

AIR SHOW ACCIDENT OVERVIEW 2008

DISPLAY SAFETY FOCUS 2008

By Des Barker

By the end of February 2008, with no reported airshow accidents or incidents worldwide, safety analysts contemplated that just maybe, the 2008 Airshow Accident and Incident Overview would be a blank page with some bold print reading: “Zero Airshow Accidents in 2008”.

Unfortunately, this illusory state of affairs was just a figment of the imagination. But, was it really that far-fetched? Was it really that unrealistic considering that in previous years, the months of January and February had typically experienced several accidents within the first two months of the year?

Just maybe, the efforts launched by the United States’ International Council of Airshows (ICAS), the European Airshow Council (EAC) and the Air Show Society of South Africa (ASSA), following the exceptionally bad airshow safety statistics of 2007, had been taken to heart and that display pilots, organisers and display safety officers worldwide would be exercising their safety mandates to full effect.

The focus area for 2008 by the ICAS, EAC and ASSA, was to attempt to bring airshow accidents and incidents down at all costs and one could therefore be forgiven for having thought that the zero accident rate during the first two months raised the possibility of achieving zero accident rate.

However, March 2008 soon brought the airshow circuit back to reality with a thump; in fact, the first accident was recorded promptly on 1 March 2008 – just to dispel any form of unwarranted fervour.

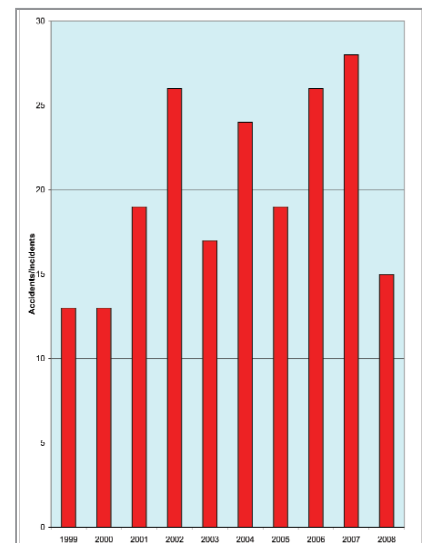
Accident/Incident Analysis

The year was characterised by a sharp reduction in accidents and incidents with a total of only 15 being registered versus the 27 of the previous year, 45% less. What was more surprising, though, was the number of accidents that occurred during what were essentially ground operations such as the take-off and landing phases of flight, with resultant loss life. Of concern to airshow organisers and safety officers, however, were the spectator injuries attributable to the Zlin departing the runway at Kindel, Germany, on 26 April 2008.

One of the major planning efforts of organisers and safety officers is that of spectator safety and the implementation of regulations governing the distance from the display line and the spectator enclosure which are usually rigidly executed and policed.

The dramatic image above was captured by pilot and journalist, David Cenciotti, of the Agusta Westland NH-90 impacting Rome’s Lake Bracciano, a mere 10m away from waterborne spectators.

The question is: “How does the safety officer plan for so-called “rogue” aircraft departing the show line while on the ground and penetrating the designated safe spectator areas?”



The bottom line is that despite show organisers complying with safety regulations and keeping spectators out of the way, there is no way that spectators can be guaranteed total safety from such rogue aircraft trajectories.

A total of 15 accidents and incidents was recorded during the 2008 season, involving 17 aircraft, in which 6 pilots were killed and 5 injured. During the 2007 season, 31 aircraft were involved in which 13 pilots were killed, 2 pilots, eleven spectators and two race judges were injured; the worst accident rate on record in 101 years. The 2008 accident/incident rate of 15 was significantly lower than the 20,7 average for the preceding 10 years.

Other observations were that eleven of the fifteen accidents and incidents occurred during actual airshows and for first time in many years, there were no formation aerobatic incidents. Only three of the accidents/incidents were attributable to military participants, the other twelve were all civilian aircraft.

Not surprisingly, the primary cause, *flight into terrain* at 27%, remained the highest causal factor, with *loss of control* following at 20%. *mechanical causes* increased by 5% to 20% against the 101-year average. With two structural failures occurring, an increase to 13% over the 101-year average from 8%, was statistically significant. It is quite uncanny how closely the accident annual statistics follow the 101-year trends.

Does this imply that display pilots are not learning from the analysis of airshow accidents, or rather that the fickleness of human judgement in the low level display arena is the weakest link in the display safety chain and therefore, a zero accident rate is not possible?

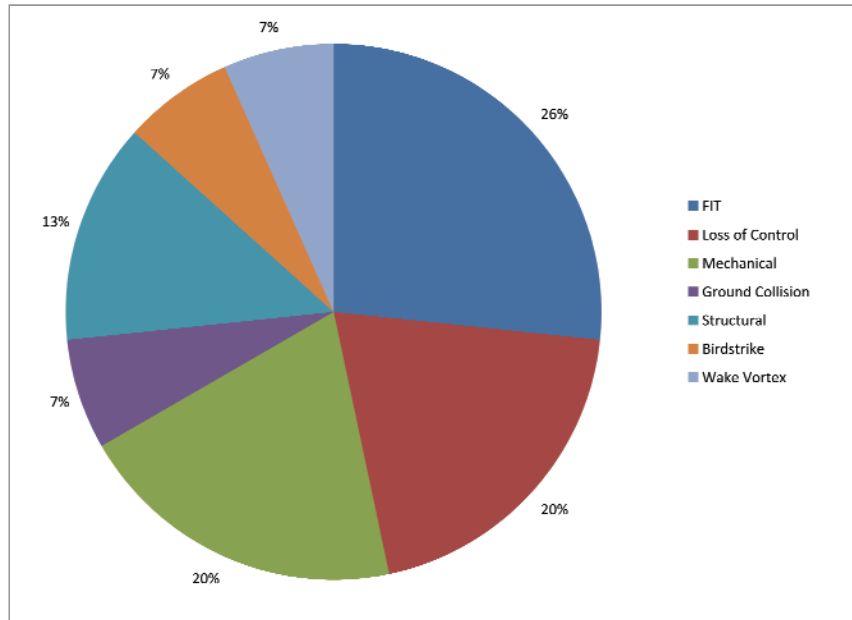
The question that must be asked though, is: *What education and training is being implemented worldwide to compensate for human judgement fickleness during low level display flying?*

**1 MARCH 2008:
VELOCITY XL RG
(FLORIDA, USA)**

There was little good to report in the aftermath of a tragic ground collision that took the lives of three pilots attending a monthly *EAA Chapter 86 "Pancake Breakfast"*, but for the fact that a fourth person (the pilot of the Velocity XL RG), survived the accident.

The accident took place as two aircraft, the one on a go-around from a balked landing approach, and the other one taxiing, collided with each other.

Witnesses stated that a flight of four RV-



8s had landed in turn and were exiting the runway at Bravo intersection. The lead RV-8 had entered the intersection when it was struck from the left side by a Velocity that had just landed on runway 15 behind the flight of four RV-8s.

The Velocity had committed to a go-around due to its high closure rate when it drifted from the runway far enough on the left side to collide with the RV-8, impacting in a left bank and with full engine power. Both aircraft exploded into a fire ball.

No air traffic control facilities were available at the airfield which may have been a contributory cause to this accident.

**27 APRIL 2008:
SPITFIRE/HURRICANE
(GALVESTON, USA)**

In what was nearly a *'d  ja vu'* of the 2007 Oshkosh Mustang accident, the Lone Star Flight Museum Airshow at Galveston suffered the ignominy of seeing a two-seat Spitfire collide with a newly restored Hawker Hurricane during the landing roll.

A group of vintage aircraft had just landed from a WWII fighter demonstration of multiple aircraft.

The Hurricane had come to a stop on the runway when it was struck by the Spitfire's wing. In the process, the Hurricane had its left wing tip and vertical fin damaged, while the Spitfire's left main wheel collapsed and the aircraft nosed-over, causing significant damage to the engine and propeller; good news though, was that both pilots emerged unscathed.

Sadly, this was the first airshow for the Hurricane which had recently completed a sixteen year restoration.

The initial investigation concluded that the Hurricane was at taxi speed when a

brake problem caused a slow ground loop to the left resulting in the Spitfire impacting the tail and left wing.

"Even though we brief, execute the brief flawlessly, and do everything we can, there are still inherent risks and hazards, but thankfully no one was hurt," said Gregory, owner and pilot of several vintage aircraft.

The Hurricane is currently being repaired to flying status.



**26 APRIL 2008:
ZLIN Z-37A "BUMBLEBEE"
(EISENACH, GERMANY)**

In what was an airshow organiser's 'nightmare scenario', a "rogue" aircraft departed the runway during take-off, veering sharply to its right at an aggressive rate, typical of a locked-up brake or tyre failure, before impacting a nearby children's attraction, a carousel which was fortunately not in operation at the time and a candy stand.

The aircraft, without much deceleration, careened through the safety area and barrier separating the spectators from the showline, and impacted the stalls.

Headlines in international newspapers and TV broadcasts announced: "German Airshow Accident Kills Spectator". A crop-dusting Zlin Z-37A "Bumblebee" being

flown at Kindel Airfield, Germany, was involved in an accident that killed a 45-year old woman spectator, and injured fifteen others. The event was cancelled as civil aviation accident investigators began their investigations to determine the cause and the implementation of safety regulations.



Pic: Michael Horn

**10 MAY 2008:
ZLIN 50LX
(MODESTO, USA)**

A 66-year-old display pilot was seriously injured when his single-engined Zlin 50LX crashed while doing a series of straight rolls at the 14th annual Modesto Airport Appreciation Day in front of a crowd of approximately 4 000. Rob Harrison, also known by his performance name, “The Tumbling Bear,” was taken by helicopter to Memorial Medical Centre, where he was listed in serious condition having broken both ankles, some bones in his left hand and fractured several ribs.

The crash was the first at the air show in its 13-year history.

Harrison, on his final run-in to complete his airshow, set up for a series of low-level, straight rolls left. Approximately two rolls before the crash impact, it became clear to experienced observers that the nose had ‘buried’. This was evidently not obvious to the pilot, but during the last roll before impact, the trajectory had changed from straight roll to an exaggerated ‘barrel roll’.

An eyewitness stated that he saw the unexpected. “The aircraft just slammed right into the ground. The pilot miraculously, partially pulled himself out of the wreck and waved his hand high like he was saying, “Here I am, I’m OK, I’m OK.”

The crash rescue team responded immediately to a small fire which was sparked at the crash site, and suppressed the flames. Harrison was pulled from the wreckage by the firefighters and handed off to ambulance personnel for treatment within 21 minutes before being dispatched to hospital.

The air show continued after the crash,

but only with radio-controlled planes. Harrison had been involved in flying since age 6 and had given more than 300 performances as of 2007. Rob Harrison is also one lucky guy.

**27 MAY 2008:
DORNIER S-RAY 007:
(BERLIN GERMANY)**

Following on from the Bf-109 ground accident, the incident gods decided to strike another blow to the airshow organisers when two Indian Air Force Dhruv helicopters from the *Sarangs Aerobatic Team* air taxied directly overhead the S-Ray waiting at the holding point for take-off. Needless to say, their thoughtless behaviour resulted in the relatively light aircraft being lifted up and tipped over to one side.



Pic: Kai Block

**27 MAY 2008:
MESSERSCHMITT ME-109
(BERLIN, GERMANY)**

The restored Bf 109 G-10 “Black 2” (a hybrid Spanish 109 retrofitted with a Daimler engine) of EADS Heritage Flight, was damaged during landing at the Berlin Airshow as a result of an undercarriage problem. The Bf-109, one of 33 000 built, had just completed a flying display in formation with a replica of Nazi Germany’s Me-262 turbo-jet fighter.

The historic flight aircraft skidded off the side of the runway at the Berlin-Schoenefeld airport, shortly after the official opening of the annual Berlin Air Show. The aircraft was not seriously damaged except for its right wingtip which dragged across the ground, apparently after its right-side undercarriage had collapsed on landing and it had skidded onto the grass next to the runway.

The pilot, Walter Eichhorn, jumped clear and waited alongside the immobilised aircraft as airport fire crews raced to check that there was no fire threat. Regular airline take-offs and landings had to be halted during the emergency.

**1 JUNE 2008:
AGUSTA WESTLAND NH-90
(ROME, ITALY)**

An Italian army NH90 helicopter was taking part in the Vigna di Valle Airshow

when it crashed into Lake Bracciano, north of Rome during a public flight demonstration at Italy’s Airshow Club, killing a member of the crew. The helicopter pulled up into a stall turn to the right but with insufficient height available to complete the dive recovery safely, the helicopter impacted the lake surface and scattered debris in all directions while spectators stood in awe of the unfolding catastrophe.

The three crew members were rescued and taken to hospital, where one of them, Capt. Filippo Fornassi, died. Fornassi had 4 000 flight hours. The first Italian Army tactical transport version NH90s were officially handed over to the Army in December 2007.

An eyewitness stated: “I was attending the show when I saw the helicopter performing a fiesler with an apex at low altitude: as soon as the aircraft’s nose was diving towards the lake, I understood that the pilot could not recover the chopper before touching the water. The aircraft touched the surface of water and broke up in many pieces before sinking”.

The fact that no collateral damage or injury was caused to boats on the lake was most fortuitous. The question that requires asking is how safety officers allowed boats on to the lake along the display line? The implications of recreational boaters deaths from the accident is too dastardly to consider.

**13 JUNE 2008:
SCHWEIZER HELICOPTER 269C
(UTAH, USA)**

A rather melodramatic report in a local Fairfield newspaper: “After 56 years of flying helicopters, a man from England did something today in Lehi he had never done before. He crashed!”

Fortunately, the pilot, Dennis Kenyon, was able to walk away with just a few scratches.

The report added: “It’s amazing he hasn’t done this before, especially when you consider he has more than 13 000 hours in the air as a helicopter pilot; and not as just any helicopter pilot, but as an acrobatic helicopter pilot and former world freestyle champion.”

The flying ended early on the first day of an informal rotorcraft meet in Utah for a small group of experimental rotorcraft enthusiasts on hand at West Desert Airpark, in Fairfield, to enjoy an informal demo by Kenyon, who had been involved in helicopter sales and training in Southern England since the early 1970s. Kenton lifted off at near midday and demonstrated some precision ground work on the tip of one skid.

After climbing to perform some more aggressive flight manoeuvres, Kenton pulled-up for a wingover. As he exited the manoeuvre and rounded out the bottom of a swooping descent, he impacted the ground.

The helicopter came down hard on the skids, struck a rotor blade and tumbled into the dirt. As the dust cleared and on-lookers ran to assist, Kenyon crawled from the wreckage, stood up and said, "I feel stupid."

After the Schweitzer made its last, ignominious taxi to a storage hangar, powered by John Deere, airport owner Mark Pringle said plans for the Saturday show would continue as scheduled. Kenyon said the crash was his mistake. "Having happened to me for the first time in 56 years, I was concerned. What have I done?" asked Kenyon. On the brink of retirement, Kenyon thought he would end his career with a big stunt. Now, that seems unlikely.

Dennis Kenyon, up to this accident, had logged over 13 000 accident free hours and has put on over 1 200 displays; he was certified by the CAA as a display pilot. He had arrived from the UK just a day before the event and was operating at a field elevation of almost 5 000 ft and an OAT of

32°C, to which he was not accustomed.

He was, however, aware of the higher density altitude and had practiced earlier in the day. He had flown for an hour and a half practicing prior to the show.

To compensate for the high density altitude, he had the helicopter 300 lbs lighter in fuel for the show, and lifted the height of each manoeuvre by 50 foot and speed by 10 knots. He said: "it was not enough, and I just didn't have enough induced lift to recover from the steep descent following the 270° wing over."

He felt that not being used to Utah's density altitude had contributed to the accident.

**24 JUNE 24, 2008:
BOEING EF-18 HORNET
(LEEUWARDEN, NETHERLANDS)**

The pressure involved in display flying is well understood by the more experienced display pilots, to such an extent, that at a certain period prior to the display, they 'get into the zone' by focussing exclusively on the upcoming display.

They also ensure that their support team gets 'into the zone' at the same time and that they will not be pressurised into displaying an unserviceable aircraft.

On the annual Open Day of the Dutch Air

Force at Leeuwarden Airbase, the Spanish Air Force EF-18 experienced a problem during its routine. Right after take-off, in full afterburner mode, the left main landing gear did not retract. The show was aborted and during a wide downwind leg, the nose-wheel and the right main landing gear were lowered. In a low level flyby, the ground-crew did a visual check and confirmed that all wheels were down. After landing, the problem was identified as an undercarriage safety-pin that had not been removed by the technicians nor detected by the display pilot during the pre-flight inspection. The pilot took off for the second time to perform his show approximately one hour later.

**13 JULY 2008:
NORTH AMERICAN P-51D
MUSTANG. (DUXFORD, UK)**

On Day 2 of Duxford's Flying Legends, as *Miss Helen* was coming in to land, her engine appeared to be spluttering and smoke streamed from the exhausts. She seemed to lose airspeed as she approached the runway and came down on the airfield quite heavily and bounced high.

An eyewitness said: "Her first touchdown was very short, well outside the taxiway and the bounce was extremely high, in fact I thought it was going to cartwheel.



Pic: Kevin Barker

From what I could see after that, she came to a stop at right angles to the runway heading; it looked like one of her main undercarriage legs was slightly out of shape”

Pilot, Pete John, did an exceptional job when the engine more or less quit on final approach. He selected flap to minimum drag and got the nose down as much as he could and as a consequence, made the airfield, but then had to contend with the taxiway which unfortunately was raised and propelled the aircraft back into the air with little airspeed. But for the elevated taxiway, he would probably have got away with just a very firm landing.

A very despondent and visibly hacked off pilot exited the aircraft throwing his gloves down and burying his head in his hands on the wing for a minute or so. Well handled, though



**17 AUGUST 2008:
REPLICA NIEUPOINT
(RHINEBECK, NEW YORK, USA)**

The world famous Old Rhinebeck Aerodrome suffered a tragedy when a simulated dogfight, part of a scheduled aerial performance for this New York area tourist mainstay, went horribly wrong.

The act involved two aircraft, one of them a replica French WWI Nieuport biplane and the other, a German WWI replica Fokker DR-1 triplane warbird of the same period. The German warbird was often the “villain” in a number of the Rhinebeck re-enactments.

No midair collision was reported. The NTSB accident investigation reported that an amateur-built Nieuport 24bis, N5246, was destroyed when it impacted trees and terrain while manoeuvring near Old Rhinebeck Airport, fatally injuring the certificated airline transport pilot.

According to preliminary information provided by an FAA inspector, the two airplane aerial demonstration of World War I vintage aircraft were simulating a “dogfight.” at about 300 feet above ground level.

According to the pilot of the Fokker, he and the accident pilot briefed prior the flight, and the accident pilot departed first in the Nieuport. The Fokker pilot then followed behind the Nieuport while they per-



Spanish EF-18 with a gear retraction problem

Pic: Joris van Boven / Sentry Aviation News

formed a 360° turn, followed by a “lead change,” where the trailing airplane would turn first, and the previous lead airplane would follow. The Nieuport then followed the Fokker for another 360° turn, before performing another lead change at show centre. After a third 360° turn, both airplanes proceeded east before turning away from each other, the Nieuport going south and the Fokker north.

As the Fokker turned back around toward the show line, he noticed the Nieuport beginning a left turn. The Fokker pilot looked away for a moment and he next saw the Nieuport in “what looked to be a 3-turn spin to the left,” before it disappeared into the trees below. The Fokker pilot subsequently circled the accident site in order to help first responders on the ground locate the wreckage that had been consumed by a post impact fire.

According to training documents maintained by the operator, as of 8 August 2008, the pilot had accumulated 3 881 total hours of flight experience, 2 372 hours of which were in tail-wheel equipped airplanes. Additionally, the pilot completed the operator’s initial qualification training in the Nieuport 24 on 10 July 2008.

According to the qualification record, the pilot had completed five flights, for a total of 10 hours of training. According to the FAA inspector, the pilot had flown about 3 additional hours in the accident airplane since that time. (NTSB Identification: NYC08LA28114)

**8 SEPTEMBER 2008:
CASSUTT IIIM RACER
(RENO, USA)**

With the annual excitement of the Reno air races not quite underway, a tragic accident took the life of Formula One air-racer Erica Simpson, 32, of Phillipsburg, N.J., in the process of final preparation for her race.

Flying a Cassutt IIIM racer, she was killed when her aircraft suffered a catastrophic structural failure during a validation flight prior to the start of racing on Monday.

Simpson, a 7 000 hour commercial pilot, had previously competed in Reno’s biplane class in 2006.

According to an FAA spokesman, the wing of Simpson’s aircraft separated as she executed a roll; her aircraft came apart and impacted the ground.

Reno 2007 was marred, inexplicably, by three very different accidents that took the lives of three pilots in three separate accidents.

**3 SEPTEMBER 2008:
HONGDU K-8 KARAKORAM
(GWERU, ZIMBABWE)**

An Air Force of Zimbabwe (AFZ) K-8 crashed killing two pilots during a training exercise over the Midlands town of Gweru.

The Chinese-made K-8 Karakoram jet trainer came down near the Thornhill Air Base in Zimbabwe’s midlands during a routine training sortie.

The names of the pilots were withheld, but the Air Force confirmed there were no



Damaged leading edge of the SAAF Museum's Mirage IIICZ

Pic: Anton Dyason

civilian casualties in the crash. "The two pilots were on a routine training sortie when tragedy struck," Air Commodore Shumbayawonda, the AFZ's Director General (Operations) told reporters. Shumbayawonda said the two pilots, attached to No 2 Squadron, "were being trained in performing fly-past stunts which are normally performed during national events such as Independence Day".

20 SEPTEMBER 2008:

**MIRAGE IIICZ
(CAPE TOWN, SOUTH AFRICA)**

Birds remain a constant threat to the display pilot in the low level display environment. Airfields close to the coast pose an even greater birdstrike threat to display aircraft due to the large numbers of seagulls and birds that nest off and around coastlines.

Both Cape Town International and AFB Ysterplaat, the venue for AAD 2008, are continuously under threat from birdstrikes, so it was not unexpected for at least one aircraft to experience a birdstrike during the high intensity of flying during the AAD 2008.

Unfortunately, one of the main attractions, the South African Air Force Museum's Mirage IIICZ "*Black Widow*",

flown by Lt Col Glen Warden, suffered a multiple bird-strike returning to Cape Town International Airport after a practice session at the Africa Aerospace and Defence 2008 air show. The damage was limited to the starboard wing's leading edge, but was sufficiently severe, to prevent the aircraft from taking part in the show.

**31 OCTOBER 2008:
ULTRALIGHT TRAINER
(KISH ISLAND, IRAN)**

The accident happened at the closing ceremony of the Fourth Air International Aviation Exhibition on the southern Iranian island of Kish.

Witnesses stated that the wing of the trainer ripped apart as it was performing a loop; the aircraft impacted the taxiway at the Kish International Airport, claiming the life of its 54-year-old German pilot.

More than 80 light and ultra-light planes were among the attendees to the show. Accident investigator's initial conclusions identified pilot error as the cause. They maintained that the pilot had caused the accident by "failing to show timely reaction while performing an air show".

The direct interpretation of the rather ambiguous finding was that the pilot overstressed the plane during the pullout from

the vertical, resulting in catastrophic structural failure.

2 NOVEMBER 2008:

**REPLICA AVRO 504K
(MASTERTON, NEW ZEALAND)**

The Vintage Aviator Fighter Collection is a joint venture between the Old Stick and Rudder Company and the Vintage Aviator, two groups in New Zealand that work to preserve and fly WWI and WWII aircraft.

After takeoff from Hood Aerodrome during the opening weekend of the Vintage Aviator Fighter Collection showcase, while climbing through approximately 100 ft agl and turning right to parallel runway 24, the aircraft experienced a total loss of engine power.

The 34-year old pilot had no option but to attempt to land the airplane back on the airfield but with no significant energy available, was unable to avoid a stand of willow trees at the end of the runway, getting lodged six metres above the ground.

The pilot climbed down from the aircraft and was uninjured.

Vintage Aviator spokesman, Gene DeMarco, said the plane had been disassembled in the tree and carefully removed. "She needs a little repair but we'll get her going again."

He continued: "Replicas like the Avro take thousands and thousands of hours over a period of years to build, and would be worth over \$100 000. The replica warbird the only plane of its kind in the country, was owned by Wellington-based company, The Vintage Aviator Flight Collection, which had built planes for Peter Jackson's film King Kong.

Gavin Trethewey, who flew the Avro in a mock dogfight at Taupo's Picnic in the Park this year, hoped it could be rebuilt.

"That's really sad, but the main thing is the pilot is okay.

"The aircraft is a fairly gentle old performer and only gets up to around 110 kmh. Because she's made of such light construction, the fabric could all be destroyed."

CONCLUSION

So, Airshow Season 2008 concluded on a much more positive note than that of the preceding two years.

The question that will certainly be asked by the international airshow regulatory bodies is: "Were these significantly reduced accident/incident rates a result of increased safety efforts by all participants, or was it just statistical dispersion?"

The momentum for improved airshow safety has been established. The challenge is to improve even further on airshow safety!



Zimbabwean K-8 Pic: Kevin Barker