Submission to the
National Transportation Safety Board

for the
investigation of the

Heart of Texas Hot Air Balloon Accident
Balony Kubicek BB85Z balloon, N2469L
Lockhart, Texas; July 30, 2016

Federal Aviation Administration
Office of Accident Investigation and Prevention
Accident Investigation Division (AVP-100)

U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., SW.,
Washington, DC 20591

Office of Accident Investigation & Prevention

April 19, 2017

Mr. Bill English
Investigator-in-charge
National Transportation Safety Board
Office of Aviation Safety
Major Investigation Division (AS-10)
490 L'Enfant Plaza East, SW
Washington, DC 20594

RE: FAA Submission for the *Heart of Texas* Balloon Accident Investigation

Dear Mr. English:

As requested during the technical review, please find the attached submission on the subject accident. Per your request we are sending this electronic version to your attention for distribution within the NTSB.

This submission was developed by AVP with input from various specialists in other FAA offices that have expertise with the issues addressed in the subject investigation. The findings that are presented in the attached submission are based on factual information contained in the NTSB public docket for this investigation. These findings are presented in a concise and logical manner to best convey our views to NTSB staff and Board Members regarding the issues that have arisen from this accident.

We would like to thank the NTSB for giving AVP the opportunity to make this submission. Should you have any questions or concerns related to this matter, please contact me at (202) 267-7788, or email at Jeffrey.guzzetti@faa.gov.

Sincerely,

Jeffrey B. Guzzetti

Jeffrey B. Guzzetti
Manager; Accident Investigation Division (AVP-100)

Attachment: FAA Submission to NTSB for the subject accident

Federal Aviation Administration
Submission to the National Transportation Safety Board
for the investigation of
Heart of Texas Hot Air Balloon Accident; Balony Kubicek BB85Z balloon, N2469L
Lockhart, Texas; July 30, 2016

Table of Contents

Submission to NTSB by the Federal Aviation Administration:

NTSB Aircraft Accident Investigation Case No. DCA16MA204
Heart of Texas Hot Air Balloon Rides; July 30, 2016; Lockhart, Texas

INTRODUCTION

On July 30, 2016, at 7:42 am EDT, a Balony Kubicek BB85Z hot air balloon, N2469L, operated by *Heart of Texas Hot Air Balloon Rides*, impacted power lines and burst into flames in a pasture near Lockhart, Texas. The commercial-rated pilot and all 15 passengers were killed. The accident flight was conducted under 14 Code of Federal Regulations (CFR) Part 91 as a commercial air tour balloon flight.

The safety investigation into the accident was led by the National Transportation Safety Board (NTSB). A senior air safety investigator from the Federal Aviation Administration's (FAA) Office of Accident Investigation and Prevention (AVP) travelled to the accident site with the NTSB investigative team. He was assisted on scene by three inspectors from the local San Antonio Flight Standards District Office (FSDO) as well as an inspector from the Albuquerque FSDO who had expertise in balloon operations. Support from several FAA staff and mangers from the offices of AVP, Flight Standards Service (AFS), and Aircraft Certification Service (AIR) also assisted NTSB with the on-scene investigation, follow-up activities, and the related NTSB Public Hearing held in Washington DC on December 9, 2016.

The FAA appreciates the opportunity to provide this submission to the NTSB in accordance with 14 CFR Part 831.14.[1]

KEY FACTS and FINDINGS FROM THE INVESTIGATION

Preflight Activities and Forecast Weather Conditions

- At 5:06 a.m. local time on the morning of the accident, the pilot received a weather briefing from a federally-contracted Flight Service specialist. The specialist noted in the briefing that the cloud ceiling was 1,200 feet and the temperature/dew point spread was zero. The specialist told the pilot that "Clouds may be a problem." The pilot responded with: "We find a hole and we go."[2]

- Over the next two hours, the forecast and observed weather conditions worsened. At the time of the takeoff, the San Marcos Airport, located about 6 miles to the west of the launch site, reported a cloud ceiling of only 700 feet with 2 miles of visibility.

> **Finding 1:** The pilot was made aware that the weather conditions were below the required visual flight rule minimums, yet he chose to initiate the flight into these conditions despite this awareness.

[1] 49 CFR Part 831.14 states, in part: "Any … government agency…. whose employees, functions, activities… were involved in an accident … may submit to the Board written proposed findings to be drawn from the evidence produced during the course of the investigation… To be considered, these submissions must be received before the matter is calendared for consideration at a Board meeting."

[2] The verbiage in this section is mostly from the NTSB investigator-in-charge's opening presentation from the Public Hearing on the investigation held on December 9, 2016, in Washington, D.C.

Weather Conditions During the Accident Flight

- The balloon departed from a private airstrip about 8 miles south of the accident site at 6:59 a.m. Information from the pilot's iPad memory provided the route of flight, which was about 8 miles long.
- A photograph from a ground witness taken shortly after takeoff shows a radio tower in an area that is partially obscured by clouds. Additional photos taken from passenger smartphones that were transmitted a few minutes before the accident indicate the balloon was flying above a low cloud deck. The photos also depict a gap in the clouds; transmission towers with power lines can be seen through the gap in the vicinity of the accident site.
- The pilot sent a position report to his ground crew at 7:26 a.m., which is something that the pilot would typically perform when he would prepare to identify a landing site. However, the ground crew that received the position report had lost visual contact with the balloon. No distress calls were reported by radio or cell phone from the balloon pilot.

Finding 2: The pilot continued to fly in weather conditions that were below the required visual flight rule minimums, contrary to Federal Aviation Regulations.

Impact and Wreckage Information

- At 7:42 am, the balloon struck high voltage power lines about 130 feet above the ground. Evidence indicates the balloon impacted the power lines at a location which severed the balloon's steel structural cables that supported the gondola. The gondola separated, fell directly beneath the lines, and burned. The balloon envelope, with the burner assembly attached, continued about a one half-mile downwind until coming to rest in another pasture.
- The investigation did not reveal any airworthiness issues or deficiencies that had an impact on the accident flight. No evidence of any pre-impact mechanical problems with the balloon was found. The fuel cylinders and valves were found with no evidence of pre-impact leaks or rupture. A small area of burning was evident at the base of the envelope. The burners were tested and functioned normally.
- Examination of the balloon's maintenance records revealed that FAA airworthiness directives and required periodic maintenance were not performed on the accident aircraft by the pilot/owner. According to the NTSB,[3] the most recent annual inspection of the balloon had expired on May 31, 2016.

Finding 3: No aircraft hardware deficiencies are known to have been involved in the accident. However, the aircraft was not maintained in accordance with Federal Aviation Regulations.

Pilot Information

- The 49-year-old accident pilot was the owner and sole pilot of the operation. He held a commercial pilot certificate for lighter-than-air balloons that he obtained in 1993.

[3] NTSB Airworthiness Group Chairman's Factual Report, page 20.

- The pilot had reported a total of 300 flight hours at the time of his only FAA medical exam application (Third Class) which was dated 20 years before the accident on July 19, 1996. The pilot had been convicted of a drunk driving charge three years prior to his completion and signature of this medical application; however he indicated on the form that he had no convictions.
- 14 CFR Part 67.403 states: "Falsification of the airman medical application form 8500-8 may result in adverse action including fines up to $250,000, imprisonment up to 5 years and revocation of medical and all pilot certificates."
- 14 CFR Part 61.59(a)(1) states: "No person may make or cause to be made: any fraudulent or intentionally false statement on any application for a certificate, rating, authorization, or duplicate thereof, issued under this part."

Finding 4: The pilot falsified his FAA medical certificate application in 1996, contrary to Federal Aviation Regulations.

- The pilot had a substantial history of drug and alcohol convictions that he did not report to the FAA. According to FBI National Crime Information Center records and Missouri driving records, the pilot had multiple arrests, convictions, and incarcerations. Additionally, at the time of the accident the balloon pilot did not have a valid Missouri driver's license and was not eligible to obtain a license until 2020. A historical summary was provided by the NTSB Senior Advisor Special Operations and Interagency Coordination, and included the following:
  - 1987 - Arrested twice, possession of drugs - Felony
    - Given 3 years of probation starting October 1987
    - Completed drug counseling
  - 1996 - Interfering with an arrest – Misdemeanor
  - 1998 - DWI /Alcohol and possession of a controlled substance – Felony
  - 1999 - Possession of a controlled substance – Felony
  - 1999 - Distribution and delivery of manufactured substance 4
    - Convicted and sentenced for 10 years August 2002
  - 2000 - DWI/Alcohol "persistent offender"
    - Sentenced to 1 year, guilty as of September 2002
    - Incarcerated from October 2002 to April 2004
  - 2007 - Leaving scene of an accident and operating with suspended Driver's License
  - 2010 - DWI/Alcohol "aggravated offender" and driving with a revoked Driver's License
    - Drivers license revoked until 2020
    - Incarcerated July 10, 2010 - released into probation on January 28, 2012
    - Complete release (finished jail and probation period) as of August 26, 2013
- FAR 61.15(e) states, in part: "Each person holding a certificate issued under this part shall provide a written report of each motor vehicle action to the FAA, Civil Aviation Security Division (AMC-700), P.O. Box 25810, Oklahoma City, OK 73125, not later than 60 days after the motor vehicle action."

Finding 5: The pilot continued to operate his balloon after failing to report his motor vehicle actions, contrary to Federal Aviation Regulation 61.15.

- The NTSB Medical Factual Report revealed that the pilot had the following active diagnoses: alcohol dependence in remission since 2007; high blood pressure and elevated cholesterol treated with losartan and simvastatin respectively; type 2 diabetes first diagnosed in 2002, treated with the oral medication metformin and injectable insulin; major depressive disorder diagnosed in 1990, treated with bupropion and fluoxetine; attention deficit disorder, diagnosed in childhood, treated with methylphenidate; insomnia, diagnosed in 2007, treated with zolpidem; fibromyalgia diagnosed in 1990 treated with cyclobenzaprine, piroxicam, and pregabalin; and chronic back pain with muscle spasm, diagnosed in 2007, treated with oxycodone and diazepam. However, he did not report any of these disqualifying medical conditions to the FAA, and he continued to fly.

- 14 CFR Part 61.53(b) states, in part: "… a person shall not act as pilot in command, or in any other capacity as a required pilot flight crewmember, while that person knows or has reason to know of any medical condition that would make the person unable to operate the aircraft in a safe manner."

Finding 6: The pilot initiated the flight -- with passengers -- despite having numerous disqualifying medical conditions, contrary to Federal Aviation Regulations.

- Multiple prescription medications were detected in the pilot's post-mortem toxicology, including a muscle relaxant (cyclobenzaprine), painkiller (oxycodone), amphetamine (methylphenidate), and antidepressant (diazepam).[4]

- Most of the aforementioned medications disqualified the pilot from acting as a crewmember of a civil aircraft in accordance with 14 CFR Part 91.17(a)(3), which states, in part, that no person may act or attempt to act as a crewmember of a civil aircraft while using any drug that affects the person's faculties in any way contrary to safety.

Finding 7: The pilot initiated the flight -- with passengers -- while under the influence of numerous drugs, contrary to Federal Aviation Regulations.

- On January 4, 2013, information regarding the pilot's alleged alcohol related motor vehicle actions (MVAs) was received in the FAA's Security and Investigation Division's (AMC-700) DUI/DWI group email inbox. Upon receipt, AMC-700 initiated a preliminary investigation. A formal investigation was initiated on February 21, 2013. The investigation was closed informally with a Letter of Counseling to the pilot, dated July 29, 2013.

- An enforcement action against the pilot to revoke/suspend his airman certificate was not pursued by FAA, in part because the violations were stale[5] upon discovery.

- The maximum period for FAA suspension/revocation of an airman certificate is one year for the most serious violations.

Finding 8: FAA legal authority is limited. If the accident pilot's certificate had been suspended or revoked in 2013-2014, the pilot would have had the opportunity to receive a new airman certificate well before the accident.

[4] Table 4 in the NTSB Medical Factual Report lists all of the medications found.

[5] According to FAA Order 2150.3B, chapter 4, paragraph 5 the "stale complaint rule, provides that an FAA complaint (order) may generally be dismissed if the offenses alleged occurred more than six months prior to the Administrator advising a respondent of the reasons for the proposed action."

Balloon Pilots and Medical Certificates

- The FAA has never required a medical certificate for commercial balloon pilots. 14 CFR Part 61.23(b)(3) states: A person is not required to hold a medical certificate… (3) When exercising the privileges of a pilot certificate with a glider category rating or balloon class rating in a glider or a balloon, as appropriate…"
- As mentioned previously, a review of balloon accident data revealed that no balloon accident has ever occurred due to a medical issue.
- During the Public Hearing, the FAA Federal Air Surgeon testified that the FAA's *Guide for Aviation Medical Examiners* contains a pharmaceutical section that discusses the general medications that FAA will and will not allow for airmen. He testified that the guide specifically includes a "don't fly" section which lists the classes of medications that are prohibited, and that the list is addressed to not only AMEs, but also to all airmen. When asked if an airman should know what is contained on this list, the Federal Air Surgeon replied: *"Absolutely. Certainly sedating medications, the antidepressant medication, the medicine used to treat the ADHD, the Methylphenidate -- certainly if he were able to read the English language, he could read that these medications would not be allowed."*
- The Federal Air Surgeon also testified that that the FAA's *Airman's Information Manual*, Chapter 8, Medical Facts for Pilots, Sections 2b and 2c, provides guidance to pilots about not flying if they suffer from any illness, and prohibits crewmembers from using any medication that affects the faculties in any way.

Finding 9: The accident pilot/operator demonstrated a longstanding, willful non-compliance with regulations. The investigation did not reveal evidence to indicate that the pilot would have likely complied with a requirement for a medical certificate should one had been in effect prior to the accident.

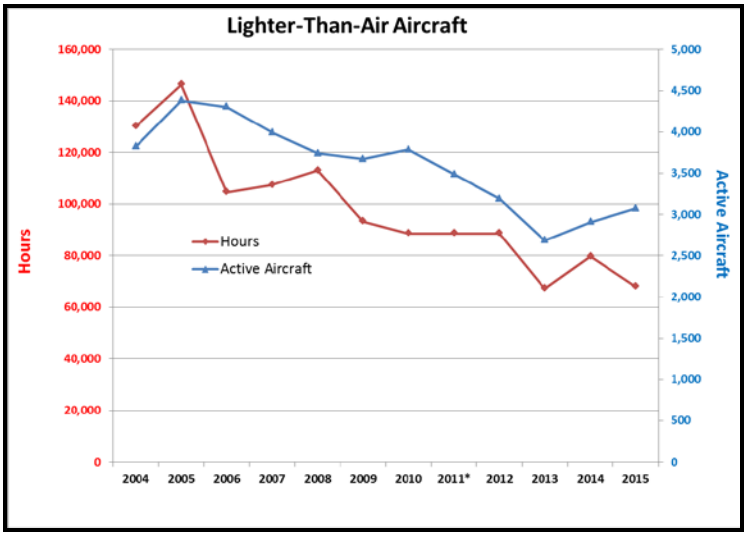
Finding 10: The findings from this investigation do not support a need for additional guidance or rules regarding prohibited medications for balloon pilots.

Balloon Operations in the U.S.

- Hot air balloon activity is captured in the F*AA Annual General Aviation and Part 135 Activity Survey* under the category "lighter-than-air."[6]
  - Active lighter-than-air aircraft account for **1.4%** of all GA active aircraft.
  - Lighter-than-air hours account for only **0.3%** of all GA hours
  - A lighter-than-air aircraft flies an average of **27 hours per year**
  - Between 2005 and 2014, lighter-than-air active aircraft were reduced by 33.6%, and hours were reduced by 45.5% (see Figure 1 below)
  - The number of balloon flight hours and the number of registered balloons have been on a steady decline since 2005, as depicted in Figure 1 below.

[6] This category also includes blimps.

Figure 1: Flight Hours and Active Aircraft for Lighter-than-Air Aircraft



- 35% of all lighter-than-air hours are for sightseeing.[7] Other categories include the following percentages:
  - 51% are Personal Use
  - 3% are Instructional Use
  - 2% are Business Use
  - 7% Other Work Use
  - 1% are On-demand Part 135 Air Tours

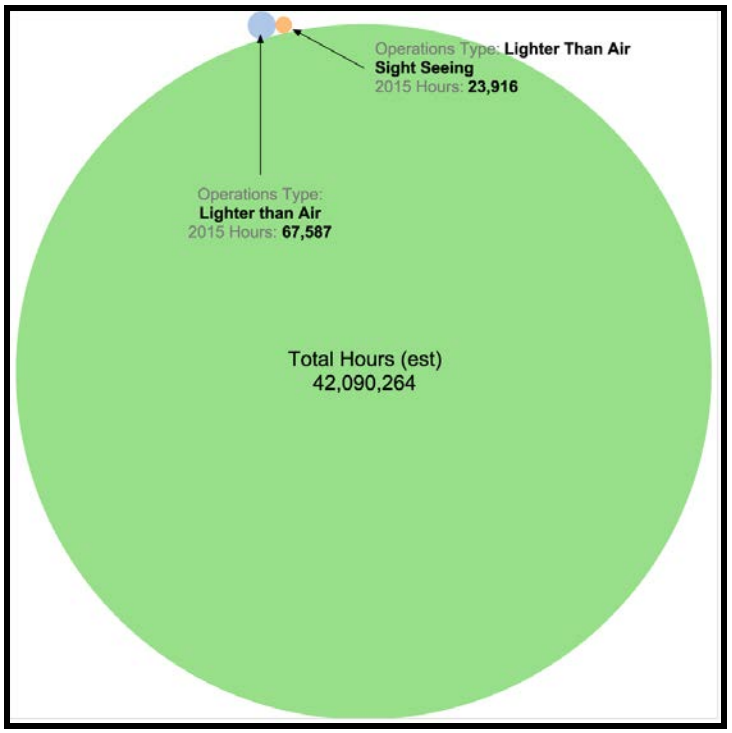
- Balloon operations comprise an extremely small segment of aviation in the United States, as shown by Figures 2 and 3 below:

Figure 2: Flight Hour Comparison: Lighter Than Air vs. All U.S. Aviation

Aviation Sector	CY 2015 Hours	Percent of Total Hours
General Aviation (survey)	**24,141,864**	
Part 121 (estimate)	**17,599,000**	
Commuter (estimate)	**349,400**	
TOTAL	**42,090,264**	
Lighter than Air (All)	**67,587**	**0.161 %**
Lighter-Than-Air Sight Seeing	**23,916**	**0.057 %**

[7] These percentages were calculated by using the average of GA survey data from the past three years of full data from 2012, 2013, and 2014.

Figure 3: Graphical Representation of Balloon Flight Hours versus Total Aircraft Hours



Finding 11: Commercial hot air balloon operations in the United States comprise an extremely small portion of the aviation community - 0.057% - which is about 1/20th of one percent of all aircraft operations in flight hours annually in the NAS.

Number of Balloons in the U.S and their Lift Capability

- There are currently about **4,390 balloons** in the entire FAA registry. Of these balloons,
  - **134** balloons are capable of lifting ***12 or more*** people[8] -- representing **3%** of the fleet. See figure 4 below for a representation of the location in which these balloons are registered.
    - **11** balloons of the 134 are capable of lifting ***20 or more*** passengers.
      - **2** of the 11 balloons are capable of lifting ***24 or more*** passengers.
        - **1** of the 11 balloons has a gondola that can fit ***32*** passengers[9] plus **2** crew;

[8] About 15 of these 134 balloons are likely limited in their capability to carry 12 people due to their operating environment. Balloons must have at least 250,000 cubic feet of volume to generate enough lift for 12 people under typical operating conditions, even if the gondola could hold more people. Balloons that carry 12 or more are all likely to be by commercial balloon operators.

[9] However, the operator of this balloon/gondola reportedly does not fly more than 24 -26 passengers due to its operating location environment and company operations.

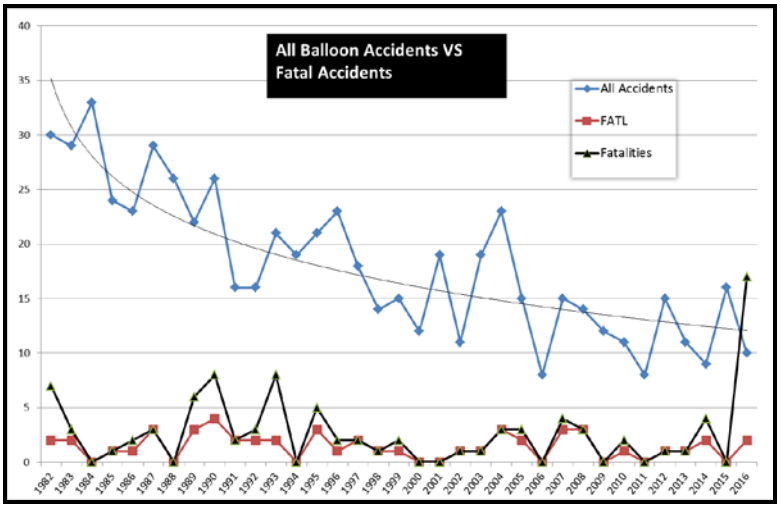
Figure 4: Location of the 134 balloons that can carry 12 or more people

Balloon Accidents

- The *Heart of Texas* Lockhart accident accounts for the highest number of fatalities in a single balloon accident ever in the United States.
- The number of fatalities in this accident is *equal* to the *total* number of fatalities that occurred in <u>all</u> fatal balloon accidents in the U.S. during the *ten-year period* from 2002 to 2012.
- Prior to this accident, the deadliest balloon accident in the U.S. occurred on August 8, 1993 in Woody Creek, Colorado, when 5 people were killed.[10]
- An FAA analysis[11] of all U.S. N-registered balloon accidents in the U.S. from October 1, 2003 through July 29, 2016 (i.e. just prior to Lockhart Texas accident) revealed the following:
  - 160 total accidents (over a 12-1/2 year period):
    - 15 fatal accidents of which 5 were in commercial balloon operations with a total of 5 fatalities
    - 145 non-fatal accidents of which 66 were in commercial balloon operations
- A review of the numbers of <u>all</u> balloon accidents *versus* <u>fatal</u> balloon accidents revealed the following (see Figure 5 below):

[10] The accident involved a commercial sightseeing flight that encountered a wind shift and high winds. The basket was severed after striking a powerline, causing it to fall 108 feet above the ground. (NTSB Case no. DEN93FA100)
[11] Analysis conducted by the General Aviation Operations Branch (AFS-830) within FAA's Flight Standards Service.

Figure 5: Comparison of All Balloon Accidents vs. Fatal Balloon Accidents since 1982

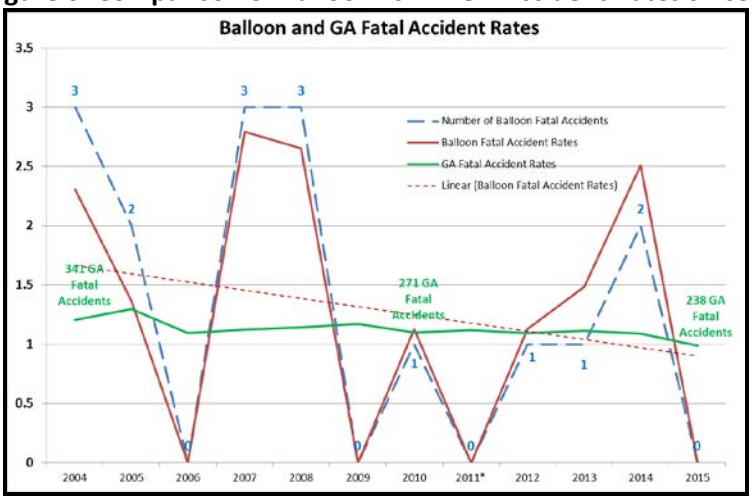


- Since 1982, the trend line for all balloon accidents (both fatal and non-fatal, and both commercial and non-commercial) has been *decreasing*, as shown above via the blue line.
- All balloon accidents since 2004 (including those operating commercially) have averaged 1.33 fatal accidents per year.
- In 2016, a sharp rise or "spike" in the number of people killed in balloon accidents occurred *(indicated by the black line with triangles*). This spike is representative of one of the two fatal balloon accidents during that year -- the *Heart of Texas* accident with 16 fatalities. There is no spike in the total *number* of accidents involving fatalities, as seen by the red line with the squares.

Finding 12: Fatal and non-fatal balloon accidents have been on the decline for the past several years. Balloon operations have been getting safer.

- A review of fatal balloon accidents versus fatal General Aviation (GA) aircraft accident rates and counts revealed the following (see Figure 6 below):

Figure 6: Comparison of Balloon vs. All GA Accident Rates since 2004



- The number of fatal balloon accidents *(solid red line)*, and the rate of those fatal balloon accidents *(dashed blue line)* are characterized by several "spikes" as compared to the all General Aviation (GA) aircraft *(solid green line)*. This spiking characteristic is due to the small numbers of accidents and rates -- running 0 to 3 fatal accidents per year (averaging 1.33 per year).
- Because the total population for all GA aircraft constitutes a much higher number, the total GA accident rate is much more stabilized (no spiking) – at 341 GA fatal accidents in FY04 to 238 in FY15. Regardless, all of the graphed lines in this chart fall into a total scale (y-axis) from 0 to 3 fatal accidents per year.

Finding 13: On average, the balloon accident rate is very similar to the accident rate of all general aviation operations.

FAA Surveillance Activities of Balloons

- Balloons are not normally "parked" at airport ramps like airplanes, and balloon operations are not typically conducted near airports. Therefore, FAA inspectors conduct their surveillance activities in outlying locations in which balloons are staged, inflated, and launched. There are typically other balloons in the same area during these operations, including commercial balloon operators. Additionally, the destination sites for balloons are unpredictable and not near airports.
- A lengthy search and review of the FAA Program Tracking and Reporting System (PTRS) was undertaken by AVP to determine the number of Part 91 inspections of balloons during the time period January 1, 2014 until December 16, 2016.[12] The data was then reviewed in the aggregate. AVP's review of the data indicates the following:
  - The FAA conducted *at least* 2,300 Part 91 inspections of balloons during the 3-year time period from January 1, 2014 until December 16, 2016.
  - The vast majority of the inspections were coincident with nearly 100 balloon gatherings of varying sizes during the 3-year period (i.e. an average of about 33 balloon gatherings each year during the 3-year period reviewed).
  - Many of the inspections occurred with small groups of two or three balloons/pilots being inspected on the same date and location, while other entries indicate *large gatherings* of balloon inspections (from 20 up to 70) at the same event, such as the Balloon Fiesta in New Mexico each October.
  - About 825 inspections from the total set of 2,300 – roughly 36 percent – occurred at *small gatherings* of less than 20 balloons.
  - About 42 inspections from the total set of 2,300 – roughly 2 percent – were "*solo*", i.e. only one balloon inspection occurred on the same date and location.

[12] The data was searched in all three possible coding categories of data input – *Make/Model/Series (MMS) Code*, *National Field Use Code*, and *Manufacturer Name*. The data was then culled for use of the following "Activity Codes." This review and all supporting data can be found in the NTSB's public docket.

- The inspections occurred at locations throughout the entire Continental U.S., with more in the southwestern region of the country where weather conditions favor balloon operations.
- The majority of surveillance events were recorded in the categories "ramp checks" and "records reviews".

Finding 14: Balloon operations receive significant oversight in the form of Part 91 ramp checks and other surveillance activities, especially given the small number of operations in comparison with other general aviation aircraft operations.

Balloon Complexity

- The FAA does not require additional training or a logbook endorsement for varying sizes of balloons.
- During the NTSB Public Hearing, the FAA executive in charge of Flight Standards, the FAA's balloon subject matter expert, and a balloon manufacturer all testified that larger balloons are not more difficult to operate. Salient excerpts of this testimony include the following:
  - Balloon Manufacturer: *"They're much more stable. They're not misdirected or guided by the winds or fickle winds as much as a small balloon would be. On a landing… a large balloon will typically stop quicker than a smaller balloon and also the basket which can tip over on a windy landing, is much less likely to do so in the large balloon."*
  - FAA Subject Matter Expert: *"If you say complexity, you know, I assume you mean system complexity …. It has a fuel system that you turn off and on just like a small balloon. It has… a mechanism for deflation in the top, just like a small balloon. It may have rotational vents to rotate it on its vertical axis which is a nominal increase, you know, one more rope that's hanging down into a basket, but from an aircraft complexity standpoint, they're very similar."*
  - FAA Executive: "[We] *require endorsements in situations where we believe the complexity or the operational requirements from moving from one aircraft to another warrants that kind of proof of having achieved that skill level. In the case of balloons, we don't have information that leads us to believe that's necessary.…We would consider such a requirement certainly if the information was available. In many cases, those kinds of determinations require rulemaking."*

Finding 15: The findings and testimony from this investigation do not support the need for an additional endorsement or rule for pilots of larger balloons.

NTSB Safety Recommendations and FAA Responses Regarding LOAs

- On April 7, 2014 the NTSB issued two recommendations to the FAA urging greater oversight of commercial balloon operations.[13] The recommendations were:

[13] Letter from NTSB Chairman Chris Hart to FAA Administrator Michael Huerta, dated April 7, 2014.

- **A-14-11** -- Amend 14 Code of Federal Regulations Section 91.147 to require commercial balloon operators to obtain and maintain a letter of authorization (LOA) to conduct air tour flights.
- **A-14-12** -- Through appropriate revisions to FAA Order 1800.56J, "National Flight Standards Work Program Guidelines," encourage principal operations inspectors to include in their general surveillance activities commercial balloon operators that hold letters of authorization(LOA), especially upon initial issuance of the LOA and then as necessary, particularly if the operator is involved in an accident.

- On November 6, 2015, the FAA responded[14] to the recommendations by conveying the following:
  - An LOA would not result in a significantly higher level of operational safety for commercial balloon operations.
  - No compelling evidence exists that supports the notion that medications not approved by the FAA have led to balloon accidents.
  - Airmen operating under an LOA do not undergo additional FAA check rides/surveillance common to air carrier operations.
  - The FAA regularly attends ballooning events and performs certain oversight activities, such as checking pilot credentials and reviewing the airworthiness condition of the balloon.
  - Since the amount of ballooning is so low, the risk posed to all pilots and participants is also low given that ballooners understand the risks and general hazards associated with this activity.
- On March 4, 2016, the NTSB responded to the FAA's response by clarifying that the intent of their recommendations is to "ensure that … FSDOs maintain a record of all commercial air tour balloon operators and … these operators are included in principal operations inspectors' general surveillance activities."
- The Board also asserted that commercial balloon operations "do not receive oversight equal to that of similar airplane and helicopter air tour operations" that is stipulated by 14 CFR 91.147 and that an LOA "imposes some level of FAA oversight by creating a record of operators with FSDOs for periodic surveillance checks to verify that flights are being conducted in accordance with the LOAs."
- However, FAA Order 1800.56, *National Flight Standards Work Program Guidelines* requires very limited oversight requirements for Part 91 Air Tour operators.[15] Specifically, airworthiness inspectors must conduct two of the following inspections on *10 percent* of the air tour operators that have authorization via a LOA within the region: Ramp check; Spot check; Aircraft records review; or Airworthiness Directive compliance Inspection. Also, one inspection must be a maintenance inspection one must be an avionics inspection

[14] Letter from FAA Administrator to NTSB Chairman, dated November 6, 2015.
[15] Two fatal commercial air tour helicopter accidents (in Honolulu, Hawaii and Pigeon Forge, Tennessee) occurred recently in the U.S. despite oversight conducted under 14 CFR 91.147. The NTSB and FAA are currently investigating these accidents.

- An analysis was performed by the FAA[16] in response to a similar internal FAA safety recommendation regarding balloon operations that was submitted in 2013. The analysis considered all N-registered Balloon Accidents in the U.S, from October 1, 2003 through September 30, 2013 (10 years). The analysis revealed the following:
  - *127 total accidents* – 12 fatal accidents + 115 non-fatal accidents
    - **4 fatal** accidents in commercial balloon operations with a total of 4 fatalities
    - 50 non-fatal accidents in commercial balloon operations.
    - None of the accident causes or factors involved impairment.

Finding 16: The findings and testimony from this investigation do not support the need to impose a rule such as 14 CFR 91.147 (Letter of Authorization) to improve the safety of commercial air tour balloon operations.

- The Board also indicated in its response to the FAA's response for recommendations A-14-11 and -12 that:

"…commercial balloon operations would be motivated to comply with the provisions in their LOAs, knowing that an enforcement action, including suspending or revoking an LOA, could result in a loss of business. We continue to believe that if operators were required to obtain and maintain an LOA, FSDOs would have a record of all such operations, and principle inspectors could include these operators in their general surveillance activities."

Finding 17: The accident pilot/operator demonstrated a longstanding, willful non-compliance with the regulations. The investigation did not reveal evidence to indicate that the pilot would have complied with a Letter of Authorization under 14 CFR 91.147 should one have been imposed upon his operation.

- The NTSB concluded its response by classifying the recommendations as "Open – Unacceptable Response", and encouraged the FAA to "reconsider its position...."

FAA Compliance Philosophy

- In 2015, FAA Order 8000.373, *Compliance Philosophy*, was published, followed by FAA Notice 8900.323, *Flight Standards Service Compliance Policy*. Additionally, the primary guidance document utilized by FAA inspectors – FAA Order 8900.1 – was revised to align AFS policy with Order 8000.373, Notice 8900.323, and related changes to the current edition of FAA Order 2150.3, *FAA Compliance and Enforcement Program*.[17] The following is a synopsis of the key tenants of this compliance philosophy:
  - **The responsibility for aviation safety does not rest entirely with the FAA.** All airmen, air carriers, aircraft owners and operators, air agencies, and certain airport operators who qualify for and accept an FAA certificate have statutory or regulatory safety duties. The safety of the National Airspace System (NAS) is based on each individual certificate holder's duty and responsibility to provide for public safety.

[16] This analysis conducted by the FAA's Balloon Subject Matter Expert and the General Aviation Operations Branch (AFS-830) within FAA's Flight Standards Service.

[17] Flight Standards Information Management System (FSIMS) Volume 14 - Compliance and Enforcement - Chapter 1: Flight Standards Service Compliance Policy - Section 1, 14-1-1-1 General.

- **The high level of safety in the NAS is largely based on, and dependent upon, voluntary compliance with regulatory standards.** The U.S. aviation safety record shows that the majority of NAS participants have a good safety culture. The success of FAA voluntary programs has demonstrated that a collaborative compliance philosophy, supported by a positive safety culture, provides the highest levels of compliance with regulations, the most effective identification of hazards, and the most efficient management of risks.
- **The FAA has adopted Risk-Based Decision Making (RBDM) as an agency strategic initiative**[18] in order to build on system management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system level, risk-based decisions. However, regardless of how robust and compliant a system is, risk still exists. Developing rules for every possible situation is ineffective, if not impossible. Although compliance is still a minimum expectation, experience has shown that simple compliance with regulations does not guarantee safety. Operational risks must still be managed through positive system-level action by the airmen and organizations themselves. It is important to recognize that this obligation includes a duty to develop and use processes and procedures that will prevent deviation from standards and enhance safety.[19]

- The FAA cannot directly oversee all aspects of aviation activities due to the wide variety and large amount of GA operations in the U.S. Regulatory compliance is expected and required of everyone. The U.S. civil aviation depends on -- and the FAA expects -- voluntary adherence to legal requirements. In addition, the FAA expects that pilots will maintain the knowledge and skills required for the privileges that they are exercising. Most of the time the person involved is willing and able to make corrections that prevent future reoccurrence. By taking needed measures, they adequately control for future risk. In contrast, someone who refuses to take action to prevent future reoccurrence presents the greatest safety threat. Regardless of their previous flights, this person will likely continue to violate the regulations, or will remain unable to meet the standard, until a negative result eventually occurs.
- The willingness and ability to comply with the regulations is necessary to control for safety risks. It seems intuitive to link the outcome, such as an accident or a negative finding during FAA surveillance (such as a ramp check), as requiring the strongest corrective action. In parallel, it is natural to conclude that a flight that ended without occurrence does not necessitate any changes in procedure. The Compliance Philosophy requires this mindset to change.

Finding 18: Pilots and/or operators who consistently demonstrate willful non-compliance with Federal aviation regulations pose a safety risk that cannot be controlled through additional regulations.

[18] FSIMS Volume 14 - Compliance and Enforcement - Chapter 1 Flight Standards Service Compliance Policy - Section 1 Flight Standards Service Compliance Philosophy 14-1-1-5 - Evolution of Compliance Strategies - A. The 2014 FAA Strategic Initiatives.

[19] At the NTSB Public Hearing for this investigation, the Director of FAA's Flight Standards Service testified that "All of our oversight is risk-based oversight. We determine where we will use our resources based on an operational risk evaluation of the system, and we have used for a long time something we refer to as a safety continuum. At the high end of the continuum in large scale commercial operations, Part 121, we spend a great deal of resources dealing with that because of the exposure there. At the other end of that scale, in the general aviation industry, we spend a lesser amount of resource dealing with those."

Voluntary Standards for the Balloon Industry

- Following the initiation of an FAA "Call to Action" for Commercial Balloon Safety, the Balloon Federation of America (BFA) elected to take a pro-active approach and establish a comprehensive set of guidelines that incorporates all aspects of balloon ride operations. The guidelines provide many practical applications and sample forms to be used. The BFA developed this "Balloon Ride Operators Guidelines for Excellence Handbook" to convey the basic knowledge and skills essential for organizing and running a successful ride operation using a well thought out decision-making model that places pilot and public safety first.

- The BFA is also developing a voluntary safety program modelled after the Medallion Foundation in Alaska. The program is a five-tier ranking of commercial balloon operators that the public can use, like a seal of approval to rate their balloon ride operator. The BFA has finalized the basic entry requirements for its PRO division and have determined the appropriate options for varying levels of accreditation, including required training, additional flight reviews, and different requirements based on the number of passengers flown. Once the safety accreditation program is complete, BFA will develop a publicly available list of pilots/ ride companies that have demonstrated certain levels of safety and have met its list of requirements as professional operators. The BFA intends to direct the buying public to make better informed decisions regarding taking a hot air balloon ride. By establishing a higher level of operating standards, the BFA believes they can reduce the chances of further commercial balloon accidents, and the FAA concurs with this belief.

- During the Public Hearing, the FAA's Director of Flight Standards testified that the FAA is *"…constantly looking to determine whether we need to change those rules or not,"* but he also stated the following: *"Changing of the rules is very cumbersome. The rulemaking process is a very deliberative process. It takes a lot of effort. A more effective and a more timely way to deal with that is with what these gentlemen [from the BFA] have been describing and that is the community recognizing that they would choose to operate with higher standards and require those standards, and we support them and want to leverage that in the work we do."*

Finding 19: Voluntary efforts by the balloon industry will likely provide timely and effective accident prevention measures, as proven by voluntary safety programs in other areas of aviation.

Summary of Findings

1. The pilot was made aware that the weather conditions were below the required visual flight rule minimums, yet he chose to initiate the flight into these conditions despite this awareness.

2. The pilot continued to fly in weather conditions that were below the required visual flight rule minimums, contrary to Federal Aviation Regulations.

3. No aircraft hardware deficiencies are known to have been involved in the accident. However, the aircraft was not maintained in accordance with Federal Aviation Regulations.

4. The pilot falsified his FAA medical certificate application in 1996, contrary to Federal Aviation Regulations.

5. The pilot continued to operate his balloon after failing to report his motor vehicle actions, contrary to Federal Aviation Regulation 61.15.

6. The pilot initiated the flight -- with passengers -- despite having numerous disqualifying medical conditions, contrary to Federal Aviation Regulations.

7. The pilot initiated the flight -- with passengers -- while under the influence of numerous drugs, contrary to Federal Aviation Regulations.

8. FAA legal authority is limited. If the accident pilot's certificate had been suspended or revoked in 2013-2014, the pilot would have had the opportunity to receive a new airman certificate well before the accident.

9. The accident pilot/operator demonstrated a longstanding, willful non-compliance with regulations. The investigation did not reveal evidence to indicate that the pilot would have likely complied with a requirement for a medical certificate should one had been in effect prior to the accident.

10. The findings from this investigation do not support a need for additional guidance or rules regarding prohibited medications for balloon pilots.

11. Commercial hot air balloon operations in the United States comprise an extremely small portion of the aviation community -- 0.057% -- which is about 1/20th of one percent of all aircraft operations in flight hours annually in the NAS.

12. Fatal and non-fatal balloon accidents have been on the decline for the past several years. Balloon operations have been getting safer.

13. On average, the balloon accident rate is very similar to the accident rate of all general aviation operations.

14. Balloon operations receive significant oversight in the form of Part 91 ramp checks and other surveillance activities, especially given the small number of operations in comparison with other general aviation aircraft operations.

15. The findings and testimony from this investigation do not support the need for an additional endorsement or rule for pilots of larger balloons.

16. The findings and testimony from this investigation do not support the need to impose a rule such as 14 CFR 91.147 (Letter of Authorization) to improve the safety of commercial air tour balloon operators.

17. The accident pilot/operator demonstrated a longstanding, willful non-compliance with the regulations. The investigation did not reveal evidence to indicate that the pilot would have complied with a Letter of Authorization under 14 CFR 91.147 should one have been imposed upon his operation.

18. Pilots and/or operators who consistently demonstrate willful non-compliance with Federal aviation regulations pose a safety risk that cannot be controlled through additional regulations.

19. Voluntary efforts by the balloon industry will likely provide timely and effective accident prevention measures, as proven by voluntary safety programs in other areas of aviation.