The NTSB and Balloon Accident Investigations

Be Prepared for the Unthinkable with Knowledge and a Plan

By Christine Kalakuka and Brent Stockwell

National Transportation Safety Board

In the United States, aircraft accidents (including balloon accidents) are investigated by the National Transportation Safety Board (NTSB), with a mandate to "establish the facts, circumstances, and cause or probable cause…of each accident involving civil aircraft", according to US Code, Title 49, Chapter 11. The NTSB is an independent agency of the U.S. Government. The Board is composed of 5 members appointed by the President, and confirmed by the Senate. Not more than three members may be appointed from the same political party. In other words, right or wrong, it is a political body.

According to Title 49, Chapter 11, at least 3 members shall be appointed on the basis of technical qualification, however, as of July 29, 2005, with the resignation of Richard Healing, there is currently no member with a background in engineering or aviation. According to the NTSB website, as of the end of July 2005, there are only three people on the board: one with a background in organ sharing and Department of Defense assets; a lawyer; and a professional congressional staff member/legislative aide. If a corporate personality is created by its board members, the present NTSB may have the wrong personality for the job.

Be Prepared

Nobody plans to have an accident. But if you do have an accident, you should have a plan. Your plan should be based on knowledge of the system and your rights. Know what an accident is. Know what you must report. Do not report anything you need not report. (By reporting events that are not accidents, you subject yourself to what may be unwelcome scrutiny, and you waste resources.) The most important right you have is that of representation. According to Code of Federal Regulations, Title 49, Part 831, §831.7 "Any person interviewed by an authorized representative of the Board during the investigation, regardless of the form of the interview (sworn, unsworn, transcribed, not transcribed, etc.), has the right to be accompanied, represented, or advised by an attorney or non-attorney representative." At the end of this article, we have proposed an "Accident Checklist". This is a new idea to us, and is based on some of the things we learned preparing this article.

Flawed Investigations

In a perfect world, balloon accidents would be investigated by knowledgeable people who know what to look for. An example of an individual who might be qualified to investigate a balloon accident would be a balloon pilot who operates a repair station; such a person would be familiar with flying a balloon and with technical and maintenance problems. Another example might be a team of a balloon pilot and a balloon maintenance technician.

The world is imperfect. The NTSB parcels out a high percentage of accident investigation to the Federal Aviation Administration (FAA), and most balloon accidents are investigated by FAA personnel who have little or no knowledge of balloon flying, balloon construction, or balloon maintenance. They often arrive at incorrect explanations of what happened in a balloon accident because of perfectly understandable ignorance, and sometimes they come up with no explanation at all. The same regulations that appoint the NTSB to be the investigating body of aircraft accidents also authorize the Board to use outside consultants, but that doesn't often happen with balloons. In our perfect world, balloon accidents would be investigated properly, and we would learn how to modify our activities, procedures, and equipment, from reading accident reports.

Because balloon accidents are rarely investigated by people with knowledge of balloons and balloon flying, meaningful cause or probable cause is rarely established. "Pilot error" is most often cited; a great catchall cause that covers many different kinds of errors.

Because balloon accidents are rarely investigated by people with knowledge of balloons and balloon flying, meaningful cause or probable cause is rarely established.

Recently, a discussion among balloon homebuilders centered around a builder trying to decide whether he should use aluminum or steel propane tanks. Aluminum tanks are cheaper, which makes them attractive. Unfortunately, aluminum tanks are subject to BLEVEs (Boiling Liquid Expanding Vapor Explosion), eloquently described as "the worst possible outcome when a tank holding [propane] fails due to fire contact or impact", by Dr. A. M. Birk, PhD, P.Eng, one of the leading

international experts on propane fires. NTSB reports should help with this kind of decision. A search using 'BLEVE' in the NTSB database returns nothing. We know from our extensive research of balloon accidents that BLEVEs occur in a high percentage of fatal balloon accidents, and that in every balloon accident in which a BLEVE occurred, the propane was contained in an aluminum tank. In most, but not all cases, the balloon struck a powerline. Pilot error? Perhaps, because someone in the basket was not vigilant in spotting powerlines. Might the outcome have been different if steel tanks had been used? Probably. Shouldn't this kind of information be readily available? We think so.

We were contacted last year by an NTSB investigator who wished our help in drawing conclusions about balloon safety with, as we understood it, the ultimate goal of proposing regulatory change to the FAA based on NTSB report data. Our response was that because the data were flawed no valid conclusions could be drawn, and we proposed a new balloon accident investigation protocol to allow pertinent investigations and conclusions. We offered to help write the protocol for no fee. We got an unsatisfactory response.

To illustrate the lack of relevance of NTSB reports on balloon accidents we can relate a conversation with an NTSB investigator who signed a fatal accident report: the investigator didn't know whether the tanks in the balloon were steel or aluminum, and didn't know how the pilot died. The investigator had never been in a balloon, and, clearly, didn't know what kinds of information to elicit to determine probable cause. We learn practically nothing from such a report.

We proposed a new balloon accident investigation protocol to allow pertinent investigations and conclusions. We got an unsatisfactory response.

The FAA Wants to Know

A few years ago, the FAA decided to take a closer look at "pilot error". A paper, titled *The Human Factors Analysis and Classification System—HFACS*, was published by the Office of Aviation Medicine, in 2000. The FAA is ahead of the NTSB in realizing "pilot error" must be broken down into different components. As one FAA investigator said: "We know the light airplane hit the ground because the pilot was distracted; what we want to know is what distracted him. Was it a moving map, or was he being stung by a wasp? If it was a moving map, do we need to consider establishing procedures for their use?"

Flawed Procedure

A criticism of NTSB procedure made by a veteran FAA investigator is that the NTSB often goes to the aircraft manufacturer to find the cause of an accident. Aside from asking the fox to watch the henhouse, there are several inherent problems in this approach. For example, as happened in the Challenger disaster in 1986, the manufacturer (NASA in this case) may try to limit access to personnel directly involved with design and manufacture, but not specifically charged with talking with the media, or investigators. This is one way to stifle thorough fact-finding.

In 1999, when he was Chairman of the NTSB, Jim Hall commissioned the Institute for Civil Justice of The Rand Corporation to investigate NTSB procedures. Rand spend significant time studying NTSB's practice of naming "parties" to participate in the investigation, including manufacturers. The Rand report states: "However, the reliability of the party process has always had the potential to be compromised by the fact that the parties most likely to be named to assist in the investigation are also likely to be named defendants in related civil litigation."

The report says further: "Party participants in an NTSB investigation may have conflicting agendas … Augmenting the party process through expanded use of nonparty resources or expertise is the best way to ensure … independent investigations."

In our imperfect world, "nonparty" or independent experts are rarely, if ever, used in balloon accidents, and the wise pilot should be prepared to defend his actions, and to assume that not everybody participating in the investigation is objective.

The best way for each balloon pilot to protect himself/herself in advance is to know as much as possible about how the accidents are investigated. And if the unthinkable happens, and you have an accident, find out how it will be investigated, who will be investigating, what their credentials are, and what laws are operable. It's probably a good idea to seek out an advocate. Below is our first attempt at a checklist; we think this is something to discuss with your crew and perhaps your passengers.

Accident Checklist

• Invoke your right to say nothing without representation.

• Advise your crew to say nothing.

• Assume the investigator is not your friend.

• Assume the investigator knows nothing about balloons.

• Assume the investigator does not know the law.

• Be familiar with, and read again NTSB 830, and fulfill your obligations.

• Recall your rights: particularly your right to representation.

• Take photos for your own use.

• Write down what happened for your own use.

Bibliography:

BLEVE Incident Simulator Description, ThermaDyne Technologies Ltd, Kingston, Ontario, Canada

Blink, The Power of Thinking Without Thinking, Malcolm Gladwell, 2005, Little, Brown and Company

Code of Federal Regulations, Title 49 – Transportation Safety Board, *Parts 830, 831*

Mr. Feynman Goes to Washington: Investigating the Space Shuttle Challenger Disaster, from *What Do You Care What Other People Think*, Richard P. Feynman, W. W. Norton & Company, Inc., 1988

The Human Factors Analysis and Classification System—HFACS, Scott A Shappell and Douglass A Wiegmann, U.S. Department of Transportation, Federal Aviation Administration, February 2005

Pilot/Operator Aircraft Accident Report, NTSB Form 6120.1/2

Safety in the Skies, Personnel and Parties in NTSB Aviation Accident Investigations, Rand Institute for Civil Justice, 1999

Transportation Safety Board in Turmoil, Brian Friel, National Journal, 29 July 2005

Various NTSB *Accident Reports* and NTSB *Safety Recommendations*