

Accident report occurred to the airplanes:

Airbus A321-231 reg. TC-JMM and

Airbus A330-300 reg. HL-7792

Istanbul Ataturk airport

May 13th 2018

NOTE : This is an English unofficial translation by



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**Ulaşım Emniyeti
İnceleme Merkezi**

TR

MINISTRY OF TRANSPORT AND INFRASTRUCTURE
TRANSPORTATION SAFETY INSPECTION CENTER

FINAL REPORT OF AIRCRAFT ACCIDENT INVESTIGATION AND INVESTIGATION

Owner : PAFCO 2916, LLC
: Jetstream Aircraft Leasing Limited

Operator : Turkish Airlines AO
: Asiana Airlines

Aircraft Types and Models : Airbus A321-231
: Airbus A330-300

Registration Marks : TC-JMM / Republic of Turkey
: HL-7792 / South Korea

Accident Site : Istanbul Ataturk Airport

Accident Date : 13 /05/ 2018

Dead and Injured Status : No

Damage Status of Aircraft : Heavy Damage / Light Damage

Decision No:...../ H-..... / 2023

Date: / / 2023

The sole purpose of this research and review is to make recommendations to prevent similar accidents and incidents within the framework of the Transportation Safety Review Center legislation.
This report is not in the nature of a judicial and administrative investigation and does not aim to determine the crime, the criminal and to reveal the responsibility sharing.



PREFACE

At 14:47 UTC on 13.05.2018, the Airbus A321-231 type aircraft with the TC-JMM registration mark, which made the THY696 flight numbered Ercan Istanbul belonging to Turkish Airlines, entered the parking position 217 at the G taxiway center. A damaged aircraft accident occurred as a result of the collision of the wing tip of the Airbus 330-300 type aircraft with the registration mark HL7792, belonging to Asiana Airlines, making the AAR552 flight numbered Istanbul-Seoul flight, passing through the Asiana Airlines route, to the tail of the THY aircraft, and no one was killed or injured in the accident.

Research and investigation related to this accident, Article 489/A of the Presidential Decree No. 1, Regulation of the Ministry of Transport and Infrastructure, Transportation Safety Investigation Center Presidency dated 11.05.2019, Regulation of Investigation and Investigation of Civil Aircraft Accidents or Serious Incidents dated 08.11.2022 HKY -13 and ICAO Annex-13.

Regarding the accident of the Airbus A330-300 type aircraft with the registration mark HL7792 and serial number 1001, the Republic of South Korea, the state of registration and operator of the aircraft in question, the Aviation and Railway Accident Investigation Board (ARAIB), the design and production state of France Investigation and Analysis The participation of an accredited representative was provided from the BEA within the framework of ICAO Annex-13, Aircraft Accident Investigation Document, Part 5 related articles.

The Transportation Safety Review Group consists of the members listed below with the Consent numbered E-94665312-403.03-112170.

Group leader

Member

Member

This report has been prepared in Turkish and English, and in case of conflict, the Turkish report is valid.



ABBREVIATIONS

AIP	Aviation Information Broadcast
ATC	Air Traffic Control Unit
ATPL(A)	Airline Transport Pilot License
ARAIB	Republic of South Korea Aviation and Railway Accident Investigation Board
BEA	French Bureau of Investigation and Analysis
CPL(A)	Commercial Pilot License (Airplane)
CVR	Cockpit Voice Recorder
FDR	Flight Data Record
ICAO	International Civil Aviation Organization
IR	Instrument Rating
IST	Istanbul Ataturk Airport IATA
LCEN	Ercan airport
LTBA	Istanbul, Ataturk airport
METAR	Routine Meteorology Report
MTOW	Max Takeoff Weight
PM	Pilot Monitoring
RCI	Incheon International Airport
SHGM	General Directorate of Civil Aviation
HKY-13	Investigation and Investigation of Civil Aircraft Accidents or Serious Incidents regulation
TAF	A concise statement of meteorological conditions expected at an aerodrome during a specific period
TGS	Turkish Ground Service
NIEC	Transportation Safety Review Center
UTC	Local Time - 2 hours



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1. INFORMATION ABOUT THE ACCIDENT

1.1 History of the flight

1.1.1 General:

Purposes of Flights	Commercial Air Freight
Types of Operations:	Airways transporting
Final Departure Locations:	TC-JMM Ercan Airport (LCEN) HL-7792 Istanbul Ataturk Airport (LTBA)
Planned Landing Points:	TC-JMM Istanbul Ataturk Airport (LTBA) HL-7792 Incheon International Airport (RKSI)
Accident Date	13.05.2018
Time/Place of the Accident:	14:47 UTC / Istanbul Atatürk Airport (LTBA) G Taxiway and parking stand 217

1.1.2 Flight Preparation, Flight Phase until the Accident:

From the examination of the electronic flight plan of the THY696 Ercan Airport (LCEN)-Istanbul Atatürk Airport(LTBA) flight carried out by the TC-JMM registered Airbus A321-231 type aircraft on 13.05.2018 by the Transportation Safety Investigation Group;

- The aircraft took off from Ercan Airport (LCEN) in the Turkish Republic of Northern Cyprus at 13:15 UTC with 2 pilots, 6 cabin attendants and 178 passengers,
- LCEN R29 KYRENIA1B KYRENIA DCT DOREN A28 MUT UB545 KFK UL610 DEKEK
The aircraft, following the DEKEK1C LTBA R23 route, arrived in Istanbul at 14:34 UTC. Atatürk Airport (LTBA) made a smooth landing on runway 23,

From the TC-JMM Captain's Statement;

- After landing on LTBA 23 runway on 13.05.2018, they started taxiing to parking position 217,
- When they come to the parking position, the guidance works and they return to the parking position,



- Seeing that the cones in the parking lot are in the wrong place with the turn they slow down
- Later, the ground attendant started to move to get the cone on the right, then he started running in front of the plane to get the cone on the left, and another ground attendant started to pass in front of the aircraft following this person,
- The pilots did not decide to stop until this stage and the nose of the plane was thrown to the right with a jolt while trying to understand what the ground crew was trying to do,
- The pilots contacted the tower and informed them that something had hit them. understood.

From the TC-JMM Co-Pilot's Statement;

- As the aircraft approached the parking position from taxiway G, aircraft number 217 saw two cones in the parking area and slowed down considerably,
- The ground personnel, who saw that the aircraft was slowing down, first took the cone on the right, then the cone on the left, while they were giving information to the tower, they were shaken violently and the nose of the aircraft moved about one and a half meters to the right,
- Then about the situation about whether there is a fire from the tower by turning off the engine. understood that they received information.

From the examination of the electronic flight plan of the Airbus A330-300 type aircraft with the registration mark HL-7792, by the Transportation Safety Investigation Group, on the flight AAR552 to Istanbul Atatürk Airport (LTBA) Incheon International Airport (RKSI) on 13.05.2018;

- There are 223 passengers, 2 pilots and 14 cabin attendants in the aircraft,

HL-7792 From the Captain's Statement;

- At 14:34 UTC, they received push back approval and ground control was set to "Push back position". approved as "four",



- After completing the push back, they ask for taxi permission as “Taxing 4A” and leave the tower.
They have been approved as a 4A taxiway,
- While taxiing on taxiway G, pay attention to their speed and taxiway clearances.that they
- When they come to the parking position No. 219, they hear the crash sound when they feel the aircraft shake, and then they stop and control the aircraft,
- They realized that they had hit another aircraft at 14:48 UTC,
- They report the situation by contacting the ground control,
- They received a taxi order to L2 at 15:15 UTC,

From HL-7792 Co-pilot's Statement;

- Received push back approval at 14:34 UTC and ground control confirmed as “Push back position 4”,
- Later, they obtained a taxi permit and started taxiing as “Taxing 4A”,
- They taxi slowly due to other taxiing aircraft,
- Checks the right side, is clean and has no aircraft movement,
- They continue the taxi by paying attention to the taxi lines and signs,
- Then they heard the sound and stopped on the G taxiway,
- Towed appears to have moved to the parking position GD-L2 voluntarily.

From review of 121.8 Ground South tape recordings on 13.05.2018;

Time Hr Min Sec			Station	121.8 Ground South Communications
14	32	20	AAR552	Ground, good afternoon, AAR552 requesting push back and start up, gate 227
			GND-S	AAR552, copied Sir, 227 standby, I will call.
14	32	47	GND-S	AAR552 push back and start up approved 35R position 4
			AAR552	AA position 4, AAR552 thank you !
14	35	01	THY8GC	Ground merhabalar THY8GC runway vacated.
			GND-S	THY8GC merhaba, continue via F, E5, hold before G
			THY8GC	F, E5, hold before G, THY8GC
14	39	00	AAR552	GND, AAR552 request taxi
			GND-S	AAR552, copied standby, I will call
			THY8GC	Ground THY8GC approaching G, E5
			GND-S	8GC via G orange gate 217
			THY8GC	Via G orange gate 217 THY8GC
			GND-S	AAR552 taxi via Departure 4A
			AAR552	Taxi via departure 4A, AAR552
14	47	36	THY8GC	8GC arkadan bir hasar var sanıyoruz (<i>translated "we think there is some damage from the rear"</i>)
			GND-S	Anlasiladi ? (<i>translated: "not understood"</i>)
			THY8GC	Efendim arkadaki uçak kuyrugumuza çarptı 217 numaradayız bloke var (<i>translated: "Sir, the plane behind us hit our tail, we are at number 217"</i>)
			GND-S	AAR552 Hold position sir
			AAR552	Honding position AAR552

13 August 2018 Istanbul Atatürk Airport 14:20 UTC METAR observation information:

LTBA 131420Z 24009KT CAVOK 18/08 Q1012 NOSIG RMK RWY17L 22009KT RWY0523008KT
RWY23 25011KT



Sketch-1: Accident Site



Picture-1: Aircraft Entering Parking Position No. 217, TGS Entering the Parking Area Staff



Picture-2: 2 TGS Personnel Entering the Parking Area No. 217



Picture-3: The Moment of the Accident



Picture-4: The Moment of the Accident

1.2 Dead and Injured Status:

Casualty Status	Crew	Passengers	Others
Dead	-	-	-
Seriously injured	-	-	-
Lightly Injured / no injures	- / 24	- / 401	-

1.3 Aircraft Damage Condition:

TC-JMM Damage Status

In the post-accident investigations, it has been determined that there are damages outside the damage and repair limits determined and published by the manufacturer in the tail gear components and structure of the aircraft with the TC-JMM registration mark.

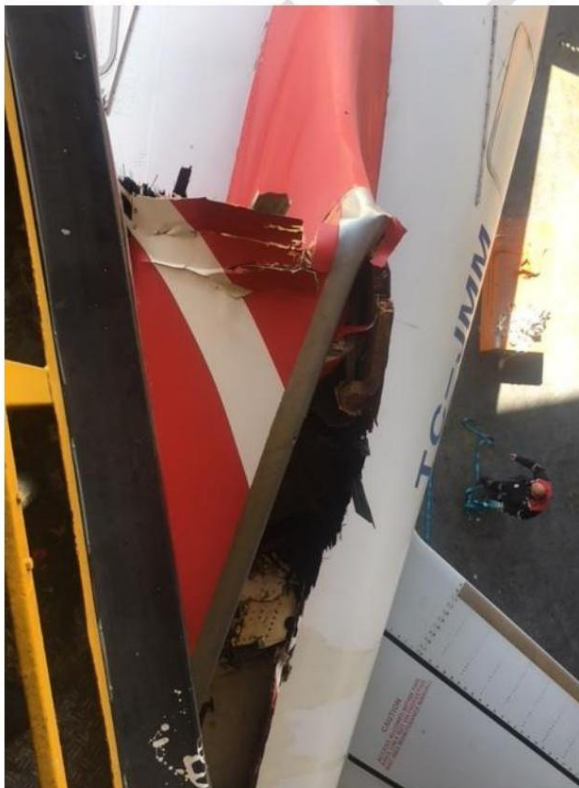
The damage degree of the aircraft with the registration mark of TC-JMM is considered to be at the level of heavy damage within the framework of Article-37 of HKY-13 (Regulation on Investigation and Investigation of Civil Aircraft Accidents or Serious Incidents).



Picture-5: Tail Damage



Picture-6: Tail Damage



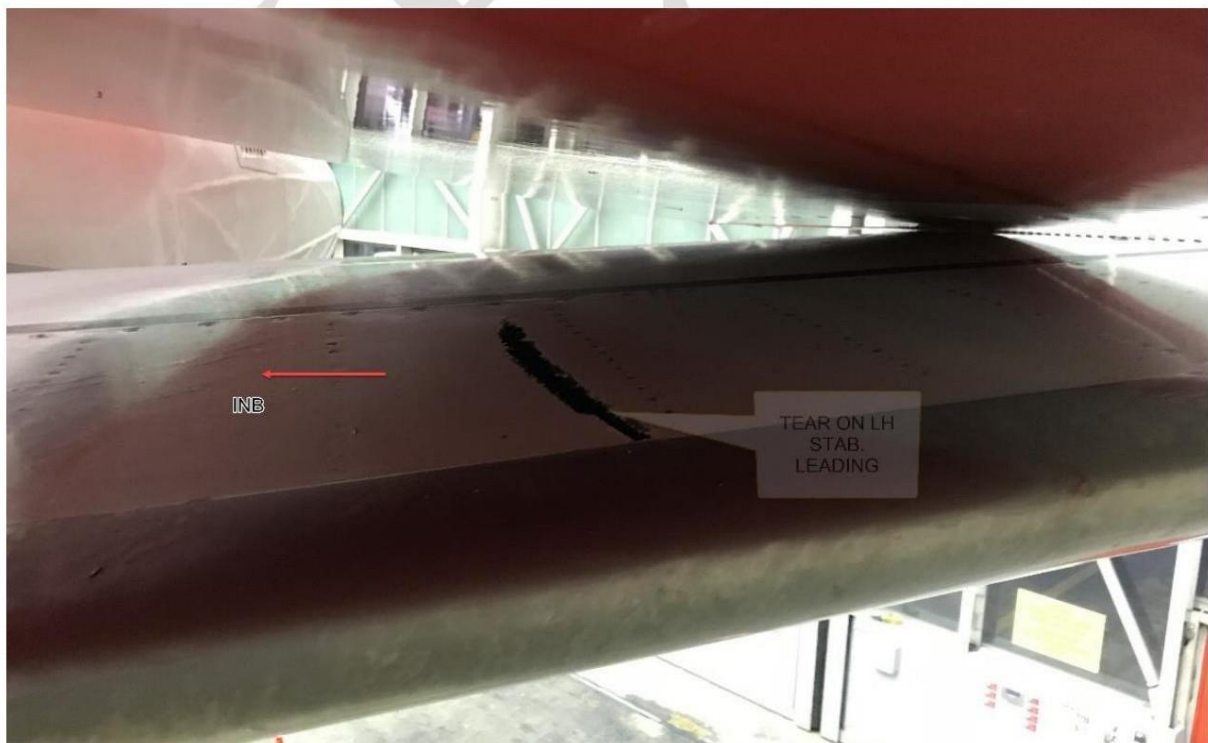
Picture-7: Tail Damage



Picture-8: Tail Damage



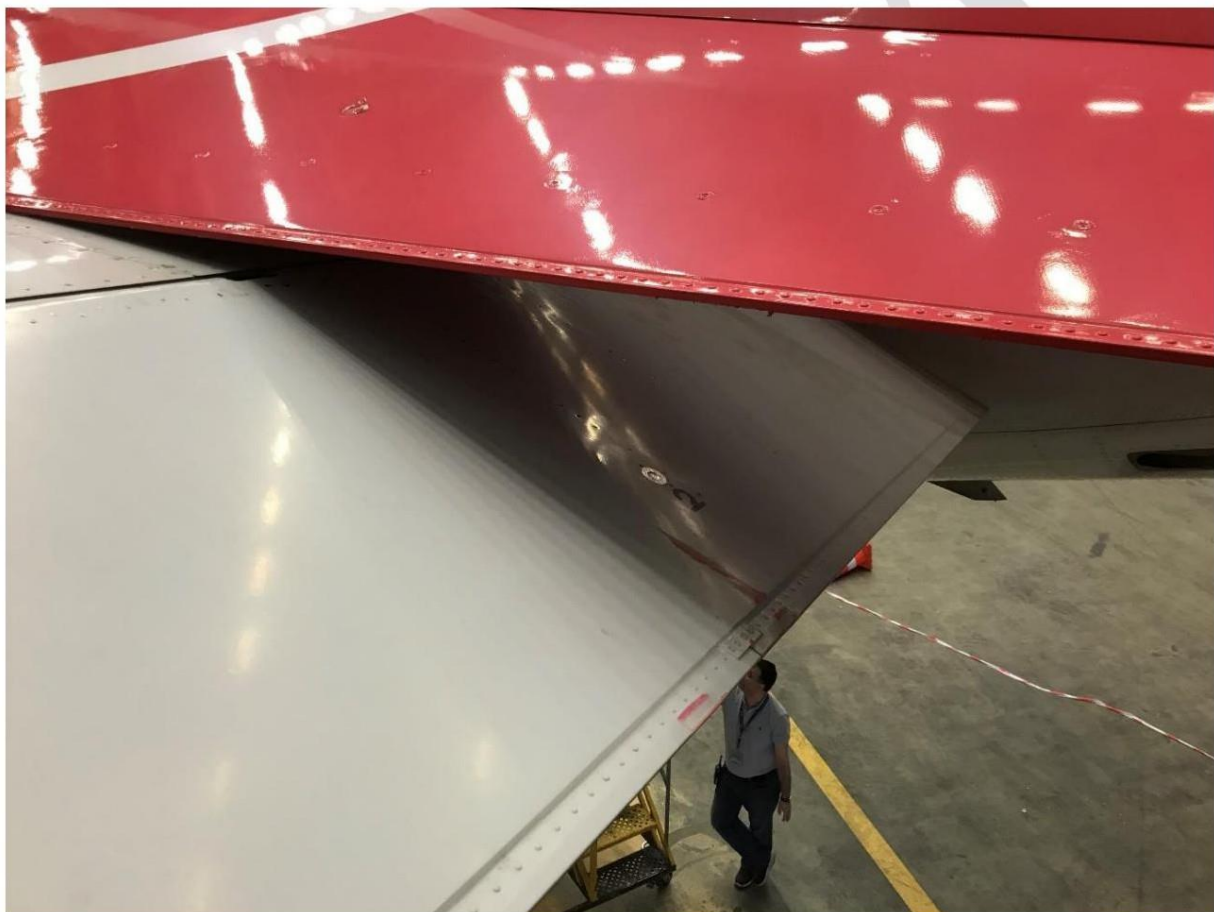
Picture-9: Tail Damage



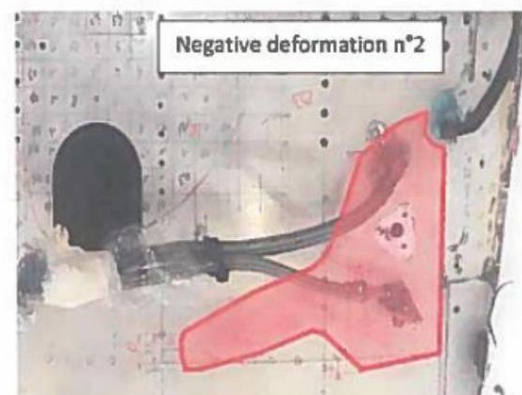
Picture-10: LH- Leading Edge Upper Part



Picture-11: LH- Leading Edge Upper Part



Picture-12: LH- Trailing Edge



Picture-14: Body Surface Panel Stringer 1 / Frame 73

HL 7792 Damage Status

In the post-accident inspections, on the aircraft with the registration mark HL7792:

- Upper surface of the right wing,
- Right wing tip,
- Rightwing winglet,
- D-Nose structure,
- Right wing L/E 623NB panel,
- Crossing rib type,
- Right wing slat 7,
- Navigation lights, strobe lights were damaged.

The damage degree of the aircraft with registration mark HL7792 is considered to be at the level of light damage within the framework of Article-38 of HKY-13 (Civil Aircraft Accidents or Serious Incidents Investigation and Investigation Regulation).



Picture-15: Damaged Right Wing of HL7792



Picture-16: Right Wing Tip



Picture-17: Right Wing Tip



Picture-18: Right Winglet



Picture-19: Wing Tip



Picture-20: Slat #7



Picture-21: Access Panel



Picture-22: D-Nose



Picture-23: Closing Rib



Picture-24: Wing Upper Surface



Picture-25: Navigation Illuminations



Picture-26: Strobe Lights

1.4 Other Damages:

After the aircraft accident that occurred on 13.05.2018 at the entrance of the parking area number 217 with the G taxiway of Istanbul Atatürk Airport, no damage to third parties occurred.

1.5 Personnel Information:

1.5.1 TC-JMM Captain:

Role in flight	CM1
Date of birth	15.08.1980
Nationality / gender	TC / Male
License number	TR-A-06502
License type	ATPL(A)
License effective date	05.04.2018

Type rating and effective date	A320 IR / 31.03.2019
English level and validity date	Level 6 / lifetime
Medical certificate class	Class 1
Medical certificate issue date	09.01.2018
Inspection date	09.01.2018
Medical certificate validity date	14.01.2019
Medical restriction	None
Total flight hours	6739:05

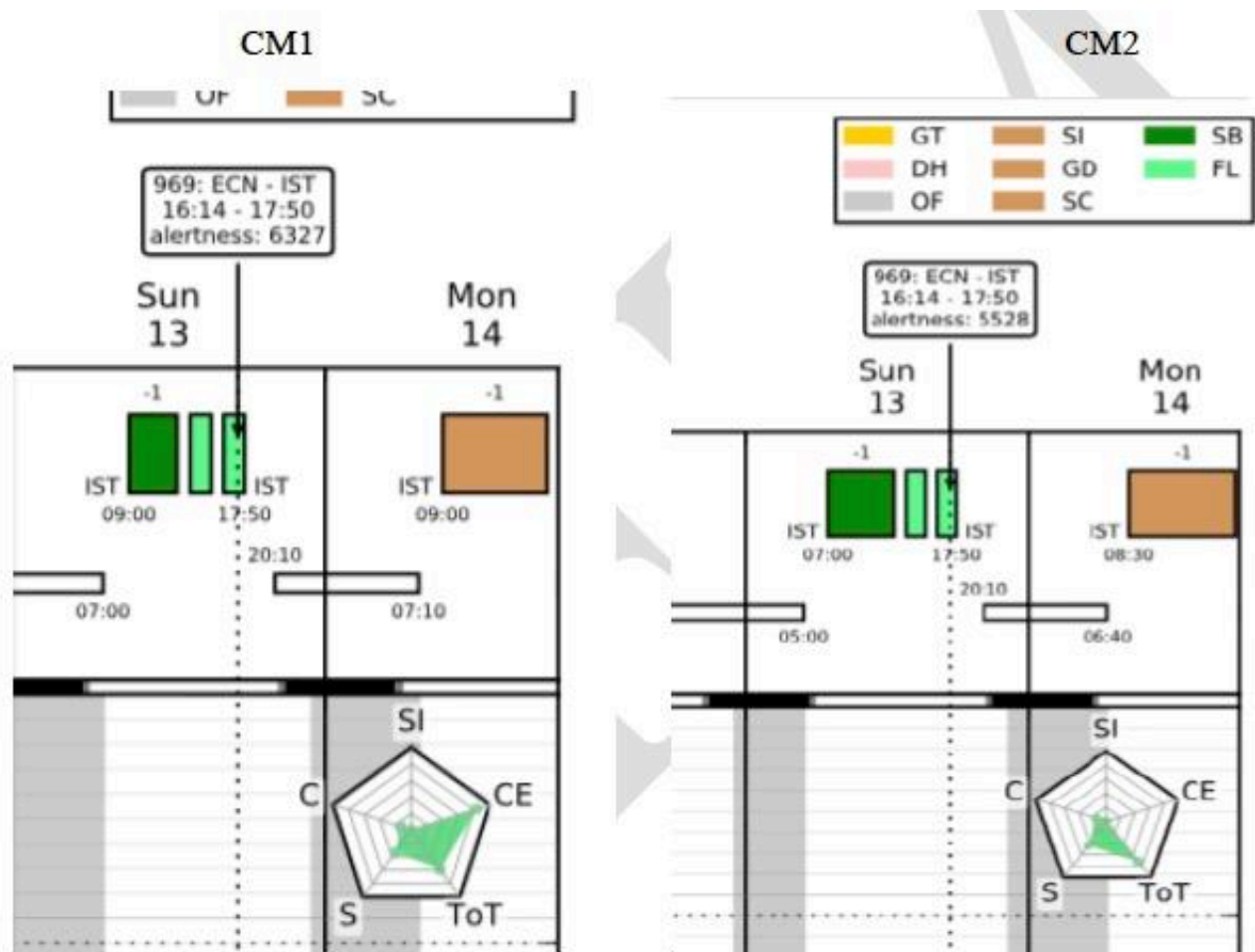
1.5.2 TC-JMM co-pilot

Role in flight	CM2
Date of birth	16.06.1990
Nationality / gender	TC / Male
License number	TR-A-12267
License type	CPL(A)
Date of issue	18.10.2018
License effective date	17.10.2023
Type rating and effective date	A320 IR / 31.05.2019 A330/A350 IR 31.10.2019
English level and validity date	Level 5 / 10.07.2023
Medical certificate class	Class 1
Medical certificate issue date	16.01.2018
Inspection date	16.01.2018
Medical certificate validity date	14.01.2019
Medical restriction	VDL
Total flight hours	731:52

Team and tenure

Both CM1 and CM2 were in status of CM1 C1 and CM2 P5 at the time of the accident.

It was determined that the duty times were appropriate, they had enough rest, • The alertness level calculated from the previous three days of both crews was 6327 for CM1 and 5528 for CMW, and according to this measurement the pilots were not fatigued (warning and alertness is considered above 5000 points)



1.5.3 HL-7792 Captain

Role in flight	CM1
Date of birth	01.07.1967
Nationality / gender	Taiwan / Male
License number	11-006457
License type	ATPL
License issue date	29.08.2017

Type ratings	Aeroplane Multi engine Land – A330
English level and validity date	Level 5 / 26-12-2019
Medical certificate class	Class 1
Medical certificate issue date	23.05.2017
Inspection date	23.05.2017
Medical certificate validity date	31.05.2018
Medical restriction	VDL
Total flight hours	15763:00

1.5.4 HL-7792 Co-pilot

Role in flight	CM2
Date of birth	11.12.1976
Nationality / gender	Republic of Korea / Male
License number	12-004379
License type	CPL
License issue date	27.07.2016
Type rating and effective date	Airplane Multi engine IR(A) FI(A) A330 31.10.2019
English level and validity date	Level 4 / 30.12.2018
Medical certificate class	Class 1
Medical certificate issue date	12.04.2018
Inspection date	12.04.2018
Medical certificate validity date	30.04.2019
Medical restriction	None
Total flight hours	3930:00

License and health Certificates of pilots are in the archive of UEIM

1.6 Aircraft Information:

1.6.1 TC-JMM Aircraft General Information:

Owner	PAFCO 2916 LLC
Operator	Turkish Airlines AO
Registration marks	TC-JMM
Model	Airbus A321-231
MSN	2916
Year of manufacture	2006
MTOW	89.000 KG
Total flight hours	30.686
Total flight cycles	15.699
Registration Certificate issue date	25.12.2014
Airworthiness Effective date	28.03.2020
Radio Certificate issue date / Number / validity	15.08.2016 / HV201400025 / 15.08.2021

Engine model	V2500	
Engine	No. 1	No. 2
Serial number	V16581	V15813
Total flight hours	20675:36	26912:11
Total number of flights		11939

General Features of HL-7792 Aircraft

Owner	Jestream Aircraft Leasing limited
Operator	Asiana Airlines
Registration marks	HL-7792
Model	Airbus A330-300

MSN	1001
Registration Certificate issue date	23.04.2009
Airworthiness Effective date	21.09.2012

1.6.2 Aircraft Maintenance Status:

As the last maintenance of Airbus A321-231 type aircraft with TC-JMM registration mark and 2916 serial number, with work order number 1938408, A024-A024 ADD-DAMAGE2 -A024 CHILD-DEMAGE maintenance is requested, aircraft flight time 30612:50, engine 1 of the maintenance While 20675:36, engine no. 2 was 26912:11, it was understood that it was started on 03.05.2018 and finished on 06.05.2018 and it was actively given to the flight by issuing a service certificate, and it was evaluated that the maintenance was not a factor in the accident.

1.6.3 Certificate of Airworthiness:

For the Airbus A321-231 type aircraft with TC-JMM registration mark and serial number 2916, the Certificate of Airworthiness with the number 2869 issued by the General Directorate of Civil Aviation on 03.04.2014 and by THY AO on 29.03.2017, dated 28.03.2018 Airworthiness Review 2869, validated until

Certificate available.

For the Airbus A330-300 type aircraft with registration mark HL7792 and serial number 1001, Certificate of Airworthiness with the number AS09024 issued by the Republic of Korea Ministry of Land Transportation and Maritime on 21.09.2012 is available.

Airworthiness and Review Certificates of both aircraft are given in **Annex-A** .

1.6.4 Aircraft Registration Certificate:

For the Airbus A321-231 type aircraft with TC-JMM registration mark and serial number 2916, there is a Registration Certificate with 2869 number issued by the General Directorate of Civil Aviation on 25.12.2014. According to this certificate, it is understood that the owner of the aircraft is Pafco 2916 LLC and the operator is Turkish Airlines AO.

For the Airbus A330-300 type aircraft with registration mark HL7792 and serial number 1001, there is a Registration Certificate numbered 2009-35 issued by the Republic of Korea Ministry of Land

Transportation and Maritime on 23.04.2009. Aircraft according to this certificate owned by Jetstream Aircraft Leasing Limited and operated by Asiana Airlines Inc. it is understood to be.

Registration Certificates of both aircraft are given in **Appendix-B**.

1.6.5 Weight and Balance:

The following data were obtained as a result of the examination of the Load Sheet prepared for the LTBA-RKSI flight to be performed on 13.05.2018 of the A330-300 type aircraft with registration mark HL7792, serial number 1001.

Total Traffic Load	: 64565 lbs	
Dry Operating Weight	: 285321 lbs	
Zero Fuel Weight	: 349885 lbs	Max 381400 lbs
Actual Take-off Fuel	: 140700 lbs	
Take-off Weight Actual	: 490584 lbs	Max 493600 lbs
Trip Fuel	: 123700 lbs	
Landing Weight Actual	: 366885 lbs	Max 407856 lbs

The following data were obtained as a result of the examination of the Load Sheet prepared for the LCEN-LTBA flight of the A321-231 type aircraft with the serial number 2916 with the TC-JMM registration mark.

Total Fuel	: 7298 kg :	
Zero Fuel Weight Actual	68707 kg :	Max 73800kg
Take-off Weight Actual	75735 kg :	Max 89000kg
Trip Fuel	4109 kg :	
Landing Weight Actual	71726 kg	Max 77800kg

According to these calculations, it has been observed that the take-off and landing weights of both aircraft are within the limits, and it is thought that the weight and balance are not factors in the accident.

1.6.6 Fuel:

The following data were obtained as a result of the examination of the Load Sheet prepared for the LTBA-RKSI flight to be performed on 13.05.2018 of the A330-300 type aircraft with registration mark HL7792, serial number 1001.

	FUEL	TIME
TRIP	1237	09.32
CONT/ZBAA	0037	00.17
ALTN/RKSS	0038	00.17
F-RSV	0054	00.30
E-RSV	0000	00.00
RQRD	1367	10.37
EXTRA <i>+4400</i>	0040	00.19
PAD	0000	00.00
TKOF	1407	10.56
TAXI	0009	
RAMP	1416	10.56
	<i>1460</i>	
TTL RSV	0169	01.23

1 Unit = 100 LBS

The following data were obtained as a result of the examination of the Load Sheet prepared for the LCEN-LTBA flight of the A321-231 type aircraft with TC-JMM registration mark, serial number 2916.

5MINUTES	FUEL	TIME
TRIP	4109	01:20
CONT5MINUTES	244	00:05
ALTN (LTBU)	1254	00:25
FINAL RESERVE	1421	00:30
ETOPS/ADDNL	0	00:00
DISP.EXTRA	0	00:00
TAXI	140	00:10
APU	130	01:00
COMNDR.EXTRA	0	00:00
REQUIRED FOB	7298	02:20
TANKERING	0	00:00
TOTAL RAMP FOB	7298	02:20

From these fuel plans, it has been evaluated that the fuel planning is appropriate for both aircraft, and it is thought that the fuel is not a factor in the accident.

1.7 Meteorological Information:

TAF (LTBA)

LTBA 130440Z 1306/1406 20006KT 9999 FEW030 BECMG 1313/1316
03010KT CAVOK BECMG 1405/1408 22007KT=

LTBA 131040Z 1312/1418 22008KT 9999 FEW040 BECMG 1312/1316
03010KT CAVOK BECMG 1403/1407 22008KT=

METAR (LTBA)

LTBA 130950Z 22008KT 180V250 9999 FEW040 17/09 Q1014 NOSIG RMK RWY
17L22009KT RWY05 20008KT 180V240 RWY23 22008KT=

LTBA 131050Z 24008KT 220V280 9999 FEW040 17/10 Q1013 NOSIG=
LTBA 131350Z 25011KT 230V290 CAVOK 18/08 Q1012 NOSIG RMK
RWY17L22009KT RWY0523008KT RWY23 25011KT=

LTBA 131420Z 24009KT CAVOK 18/08 Q1012 NOSIG=
LTBA 131450Z 25010KT 230V290 CAVOK 18/09 Q1012 NOSIG RMK RWY17L
23009KT RWY05 24009KT RWY23 25010KT=

LTBA 131520Z 26007KT 230V290 CAVOK 18/07 Q1012 NOSIG RMK RWY17L
24007KT RWY05 25008KT RWY23 26008KT=

LTBA AD 2.11 Meteorology Information for Istanbul Atatürk Airport is given below.

LTBA AD 2.11 METEOROLOGICAL INFORMATION PROVIDED

3	Office responsible for TAF preparation Periods of validity	ATATÜRK 30 HR
4	Type of landing forecast Interval of issuance	TREND 1/2 HR
5	Briefing/consultation provided	Personal consultation
6	Flight documentation / Language(s) used	Charts, abbreviated plain language text. / TU-EN
7	Charts and other information available for briefing or consultation	Surface and upper air actual and prog. Charts. SIGWX, UL W/T, Model TA-M
8	Supplementary equipment available for providing information	Teletax, VSAT, ADSL PC connection
9	ATS units provided with information	Yeşilköy Control TWR
10	Additional information (limitation of service, etc.)	SIGMET, AIRMET, Aerodrome Warnings.

Table-1: Meteorological Information

Meteorological conditions are not considered to be a factor in the accident.

1.8 Navigation Aids:

Aircraft with TC-JMM A321 and HL-7792 A330 registration marks have been equipped with the necessary devices for navigation by the manufacturer Airbus and have been certified by the relevant authority. Information on navigation devices is available in the Aircraft Station License issued for the aircraft with the TC-JMM registration mark.

Istanbul Atatürk Airport has been equipped with sufficient devices within the framework of international regulations

LTBA AD 2.19 RADIO NAVIGATION AND LANDING AIDS

Type of aid, CAT of ILS/MLS (For VOR/ILS/ MLS, give VAR)	ID	Frequency	Hours of operation	Site of transmitting antenna coordinates	Elevation of DME transmitting antenna	Remarks
1	2	3	4	5	6	7
LLZ 17L ILS CAT I	IISB	111.1 MHZ	H24	405805.1N 0284834.3E	-	
GP		331.7 MHZ	H24	405937.6N 0284826.4E	-	3 DEG RDH 50 FT
DME	IISB	CH48X	H24	405937.6N 0284826.4E	67 M	
MM		75 MHZ	H24	410020.5N 0284829.6E	-	
OM		75 MHZ	H24	410326.1N 0284822.9E	-	
LO	IS	396 KHZ	H24	410326.1N 0284822.9E	-	
LLZ 35R ILS CAT II	IYES	111.3 MHZ	H24	405953.6N 0284830.5E	-	Effectuated by from FM radio broadcasting stations
GP		332.3 MHZ	H24	405819.0N 0284829.1E	-	3 DEG RDH 52 FT
DME	IYES	CH50X	H24	405819.0N 0284829.1E	50 M	
<i>RWY 35R IYES ILS/DME is unusable outside 10 degrees left side of Localizer centerline (90 HZ sector II)</i>						
MM		75 MHZ	H24	405735.4N 0284835.4E	-	
LM	ES	380 KHZ	H24	405735.4N 0284835.4E	-	
LLZ 05 ILS CAT III	IIST	110.3 MHZ	H24	405843.2N 0285017.1E	-	
GP		335.0 MHZ	H24	405801.1N 0284856.1E	-	3 DEG RDH 57 FT
DME	IIST	CH 40X	H24	405801.1N 0284856.1E	43 M	
MM		75 MHZ	H24	405745.9N 0284813.5E	-	
LM	ST	340 KHZ	H24	405745.9N 0284813.5E	-	

Table-2: Airport Radio Navigation Devices 34

LTBA AD 2.19 RADIO NAVIGATION AND LANDING AIDS

Type of aid, CAT of ILS/MLS (For VOR/ILS/ MLS, give VAR)	ID	Frequency	Hours of operation	Site of transmitting antenna coordinates	Elevation of DME transmitting antenna	Remarks
1	2	3	4	5	6	7
LLZ 23 ILS CAT I	IATA	111.9 MHZ	H24	405753.9N 0284830.7E	-	
GP		331.1 MHZ	H24	405831.7N 0285002.2E	-	3.2 DEG RDH 57 FT
DME	IATA	CH56X	H24	405831.7N 0285002.2E	41 M	
MM		75 MHZ	H24	405853.9N 0285040.2E	-	
OM		75 MHZ	H24	410037.8N 0285425.4E	-	
LLZ 35L ILS CAT I	ISEF	111.5 MHZ	H24	405953.7N 0284821.5E	-	-
GP		332.9 MHZ	H24	405819.0N 0284828.5E	-	3 DEG RDH 54 FT
DME	ISEF	CH52X	H24	405819.0N 0284828.5E	50 M	-
MM		75 MHZ	H24	405738.1N 0284825.1E	-	-
VOR/DME	BKZ	117.3 MHZ CH120X	H24	410737.1N 0290834.4E	327 M	Coverage 50 NM
VOR/DME	CEK	114.6 MHZ CH93X	H24	410023.6N 0283143.0E	93 M	-
VOR/DME	EKI	116.3 MHZ CH110X	H24	405703.8N 0272534.2E	321 M	-
VORTAC	IST	112.5 MHZ CH 72X	H24	405741.3N 0284838.5E	-	TACAN coverage 200 NM serving RWY 05
NDB	CEK	328 KHZ	H24	410023.6N 0283143.0E	-	-

Table-3: Airport Radio Navigation Devices

1.9 Communication:

It has been observed that the aircraft with the registration mark TC-JMM and HL-7792 are equipped with radiodevices that provide two-way communication, in addition, the aircraft with the registration mark of TC-JMM belonging to Turkish Airlines A.O. was issued by the General Directorate of Coastal Safety on August 15, 2016. and Aircraft Station License HV201400025 valid until 15 August 2021.

TC-JMM Aircraft Station License is given in **Appendix-C**.

In the examinations made by the Transportation Safety Investigation Group, it is thought that there is no problem in the two-way communication between aircraft and ATC sectors and that the communication is not a factor in the accident.

LTBA AD 2.18 ATS COMMUNICATION FACILITIES

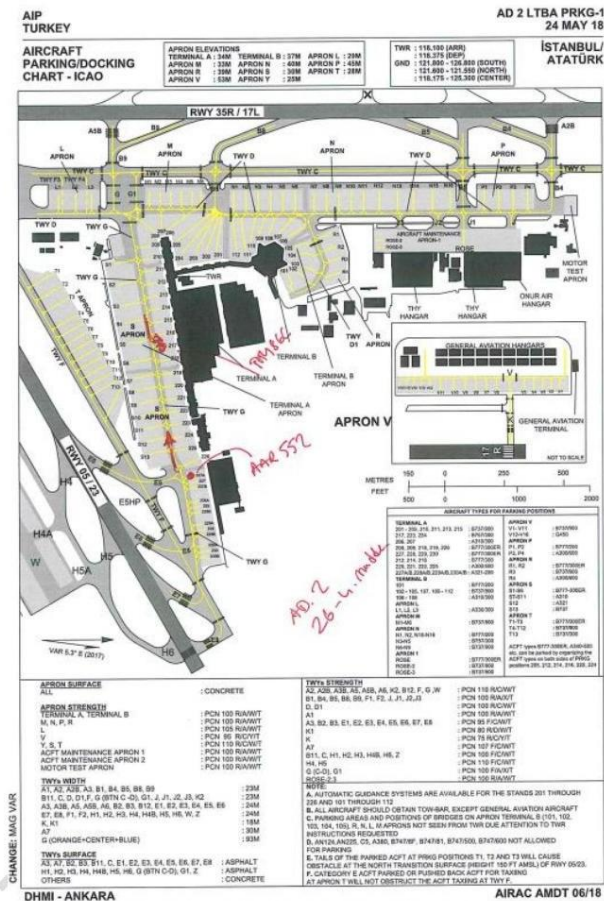
Service designation	Call sign	Channel	Hours of operation	Remarks
1	2	3	4	5
TWR	Yeşilköy TWR	118.1 MHz 118.375 MHz 123.525 MHz 125.9 MHz 257.8 MHz 121.5 MHz 243.0 MHz	H24	only for ARR only for DEP Alternate for DEP and ARR Emergency Emergency
	Yeşilköy Delivery	121.7 MHz		Pilots of departing aircraft are reminded to contact 121.7 MHz (Yeşilköy Delivery) for ATC clearance 10 minutes before start up.
	Yeşilköy Ground South - North Yeşilköy Ground South - North	121.8 MHz 126.8 MHz 121.6 MHz 126.8 MHz		For the usage of the Frequencies see the "NOTE" on "AD 2 LTBA ADC"
APP	Yeşilköy APP/Radar	119.475 MHz 127.1 MHz 121.25 MHz 120.7 MHz 120.125 MHz 122.675 MHz 118.95 MHz 120.5 MHz 119.35 MHz 121.1 MHz 120.45 MHz 126.425 MHz 127.825 MHz 119.425 MHz 362.3 MHz 121.5 MHz 243.0 MHz	H24	APP West / Upper APP West / Upper APP West / Lower APP East / Upper APP East / Upper APP East / Lower APP East / Lower APP South APP North APP North APP South APP North APP Sabiha Gökçen Sector APP Sabiha Gökçen Sector Emergency Emergency Radar coverage 80NM
ATIS	Yeşilköy Information	128.2 MHz 130.25 MHz	H24	Only for DEP Only for ARR
SAR	Istanbul Rescue Sub-Center	123.1 MHz 282.8 MHz 5680 KHZ 3023 KHZ	H24	

Table-4: Airport Communication Units

1.10 Information About the Airport:

Istanbul Atatürk Airport, where the accident occurred on 13.05.2018 took place, was put into service in 1953, the ICAO code is LTBA and the IATA code is IST. It is 163 feet high.

Lighting category is CAT II and firefighting category is CAT X. There is an asphalt runway with dimensions of 2600 x 60 meters in the direction of 05/23.



LTBA AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA

1	ARP coordinates and site at AD	405834N-0284851E in front of Apron M on TWY D
2	Direction and distance from (city)	24KM W of Istanbul
3	Elevation/Reference temperature	163 FT / 29° C
4	Geoid Undulation at AD ELEV PSN	121 FT
5	MAG VAR/Annual change	4.3°E (2010) / 0.05° Increasing
6	AD Administration, address, telephone, telefax, telex, AFS	General Directorate of State Airports (DHMI) Atatürk Havaalanı Başmüdürlüğü 34830 Yeşilköy-Istanbul/Turkey Airport Authority : +90 212 4653262 Airport Manager : +90 212 4653253 Switchboard : +90 212 4637777 Telefax : +90 212 4653250 AIS TEL : +90 212 4653283 AIS FAX : +90 212 4653260 / +90 212 4653278 FIC TEL : +90 212 4653232 FIC FAX : +90 212 4653200 AFS : LTBAYDYX
7	Types of traffic permitted (IFR/VFR)	IFR/VFR
8	Remarks	NIL

Table-5: Airport Geographical Location

Slope of RWY-SWY	SWY dimensions (M)	CWY dimensions (M)	Strip dimensions (M)	OFZ	RESA (M)	Remarks
7	8	9	10	11	12	13
RWY 05 - 0.03%	-	60X150	2700X300	Available	125X120	CBR can vary within RESA due to meteorological conditions
RWY 23 - 0.03%	-	80X150	2700X300	Available	90X120	
RWY 17L - 0.58%	-	60X150	3120X300	Available	85X90	
RWY 35R - 0.58%	-	60X150	3120X300	Available	140X90	
RWY 17R - 0.62%	-	60X150	-	-	170X90	
RWY 35L - 0.62%	-	-	-	-	140X90	
130 M displaced THR for RWY 05 A) The dimension of the strip area situated at the eastern side of RWY 17R/35L is 3120x150M. The strip area dimension of the western portion of the RWY 17R/35L is 2260X150M for the portion of 2200M beginning from RWY 17R towards south. The dimension of the strip area for the remaining 800M towards RWY 35L is 860X130M. B) RWY 17L/35R from the head of RWY 35R first 700M and 15M width - 7.5M right and 7.5M left side of the centerline are changed as Asphalt.						

Table-6: Physical Condition of the Airport Runways (chart valid on the date of the accident)

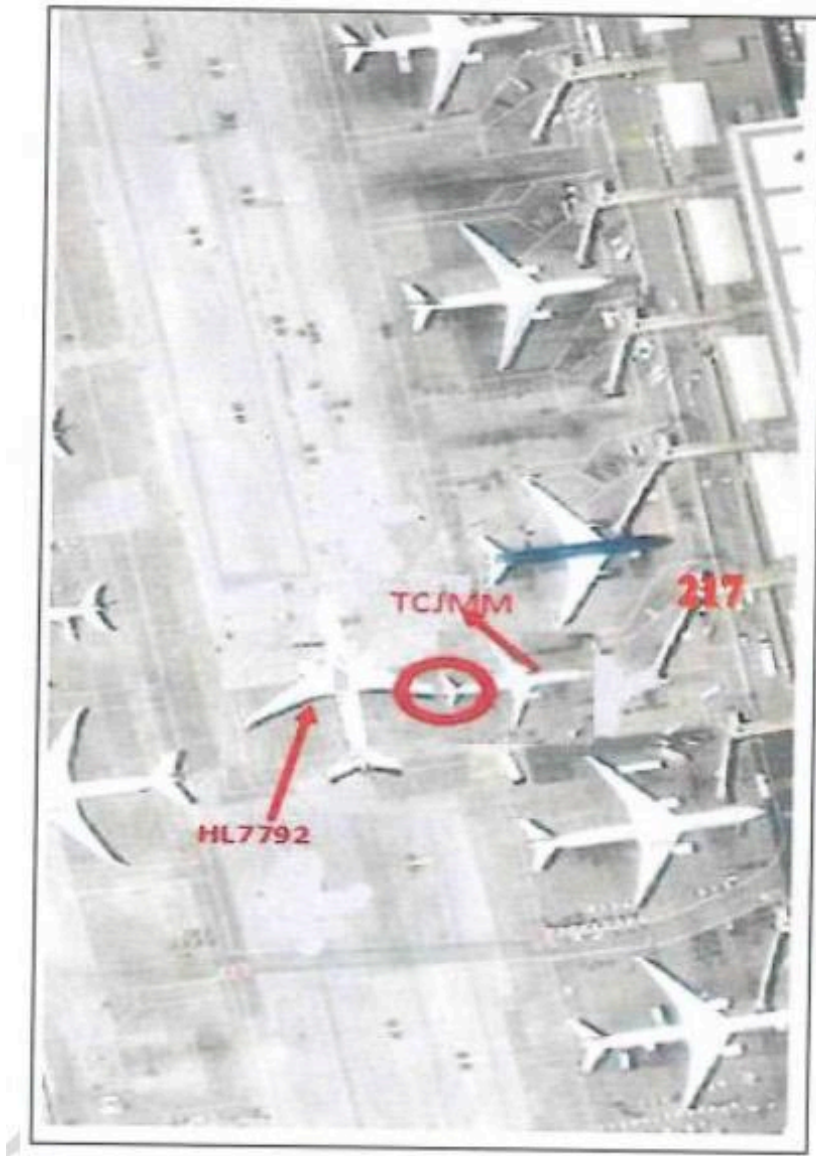
1.11 Flight Recorders:

Aircraft with TC-JMM registration mark, serial number 2916, type A321-231, Honeywell brand, serial number CVR120-14791, part number 980-6022-001, Cockpit Voice Recorder (CVR) and SSFDR-16787 serial number 980-4700 It is equipped with Flight Data Recorder (FDR) devices with part number -42, and the devices were deciphered after the accident that occurred at Istanbul Atatürk Airport on 15.05.2018.

A330-300 aircraft with registration mark HL-7792, serial number 1001, Honeywell brand, serial number 1518, part number 980-6022-001, Cockpit Voice Recorder (CVR) and SSFDR 17707 serial number 980-4700-042' It is equipped with Flight Data Recorder (FDR) devices, part numbered, and the devices were deciphered from the aircraft after the accident that occurred at Istanbul Atatürk Airport on 15.05.2018.

1.12 Wreckage and impact information:

A321-231 type aircraft with TC-JMM registration mark, 2916 serial number, entering the parking area 217 at Istanbul Atatürk Airport on 13.05.2018, coming from G taxiway, with HL7792 registration mark, 1001 serial number, A330-300 type. A damaged aircraft accident occurred as a result of the right wing of the aircraft colliding with the vertical stabilization of the aircraft with the TC-JMM registration mark, and the vertical stabilization of the aircraft was broken and the integrity of the HL7792 registered aircraft was not damaged.



Sketch 2: Accident site

1.13 Medical and Pathological Information:

According to the alcohol examination results of the pilots carried out on 13.05.2018 by the Forensic Medicine Institute, Institution Physician, after the aircraft accident with material damage that occurred on the apron of Istanbul Atatürk Airport, at the entrance of the G taxiway and the parking area number 217 on 13.05.2018:

TC-JMM:

- a) The captain pilot (Report No: 500 date and time 13.05.2018 20:27) alcohol meter and alveolus
The amount of alcohol detected in the air is zero per thousand.
- b) The second pilot's (Report No: 499 date and time 13.05.2018 20:01) alcohol meter and
alveolusThe amount of alcohol detected in the air is zero per thousand.

HL-7792:

- a) The captain pilot (Report No: 501 date and time 13.05.2018 21:00) alcohol meter and alveolus The amount of alcohol detected in the air is zero per thousand.
- b) The second pilot's (Report No: 502 date and time 13.05.2018 21:26) alcohol meter and alveolus The amount of alcohol detected in the air is zero per thousand.

The alcohol report of the pilots is in the archive of **UEIM** .

1.14 Fire:

As the A321-231 type aircraft with TC-JMM registration mark, serial number 2916, enters the parking area 217 at Istanbul Atatürk Airport on 13.05.2018, the right wing of the A330-300 type aircraft with HL7792 registration mark, serial number 1001, TC -After an aircraft accident resulting from the collision with the vertical stabilization of the aircraft with the JMM registration mark:

- The pilots of the aircraft with the TC-JMM registration mark have contacted the tower and received damage.

and then the tower contacted the aircraft with registration mark
HL7792. He gave the instruction "Hold your position",
- Later, at 17:47:00 by the tower, it informed the ARFF units,
- RFF units leave the station at 17:47:30 with 5 vehicles and 12 personnel,
- Hydraulic oil leakage in the tail section of the aircraft with the TC-JMM registration mark. due to smoke,
- There is a fuel leak from the right wing of the aircraft with registration mark HL7792,
- After the accident, RFF units confirmed that both aircraft were intervened with water. determined from the report.

The aircraft with the TC-JMM registration mark was towed to the THY hangar under the supervision of the ARFF units, and the aircraft with the registration mark HL7792 to the L2 parking lot. Later, ARFF units returned to their stations.



Picture 27: ARFF Team

1.15 Search and Rescue

No one was killed or injured in the accident that occurred at Istanbul Atatürk Airport on 13.05.2018 . RFF and related units were dispatched to the scene, and after the aircraft turned off the engine, the passengers were evacuated as normal by ladder and transferred to the terminal by buses.

1.16 Other information

It has been determined that THY AO and Asiana Airlines are authorized by their national authorities to carry out international passenger transportation.

It has been determined that THY AO and Asiana Airlines are authorized by their national authorities to carry out international passenger transportation.

2. ANALYSIS

2.1 Video Footage, FDR and CVR Analysis

From the video footage of the parking lot 217 after the accident:

- As soon as the aircraft with the TC-JMM registration mark enters the parking position, a TGS
217 parking lot for staff to pick up the marking cone located in the parking area.
enters his position,
- It takes approximately 7 seconds for TGS personnel to pick up the marking cone.
noticing that the pilot slowed down and stopped,



Picture-28: The first TGS personnel to enter the Park Area

- TGS personnel pulling the cone aside and another TGS personnel without reason.
Entering the parking position number 217 on the ground, he ran to the opposite side with running steps,
- It takes approximately 21 seconds for TGS personnel to cross over to the opposite side,
- The aircraft with the TC-JMM registration mark is stationary for approximately 42 seconds.
stays,
- It has been determined from the CVR records that the pilots did not report this situation to the tower.

► According to THY Operational Manual Part B Section 2.14, the situation should be reported to ATC immediately.

- If there is no docking guidance signal or marshaller available, final turn to parking spot shall not be initiated. In case of entrance to parking position is not completed for any reason, ATC shall be informed immediately.

Operations Manual Part B Section 2.14



Picture-29: Second TGS Personnel Entering the Parking Area

- Park the aircraft with the registration TC-KMM for approximately 42 seconds with the number 217 standing 15 meters outside the area,
- From the FDR analysis, 2 minutes after the aircraft with registration mark HL7792 took off. Seconds later, at 15 knots, the aircraft with registration mark TC-JMM hits the vertical stabilizer. hit,



Picture-30: The Part of the Aircraft Outside the Safe Area

- As can be seen on the AIP page, it has been determined that the flight crew is responsible for the wing separation and that the pilots of the aircraft with the HL7792 registration mark did not notice the TC-JMM registration marked aircraft standing 15 meters outside and did not pay attention to the wing separation.

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AIP
TURKEY

3) Pist kapasitesini verimli kullanabilmek ve CTOT zamanlarına uyabilmek için, Meydan Kontrol kalkış sıralamalarını değiştirebilir.

De-icing & Anti-icing Uygulamaları

1) De-icing işlemi park yerinde yapılabilir ancak; Anti-icing işlemi belirlenen sahalarda yapılmaya başlanmışsa park yerinde De-icing işlemine izin verilmeyecektir.

2) Anti-icing işleminin yapılacağı bölgeler için AD.2 LTBA AAC-1 ve AAC-2 sayfalarına bakınız.

Alternatif TWY Merkez Hattının Kullanım Talimatları

1) Düşük görüş şartlarında mavi ve turuncu hatlar kullanılmayacak olup, sadece sarı merkez hattı kullanılacaktır.

2) Mavi ve turuncu hatlar düşük görüş şartlarının olmadığı gece şartlarında kullanılacaktır.

3) Aksi bildirilmedikçe maksimum kanat genişliği 36 M olan uçaklar park sahalarından mavi ve turuncu hatta push-back yapacaklardır.

4) Uçuş ekibi hareket sahasında her zaman titizlikle gözlem yapmalı ve kanat ucu ayırmasından sorumlu olduklarını göz önünde bulundurmalıdır.

3) As a precautionary measure for RWY usage capacity augmentation, TWR can change the departure sequence at any time so as to ensure all aircraft ready for take-off do not miss their CTOT.

De-icing & Anti-icing Applications

1) De-icing can be handled at the park area; however, in case anti-icing has been started at the designated areas, de-icing in the parking area shall not be permitted.

2) For Anti-icing areas see AD.2 LTBA AAC-1 and AAC-2.

Usage Instructions of the Alternative TWY Center Lines

1) Under low visibility conditions, shall only be used yellow TWY center lines shall not be used blue and orange TWY centerline.

2) Blue and orange TWY centerline shall only be used under night conditions which do not have low visibility conditions.

3) Unless otherwise specified by ATC, aircrafts with a maximum wingspan of 36 M must use pushback from the parking areas to blue and orange centerlines.

4) Flight crews have to observe carefully on the movement area and consider wingtip separation is under their responsibility.

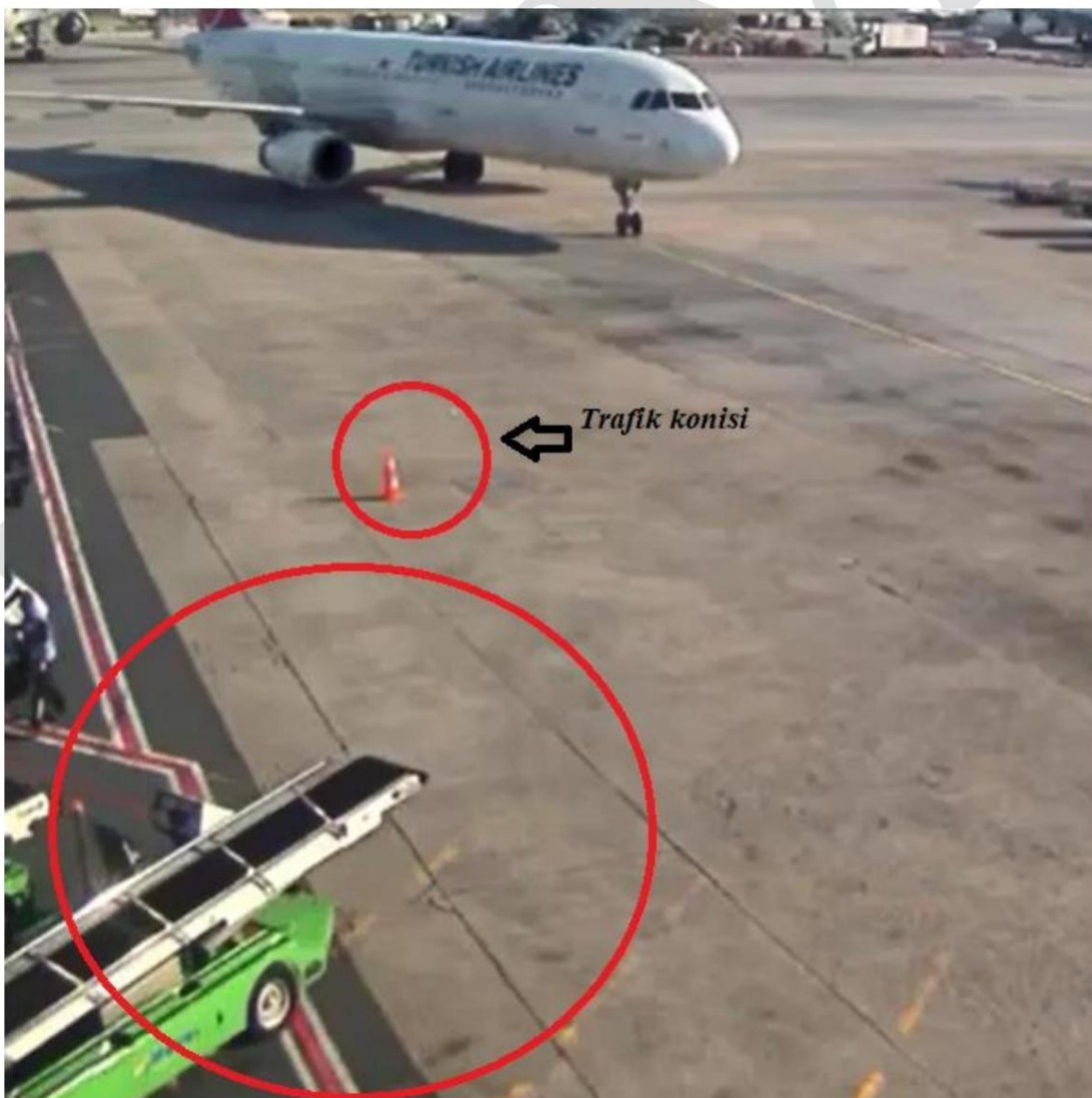
2.2 Turkish Ground Services (TGS) Analysis

Analysis of TGS Ground Operations Manual (GOM) rules and regulations,

- ▶ In the examinations made, it is stated that there are sufficient rules and regulations in GOM, but the personnel did not show maximum attention in practice,
- ▶ However, there is no information in the Handbooks about the roles, responsibilities and task distribution of the personnel at the stage of arrival at the parking area,
- ▶ Where there is detailed information about what to do in the manual, but the tasks There is no clear information about who will execute it.
- ▶ Since there is no instantaneous change system for incoming aircraft, it was considered that it would be appropriate to have different safety and performance levels for different parking situations.
- ▶ The Ground Operations Manual published by TGS on 10.11.2016, Section 4, 4.1.8.1 Actions to be Taken Before the Aircraft Arrives at the Parking Lot;

- Article-b: "To prevent Foreign Object Damage (FOD), it must be ensured that there are no exposed elements in the ramp area",

- Article-d : *“It should be ensured that there are no objects in the taxiway and ramp area used by the aircraft that may be hit by the aircraft or that may endanger others due to 'jet blast' effects.”*
 - Clause-e : *“All ground support equipment, vehicles and bridges must be parked in a safe position, clear from the taxiway used by the aircraft, outside the Equipment Restriction Area (ERA), except as applicable to the operation for the arrival of the aircraft in accordance with local regulations.”*
- As can be seen in the pictures below, it has been determined that the TGS personnel did not prepare the parking area 217 before the arrival of the aircraft, there was a marker cone in the parking area and a ground handling vehicle entered the parking area by crossing the red line.




Picture-31: Sign Cone and Luggage Loading Belt Vehicle in the Parking Area

- The Ground Operations Manual published by TGS on 10.11.2016, Section 4, 4.1.8.1 Actions to be Taken Before the Aircraft Arrives at the Parking Lot;

- Article-i: *"All personnel must stand in a safe position in accordance with local regulations. (The safe position is at least outside the aircraft stand.)"*
- Article-j: *"Persons not directly involved in the aircraft chocking process, It must wait outside the Equipment Restriction Area (ERA)."*
- Article-m: *"No personnel or equipment should approach the aircraft until the aircraft has come to a complete stop at its final stop position, the engines have stopped, and the anti-collision beacons have been turned off."*

- It was determined that the articles were violated by two TGS personnel.

 TURKISH AIRLINES A STAR ALLIANCE MEMBER	YER HİZMETLERİ EL KİTABI BÖLÜM 4 UÇAK HİZMETLERİ VE YÜKLEME		Doküman No	EİK 10.57.001
			Revizyon Tarihi	10.11.2016
			Revizyon No	10
			Sayfa No	22/64

g. Uçağın hangara çekilmesine yönelik kılavuzluk sisteminin çalışır durumda olduğundan veya uçak karşılama (marshalling) personelinin hazır bulunduğundan emin olunmalıdır.

h. Amaçlanan varış faaliyeti için uygun ve yeterli sayıda teçhizat hazır bulundurulmalıdır.

i. Tüm personel, yerel düzenlemeler doğrultusunda uygun olan emniyetli pozisyonda durmalıdır. (Emniyetli pozisyon, en azından uçak park yerinin dışıdır.)

j. Uçak takozlama işlemine doğrudan müdahil olmayan personel, Teçhizat Tahdit Sahası (ERA) dışında beklemelidir.

k. Mümkün olan her durumda uçak park yerine girdiği sırada bir ramp personeli "DUR" işaretleri vermek üzere uçuş ekibinin rahatlıkla görebileceği bir konumda olmalı veya gerekli olması halinde acil durum durdurma sistemini çalıştırmak üzere söz konusu butonun Park Yeri Kılavuzluk Sistemi'ne takılı olduğu durumlarda "ACİL DURUM DURDURMA" butonu başında görev yerinde hazır bulunmalıdır.

l. "ACİL DURUM DURDURMA" butonlarının her iki ramp seviyesinde ve körükte takılı olduğu durumlarda iki butonun başında da bulunulabilir. Körükteki "ACİL DURUM DURDURMA" butonunun başında bulunduğu ve diğer ramp personelinin hazır bulunduğu durumlarda yer seviyesindeki "ACİL DURDURMA" butonunun başında bulunmak üzere bir kişi tahsis edilecektir.

m. Uçak nihai durma pozisyonunda tamamen duruncaya, motorlar duruncaya ve çarpışmayı önleyici işaret ışıkları (beacons) kapanıncaya değin uçağa hiçbir personel veya teçhizat yaklaşmamalıdır.

n. Takozların yerleştirildiği bilgisi kokpite verilmelidir.

o. Emniyet konilerinin yerlerine konulduğu ve çalışmaya başlamanın emniyetli olduğu görsel olarak doğrulandığında, uçak hizmetlerini gerçekleştirecek personel ve teçhizat uçağa yaklaşabilir.

3. FINDINGS:

- a) TC-JMM and HL7792 registered aircraft captain pilots and co-pilots, are licensed in accordance with established existing procedures,
- b) TC-JMM and HL7792 registered aircraft captain pilots and co-pilots have a Health Certificate in accordance with valid rules, health checks have been made on time,
- c) The flight time and duty periods of the pilots and co-pilots of the aircraft with registration marks TC-JMM and HL7792 comply with the existing rules,
- d) The valid registration of both aircraft in accordance with the established procedures, Registration and Airworthiness Certificates,
- e) Periodic maintenance of both aircraft is carried out on time, and according to the maintenance records, there are no deficient maintenance procedures that may affect this accident,
- f) The weight and balance condition of both aircraft is appropriate and the weight & balance is correct. not a factor in the accident,
- g) There is no problem in two-way communication and communication is not a factor in the accident,
- h) Meteorological conditions are suitable and not a factor in the accident,
- i) Parking area 217 is not prepared before the aircraft enters the parking area, and there is a traffic cone in the parking area that prevents the parking,
- j) As soon as the aircraft with the TC-JMM registration mark enters the parking position, two TGS personnel enter the parking position number 217, in order for these persons to complete their passage.
The aircraft with the TC-JMM registration mark stopped 15 meters outside the parking area 217 for approximately 42 seconds,
- k) According to THY Operational Manual Part B Section 2.14, the situation should be reported to ATC immediately, but the pilots did not report this situation to the tower from the CVR records,
- l) The flight crew is responsible for the wing separation, and the pilots of the aircraft with the HL7792 registration mark do not notice the TC-JMM registration marked aircraft standing 15 meters



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outside and do not pay attention to the wing separation,

- m) There are sufficient rules and regulations in the TGS Ground Operations Manual, but the personnel did not show maximum attention in practice,
- n) Ground Operations Handbook published by TGS on 10.11.2016, Section 4, 4.1.8.1 Actions to be Taken Before Arrival at the Aircraft Parking Lot, section; Articles (b), (d), (e), (i), (j) and (m) have been violated,
- o) A ground handling vehicle crosses the red line and enters the parking area,
- p) After the accident, smoke appeared in the aircraft with the registration mark of TC-JMM due to hydraulic leakage,
- q) Fuel leaking from the wing of the aircraft with registration mark HL7792,
- r) It was determined that both aircraft were intervened with water by RFF units.

4. POSSIBLE CAUSE:

Transportation Safety Review Group; On 13.05.2018, the Airbus A321-231 type aircraft with the TC-JMM registration sign, which made the THY696 flight numbered Ercan-Istanbul flight belonging to THY AO, entering the parking position 217, Asiana Airlines flight AAR552, passing through the G taxiway central line. As the probable cause of the accident that resulted in the wing tip of the Airbus 330-300 type aircraft with the registration mark HL7792 making the Istanbul-Seoul flight hitting the tail of the THY aircraft;

- The TC-JMM cockpit crew, while focusing on foreign objects in the parking area and TGS personnel, lost situational awareness that the aircraft violated the G taxiway and did not report this situation to the ATC unit,
- While the HL7792 crew should be performing taxi procedures, not being able to focus and not distinguish between wings,
- TGS personnel not complying with the rules and regulations in the Ground Operations Manual (GOM),

As a result of the joint evaluation of the above issues, it is thought that the accident occurred due to the human factor.

5. RECOMMENDATIONS:

5.1 Asiana Airlines Recommendations:

Following the following issues by Asiana Airlines, showing the necessary sensitivity to eliminate these issues, taking preventive measures promptly and sending these measures to the Transportation Safety Investigation Center (UEIM);

- Taking appropriate measures within your company so that similar situations do not occur again based on this accident, (2023-001-Y)
- It is considered appropriate to share the report with all your pilots. (2023-002-Y)

5.2 TGS A.S. Recommendations:

Following the following issues by Turkish Ground Service, showing the necessary sensitivity to eliminate these issues, taking preventive measures promptly and sending these measures to the Transportation Safety Investigation Center Presidency (UEIM) and DGCA;

- TGS provides job descriptions and job descriptions of each personnel at all stages of ground operations. determining the areas of responsibility, (2023-003-I)
- TGS has made special arrangements to fulfill the 4.9.1 Pre-Arrival Activities section of the Handbook. establish an "arrival crew" procedure (2023-004-I)
- More frequent inspections by the supervisory staff at TGS (2023-005-I)
- Inspection for the purpose of disciplining operation malfunctions and personnel It is considered appropriate to develop the procedure. (2023-006-I)

5.3 THY AO Recommendations:

Following the following issues by THY AO, showing the necessary sensitivity to eliminate these issues, taking preventive measures immediately and sending these measures to the Transportation Safety Investigation Center Presidency (UEIM) and DGCA;



- In order to draw the attention of the flight crews and raise awareness of the report, all announcement to flight personnel, (2023-007-H)

- It is considered appropriate to remind all personnel of the Turkish Airlines Operations Manual, Section B, 2.14, which is within the scope of precautions to prevent accidents that may occur in case of non-obligatory stops and pauses in the operation.
(2023-008-H)



6. ATTACHMENTS

APPENDIX-A: AIRWORTHINESS AND REVIEW CERTIFICATES OF BOTH AIRCRAFT

APPENDIX-B: REGISTRATION CERTIFICATES OF BOTH AIRCRAFT

APPENDIX-C: TC-JMM AIRCRAFT STATION LICENSE