GainJet Aviation S.A
Organisational Structure

Accountable Manager
Capt. James McBride

Safety Manager
Panagiotis Droupounetis

Quality Unit Director
Symeon Roussos

ARS
Symeon Roussos

Auditors

Ground Operation Mgr.
Georgina Kotsi

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Capt. Dimitrios Kehayas
Deputy Capt. A. Kourniaktis

Training Mgr.
Capt. A. Kourniaktis
Deputy Capt. P. Cullen

Maintenance Mgr.
Stavros Arampatzis

Fuel Dept.

Ops

Flight Standard
Capt. N. Serfas

Cabin Crew Mgr.
Olga Beglopoulou

Maintenance Part 145
GainJet 145 or Contracted Orgn.

Maintenance Planning/Control
GainJet or Contracted Orgn.

Roster

Security Officer

Dispatchers

Pilots

Cabin Crew
Welcome to Blue Skies 001, the first edition of the bi-annual GainJet Aviation Flight Safety Magazine.

The purposes of our Flight Safety Magazine are as follows:
1) To help in the development of our non-punitive and open reporting safety culture.
2) To assist in our understanding safety in a proactive way.
3) In order that relevant safety information may be disseminated to all.

There are two distinct themes for our first publication and they are as follows: firstly, the observance of SOPs (Standard Operating Procedures) which are a major feature of the two accident reports which are discussed here and secondly, the importance of CRM (Crew Resource Management) which was also a contributing factor on both occasions.

It is important for us to recognise the similarities in these accidents. In both cases the aircraft overran the end of the runway, one during takeoff and one during landing. Specifically in the Learjet overrun accident, the RTO (Rejected Take Off) was commenced 4 seconds after the call of Vee One at 144 knots (V1+9) which was contrary to both SOPs and Training Philosophy. In the case of the MD82 crash, if the crew had carried out the Before Landing Checklist and ‘armed the auto-speedbrake system’, then post-accident calculations indicate the aircraft would have stopped before the end of the runway.

Finally, while reading the reports, please remember that we should have respect for our colleagues who have gone before us and in some cases have lost their lives in order that we might learn from their mistakes. Do bear in mind that when they reported for duty on that fateful day, they did not intend to die. I suspect there are many like myself who view some of the accident reports and take a moment to think, “There... but for the grace of God go I”.

Fly Safe!

James McBride
Editor, Blue Skies

A special thanks to all those who contributed:
Captain Ramsey Shaban, President; Simon Roussos, Quality Manager; Andrew Hallak, Marketing Director; Captain Dimitris Kehayias, Flight Operations Manager; Captain Anestis Kourniaktis, Training Manager/Captain; Panagiotis Droumpounetis, Safety Manager/First Officer; Rob Brown, Engineer
Blue Skies


At GainJet we are committed to making Flight Safety our first priority and every person in the company plays their part in this mission. We have a strong ‘non-punitive’ culture now and we encourage open reporting of all incidents which may have safety implications.

There are various methods of incident reporting which are available to all of our staff whom we urge to make the management aware of any condition or situation which could affect the safety of any aspect of our company.

We are fortunate to work in a part of the transport industry which embodies SAFETY at its core. This is driven further by our passengers who are ever more demanding higher standards of operations which incorporate enhanced safety margins.

Gainjet will continue to be driven by its motivation to improve the service to its clients and will continue to make ‘Safety’ the number one priority.

By Captain Ramsey Shaban
President
GainJet Aviation S.A

What... No-Blame?

What do we mean when we say no-blame? Quite simply it is this. We acknowledge that all of us make mistakes from time to time; after all we are only human. When somebody makes a mistake or error and recognises/reports it, they will not be punished for admitting their failing. We must all realise that nobody intentionally makes a mistake. I am a great believer in the old saying, “If Human Beings did not make mistakes, they would not make anything!”

Our main focus with the Flight Safety Team at GainJet is to analyse why incidents happen and work towards preventing incidents being repeated. As part of the analysis process, we use a method to establish the chain of errors which lead up to the main event. As you will be aware, there is never just one cause - typically there will be between 7 and 11 different causal factors in the chain. If any one of these errors is removed, (it could be as simple as the correct use of a normal checklist with standard Challenge and Response) then the chain is broken and the incident would not occur. It is our hope that by increasing our level of communication between all personnel in our company by the publication of “Blue Skies” we can promote Safety Awareness and enhance the quality of our operations.

There is a direct and very positive relation between enhanced quality and commercial success, which means that the company will grow and prosper. With that corporate growth, will come great opportunities for the future which will benefit every one of us and we will truly be able to look forward to Blue Skies ahead!

By Captain James McBride
CEO and Accountable Manager
Annual Safety Manager’s Review Year 2010

GainJet Safety Management consists of a committee, main purpose of which is to review, analyse and take appropriate actions in response to incidents occurring. There is a Safety Review Meeting (attended by Safety Manager, Quality Manager and Accountable Manager) which is held monthly. The minutes of these meetings are distributed to all of the members of the full Safety Committee.

The full Safety Committee, meets twice per year and this is where the overall company performance is reviewed and the targets for the next year are set. The full Safety Committee is composed of all the Postholders and Heads of Departments in Operations and Engineering. Our Flight Safety culture is not based on punishment or secrecy, and our annual report is published, where the quality of the company services is proven.

Those together with regular inspections from several authorities demonstrates the quality of service GainJet provides.

Here we can see the annual review for the year 2010:

<table>
<thead>
<tr>
<th>DATE</th>
<th>AIRCRAFT</th>
<th>TYPE OF INCIDENT</th>
<th>LEVEL OF SERIOUSNESS</th>
<th>CASE OPEN/CLOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/02/2010</td>
<td>SX-GAB</td>
<td>Rejected take-off</td>
<td>LOW</td>
<td>CLOSED</td>
</tr>
<tr>
<td>17/09/2010</td>
<td>SX-IDA</td>
<td>Suspected fuel leak</td>
<td>HIGH</td>
<td>CLOSED</td>
</tr>
<tr>
<td>07/03/2010</td>
<td>SX-RFA</td>
<td>TCAS RA</td>
<td>MEDIUM</td>
<td>CLOSED</td>
</tr>
<tr>
<td>24/03/2010</td>
<td>SX-RFA</td>
<td>Bird Strike</td>
<td>MEDIUM-HIGH</td>
<td>CLOSED</td>
</tr>
<tr>
<td>28/04/2010</td>
<td>SX-MFA</td>
<td>Fuel truck leak during refueling</td>
<td>N/A</td>
<td>CLOSED</td>
</tr>
<tr>
<td>19/05/2010</td>
<td>SX-IDA</td>
<td>Air navigation error</td>
<td>HIGH</td>
<td>CLOSED</td>
</tr>
<tr>
<td>09/06/2010</td>
<td>SX-RFA</td>
<td>Gear pins installed on take-off</td>
<td>HIGH</td>
<td>CLOSED</td>
</tr>
<tr>
<td>20/06/2010</td>
<td>SX-IRP</td>
<td>Defueling access door lost in flight</td>
<td>LOW</td>
<td>CLOSED</td>
</tr>
<tr>
<td>30/06/2010</td>
<td>SX-MFA</td>
<td>Fuel calculations at flight plans</td>
<td>HIGH</td>
<td>CLOSED</td>
</tr>
<tr>
<td>17/07/2010</td>
<td>SX-NSS</td>
<td>GPU Procedures</td>
<td>HIGH</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>

All these figures against the frequency of flights shows that GainJet’s level of Safety is high and the goal for the future is to invest more on safety and especially our Safety Culture.

By Panagiotis Droumpounetis
Safety Manager
What is Flight Safety?

If you ask ten different people what flight safety means, I expect you will get 10 different answers.

Let’s start with a definition. ‘Safety’: Maximum freedom from injury or risk.

Although safety is an abstract idea, at best; it has no quantitative meaning for employees. What would differentiate between too much safety, and too little safety? The term ‘safety’ cannot mean total freedom from injury or risk, as there is no such thing. So the definition ‘Safe’: Secure from liability to injury or risk, gives a better one-word sense. Consider, for example, that a Pilot reduces the liability to injury or risk if he abides by safe operational practices and procedures.

Now let us consider a few more terms to be out of this convenient simplicity. ‘Risk’: The exposure to the chance of injury or loss and can be controlled or managed. ‘Danger’: Liability to harm or injury and may result in the execution of an uncontrollable exercise. ‘Luck’: The force that seems to operate for good or ill in life, but is there a relationship between skill, chance and tolerance for error? In distinguishing all these definitions can be found that risk has a relative value that can be identified, evaluated, and controlled. Therefore ‘risk management’ is a term that can be rationally expected as a Flight Safety definition; But is it? Or is it only that?

Well another term may complete (or complicate) the puzzle a little bit more. One special safety aspect is ‘redundancy’. Safety is also redundancy - that extra layer of protection to ensure important safety actions are accomplished and that nothing falls through the organization cracks. Of course, as is commonly accepted; The FOM is responsible for the safety of his operation. The Safety department should also provide the necessary overview to bring deficiencies to his attention and to assure that critical safety items are accomplished. Sometimes, the senior managers of a company may take the view that a flight safety department is not so important.

However, this can only be supported in a world where everything is done perfectly. The fact is that it isn’t and probably never will be. As long as Humans are involved in Aviation, we will need that extra layer of redundancy. Redundancy is central to all areas of aviation safety.

And if we go deeper and start analyzing ‘Accident Prevention Programs’, ‘Management commitment’, ‘Collection/Analysis/Communication of safety information’, ‘Technical and Training Liaison’, ‘Quality System involvement’, ‘Emergency Response procedures’, ‘CRM’, ‘Human Factors’ probably we will confuse our reader who may forget that his main concern was to find out what Flight Safety is.

Well, bearing in mind that safety’s goal is always to strive to be more proactive and less reactive, then we could say that Flight Safety is much like an umbrella, an insurance policy which supplements, not replaces, the basic coverage.

By Captain Dimitris Kehayas
Flight Operations Manager

A Lesson: The Hard Way

One thing that I learned the hard way in aviation is do not use drugs (even innocent ones) without advice from your doctor and do not modify the use of them according to your needs.

Many of our daily, almost routine, actions are air safety related. One that comes to mind is the use of nasal sprays or ointment in order to get rid of a common cold. These medicines sometimes have side-effects such as sleepiness or drowsiness.

I plead guilty myself to using excessive various sprays in the past several times daily in order to get rid of the symptoms and perform a flight. It is common knowledge that many pilots are in the same path, due to lack of extra crew to replace them and subsequent company pressure. I remember an accident which took place in Saudi Arabia with a Lear Jet.

The night before the accident there was a dinner taking place with two pilots and three stewardesses.
One of the pilots had a stuffy nose and he was using some nasal sprays and pills. He was complaining that he did not feel fit to fly. The other pilot told him to report sick, but he refused since there was nobody else to perform the flight and certain pressure was applied by the company.

Next morning he took-off from Jeddah to Medina. During the descent he lost one of the two yaw dampers. The Lear is a very unstable aircraft hence it is fitted with two yaw dampers. This constitutes an emergency, but normally does not lead to fatal accidents. In this case, the captain was not up to standard (due to his sickness). He lost control of the aircraft and crashed. I participated on behalf of the company in the accident investigation and, believe me, it was not a pretty sight. The Deceased left behind a young wife and a one year old son.

It took more than six months to clear matters with the insurance company in order to get the money for his family. I believe that the above will be food for thought and maybe will act as deterrent from flying when sick.

By Captain Anestis Kourniaktis
Training Manager

Travelling Safely

Being in the Aircraft Trade, Pilots, Cabin Crew and Engineers, we all commute to and from the job. Here are a few helpful tips that will make your day go a lot better.

Severe turbulence can happen in any phase of flight, but is potentially more hazardous during cruise when passengers and crew are most likely to be out of their seats. When the flight crew expects turbulence, they will instruct the cabin crew to make sure that passengers are in their seats with seatbelts fastened, and that the cabin is secured. When turbulence is not expected, you should take a few basics steps before and during the flight to ensure your safety: Firstly, follow the instructions of the crew - if the crew suggests that passengers return to their seats, do so as soon as you can. Then make it your personal policy to wear your seat belt at all times - Turbulence can happen even during a smooth flight in a clear sky. Finally, be aware of the contents of the overhead stowage. If you can, move to a seat that is not directly under a bin packed with heavy items.

How to Protect Your Laptop and Your Computer Data When You Fly: Baggage theft is a risk we all take each time we take a flight. Another ongoing problem in the terminal is the risk of having your laptop lost, stolen, or damaged. When it comes to protecting your laptop, two areas of risks are taking the computer through security and keeping your computer safe inside the terminal. (NOTE. Putting Laptop Computers in Checked Baggage is prohibited due to the recognized fire risk of Lithium batteries). In the US and in most other countries, laptops have to be taken out of your carry-on bag as you go through the x-ray scanners at airport security. To protect your laptop; place it in a bin yourself carefully on its own, before it goes through the x-ray machine. Keep your laptop in sight at all times. If you are traveling in a group, one thing that you can do is to have the first person through security be the person who takes care of all the laptops.

Reclaim and secure your laptop as quickly as possible once you are through the screening process. Currently, the TSA does not mandate separate screening of smaller computers such as notebooks, PDAs or iPads. You can keep these in your carry on bag as you go though security. Keep in mind that a security screener may still ask you to take out your iPad or notebook computer for separate screening, especially if you have several electrical or electronic items in the same bag.

If you decide to use your laptop during the time before boarding, take the same precautions that you would in any other public space. Do not leave your laptop unattended, and if the airport has free wi-fi access, avoid doing anything online such as ‘banking’ that requires a secure connection.

In addition to protecting your laptop from loss, damage, or theft, you should also take the time to protect the data too. One way to do this is to separate the storage from the laptop. For most users, the information on a laptop is far more valuable than
the laptop itself. One easy way to protect against the loss of data is to either backup your data before you travel, or plan to keep any important or sensitive data separate from the laptop in a device such as a flash-drive or external hard drive. If you are unwilling or unable to separate the data from the laptop, at least put some kind of password protection on the laptop or on individual files or directories within the laptop.

Quality and Safety – the perfect marriage!

The Safety and Quality Assurance (QA) Office assures safety, effectiveness and supports the quality of Aviation System Standards programs. This is done through the development/oversight of organizational safety and quality assurance policies and procedures. Key components of the Aviation System Standards integrated safety system include Flight Safety, Environmental, Occupational Safety and Health, Safety Management System, and Internal Evaluation Programs.

The Flight Safety utilizes a proactive system safety approach, relying on operational risk management to identify and manage risk to our flight operations. Two significant programs have been implemented to facilitate this effort; FOQA (Flight Operational Quality Assurance) and ASAP (Aviation Safety Action Program). Aviation system Standards is an active participant and vigorous advocate utilizing flight operational quality assurance (FOQA) programs. The programs involve the collection and analysis of data recorded during flight to improve the safety of flight operations, air traffic control procedures, airport/ aircraft design and maintenance. The data used in FOQA programs are the same types stored by digital flight data recorders for accident-investigation purposes, but can be downloaded frequently from quick-access recorders. ASAP is a voluntary safety program designed for AVN’s flight program members to report safety issues and events that may be critical to identifying potential precursors to accidents. ASAP safety data is used to develop corrective actions for identified safety concerns and to educate the appropriate parties to prevent a reoccurrence of the same type of event. ASAP is intended to obtain safety information that is not otherwise available and is an essential complement to our FOQA Program.

The Environmental Program strives to minimize environmental impacts of AVN operations through the design and development of an organizational-wide environmental management system (EMS) that is conformant to ISO 14001 and focuses on pollution prevention, integration of systems, communication of policy, compliance with legal requirements, and continuous improvement of the EMS.

The Occupational Safety and Health (OSH) Program assures that AVN employees are provided a work place that is free from recognized hazards by utilizing a safety management system that is intended to meet or exceed all federal, state, and agency OSH requirements based on OHSAS 18001 specifications.

The Safety Management System (SMS) provides a systematic and integrated method for managing the safety of Air Traffic Control and navigation services in the National Airspace System (NAS).

The Internal Evaluation Program is designed to provide management insight regarding potential problem areas before nonconformance occurs and supports continuous improvement of the Aviation System Standards organization.

Safety Management Systems in Aviation

Although aviation is among the safest modes of transportation in the world today, accidents still happen. In order to further reduce accidents and improve safety, proactive approaches must be adopted by the aviation community. The International Civil Aviation Organization (ICAO) has mandated that all of its member states implement Safety Management System (SMS) programs in their aviation industries. While some countries (Australia, Canada, members
of the European Union, New Zealand) have been engaged in SMS for a few years, it’s just now emerging in the United States, and is non-existent in most other countries.

**Reviews:** ‘Managing safety in aviation has been elevated to the next level with the current emphasis on Safety Management Systems. Safety Management Systems in Aviation describes SMS as a proactive, preventive risk management process that includes hazard identification and mitigation, tools for gathering data, and methods of analysis.

Finally, the aviation industry has recognized that effective safety management systems are necessary in today’s complex operating environments. Fortunately, a fascinating, yet comprehensive guide to the organization, management, and successful implementation of these processes is now available.

By Simon Roussos  
Quality Manager

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**The Power of Safety**

Safety. A simple word with an extremely heavy meaning. Why? Because in this industry, without safety we cease to exist. A little extreme? No, not really.

In every aspect of the aviation industry, from maintenance, ground and flight operations all the way through to even sales and accounting, safety plays the most important role to be successful. We may think it’s customer service or sales tactics, but no it’s safety. While all the other aspects of service, marketing and sales are highly important, safety is the key priority. When even one part of the company loses that sense of safety, things could turn ugly real fast.

Even the smallest safety issues can have a major toll on the reputation of a company. In this industry, reputation is everything. So, even minor incidents could have major impacts on an airline. Take for example, the Northwest Airlines incident on 21st October 2009, where the flight overshot its original destination by 150 miles due to pilots apparently being distracted by personal laptops. The airline had to deal with major public outcry. Sales decreased and Northwest’s amazing reputation suffered, so a very costly public relations campaign followed in order to repair the damage.

If such a minor issue could cause a customer to turn away and possibly never look back, ask yourselves, what could a major catastrophe do? For example, on 2nd September 1998 Swissair Flight 111 travelling from New York to Geneva crashed into the Atlantic Ocean near Nova Scotia. It was a complete tragedy, as all 229 passengers on board died.

From the commercial point of view, for Swissair, it was the beginning of the end. Before this incident, Swissair saw huge success for many years and was one of the largest airlines in the world. The airline was even regarded by the industry as “The Flying Bank” due to its financial success and stability. So, in the 1990s it invested heavily to expand in order to capture an even larger market share. However, its plans were interrupted by the events that took place on that sad day.

Swissair’s reputation took a huge hit and many passengers avoided using their services because they were too scared, even though Swissair dropped prices heavily in order to attract customers. Unfortunately, the damage was done. For 2 years, Swissair invested greatly in massive marketing campaigns to repair the repercussions of the incident. The public eventually ‘forgave’ Swissair, but it was too late. The airline was in such financial turmoil that soon after the aviation recession following the September 11th 2001 attacks, it went bankrupt.

Consider that these examples are based on major commercial airlines with large target markets and a massive amount of financial power. These companies were able to survive because of those factors. In our world, those factors don’t exist.
GainJet is a small private VIP jet operator that has a very exclusive clientele, who demand the best in service, care, and especially safety. So if we don’t deliver 100% safety, service and care every time, then they will make us suffer for it. In the case of a serious incident, not only would our reputation would be damaged, leading to decreased sales, but an accident could be the end of the company. Yes, we’ll be covered by insurance for damages etc. However, from a marketer’s point of view, it is the most difficult position to be placed in. Our reputation would officially be “down the toilet.”

Could GainJet’s reputation survive a catastrophe? I don’t know. I can certainly guarantee that it would be a nightmare to manage such a crisis and a long road to recovery. A crisis that could have been avoided in the first place if all safety measures and precautions were taken. So I ask again, a little extreme? I’ll let you be the judge.

By Andrew Hallak
Marketing Director

Case Study

AMERICAN AIRLINES FLIGHT 1420 – MD82 – 01 JUN 1999

On 1st June 1999, American Airlines Flight 1420 crashed while landing in Little Rock National Airport, U.S.A. In this tragic accident, the Captain and 10 passengers died.

The pilots of flight 1420 were Captain Richard Buschmann and First Officer Michael Origel.

According to the National Transportation Safety Board (NTSB) accident report, they learned that the winds were changing direction and that a wind shear alert had sounded on the airport due to a thunderstorm nearby. Air traffic control originally told them to expect Runway 22L for landing, but after the wind direction changed rapidly, Captain Buschmann requested a change to Runway 4R.

As the aircraft approached Runway 4R, a severe thunderstorm arrived over the airport. The controller’s last report, prior to the landing, stated that the winds were 330 degrees at 28 knots. That exceeded the MD-82’s crosswind limit for landing in reduced visibility on a wet runway. With that information, plus two
wind shear reports, the approach should have been abandoned at that point, but Captain Buschmann decided to continue his approach to Runway 4R.

During their rush to land as soon as possible, both pilots became overloaded with multiple necessary tasks. That led to errors and omissions, which proved to be the final links in the accident chain. Consequently they failed to arm the automatic ground spoiler system (hinged panels on top of the wings). The smooth airflow over the top of the wings is disrupted when the spoilers deploy automatically, as the wheels touch the runway. This negates the lifting ability of the wings, thereby making the wheel brakes more effective, by transferring the weight of the aircraft from the wings to its wheels.

The pilots also failed to arm the auto braking system. Both automatic deployment of the ground spoilers and automatic engagement of the brakes are essential to ensure the plane’s ability to stop within the confines of a wet runway, especially one that is being subjected to strong and gusting winds.

After landing, First Officer Origel stated, “We’re down. We’re sliding.” The captain then said “Oh No!” Neither pilot observed that the spoilers did not deploy, so there was no attempt to activate them manually. The result was almost no braking at all, since only about 15 percent of the airplane’s weight was supported by the main landing gear.

Directional control was lost when Captain Buschmann applied too much reverse thrust, in contradiction to the limits stated in the flight manual.

The aircraft skidded off the far end of the runway at high speed, slammed into a steel walkway with the landing lights for runway 22L and finally came to a stop on the banks of the Arkansas River. “After departing the end of the runway, the airplane struck several tubes extending outward from the left edge of the instrument landing system (ILS) localizer array, located 411 feet beyond the end of the runway passed through a chain link security fence and over a rock embankment to a flood plain, located approximately 15 feet below the runway elevation; and collided with the structure supporting the runway 22L approach lighting system.”

Such structures are usually frangible - i.e. designed to shear off on impact - but because the approach lights were located on the unstable river bank, they were firmly anchored and the impact destroyed the aircraft. It broke into three pieces and ignited.

Captain Buschmann was killed instantly, when the cockpit impacted a steel walkway attached to the approach lighting system for Runway 22L. Ten of the 139 passengers also died. Captain Buschmann’s last words included his statement of “it’s a can of worms”, as the weather deteriorated so rapidly, while he was struggling to track the proper final approach course and glide slope. Rachel Fuller, a passenger who sustained severe burns, died on June 16, following the amputation of her leg. Of the surviving flight crew, First Officer Origel received serious injuries.

Of the cabin crew:
3 received serious injuries
1 received minor injuries
Of the surviving passengers:
41 received serious injuries
64 received minor injuries
24 were uninjured

After the accident American Airlines revised its checklist so that pilots would confirm that the spoilers are armed.

Error chain identification in brief as follows:
1. Fatigue – pilots exceeding duty time, last flight of a very long duty day.
3. Commercial Pressure – flight well behind planned schedule
4. F/O inexperienced on type only recently obtained commercial licence
5. Weather bad – severe thunderstorms in vicinity of destination - Little Rock airport
6. Crew loss of situation awareness – Captain’s words CVR – “It’s a can of worms”
7. Crew operating outside crosswind limit for the a/c and failure to “Go Around” from an unstable approach – windshear on finals x2.
8. Crew failed to arm speedbrakes – also failed to perform normal landing checklist
9. Crew failed to arm autobraking system
10. Runway very wet therefore conducive to Aquaplaning.

If only one of the above factors was removed from the chain, then the accident would not have occurred.

For example, if the pilots had remembered to arm the Auto-Speedbrake system, this would have ensured that the Ground Spoilers would have deployed on touchdown and even though the landing was long and fast, on a very wet runway, the aircraft would have stopped before the end of the paved surface.

Editor’s Note: It is worth noting also there were other deviations from SOPs as indicated in the report which formed the Error Chain. In a research study by Boeing carried out in the late 1990s, it was identified that “deviation from Standard Operating Procedures” was a significant causal factor in over 50% of aircraft hull loss accidents.

For more information please visit: http://www.ntsb.gov/publictn/2001/AAR0102.pdf

Case Study

N999LJ – LEARJET 60 – 19 SEP 2008

This case study contains extracts from the NTSB report of the September 19, 2008, accident involving a Bombardier Learjet Model 60, which overran runway 11 during a rejected takeoff at Columbia Metropolitan Airport, South Carolina, USA. In this tragic accident, the captain, the first officer, and two passengers were killed; two other passengers were seriously injured.

The National Transportation Safety Board determines that the probable cause of this accident was the operator’s inadequate maintenance of the airplane’s tires, which resulted in multiple tire failures during takeoff roll due to severe under-inflation, and the captain’s execution of a rejected takeoff (RTO) after V1, which was inconsistent with training and Standard Operating Procedures. Contributing to the accident were (1) deficiencies in Learjet’s design of and the Federal Aviation Administration’s (FAA) certification of the Learjet Model 60’s thrust reverser system, (2) the inadequacy of Learjet’s safety analysis and the FAA’s review of it, which failed to detect and correct the thrust reverser and wheel well design deficiencies after a 2001 uncommanded forward thrust accident; (3) inadequate industry training standards for flight crews in tire failure scenarios; and (4) the flight crew’s poor crew resource management (CRM).

Review of the cockpit voice recorder (CVR) transcript revealed that the flight crew received clearance instructions from the CAE ground controller at
2347:04 to taxi from the northeast FBO’s parking ramp to runway 11. After a short discussion with the first officer about which way to turn, the captain, who was the pilot flying, turned the airplane left onto taxiway U. The controller provided an amended taxi clearance after noticing that the airplane had turned the wrong way. The flight crew followed the amended taxi clearance, which involved back-tracking the airplane on runway 11 and performing a 180° turn on the runway to position the airplane for takeoff. At 2351:22, the captain briefed the RTO procedure and stated, “we’ve got plenty of runway so we’ll abort for anything below eighty knots, after V-One and before V-Two, engine failure fire malfunction loss of directional control all the big things, after V-two we’ll go ahead and take it into the air treat it as an in-flight emergency.”

The first officer replied, “correct.” The captain asked if the first officer had any questions, and the first officer asked, “reference the, ah between eighty and ah V-One you’re only ah, aborting for the fire, failure, loss of directional control?” The captain replied, “yes,” then added, “or an inadvertent thrust-, ah, T-R (reverser) deployment.” The first officer then stated, “that will ah, cause the loss of directional control I guess,” to which the captain replied, “exactly hah they go together.” The first officer later stated, “well eh if the runway is long I abort but if it’s short I kinda do different briefing depending on what the length of the runway is, but we’re pretty heavy so it’s probably not a bad idea.” The CVR transcript indicated that the flight crew continued performing pre-takeoff checklist items and that the captain requested wind information.

Editor’s Note: It is worth noting here that, although post-accident estimates indicated that the airplane’s maximum gross weight may have been exceeded by up to 300 pounds, there is no evidence that weight and balance issues contributed to the accident. Certainly the aircraft could be considered “heavy” when discussing RTO situations.

The captain initiated the takeoff roll, and, at 2355:00.1, the first officer stated, “eighty knots. Crosscheck,” to which the captain replied, “check.” At 2355:10.5, the first officer reported, “V-One.”

About 1.5 seconds later, the CVR captured the beginning of a loud rumbling sound. Post-accident sound spectrum and airplane performance studies indicated that the airplane’s position on the runway at the onset of the loud rumbling sound corresponded with the location where the first main landing gear (MLG) tire fragments were found. Four-tenths second after the beginning of the loud rumbling sound, the first officer stated, “go,” the captain stated something unintelligible, and, at 2355:13.0, the first officer stated, “go go go.”

The CVR recorded a sound similar to a metallic click, and, at 2355:14.0, the captain stated, “go?” Post-accident sound spectrum and airplane performance studies estimated that, about this time, the airplane’s ground speed reached a peak of about 144kts. The first officer then stated, “no? ar-alright. Get, ah what was that?” The CVR recorded another metallic click sound, and, at 2355:17.0, the captain stated, “I don’t know. We’re not goin’ though.”

At 2355:18.4, another metallic click sound was recorded, and, at 2355:19.5, the captain stated, “full out.” Post-accident performance studies indicated that the airplane was decelerating. Within 1 second, the CVR captured a sound consistent with the application of wheel braking, and, at 2355:21.6, the CVR captured a sound consistent with the nose-wheel steering disconnect warning tone. Post-accident performance studies indicated that the airplane had then accelerated.

About 7 seconds later, the first officer stated, “shut ’em off,” and, at 2355:32.4, the first officer stated, “they’re shut off they’re shut off.” At 2355:36.0, the first officer made a radio transmission on the CAE tower control frequency, saying, “roll the equipment we’re goin’ off the end.” The CVR recording ended at 2355:41.1.

Significant causal factors identified as follows:

1) In the absence of evidence that the airplane was uncontrollable, the captain’s execution of a rejected takeoff for an unknown anomaly after the airplane’s speed had passed V1 was inconsistent with training and standard operating procedures. RTO initiated at 144 knots (V1 speed 135Kts).

2) All four main landing gear tires on the airplane were operating while severely underinflated during the takeoff roll, which resulted in the tire failures.

3) Learjet’s system safety analysis for and the Federal Aviation Administration’s review of the Learjet 60’s thrust reverser system modification and revised crew procedure were inadequate, because they failed to effectively address an unsafe condition for all phases of flight, specifically, uncommanded forward thrust during a rejected takeoff.

4) The accident pilots would have been better prepared to recognize the tire failure and to
continue the takeoff if they had received realistic training in a flight simulator on the recognition of and proper response to tire failures occurring during takeoff.

5) The captain’s indecision in responding to the anomaly and failure to follow standard operating procedures was the result of a combination of poor crew resource management skills, limited experience as a pilot-in-command in the Learjet 60, and, during the accident sequence in particular, their less than confident and assertive leadership in the cockpit. Although flight crew impairment related to diphenhydramine use or fatigue is possible, there is insufficient evidence to determine to what extent, if any, diphenhydramine use or fatigue may have affected the captain’s and the first officer’s performance.

Editor’s Note: Levels of Diphenhydramine were detected in the bodies of both pilots during Post Mortem examination. This drug is commonly found in hayfever treatments and sleep inducing medicines and can cause drowsiness.

For more information, please visit: http://www.ntsb.gov/publictn/2010/AAR1002.pdf

Safety Policy

We recognize that Safety is the number one aviation priority and will take all necessary steps to ensure the Safety and Security of our passengers, employees and equipment.

We strongly support a Non-Punitive, but just culture in our approach to establishing all possible systemic and proactive safety procedures required to ensure that safety will not be jeopardized or compromised.

To achieve our goals, we will provide all the necessary resources to run an aggressive Safety Management System which will encourage reporting any trends that affect or could affect safety.

All nominated Postholders, area managers and officers are responsible in implementing and monitoring, each in their area of operation, the safe and healthy operational performance of their personnel and equipment. This should include continuous risk assessments that could or will minimize the effect of any risks.

It is always the responsibility of every employee to report all issues that could affect safety. Employees are encouraged to provide all the necessary help to promote safety.

The Safety Manager’s main duty, is to report directly to the Accountable Manager whose responsibility will be to implement and monitor a healthy and efficient Safety Management System.

C.E.O & Accountable Manager
Capt. James McBride

Signed
Blue Skies

Safety is our number one priority