



**REPUBLIC OF TURKEY**

**MINISTRY OF TRANSPORT MARITIME AFFAIRS AND COMMUNICATIONS**

**ACCIDENT INVESTIGATION BOARD**

**FINAL REPORT ON AIRCRAFT ACCIDENT**

<b>OWNER and OPERATOR</b>	: Göreme Balonculuk Gen. Hav. Rek. Tur. San. Tic. A.Ş
<b>TYPE AND MODEL OF AIRCRAFT</b>	: Kubicek BB120P
<b>REGISTRATION MARK</b>	: TC- BGJ
<b>ACCIDENT LOCATION</b>	: Nevşehir Province, Ürgüp District, Karakuş, Üzengi Location
<b>ACCIDENT DATE</b>	: 09.04.2017
<b>NAME OF PILOT</b>	: Bekir GÜNEŞ ( TR-B 08786 )
<b>CONDITION OF CASUALTIES</b>	: 1 Dead 7 Injured
<b>CONDITION OF AIRCRAFT DAMAGE</b>	: Heavy Damage

The investigation is carried out according to the related articles of Law Number 655 of date 01 November 2011, By-Law on Accident Investigation Board of date 06 May 2013, “By-Law on Civil Aircraft Accident Investigation” SHY-13 of date 10.11.1985 included under Civil Aviation Law of date 19.10.1983 and number 2920, and ICAO Annex 13.

According to the law, the sole objective of investigation is to prevent future accidents and incidents. Purpose of this report is not to blame, keep responsible anybody or to put forth any claim.

## **PREFACE**

The Kubicek BB120P type hot air balloon having registration number TC-BGJ and serial number 1177 whose owner and operator is Göreme Balonculuk Genel Havacılık Reklamcılık Turizm Sanayi Ticaret A.Ş. went down during touristic trip and caused accident involving death and personal wound in the vicinity of Nevşehir Province, Ürgüp District, Karakuş, Üzenği Location on 09.04.2017 at 03:46:21 UTC as a result of striking energy line. 1 passenger died and 7 of them injured and brought to medical treatment as a result of the accident.

The investigation on the accident was conducted according to related articles in the Law #655 dated 01 November 2011, By-Law on Accident Investigation Board dated 06 May 2013, By-Law on Civil Aircraft Accident Investigation SHY-13 dated 10.11.1985 under Civil Aviation Law # 2920 dated 19.10.1983, and ICAO Annex 13.

According to aforementioned Law, the Accident Investigation Group that was appointed on 02.05.2017 and number 94665312-050.04/E.36616 consists of following members:

<b>Altan Yaşar TEKİN</b>	Head of Group
<b>Kamil BEKAR</b>	Member of Group
<b>Hamza DİNÇ</b>	Member of Group
<b>M. Emin AKÇETİN</b>	Member of Group
<b>Memiş Kağan ALTUNSOY</b>	Member of Group

## **ABBREVIATIONS**

<b>AD</b>	Airworthiness Directives
<b>AIP</b>	Aeronautical Information Publication
<b>GEN</b>	General
<b>ICAO</b>	International Civil Aviation Organization
<b>KAİK</b>	Accident Investigation Board
<b>lb</b>	Pound (454 gram)
<b>LTAZ</b>	Nevşehir Cappadocia Airport
<b>METAR</b>	Meteorological Terminal Air Report
<b>MTOW</b>	Maximum Take Off Weight
<b>Mbar</b>	Millibar (1 mbar = 1 hpa)
<b>N</b>	North
<b>NM</b>	Nautical Mile (1 NM = 1852 meters)
<b>NOTAM</b>	Notice to Airmen
<b>SHM</b>	Slot Service Center
<b>TAF</b>	Terminal Area Forecast (brief expression of expected meteorological conditions of an airfield during a specific period)
<b>UTC</b>	Local time - 3 hours
<b>SYK</b>	Continuing Airworthiness Management Organization

## CONTENTS

Page

Preface .....	2
Abbreviations .....	3
Contents .....	4
<b>1</b> FACTUAL INFORMATION CONCERNING THE ACCIDENT .....	5
<b>1.1</b> Flight History .....	5
<b>1.1.1</b> General .....	5
<b>1.1.2</b> Flight Preparation, Flight Stage until Occurrence of Accident .....	5
<b>1.2</b> Situation of Casualties .....	8
<b>1.3</b> Situation of Aircraft Damage .....	8
<b>1.4</b> Other Damages .....	11
<b>1.5</b> Personnel Information .....	11
<b>1.5.1</b> Pilot .....	12
<b>1.6</b> Aircraft's Information .....	12
<b>1.6.1</b> General Properties of Aircraft .....	12
<b>1.6.2</b> Maintenance Situation of Aircraft .....	13
<b>1.6.3</b> Airworthiness Certificate .....	13
<b>1.6.4</b> Aircraft Registration Certificate .....	14
<b>1.6.5</b> Weight and Balance Condition .....	14
<b>1.6.6</b> Fuel .....	17
<b>1.7</b> Meteorological Information .....	17
<b>1.7.1</b> Evaluations by Slot Service Center .....	17
<b>1.7.2</b> Meteorological Data .....	17
<b>1.8</b> Navigational Aids .....	18
<b>1.9</b> Communication .....	19
<b>1.10</b> Information about Flight Region .....	19
<b>1.11</b> Flight Recorders .....	21
<b>1.12</b> Crash and Wreckage Information .....	21
<b>1.13</b> Medical and Pathological Information .....	22
<b>1.14</b> Fire .....	23
<b>1.15</b> Search and Rescue .....	23
<b>1.16</b> Other Information .....	23
<b>2</b> ANALYSIS .....	23
<b>2.1</b> Operating Certificate and Balloon Equipment .....	23
<b>2.2</b> Evaluations of GPS Analysis .....	23
<b>2.3</b> Evaluations about the Flight .....	25
<b>3</b> CONCLUSION .....	25
<b>4</b> PROBABLE REASON .....	26
<b>5</b> RECOMMENDATIONS .....	26
<b>5.1</b> Recommendations to Civil Aviation, General Directorate .....	26
<b>5.2</b> Recommendations to Göreme Balloon .....	27
<b>6</b> ANNEXES .....	28

## 1. FACTUAL INFORMATION CONCERNING THE ACCIDENT

### 1.1 Flight History:

#### 1.1.1 General:

Registration Mark	: TC-BGJ
Type of Aircraft and Serial No	: Kubicek BB120P / 1177
Aim of the Flight	: Touristic Trip
Departure Location	: Notamlı Balloon Airfield, Göreme Area 1
Departure Time	: 03:08 UTC
Accident Location	: Ürgüp, Karakuş, Üzengi Location
Accident Time	: 03:46:21 UTC

UTC = Local Time - 3

#### 1.1.2 Flight Preparation, Flight Stage until Occurrence of Accident:

In the examinations carried out by Accident Investigation Group on the flight plan of Göreme Balonculuk Gen. Hav. Rek. Tur. San. Tic. A.Ş. (Göreme Balloon) submitted by Slot Service Center it is identified that;

The flight was planned on 09.04.2017 for five hot air balloons,

The flight plan shows that the hot air balloon having registration mark TC-BGJ with 20 passengers, and departure time was indicated as 03:00 UTC / Total Flight Time as 1 hour,

According to examination carried out by Accident Investigation Group on Cappadocia Slot Service Center records it is identified that;

For hot air balloon flights on 09 April 2017, GREEN FLAG, which indicates that meteorological conditions are suitable for balloon flights in the area of Göreme Balloon flights between 02:45 and 03:45 UTC, was hoisted. However, GREEN FLAG was turned to RED FLAG to indicate that the meteorological conditions are not appropriate for the specified flight period between 03:45 and 16:10 UTC. As a result, it is identified that the hot air balloon having registration mark TC-BGJ departed at 03:08 UTC when GREEN FLAG, which indicates that meteorological conditions were suitable for departure area, was hoisted.

During the interviews with pilot and ground crew, it was stated that passenger briefing was carried out before departure and after the passengers boarded the balloon basket.



**Picture-1: Accident Location**



**Picture-2: Accident Location**

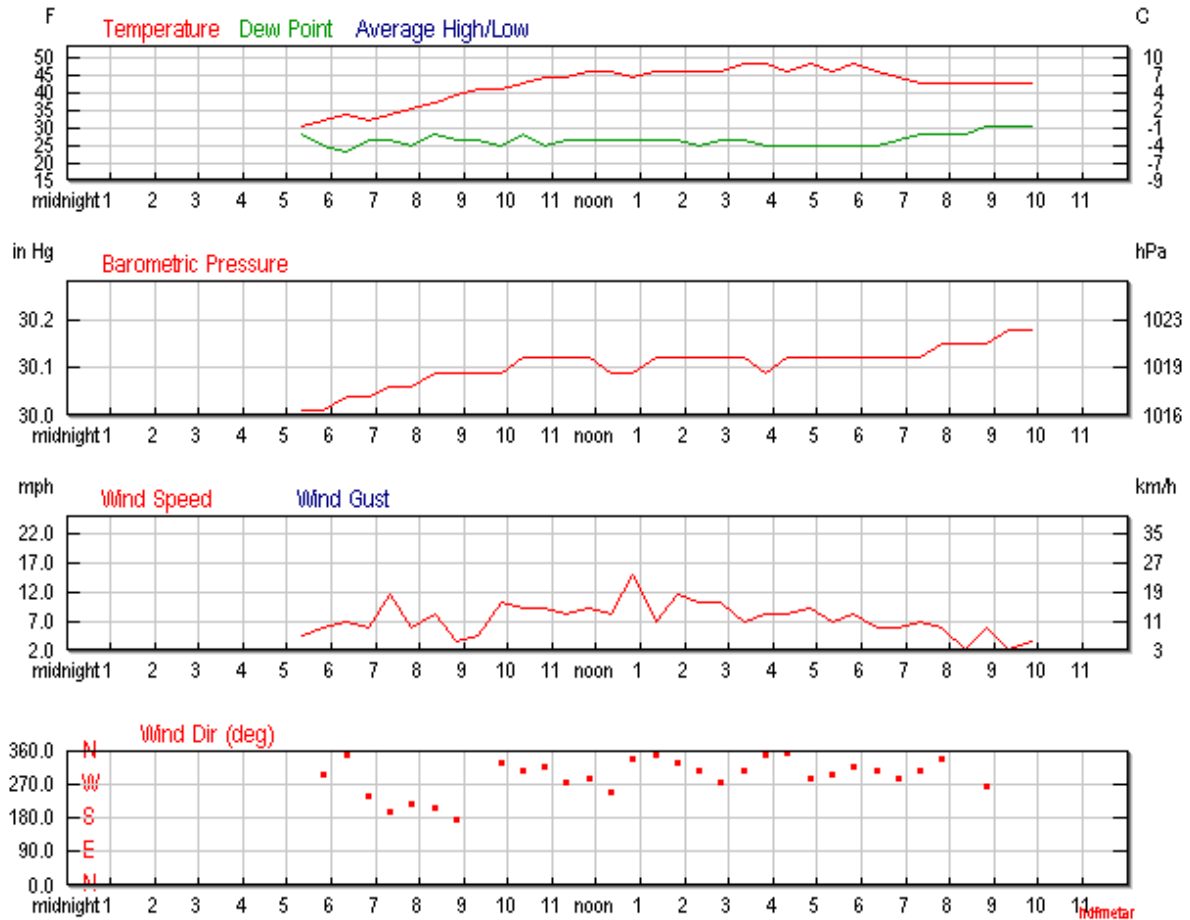
ANA SAYFA METEOROLOJİK BİLGİ GİRİŞİ İŞLETME RAPORLAMA EĞİTİM RAPORLAMA METEOROLOJİK GÖRÜŞ RAPORLAMA UÇUŞ PLANI OLUŞTUR ÇIKIŞ																		
İşletme Adı Operator's Name		SLOT HİZMET MERKEZİ				İşletme Adresi Operator's Address				Mustafapaşa / Ürgüp / Nevşehir								
İşletme Telefon Operator's Phone		(312) 000 0000				İşletme Faks Operator's Fax				(312) 000 0000								
Giriş Yapan Kullanıcı		Okan YAŞAR																
GÖREME BALONCULUK GENEL HAVACILIK REKLAMCILIK TURİZM SANAYİ TİCARET A.Ş. Hayri ÖZARSLAN - 0544 793 50 50 # Bekir GÜNEŞ - 0534 917 16 83 # Sezer İREM - 0532 516 72 21 #																		
Sıra	Balon	Pilot	Gözetimci Pilot	Yer Ekibi Şefi	Uçuş Tipi	P. Kalkış Alanı	G. Kalkış Alanı	P. Uçuş Süresi	P. Kalkış Saati	Kalkış Uygunluğu Saati	G. Kalkış Saati	G. İniş Alanı	G. İniş Saati	B. İniş Saati	P. Yolcu Sayısı	G. Yolcu Sayısı	GPS Data	İptal
1	TC-RGP	Hayri ÖZARSLAN	Gözetimci Pilot Yok	ÜMIT SUCU	Asıl Slot	GÖREME - Bölge-1	-	01:00	03:00						20			İPTAL
2	TC-RGT	Yasin ÖZDEMİR	Gözetimci Pilot Yok	ÖMER BALABAN	Asıl Slot	GÖREME - Bölge-1	GÖREME - Bölge-1	01:00	03:00	03:10	03:01	MUSTAFAPASA	03:54	03:54	20	16	201740992713115214.gpx	
3	TC-RGJ	Bekir GÜNEŞ	Gözetimci Pilot Yok	MEHMET ORHAN	Asıl Slot	GÖREME - Bölge-1	GÖREME - Bölge-1	01:00	03:00	03:10	03:08	MUSTAFAPASA	05:21	05:21	20	20	201740992726115216.gpx	
4	TC-RGV	Sabire BALTACI	Gözetimci Pilot Yok	Erdem DERİN	Asıl Slot	GÖREME - Bölge-1	GÖREME - Bölge-1	01:00	03:00	03:10	03:03	MUSTAFAPASA	04:00	04:00	20	20	201740992736115218.gpx	
5	TC-RGZ	Cafur GÖK	Gözetimci Pilot Yok	HALİL KOÇAMAN	Asıl Slot	GÖREME - Bölge-1	GÖREME - Bölge-1	01:00	03:00	03:10	03:05	MUSTAFAPASA	03:51	03:51	20	19	201740992746115221.gpx	

Table-1: SHM Flight Plan

## LTAZ Airport METAR and meteorological information on 09.04.2017:

### METAR

LTAZ 090320Z 35006KT CAVOK 01/M05 Q1017 RMK RWY29 00000KT



Graphic-1: Meteorological Data

## 1.2 Situation of Casualties

Injuries	Crew	Passenger	Others
Fatal	-	1	-
Serious	-	7	-
Minor	-	-	-

**Table-2:** Situation of Casualties

## 1.3 Situation of Aircraft Damage:

The hot air balloon with 1 Pilot and 20 passengers having registration number TC-BGJ whose owner and operator is Göreme Balloon went down during touristic trip and caused accident involving death and personal wound in the vicinity of Nevşehir Province, Ürgüp District, Karakuş, Üzengi Location on 09.04.2017 at 03:46:21 UTC as a result of striking energy line.

After occurrence of the accident, hot air balloon was transferred to Kapadokya Balloon Maintenance Center in order to perform inspection and required maintenance operations. As a result of inspections carried out in Kapadokya Balloon Maintenance Center, following damages were specified.

1. In the inspection of envelope, the situation exceeded the authorization of Kapadokya Balloon Maintenance Center, because the damage was more than 50% of the envelope, and the report on 25 April 2017 indicates that becoming unserviceable was found suitable, because the damage of the accident did not allow for a cost-effective repair.
2. A part of envelope load tapes broke off during the touch on energy line, remaining undamaged tapes were cut in order to detach from energy line.
3. Upper side of basket got burnt pursuant to touch on energy line.
4. Basket load tapes broke off after touch on energy line.
5. In burner frame, arc and tarnish formations were found as a result of energy line contact.
6. In upper basket frame, arc and tarnish formations were found as a result of energy line contact.
7. In wicker parts and bamboo parts of the basket, breakages were observed as a result of energy line contact and hitting the ground.
8. Visual inspection of fuel tanks have been performed, they needs pressure test additionally.



**Picture-3:** Envelope Load Tapes Damage



**Picture-4:** Load Tapes Damage



**Picture-5:** Basket Upper Side Damage



**Picture-6:** Burner Frame Housing Damage



**Picture-7:** Basket Damage

Kapadokya Balloon Maintenance Center Damage Examination Report and Completely Damaged Report are given in ANNEX-A.

#### **1.4 Other Damages:**

Third-party damage of goods occurred because of that the aircraft crashed into the MEDAŞ electricity energy lines on the land out of residential area, and electric pole went down after this crash.

#### **1.5 Personnel Information:**

##### **1.5.1 Pilot:**

<b>Name Surname</b>	Bekir GÜNEŞ
<b>Date of Birth</b>	12.10.1984
<b>Type of License</b>	CPL (B)
<b>License Number</b>	TR-B-08786
<b>Issue Date</b>	28.01.2015

<b>First Issue Date</b>	05.07.2012
<b>Authorization-Class/Type CAT A 300 000 ft<sup>3</sup> below</b>	valid until 28.02.2019
<b>Authorization-Class/Type CAT B 300 000 ft<sup>3</sup> above</b>	valid until 28.02.2019
<b>Authorization of Radio Communication</b>	Radiotelephone devices of the balloon
<b>Issue Date of 2<sup>nd</sup> Degree Medical Certificate</b>	01.06.2016
<b>Examination Date</b>	01.06.2016
<b>Validity Date of Medical Certificate</b>	01.06.2021
<b>Medical Certificate issued by</b>	Özel Doğan Hastanesi (Private Doğan Hospital)
<b>Restriction in Medical Certificate</b>	None
<b>Total Flight Time</b>	806:11 hrs.

Commercial Balloon License and Medical Certificate of the Pilot are given in **ANNEX-B**.

## 1.6 Aircraft's Information:

### 1.6.1 General Properties of Balloon:

<b>Type of Balloon</b>	KUBICEK BB120P
<b>Registration Marks of Balloon</b>	TC-BGJ
<b>Year of Manufacture</b>	2015
<b>Serial Number</b>	1177
<b>Total Flight Hour</b>	229:37 (by the flight on 08.04.2017)
<b>State of Manufacture</b>	Czech Republic
<b>Maximum Departure Weight</b>	3700 Kg (Registration Certificate)
<b>Minimum Landing Weight</b>	1850 Kg (Flight Manuel)
<b>Type of Envelope Envelope S/N Weight of Envelope</b>	Kubicek BB120P 1177 350 Kg.

<b>Type of Burner</b> <b>Burner S/N</b> <b>Weight of Burner</b>	Jetstream Quad BU-1385 85 Kg.
<b>Type of Basket</b> <b>Basket S/N</b> <b>Weight of Basket</b>	Cameron BH1325 10277 430 Kg.
<b>Type of Cylinder</b> <b>Cylinder S/Ns</b> <b>Weights – Empty/Full</b>	Cameron - Lindstrand 211-212-213-214-917 26 Kg / 62 Kg (4 pcs) - 20 Kg / 60 Kg (1 pc)

### 1.6.2 Maintenance Situation of Aircraft:

Accident Investigation Group performed the maintenance of the hot air balloon having registration mark TC-BGJ and serial number 1177 (acc. to Kubicek M.M 7.3, Lindstrand M.M 62, Cameron M.M 6.5).

- a) It was understood that pre-flight inspection was carried out by the pilot Bekir GÜNEŞ prior to the flight on 09.04.2017, and the inspection list was signed.
- b) Pursuant to investigation of balloon maintenance and flight book, it was detected that the last 100-hour maintenance was carried out by Kapadokya Balloon Maintenance Center on 25.01.2007, when flight hour of the balloon was 193:51, and certificate of release to service was arranged.

<b>MAINTENANCE PERIOD</b>	<b>MAINTENANCE TYPE</b>	<b>APPLICATION</b>
Pre-Flight Inspection	A	Prior to each flight it should be applied acc. to Kubicek MM 1.3.1 Category A Maintenance.
100 Hours/Year Inspection	B	It should be performed acc. to Current Kubicek M.M Rev-12 Lindstrand M.M issue 1.0 AMD 9 Cameron M.M 6.5 Maintenance Guidebook.
Special 10-year Inspection of Cylinders and Fuel Hoses	D	It is performed acc. to Cameron Maintenance Manual supplement 7.52. Current revision for related period - issue 2 (21 December 2011)

**Tablo-3:** Maintenance Table

In the scope of abovementioned maintenance aspects performed by Accident Investigation Group, it is thought that the maintenance situation is not a factor with regard to the accident.

CAMO Work Order on 18.01.2017 and 100-hour Maintenance Form are given in **ANNEX-C**.

### 1.6.3 Airworthiness Certificate:

There is an Airworthiness Certificate with number 3127 issued by Ministry of Transport Maritime Affairs and Communications, Directorate General of Civil Aviation on 13.10.2015 for hot air balloon Kubicek BB120P type having registration mark TC-BGJ and serial number 1177, and aforementioned certificate is valid until 11.10.2017 according to Airworthiness Review Certificate with number 3127.

Airworthiness Review Certificate is given in **ANNEX-D**.

### 1.6.4 Aircraft Registration Certificate:

There is an Aircraft Registration Certificate with number 3127, issued by Ministry of Transport Maritime and Communications, Directorate General of Civil Aviation on 13.10.2015 for hot air balloon Kubicek BB120P type with registration mark TC-BGJ and serial number 1177.

Aircraft Registration Certificate is given in **ANNEX-E**.

### 1.6.5 Weight and Balance Condition:

Following references were used in calculation of weight and balance for hot air balloon Kubicek BB120P type having registration mark TC-BGJ:

- a) Aircraft Registration Certificate of Hot Air Balloon having registration mark TC-BGJ,
- b) Flight Log-book of the aircraft with registration TC-BGJ,
- c) Kubicek Flight Manual, Edition 2 / Revision 7,
- d) Fuel part of this report,
- e) SHT-OPS1 Art. 130 (It is published by Directorate General of Civil Aviation)

Volume of Balloon: 425 000 ft<sup>3</sup>

Balloon Maximum Take Off Weight: 3700 Kg (Reference a) ..... (A)

Balloon Minimum Landing Weight: 1850 Kg (Reference c) ..... (A1)

#### **Empty Weight: Envelope + Burner + Basket**

Weight of Envelope	350 kg.
Weight of Burner	85 kg.
Weight of Basket	430 kg.

<b>Total Empty Weight</b>	865 kg.	<b>( B )</b>
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**Table-4: Weights**

**Tank Weights**

Acc. to Reference (b)

Number of tanks in hot air Balloon: 4 tanks Cameron 1 tank Lindstrand

Weight of filled tank Cameron brand: 62 Kg (acc. to ref d)

Fuel weight of tank Cameron brand: 36 Kg (acc. to ref d)

Weight of filled tank Lindstrand brand: 60 Kg (acc. to ref d)

Fuel weight of tank Lindstrand brand: 40 Kg (acc. to ref d)

$(36*4) + 40 = 144 + 40 = 184$  kg. Total Fuel Weight.

Total weight of filled tank =  $4*62 = 248$  Kg + 60 = 308 Kg .....(C)

**Total Weight of Balloon with Pilot and Passengers**

Pilot Weight: 85 Kg (acc. to Ref. e)

Number of Passengers: 20

Weight of a passenger: 80 Kg (acc. to Ref. e)

Total Weight of Passengers =  $20*80 = 1600$  Kg.

Total Crew + Weight of Passengers:  $85+1600 = 1685$  Kg ..... (D)

**TOTAL WEIGHT OF BALLOON = B+C+D = 865+308+1685 = 2858 Kg .... (E)**

**A>E**, therefore take off weight of the hot air balloon with registration mark TC-BGJ is included in the limits according to Maximum Take Off Weight.

When it is assumed that all fuel capacity was consumed during the flight on 09.04.2017, total landing weight is

**Total Weight of Balloon – Total Weight of Fuel = 2858-184= 2674 = L<sub>min</sub> > A1**

During the landing, the balloon meets the requirements of Flight Manual in terms of weight factor.

**While inspecting according to Kubicek Balloons Flight Manual Edition 2 / Revision 7, Paragraph 5.6 Loading Table:**

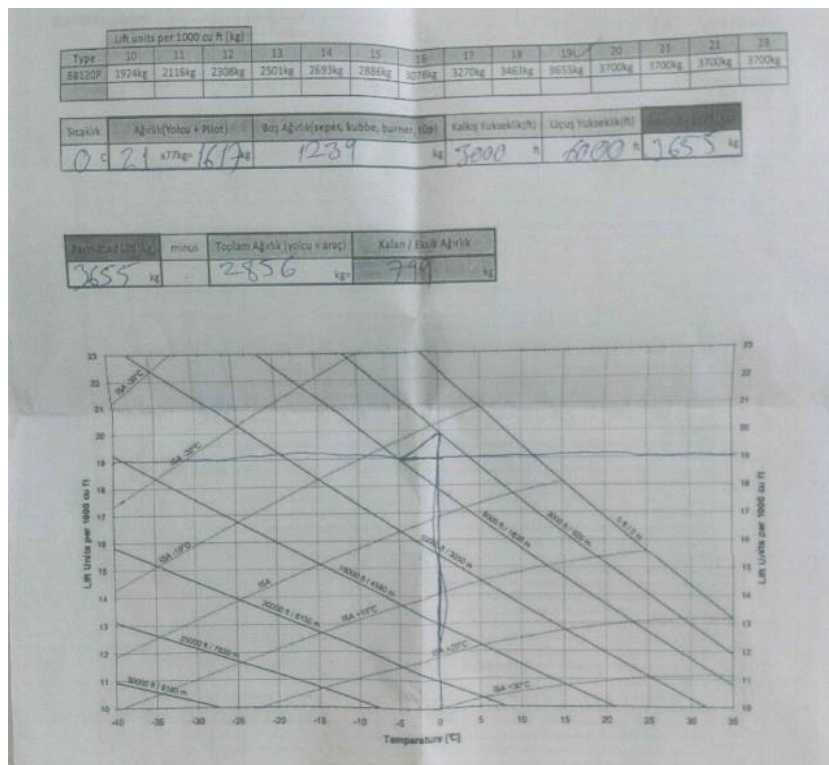
Height of Take Off: 1000 m

Temperature: 0° C

Lift Generated per 1000 ft<sup>3</sup> = 19 (Graphic - Loading Plan)

Balloon total lift = 3655 Kg. total lift (Loading Table) ..... (F)

**F is > E, therefore the take off weight of TC-BGJ Balloon is suitable.**



**Graphic-2: Load Chart**

5.6 LOADING TABLE

Envelope	Maximum balloon lifting capacity [kg]													
	Lift Units per 1000 cu ft													
	10	11	12	13	14	15	16	17	18	19	20	21	22	23
BB9	145	160	175	189	204	218	233	247	262	276	291	295	295	295
BB12	194	213	233	252	271	291	310	330	349	368	385	385	385	385
BB16	259	284	310	336	362	388	414	439	465	470	470	470	470	470
BB17GP, BB17XR	272	299	326	354	381	408	435	462	490	495	495	495	495	495
BB20, BB20E, BB20ED	323	355	388	420	452	485	517	549	582	614	630	630	630	630
BB20GP, BB20XR	323	355	388	420	452	485	517	549	582	614	646	679	711	730
BB22E, BB22ED	355	391	427	462	498	533	569	604	640	675	680	680	680	680
BB22, BB22D, BB22N, BB22Z	355	391	427	462	498	533	569	604	640	675	711	730	730	730
BB22XR	355	391	427	462	498	533	569	604	640	675	711	747	780	780
BB26E, BB26ED	420	462	504	546	588	630	672	714	730	730	730	730	730	730
BB26, BB26D, BB26N, BB26Z, BB26XR	420	462	504	546	588	630	672	714	756	798	840	840	840	840
BB30ED	485	533	582	630	679	727	776	824	840	840	840	840	840	840
BB30D, BB30N, BB30Z, BB30XR	485	533	582	630	679	727	776	824	873	921	945	945	945	945
BB34ED	549	604	659	714	769	824	879	934	945	945	945	945	945	945
BB34D, BB34Z	549	604	659	714	769	824	879	934	989	1 040	1 040	1 040	1 040	1 040
BB37D, BB37N, BB37Z	598	658	717	777	837	897	957	1 016	1 076	1 136	1 150	1 150	1 150	1 150
BB40D, BB40Z	646	711	776	840	905	969	1 034	1 099	1 163	1 228	1 293	1 310	1 310	1 310
BB42D, BB42Z	687	755	824	893	961	1 030	1 099	1 167	1 236	1 305	1 373	1 410	1 410	1 410
BB45D, BB45N, BB45Z	727	800	873	945	1 018	1 091	1 163	1 236	1 309	1 382	1 454	1 520	1 520	1 520
BB51D, BB51Z	824	906	989	1 071	1 154	1 236	1 318	1 401	1 483	1 566	1 648	1 690	1 690	1 690
BB60D, BB60N, BB60Z	969	1 066	1 163	1 260	1 357	1 454	1 551	1 648	1 745	1 842	1 939	1 940	1 940	1 940
BB70D, BB70Z	1 131	1 244	1 357	1 470	1 583	1 697	1 810	1 923	2 036	2 149	2 262	2 300	2 300	2 300
BB85D, BB85Z	1 373	1 511	1 648	1 785	1 923	2 060	2 197	2 335	2 472	2 610	2 747	2 820	2 820	2 820
BB100D, BB100Z	1 603	1 763	1 924	2 084	2 244	2 405	2 565	2 725	2 886	3 046	3 200	3 200	3 200	3 200
BB120P	1 924	2 116	2 308	2 501	2 693	2 886	3 078	3 270	3 463	3 655	3 700	3 700	3 700	3 700
BB142P	2 276	2 504	2 732	2 959	3 187	3 415	3 643	3 871	4 099	4 327	4 555	4 700	4 700	4 700

Graphic-3: Loading Table

1.6.6 Fuel

Liquid propane was used as the fuel in the flight of hot air balloon Kubicek BB120P type having registration mark TC-BGJ.

The investigation of the log book for hot air balloon having registration mark TC-BGJ indicated that there are four Cameron-type propane tubes with a capacity of 36 kg. and 1 Lindstrand-type propane tube with a capacity of 40 kg in the balloon. The aircraft has liquid propane capacity of 184 kg.

In the subsequent investigations by Accident Investigation Group on propane tubes of hot air balloon having registration mark TC-BGJ, it is thought that the fuel is not a factor for the accident.

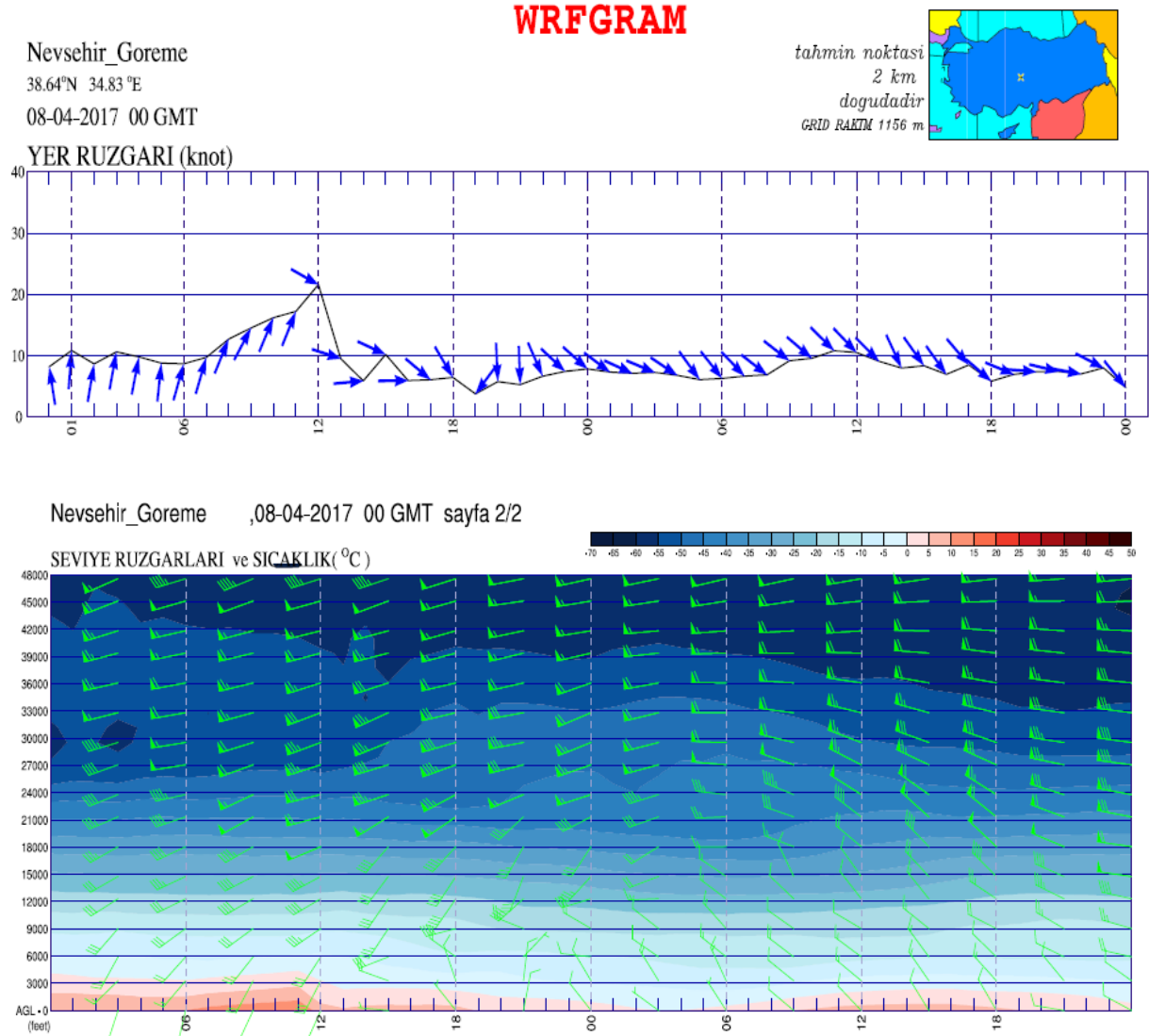
1.7 Meteorological Information:

1.7.1 Evaluation of Slot Service Center

In the investigation by Accident Investigation Group on Slot Service Center Meteorological data, it is understood that the flag was “Green” at 03:08 UTC when the system “Flag” condition is investigated prior to take off time of hot air balloon having registration mark TC-BGJ. In other words, there were no any negative meteorological factors during the stated balloon’s take off.

## 1.7.2 Meteorological Data

The surface wind and level (AGL) wind data among WRFGRAM data on 09.04.2017, which was taken by the Group, are given in following Table. When these data are collectively evaluated, it is seen that surface and level winds at 03:08 UTC did not constitute an impediment for taking off.



## 1.8 Navigational Aids:

In the investigation by Accident Investigation Group on flight bag of hot air balloon having registration mark TC-BGJ, it is seen that there were one Garmin Etrex 30 GPS device and Flytec 3040 device.



**Picture-8:** Garmin Etrex 30 GPS device



**Picture-9:** FlyTec 3040

### **1.9 Communication:**

Accident Investigation Group found out that the hot air balloon having registration mark TC-BGJ was equipped with ICOM Air Band radio which provides the communication between the aircraft, other balloons and ATC, and one handheld radio which is used in the communication with ground crew.



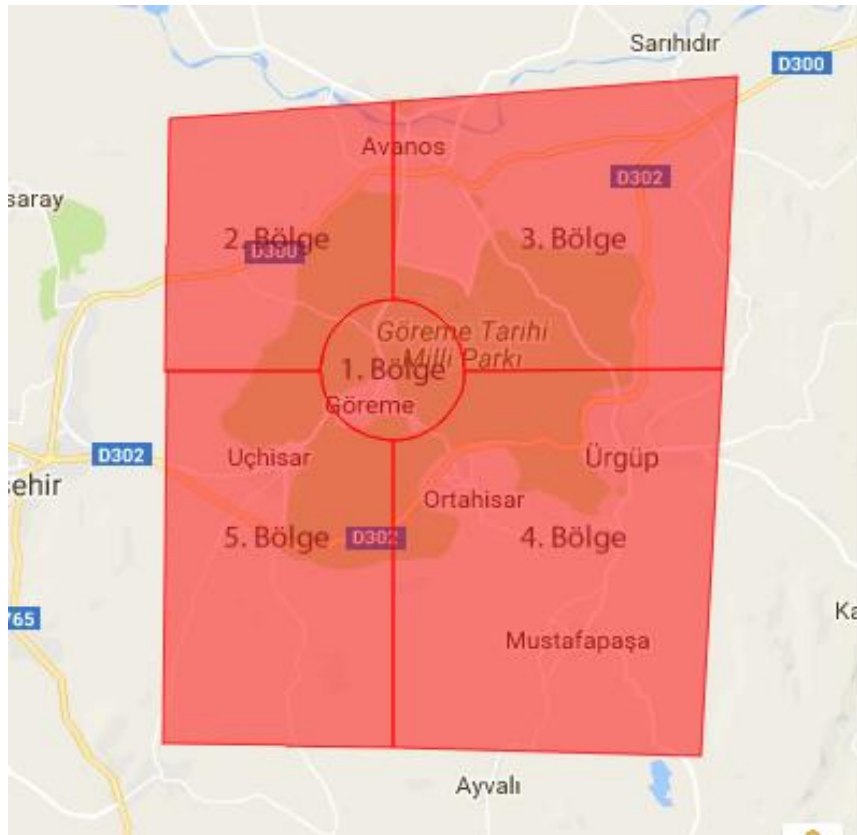
**Picture-10: Air-Ground Radio**



**Picture-11: Air Band Radio**

### **1.10 Information about Flight Region:**

In the investigations by Accident Investigation Group on the aircraft GPS data, it is understood that the hot air balloon Kubicek BB120P having registration mark TC-BGJ took off from Göreme Region 1 during the touristic-purpose flight on 09.04.2017 according to flight plan of Turkey AIP AIC B Series “Cappadocia Balloon Flight Zone in NOTAM” dated 30.06.2014 and numbered 07/14, and the balloon carried out this flight in zone specified in AIP B Series, and the accident occurred in Nevşehir Province, Ürgüp District, Karakuş Üzenği location within this zone.



**Sketch-1: Flight Zone in NOTAM**



**Sketch-2: Flight Route**

### **1.11 Flight Recorder:**

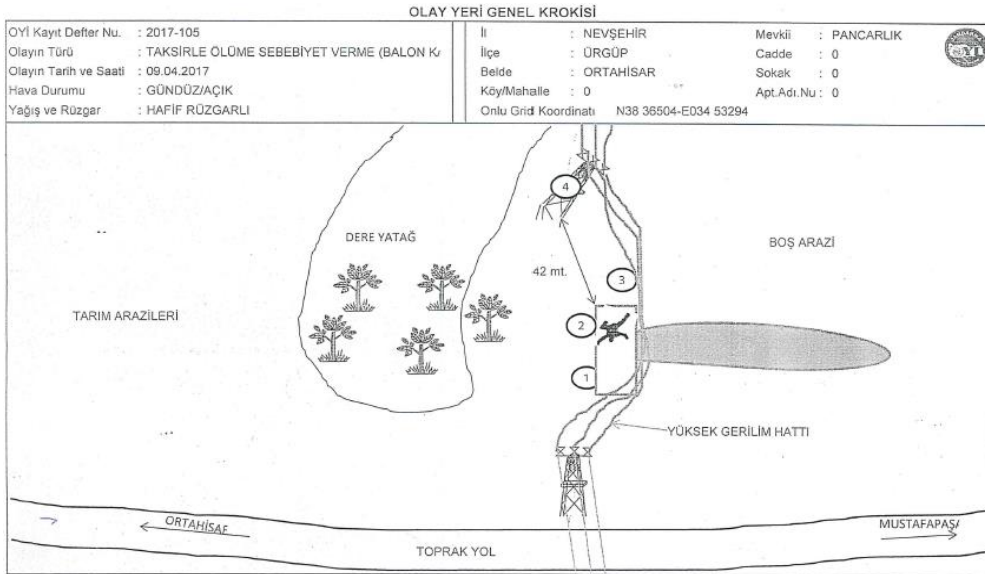
On the basis of ICAO Annex-6 Part 2 “Aircraft Operations” Section-2 Part 2.4.16, any provision is not specified for hot air balloon Kubicek BB120P having registration mark TC-BGJ in order to equipped flight recorder.

### **1.12 Crash and Wreckage Information:**

During touristic trip, on 09.04.2017 at 03:46:21 UTC the Kubicek BB120P type hot air balloon having registration number TC-BGJ whose owner and operator is Goremme Balloon, went down with 1 pilot and 20 passengers, 15 meters from ground, as a result of striking energy line of MEDAŞ in the vicinity of Nevşehir Province, Ürgüp District, Karakuş, Üzençi Location, and the skirt of the balloon closed because of the pressure caused by wind and loading tapes, and the pressurized air smashed the envelope.



**Picture-5: Smashed Balloon**



**Sketch-3: General Sketch of Accident Scene prepared by Gendarme**



**Sketch-4:** Accident Location

*Note:* Direk means electricity mast.

### **1.13 Medical and Pathological Information:**

Regarding to the accident on 09.04.2017, the pilot of the balloon took alcohol inspection report with protocol number 12730 from Ürgüp State Hospital. The proof is 0 promille according to test result.

The passengers in the accident were brought to Private Versa Hospital, Private Kapadokya (Cappadocia) Hospital and Nevşehir State Hospital, and their epicrisis reports were prepared.

Alcohol Report of the Pilot is given in **ANNEX-F**.

### **1.14 Fire:**

Accident Investigation Group did not find out any fire indications occurred in hot air balloon, after the accident.

### **1.15 Search and Rescue:**

In the investigation which was performed by the company representatives who immediately reached accident location, it is detected that there were wounded passengers; emergency service department, security units and MEDAŞ were informed, and the first aid was applied to wounds after electricity was cut and until emergency service teams reached the accident location; and the area where aircraft went down was secured by security units right after the wounds were transferred to hospitals.

### 1.16 Other Information:

Göreme Balloon has a Balloon Operating Certificate #TR-B-002 which was granted by Directorate General Civil Aviation on ..06/2016 (first issue: 01.10.2001) and is valid until 24<sup>th</sup> June 2018.

## 2. ANALYSIS

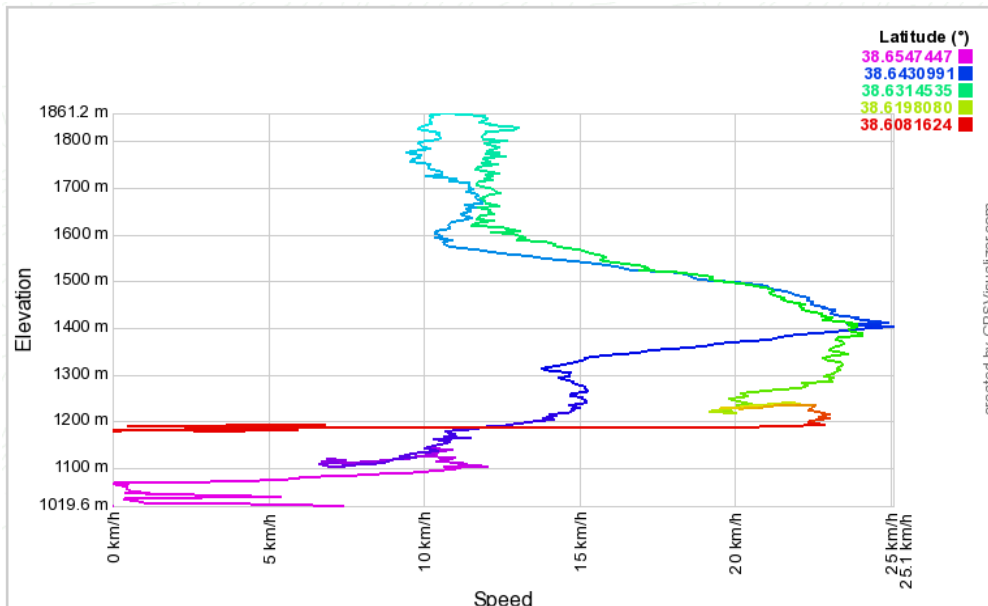
### 2.1 Operating Certificate and Balloon Equipment

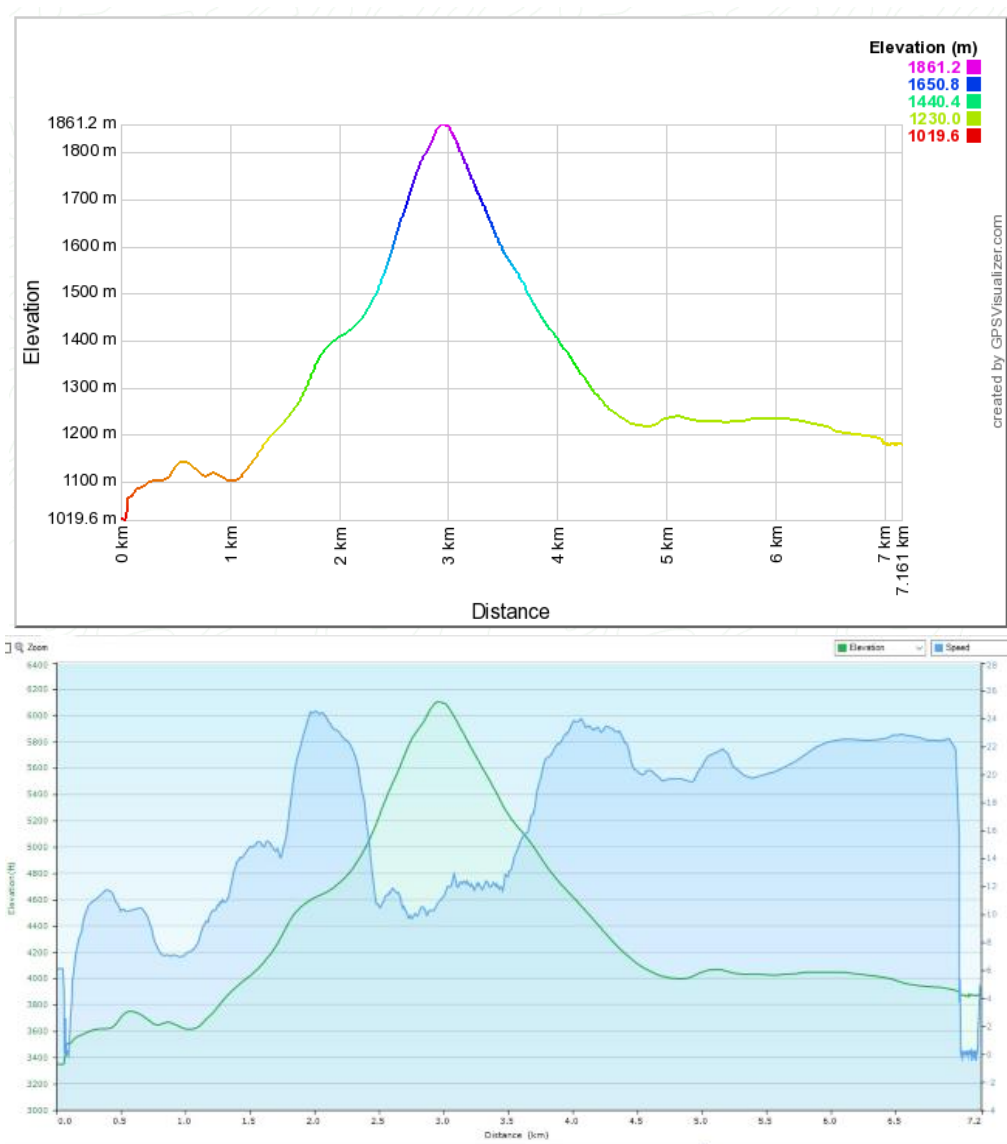
In the investigation of Balloon Operating Certificate #TR-B-002 belonging to Göreme Balloon, it is seen that the hot air balloon Kubicek BB 120P having registration mark TC-BGJ is included in listed balloons in the mentioned Operating Certificate. Investigation of balloon basket indicates that the balloon had full set of equipment.

Operating Certificate is given in ANNEX-G.

### 2.2 Evaluation of GPS Analysis

The records of GARMIN Ertex 30 GPS device were decrypted and the graphics were produced, it is detected that the flight route began from the coordinates 38<sup>o</sup> 39' 253 N, 34<sup>o</sup> 50' 518 E and finished on 38<sup>o</sup> 36' 490 N, 34<sup>o</sup> 53' 298 E, and the balloon climbed the height up to 1861 m during the flight, however, there were fluctuating wind loads up to maximum 25 km/h during the flight.





**Graphic-5: TC-BGJ GPS Graphics**

### 2.3 Evaluations about the Flight:

- In the studies carried out by Accident Investigation Group it is understood that the meteorological evaluations were performed according to SHT-BALLOON-SLOT (It is published by Directorate General of Civil Aviation) for the morning flight on 09.04.2017 before the flight of hot air balloon having registration mark TC-BGJ, and the flight was performed when the situation was in GREEN FLAG which indicates that meteorological conditions were found suitable for the balloon flight and the pilot was responsible for the final decision on the flight, moreover, the flight plan for the balloons to fly was submitted to Kapadokya SHM by Balloon Operator according to SHT-BALON-SLOT Instruction Art.7.(1).a, finally, the balloon took off at 03:08 UTC according to Art.7.(1).d of the Instruction.

### **3. CONCLUSION:**

It is determined that;

- a) The pilot was licensed according to certain current procedures,
- b) Medical inspections of the pilot were performed timely and the Pilot has a Health Certificate according to valid rules,
- c) Flight time and duty periods are suitable to current rules,
- d) Alcohol inspection of the pilot was performed,
- e) The aircraft is registered according to certain procedures, the aircraft has valid registration certificate and certificate of airworthiness,
- f) The maintenance operations of the aircrafts were performed timely; therefore, any lack of maintenance is not a matter of accident according to maintenance records of envelope, burner, fuel tubes and basket,
- g) Weight and balance situation of the aircraft was suitable and had no effect on the accident,
- h) Air-Air and Air-Ground communications had no problem,
- i) Fuel capacity of the aircraft was not a factor for the accident,
- j) The flight plan of specified flight was submitted to Slot Service Center,
- k) There are Gendarme Accident Scene Report and sketches as well as wreckage photographs.

### **4. PROBABLE CAUSE:**

Accident Investigation Group concludes that the probable cause of the accident, which the Kubicek BB120P type hot air balloon having registration number TC-BGJ and serial number 1177 whose owner and operator is Göreme Balloon, went down during touristic trip and caused accident involving death and personal wound in the vicinity of Nevşehir Province, Ürgüp District, Karakuş, Üzengi Location on 09.04.2017 at 03:46:21 UTC as a result of striking energy line, 1 passenger died and 7 of them got wounded as a result of the accident; is a human factor, since the pilot couldn't see the energy lines, as a consequence, the balloon got in touch with the wires of energy lines.

## **5.0 RECOMMENDATIONS:**

### **5.1 Recommendations to Directorate General of Civil Aviation**

It is considered that Directorate General of Civil Aviation should follow below mentioned matters; preventive precautions should be taken through suitable methods by showing required sensitivity in order to solve the problems.

1. Medium and high voltage lines within the Cappadocia Balloon Zone in NOTAM should be marked on 1:250.000 scale maps by related companies, and those maps should be hung on visible places in flight operation facilities.
2. The required precautions should be taken, i.e. all pilots may be trained to detect energy lines' location on the maps to be prepared.
3. Related institutions should perform specific studies in order to plan underground energy lines instead of current energy lines, or mark current energy line towers with a specific paint, or mark high voltage lines with specific balls.
4. The pilot involving in the accident should be dispatched to reasonable Aviation Medical Center for medical inspections in order to renew 2<sup>nd</sup> Degree Health Certificate, and the pilot should be charged with a check flight pursuant to a theoretical and practical training which shall be approved by the Directorate General.

*Note:* Upon the KAİK's formal letter #94665312-050.05-E.32300 on 14.04.2017, Directorate General of Civil Aviation has been informed of the recommendation 4.

### **5.2 Recommendations to Göreme Balloon**

It is considered that Göreme Balloon should follow below mentioned matters; the required sensitivity should be shown in order to solve the problems, and preventive precautions should be taken immediately and sent to related locations.

1. The required precautions should be taken in order to allow all pilots to get information about the locations of current energy lines.
2. Probable route should be determined before a flight; an information briefing should be performed among the pilots before taking off, and a method should be developed for monitoring such briefings.

**6. ANNEXES:**

**A. KBBM Examination Report and Completely Damaged Report**

**B. Pilot's:**

1. Commercial Balloon Pilot License
2. Medical Certificate

**C. Aircraft's:**

CAMO Work Order on 18.01.2017 and 100-hour Maintenance Form

**D. Airworthiness Certificate of Aircraft**

**E. Registration Certificate of Aircraft**

**F. Alcohol Inspection of Pilot**

**G. Operating License**



**THE ACCIDENT OF HOT AIR BALLOON KUBICEK BB 120P TYPE  
HAVING REGISTRATION NUMBER TC-BGJ**

**ACCIDENT INVESTIGATION GROUP**

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