3.2.4 Training Technique; and,
(e) 3.2.5 Organizational Aspect.

3.2.1 Flying Assessment Forms	(a) While going through the Flying Assessment forms of Student Pilot (SP), it was revealed that no revision of General Flying-3 (GF-3) and revision in General Flying-4 (GF-4) was carried out as per Training and Procedures Manual (TPM) by Instructor Pilot (IP). (b) There was no record of revision taxiing exercise also which could be found in the assessment form. (c) It was further unveiled that SP flew GF-5 on 05 August 2019 and then flew GF-6 on 29 August 2020 with more than one-year break of flying. (d) Interview further ascertained that the SP was not sure where to keep the feet during taxiing and the technique to use asymmetric rudder and brake together. Cessna-152 aircraft takes only about 25 feet to make 180 degrees turn if proper technique and procedure are followed. (e) All flying assessment forms (GF-4, GF-5, GF-6, GF-7, GF-8, GF-9, GF-10, GF-12, GF-13, GF-14, GF-15 and GF-16) of SP depicted that the SP incessantly expressed in writing the problem with taxiing, braking and rudder application. These were overlooked by the IPs. Evidences of all flying assessment forms are shown below:

Following evidences are found in the Flying Assessment of Student Pilot (SP)

Date	Mission	Self-Assessment by Student Pilot	Remarks by Instructor Pilot (IP)
04 Aug 2019	GF-4	Rough Handle of Rudder and brakes while taxiing.	Nil
05 Aug 2019	GF- 5	Problem with brakes and rudder while taxiing and maintaining' center line.	Nil
-	-	**More than one year break of flying**	-
29 Aug 2020	GF- 6	Roughly brakes applied.	Need to improve taxi.
03 Sep 2020	GF-7	Force application of rudder while taxing.	During Taxi press rudder as required'.
05 Sep 2020	GF-8	Rudder & brake application problem while taxing'	Practice Taxi, takeoff and landing
12 Sep 2020	GF-9	Taxi, Rudder Control.	Nil
13 Sep 2020	GF-10	Taxiing, center line alignment.	Advice to maintain center line
15 Sep 2020	GF-12	Rudder control during taxi.	Nil
16 Sep 2020	GF-13	Rudder too harsh application after landing, as a result went off the center line.	Nil
17 Sep 2020	GF-14	- Could not maintain center line with the runway before departure.' - While switching control I had my rudder press on brake. - Abrupt rudder application after landing.	Nil
19 Sep 2020	GF-15	-Not maintaining center line while taxiing to runway 35 & back track to Bay-2', -Power adjustment for maintaining speed', -Brakes applied abruptly while parking to Bay-2.	- Abrupt use of rudder during takeoff run - Improve the use of brake during taxi. - Improve standard of taxi out, back track, lineup, taxi, M. stopping & switch off'.
22 Sep 2020	GF-16	After touchdown center line was not maintained or lost center line while taxing flaps up and setting elevator trim for touch and go'. Brakes & taxi not done properly'. While side slip did not have proper rudder application.	Landing & action after landing. Back track, taxiing stop and switch off.

06 Oct 2020	GF-18	-Abrupt application of rudder -Could not maintain center line after touchdown	Nil
08 Oct 2020	GF-19 (Solo Check)	-Could not maintain centerline at T/O	Nil
08 Oct 2020	GF-20 (First Solo)	Nil	After landing during turning inside dumbbell for backtrack she could not turn (may be for excitement and tension) and went off the dumbbell. Immediately she switched off the aircraft. So, no damage to aircraft cadet took place

3.2.2 Brake and Rudder system	(f) The brake and rudder system of Cessna 152 aircraft is on the pedals. The upper part of the pedal is brake and the lower part is rudder. The photo of brake and rudder pedal is enclosed herewith. If proper taxi briefing/practice/training is not given, ab-initio student pilots are likely to confuse with the application of brake and rudder especially during an emergency.

The brake and rudder of Cessna 152 aircraft:

3.2.3 Conditions under which aircraft left the Dumbbell	(a) From the statements and subsequent interviews of the Student Pilot (SP), it can be understood that after landing on runway 17, the aircraft continued to roll down the runway to reach the dumbbell for making 180 degrees turn. To enter the dumbbell, as per SP's version, SP applied left rudder and opened power approximately to 1000 rpm. Left turn was accomplished successfully. SP then initiated the right turn by the use of right rudder and right brake but she was not feeling the pressure of the right brake, as she stated. (b) At that point SP added some more power. As per the statement, SP already had 1000 rpm. By adding more power, the aircraft speeded up so suddenly and so fast that SP could not keep the aircraft under control. As a result, the aircraft went out of the dumbbell area. (c) Wheel markings on the dumbbell confirmed the use of right brake. During the initial part of right turn the aircraft moved in a very low angle, almost in a straight line parallel to the runway direction. Most probably, SP out of nervousness applied other brake when the speed shot up. She also added more power to accomplish the turn when the aircraft was not turning enough just before leaving the dumbbell area. Turning angle increased significantly, indicating that the left brake was released and only the right brake remained applied. But it was too little, too late. Ultimately the aircraft went out of the dumbbell into the grassy area.

3.2.4 Training Technique	(a) During the interviews of IP and SP, it is fairly evident that the instructors do not give due importance to the taxiing practice, rather overlook the weaknesses of taxiing of students. All Flying Assessment forms also indicated the same. (b) To save taxiing time the IPs often take over the aircraft during long taxiing. (c) Students are not clearly briefed/showed where to place their feet during taxiing. (d) Cessna 152 aircraft takes only about 25 feet to make 180 degrees turn if followed proper technique and procedure. Proper taxiing technique was not followed by the IP.
3.2.5 Organizational Aspect	(a) BFA & GA possess Standard Operating Procedure (SOP), Training and Procedures Manual (TPM), Checklist, Pilots' Hand book, Operational order, maintenance manual Flying training syllabus, ground training syllabus, Emergency Response Plan (ERP) and all other necessary document. But no one is accountable to see through that all these documents and ERP are followed/maintained. (b) The training standardization for IPs as well as SPs of BFA and GA is in a disarray. The organization generates lot of flying without accountability of students' attendance, preparedness, tests and qualification. The Instructional Technique (IT) differs from instructor to instructor. Appropriate Instructional Technique by the IPs has neither been established nor practiced within the Organization. It appeared that, no one is there to oversee this and no one is answerable for this to the Operational Management. (c) The training technique and procedures are amply clear and systematic in TPM (Training and Procedures Manual) but this is not ensured to be followed by the Top/mid-level operational management. The IPs tend to follow their individual teaching techniques and procedures for flying training.

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(d) Flying Training of all SPs directly related to their individual imbursement. During training, if the imbursement cannot be made on time, then the incumbent's flying training is stopped. This situation, in turn, hampers their normal flow of training and jeopardises flight safety.

(e) The SP flew after more than one year break of flying. No document was found for the absence of flying. No refresher/type-technical training/examination papers were also found before the SP started flying again.

(f) Training and Procedures Manual (TPM) contains one taxiing exercise in GF-3 and Revision in GF-4. Taxiing, braking and application of rudder are included in every flying sortie. Though these practices are considered to be adequate for the SP to gain proficiency in taxiing but the performance monitoring of SP by the IP should be reflected in the individual flying assessment form of all SP.

(g) Most of the time, IPs carry out the taxiing during training flights depriving students' practice of taxing.

(h) The SPs are not clearly briefed/shown as to where to keep their feet during taxiing.

(i) As per the Company's Emergency Response Plan (ERP), in case of any emergency/incident the Operation Officer (Ops Officer) is to inform the Flight Safety Officer (FSO). Since the designated FSO was not present at VGRJ, Shah Makhdum Airport, Rajshahi, the FSO could not be informed immediately after the incident. As per the statement of Ops Officer, he also did not remember whether the FSO visited the site of occurrence or not.

(j) All Operational, Engineering and ATC personnel have shown negligence or ignorance of mandatory requirements and limitations after the incident had taken place. Activities like, removing the aircraft from the spot without determining possible damage, cleaning the aircraft, starting the engine and taxiing the aircraft to the parking area and then again starting the engine for ground run, running the engine at different power settings including full power etc., were absolutely uncalled for without the prior permission from the Investigation Authority. It could be a collective decision of CFI, AME and the Acting Airport Manager.

(k) No one felt the necessity of taking photo/pictures of the aircraft, cockpit and its surroundings before they removed the aircraft from grassy area.

(l) Non-availability of sufficient photo/pictures from different angles limited the scope of analysis.

(m) Safety Management System is absent in BFA & GA

(n) Notification was not done at appropriate time to the AAIC-BD about the aircraft incident by the quickest possible means.

(o) The AME worked in the aircraft without abiding by the Mandatory Service Bulletin of the Manufacturer, applicable in this case. Subsequently, releasing the aircraft for service has been an act of complete disregard to flight safety.

(p) Aircraft engine, propeller and the landing gear structure might have been subjected to further damage by starting the engine, running engine at high power and taxiing the aircraft.

3.3 CONCLUSIONS

Appended below are the **Findings, Causes and/or Contributing factors** established in the investigation.

3.3.1 Findings, Causes and/or Contributing Factors

3.3.1.1 Findings	(a) BFA & GA maintains proper SOP, TPM, Checklist, Pilots' Hand book, Operational order, maintenance manual and all other necessary document, but in practice, most of the laid down instructions and procedures are not adhered to within the Organization. (b) The IPs ignored the weak areas provided by the SP in the 'self-assessment' of 'Performance Monitoring Form' that resulted the deficient areas to remain un-attended, generating lack of skill and proficiency. (c) The IPs deprived the SP to practice taxing which led the SP to remain non-proficient in taxiing. (d) The SPs are not clearly demonstrated and practised as to where to the resting place of feet during taxiing and/or braking. (e) Neither the flying records nor the records indicating the days of absence from flying of the SPs are well-documented in the Organization. The 'one-year' absence from flying appeared as one of the main concerns for the occurrence.
3.3.1.2 Causes	**(a) The main cause of this serious incident was 'Human Factor' wherein; the Student Pilot was not able to proficiently manoeuvre the aircraft during taxiing inside the dumbbell area using proper speed-control, asymmetric brake, and rudder paddle in a coordinated manner.** **(b) The Student Pilot was not subjected to proper training/practice on taxiing, braking and rudder application.** **(c) The Instructor Pilot demonstrated tangible lack of Instructional Technique and monitoring the level of proficiency of Student Pilot's, especially in 'taxiing' the aircraft.**
3.3.1.3 Contributing Factors	(a) Bangladesh Flying Academy & General Aviation Ltd lacks top level management supervision in terms of Operational, Maintenance and Administration. (b) BFA & GA Ltd does not have long term safety awareness to identify hazards and mitigate those. (c) No safety programme was found in their training activities and no effort was visible to improve safety standards and to develop a safety culture. As a result, the institution, instructors and the students are only interested in doing as much flying as is possible, without paying any heed to safety. (d) The SP was not given adequate 'training-lessons' to become proficient in taxiing, braking and rudder application of the aircraft by the IPs of the company though the Student Pilot continuously expressed in writing the problem with taxiing, braking and rudder application. IP mainly focused in the area of flying ignoring ground exercises. (e) **The written reports (Flying Assessment form) of the SP with regard to problems during taxiing, braking and rudder application were pitilessly overlooked by the IP.** (f) The over excitement of Student Pilot's first solo flight wherein, the coordination requirements for the use of engine power, brake and rudder paddle (for ground-turning) went erratic, which could also be another contributing factor for the runway excursion.

3.4 SAFETY RECOMMENDATIONS

3.4.1 Intermediary Safety Recommendations	Interim Safety Bulletin has been issued on 'Notification' and 'Protection of 'Evidence', vide Ref. No. 30.00.0000.013.31.005.20 (CESSNA-152/S2-ADQ/08 OCT)-35, Dated: 29 October 2020, **(Attached at the end of this report as Appendix-1)**
3.4.2 Safety Recommendations	**A. Applicable to the Bangladesh Flying Academy & General Aviation Ltd:** (a) Bangladesh Flying Academy & General Aviation Ltd should develop a system to carry out supervision at every level of activity in terms of Operations, Maintenance and Administration. (b) BFA & GA Ltd needs to prepare a long-term safety awareness to identify hazards and mitigate them. (c) BFA and GA should maintain smooth flow of flying training for all Student Pilots. Break of flying should be avoided as far as possible, if not, the company must take appropriate mitigating actions to uphold safe operation of flights. (d) As per Emergency Response Plan (ERP), all designated personnel are to be present at the location/place of flying whenever the flying activity remains on-going. (e) BFA and GA should have a designated Flight Safety Officer (FSO) who will conduct the safety briefing/meeting periodically to all concerned and maintain records to raise the safety awareness. (f) The braking and rudder application of Cessna aircraft are designed in the same pedal/device. The upper part is brake and the lower part is rudder. Any time there is a likelihood for mistake; the SP might hesitate to take the precise corrective action. Therefore, Bangladesh Flying Academy and General Aviation should immediately review/develop the flying training syllabus and provide practical training to all the SP to avoid any such recurrence. (g) All Instructor Pilots must go through the Students Self-Assessment mistakes (hand written by students) developed by the Academy and take appropriate measures accordingly. (h) Standardization of Instructional Technique has been missing which is pre-requisite for any Flying Training Academy. There should be Standardization of Flight and Instructional Technique (IT) for all IPs. Proper briefing and de-briefing is to be conducted for every mission. **B. Applicable to the Civil Aviation Authority of Bangladesh (CAAB):** (a) The safety oversight by the Civil Aviation Authority of Bangladesh (CAAB) may be strengthened on BFA & GA for enhancement of safety.

4. APPENDICES

4.1 All statements, evidences, documents, photographs etc., will be preserved in the 'File'

Appendix-1

'SAFETY BULLETIN'
SUBJECT: 'NOTIFICATION' AND 'PROTECTION OF EVIDENCE'
No. 30.00.0000.013.31.005.20 (CESSNA-152/S2-ADQ/08 OCT)-35, DATED 29 OCTOBER 2020

Applicability: Concerned personnel of Operators, Departments, Service-providers and Authority

1. Visit www.caab.gov.bd (AAIC-BD Menu) to understand the theme on 'Notification';

2. Notify the AAIC-BD about an aircraft occurrence (Accident, Serious Incident or Incident), as soon as possible and by the quickest possible means;

3. Use the 'Hot-line' and others information detailed in the 'website' for the communication of 'Notification';

4. Wait for the instruction, arrival or visit by the AAIC-BD investigators before disturbing the affected aircraft, wreckage, parts and all evidences, so as not to lose important evidences for the purposes of 'accident prevention' and 'aviation safety'. However, all rescue operation with regard to 'Fire Fighting', 'Passenger evacuation' (Non-injured, Injured or diseased) will be accomplished whereby the affected aircraft, wreckage, parts and any evidence(s) may be disturbed or moved;

5. If it is necessary for rescue purpose or in the event that a runway has to be cleared, the affected aircraft, wreckage, parts, etc. maybe disturbed or moved. However, it should be ensured that adequate photographs are taken, for onward hand-over to the AAIC-BD investigator before the aircraft wreckage, parts, etc. are moved;

6. Clearance for the removal of aircraft (and wreckage), given by the AAIC-BD shall not be misunderstood as 'Airworthiness' or 'Maintenance Clearance'. The AAIC-BD accords such clearance for the purpose of 'Maintenance Work' or 'Maintenance Action' only;

7. Operators, for all the cases, shall obtain the necessary 'Airworthiness' clearance from the Regulating Authority for the purpose of its flight operation;

8. The AAIC-BD, through independent investigation, evaluates the causes and contributing factors for an occurrence. While doing so, it identifies deviations procedures and requirements which lead to occurrences. To this aim, the AAIC-BD issues, for the benefit of 'Accident prevention' and 'Aviation Safety', 'Safety Bulletins' and 'Safety Recommendations'; and,

9. Last, but not the least, the AAIC-BD neither disposes any 'Blame' or 'Liability' on an occurrence, nor it involves itself in any 'Judicial Investigation'.

Head
Aircraft Accident Investigation Committee
Bangladesh

END

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

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