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**PRELIMINARY INVESTIGATION REPORT ON
RUNWAY EXCURSION IN DHAKA BANGLADESH OF THAI AIRWAYS BOEING 777-200**

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Investigation into the Serious Incident of B-777 Aircraft, Nationality and Registration Mark HS-TJD of Thai Airways International Public Company Ltd on 24 July 2018 at Hazrat Shah Jalal International Airport, Dhaka, Bangladesh

This serious incident investigation is being 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 has been 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) through an e-mail sent by the Vice President of Corporate Aviation Safety, Security and Standards of THAI Airways International Public Company Limited narrating about the runway excursion during landing at Hazrat Shah Jalal International Airport, Dhaka, Bangladesh (VGHS) on 24 July 2018 of Flight TG 321 (BKK-DAC) involving a Boeing 777-200 aircraft having Registration Mark HS-TJD. The report indicated that there were 2 Flight crew and 13 Cabin crew Plus 1 Ground Engineer with 14 business class and 141 economy class passengers were on board. The report further indicated that 6 tyres of the aircraft were blown out.

This preliminary investigation report has been issued following the serious incident in order to present an updated status of the investigation on the aforementioned serious incident. 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 preliminary report has been derived from the factual information and evidences so far gathered during the ongoing investigation of the occurrence.

Any specific safety issue identified during the course of the investigation will be advised to all parties through the AAIG-BD Safety Recommendations procedure.

The final report, once completed, may contain altered information in the case that new evidence appears during the ongoing investigation that requires changes to the information depicted in this report. The final report will represent the complete investigation, which will be made public in due course of time, in conformity with ICAO Annex 13.

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1. TITLE

1.1 Name of Operator?	Thai Airways International Public Company Ltd
1.2 Name of Manufacturer?	Boeing
1.3 Aircraft Model?	B777-2D7
1.4 Aircraft Nationality?	Thailand
1.5 Aircraft Registration Marks?	HS-TJD
1.6 Place of Occurrence?	Hazrat Shah Jalal International Airport (VGHS), Dhaka, Bangladesh
1.7 Date of Occurrence?	24 July 2018

2. SYNOPSIS

2.1 Notification of accident to national and foreign authorities?	The Head of the Aircraft Accident Investigation Group of Bangladesh (AAIG-BD) has notified to all relevant Authorities and Agencies as per ICAO Annex 13, Standard 4.1, Civil Aviation Authority Bangladesh, Rule 235 and the Compendium of Aircraft Accident Investigation Group of Bangladesh (AAIG-BD), Part C Para-6.
2.2 Accident investigation Authority?	Aircraft Accident Investigation Group of Bangladesh (AAIG-BD)
2.3 Accredited Representation?	So far, three (3) Accredited Representatives, namely AAIC Thailand, NTSB USA and EASA EU have expressed their willingness to participate in the investigation. The AAIG-BD has included them to participate in the investigation.
2.4 Organization of the investigation?	Aircraft Accident Investigation Team (AAIT), designated by the Head of the AAIG-BD through a 'Memorandum'.
2.5 Authority releasing the report?	Aircraft Accident Investigation Group of Bangladesh (AAIG-BD).
2.6 Date of publication of report?	16-08-2018
2.7 Brief resume of the circumstances leading to the accident?	<p>a) The aircraft made an ILS approach at Runway 14 for landing during moderate to heavy rain with about 10-11 Knots of cross wind component from right side. During the final approach, visual contact with the Runway was not established by the flight crew. The flight crew reported to have commenced a missed approach.</p> <p>b) Thereafter, the aircraft made the second ILS approach for landing. The weather condition remained as before. The aircraft touched down on the right side of the centerline of the wet runway surface at 576 feet down the threshold line of Runway 14 at an angle of about 15 degrees right with the runway heading.</p> <p>c) After touchdown, the aircraft rolled on the concrete surface for 768 feet when the right main landing gear went into the grassy-mud.</p> <p>d) The aircraft then continued to roll down almost parallel to the runway with its right main gear remaining on the wet grassy mud, for 1536 feet. During this time, the right main gear wheels overran over nine concrete cable laying iron-sheet covered pits, each having about 6 feet x 6 feet x 6 feet dimension crashing about 3-4 pit covers and associated structures. Thereafter, the right main landing gear reverted back on the runway surface.</p> <p>e) The aircraft then rolled down the runway for further about 5000 feet while coming back to the centerline, entered the high speed taxi track (H) and stopped almost at the end of the high speed taxi track.</p>

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3. BODY

3.1 Factual Information

3.1.1 History of the flight:

3.1.1.1 Flight number?	TG 321
3.1.1.2 Type of operation?	International passenger/cargo operation
3.1.1.3 Last point of departure?	Suvarnabhumi Airport Bangkok, Thailand
3.1.1.4 Time of departure (local time or UTC)	0333 UTC
3.1.1.5 Point of intended landing?	Hazrat Shah Jalal International Airport (VGHS), Dhaka, Bangladesh
3.1.1.6 Description of the flight and events leading to the accident?	<p>a) TG 321 (BKK-DAC) was a scheduled Passenger/cargo flight originated from Suvarnabhumi Airport Bangkok, Thailand, for landing at Hazrat Shahjalal International Airport, Dhaka, Bangladesh. The en-route flight was uneventful. The aircraft made an ILS approach at Runway 14 for landing. The prevailing weather at Dhaka was moderate to heavy rain with about 10-11 Knots of cross wind component from the right. The runway surface was wet but without water logged. During the final approach, visual contact with the Runway was not established by the flight crew. The flight crew reported to have commenced a missed approach.</p> <p>b) Thereafter, the aircraft made the second ILS approach for landing. The aircraft reported to have established with the ILS RW 14 when the Tower Control gave the aircraft landing clearance. Soon after, the Tower Control asked the aircraft if RW has been sighted by the flight crew. There was no reply given by the flight crew. The weather conditions remained moderate to heavy rain with 10-11 knots cross wind. The flight crews were cautioned about the RW surface being wet. However, the aircraft continued approach and touched down on the right side of the centerline of the Runway 14.</p> <p>c) On visual inspection by the investigating team, it was revealed that the outer rear wheel of the right main landing gear of the aircraft touched down first at 576 feet down the threshold line of runway 14 followed by the inner rear wheel of the right main landing gear. At the time of touch down the aircraft presumably had right bank with a heading of about 15 degrees right with the runway heading.</p> <p>d) After touchdown, the aircraft rolled on the concrete surface for 768 feet as defined by the continuous tyres marks. The aircraft maintained the same right offset heading with the runway heading until the outer wheels of the right main landing gear went into the grassy-mud followed by the inner wheels of the right main landing gear.</p> <p>e) Soon after, as defined by the continuous tyres marks, the aircraft now changed its heading to almost parallel with the runway and continued to roll down for 1536 feet with its right main gear remaining on the wet grassy mud about 6-7 feet away from the concrete surface. During this time, the right main gear wheels overran crashing about nine concrete cable laying pits, covered with iron-sheets, each having about 6 feet x 6 feet x 6 feet dimension. At this time, all the six (6) right main landing gear wheel tires were</p>

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	<p>assumed to have been largely damaged and torn into fragments. The outer rear wheel drum of the right gear was found broken into a few pieces. The right main landing gear of the aircraft, thereafter, with broken wheel rim and devastated tires reverted back on the runway surface.</p> <p>f) The aircraft then rolled down the runway for further about 5000 feet while coming back to the centerline, entered the high speed taxi track (H). The aircraft further rolled down the high speed taxi track for 1440 feet and stopped near the end of the high speed taxi track, short of Southern Taxi Track (S).</p> <p>g) During the whole process of aircraft landing roll, huge amount of wheel debris and brake assembly parts those got detached from the wheel assembly into pieces, were found scattered along the path described by the aircraft covering a large area of runway and grassy mud. Naked wheel rims were found making half to one inch deep cut marks all along on the runway and high speed taxi surfaces covering a distance of about 6500 feet.</p> <p>h) Post occurrence inspection of the aircraft revealed that the entire right wheel well, the surrounding airframe and even the right engine exhaust area were partially and wholly covered with grassy mud.</p> <p>i) The aircraft inspection by the investigating team also observed minor bent to some degrees of the right inner flap of the aircraft with grassy mud deposition around the flap hinges.</p>
3.1.1.7 Reconstruction of the significant portion of the flight path?	To be developed later by the AAIT for inclusion in the final report.
3.1.1.8 Location (latitude, longitude, elevation)?	N23°51.14' E090° 23.20' Elevation: 24 Feet
3.1.1.9 Time of the accident (local time or UTC)?	0618 UTC
3.1.1.10 Whether day/night?	Day

3.1.2 Injuries to Persons

Injuries	Crew	Passenger	Others
3.1.2.1 Fatal?	None	None	None
3.1.2.2 Serious?	None	None	None
3.1.2.3 Minor?	None	None	None

3.1.3 Damage to Aircraft (Brief description)

3.1.3.1 Destroyed?	No
3.1.3.2 Substantially damaged?	<p>Yes:</p> <p>a) All the six tyres of the right main landing gear were found partially and/or completely torn and damaged with wheel hubs broken and exposed with entire wheel-well having grass-mud deposition</p> <p>b) Brake assemblies of a few wheels of the right main landing gear appeared to be torn, damaged and cables are detached from the wheel assembly</p>

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	c) Minor bent to some degrees of the right inner flap of the aircraft was found with grassy mud deposition around the flap hinges.
	d) Grassy mud was also observed inside the right engine exhaust areas of the aircraft.
3.1.3.3 Slightly damaged?	No
3.1.3.4 Other damage?	Not known at this time.

3.1.4 Personnel information

3.1.4.1 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?	<p>Pilot in Command: Age: 40 years; Nationality: Thai; ATPL No. D-1939, Valid till 02-03-2021 Ratings: Current on B-777-200/300; Mandatory Checks: Done on 16-07-2018 Flying Experience (Total): 12000Hours. Flying Experience (On type): 11780Hours. Duty time: Rested more than 72Hours prior to this flight. Instructor Rating: No Management Post: No Medical Status: Class-1 till 11-12-2018 CRM training: Done on 02-02-2018</p> <p>Co-pilot Age: 36 years. Nationality: Thai CPL No. B 4452: Valid (Information awaited) Ratings: Current on B-777-200/300 Mandatory Checks: Done on 12-07-2018 Flying Experience (Total): 2,437:51 Hours. Flying Experience (On type): 1,762:53 Hours. Duty time: Rested more than 48 Hours prior to this flight. Flight crew medical status: Class 1 valid till 15-10-2018 Flight crew CRM training: Done on 13-03-2018</p>
3.1.4.2 Brief statement of qualifications and experience of other crew members?	Not applicable
3.1.4.3 Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant?	Not relevant to this investigation.

3.1.5 Aircraft information

3.1.5.1 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. There was no deficiency detected prior to release for the flight.
3.1.5.2 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.
3.1.5.3 Type of fuel used?	JET A-1

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3.1.6 Meteorological information

3.1.6.1 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?	METAR: SW: 260/15 knots; VIS: 2000 Meter; WX: Thundershower with Rain; Cloud: Broken 900 feet; Few CBs: 2500 feet; Overcast 9000 feet; QNH: 1002.9 minibars; Temperature: 27 Degrees C; Dew point: 26 Degrees C; Humidity: 93%; SPECI: Thundershower.
3.1.6.2 Natural light conditions at the time of the accident (sunlight, moonlight, twilight, etc.)?	Sunlight but sky was obscured due to moderate to heavy rain.

3.1.7 Aids to navigation

3.1.7.1 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?	NAV Aids: VOR, DME & ILS were serviceable; VGA: Precision Approach Path Indicator Lights, Flashing Lights, Threshold Lights, Runway Edge Lights, Centerline Lights, Touchdown Zone Lights and Taxi Lights were available, ON and effective.
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3.1.8 Communications

3.1.8.1 Pertinent information on aeronautical mobile and fixed service communications and their effectiveness?	1. All Aeronautical Mobile and Fixed Service Communications were normal. 2. Communications between TG 321 and the air traffic control of Hazrat Shahajalal International Airport (VGHS), Dhaka, Bangladesh were normal.
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3.1.9 Aerodrome information

3.1.9.1 Pertinent information associated with the aerodrome, facilities and condition, or with the takeoff or landing area if other than an aerodrome?	Aerodrome facilities and associated conditions were normal. However, the runway surface was wet due to medium to heavy rain.
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3.1.10 Flight recorders

3.1.10.1 Location of the flight recorder installations in the aircraft, their condition on recovery and pertinent data available therefrom?	1. The Digital Flight data Recorder (DFDR) of the aircraft was located at the aft section of the aircraft which has been recovered intact by the investigating team; 2. The Cockpit Voice Recorder (CVR) of the aircraft was located at the aft section of the aircraft which has been recovered intact by the investigating team; Note: The AAIT is in the process of making the necessary arrangements for the decoding of the CVR and DFDR readouts. Following the decoding, the AAIT will conduct the necessary analysis to include in the final report.
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3.1.11 Wreckage and impact information

3.1.11.1 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	To be included in the Final
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charts and photographs may be included in this section or attached in the appendices?	Report
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3.1.12 Medical and pathological information

3.1.12.1 Brief description of the results of the investigation undertaken and pertinent data available therefrom?	To be included in the Final Report
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3.1.13 Fire

3.1.13.1 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 at any stage of the occurrence.
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3.1.14 Survival aspects

3.1.14.1 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?	<ol style="list-style-type: none">1. Neither any passenger nor any crew sustained any injury as a result of this occurrence.2. All passengers and crew were disembarked by stairs.
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3.1.15 Tests and research

3.1.15.1 Brief statements regarding the results of tests and research?	<ol style="list-style-type: none">1. The DFDR and the CVR will be decoded and analyzed in a suitable laboratory abroad and the report of analysis thereto will be accommodated in the final report in presence of the AAIT.2. The wheel tires will be subjected to investigation for integrity by the tire manufacturer in presence of the AAIT.
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3.1.16 Organizational and management information

3.1.16.1 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?	To be included in the final report.
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3.1.17 Additional information

3.1.17.1 Relevant information not already included in 3.1.1 to 3.1.16?	To be included in the final report
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3.1.18 Useful or effective investigation techniques

3.1.18.1 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?	To be provided in the final report.
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3.2 ANALYSIS

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[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']

3.2.1	Man?	(To be provided in the final report).
4.2.2	Machine?	(To be provided in the final report).
4.2.3	Environment?	(To be provided in the final report).
4.2.4	Organizational Aspect?	(To be provided in the final report).

3.3 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]

3.3.1	Findings?	(To be provided in the final report).
3.3.2	Causes/Contributing Factors?	(To be provided in the final report).
3.3.3	Contributing Factors?	(To be provided in the final report).
3.3.4	Intermediary Safety Recommendations?	(NIL).
3.3.5	Safety Recommendations?	(To be provided in the final report).

4. APPENDICES

4.1 All evidences, documents, photographs etc. are being systematically stored in file.

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