

Keynote Speech

By Kevin Hiatt – President & CEO

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Accident Investigation Issues

Good Morning Director Keong, and Investigator Teo of the Air Accident Investigation Bureau, and all of the honored participants of the second annual accident investigation forum. On behalf of the Flight Safety Foundation, I would like to commend you for conducting this Forum. It is my pleasure to provide a perspective viewpoint on accident investigation including the necessity of accident investigation, accident investigation sanctity, accident investigation evolution, and the new frontier of UAV, UAS – Drone accident investigation.

I would first like to mention for those of you who are not familiar with The Flight Safety Foundation, we are an independent, impartial, non-profit, international organization engaged in research, education, advocacy and publishing that strives to reduce risk in aviation operations. The Foundation’s mission is to be the leading voice of aviation safety for the global aerospace community.

The Flight Safety Foundation was started by Jerome “Jerry” Lederer in 1947. Jerry is officially known as the *Father of Aviation Safety,* as decreed by the US Congress in 1996. Other US aviation pioneers such as Orville Wright, Igor Sikorsky and Charles Lindberg helped nurture the only independent and impartial safety organization in the world. The Foundation is made of over 1100 members that contribute resources, funds, and information in order for us to continue to reduce risk in aviation. Some of the over two dozen subjects that we have facilitated have been weather as a contributing factor in air transport accidents, flight data recorders, escape slides, the synthesis of aircraft crash, fire, rescue evacuations, t radar development, terrain avoidance measures, approach-landing accident reduction, fatigue risk management, loss of control in flight, and promoting the gathering of flight information, data analysis, and the distribution of the information in order to reduce the risks in aviation.

The Flight Safety Foundation conducted the first course for civilian aircraft accident investigations at Mitchel Field, a US Air Force Base on Long Island, New York. It was a one week school using instructors from the then Safety Bureau of the Civil Aeronautics Board. That was the forerunner of the US National Transportation Safety Board, NTSB. Then in 1964, the Foundation and the US Government recognized the Society of Aviation Safety Investigators. In 1977 due to the international expansion of the society, it became known as ISASI.

It will be almost four years since the last fatal crash in the United States, a record unmatched since propeller planes gave way to the jet age more than 50 years ago. Globally, last year was the safest since 1945, with 23 deadly accident and 475 fatalities. That was less than half the 1,147 deaths, in 42 crashes, in the year 2000. There are many reasons for this remarkable development. Planes and engines have become more reliable. Advanced navigation and warning technology has sharply reduced once common accidents such as mid air collisions, and crashes into terrain.

All of these accidents were investigated by entities made up of individuals like you. The primary reason is to find out what happened and prevent it from happening again. Deborah Hersman, Chair of the NTSB said “The lessons of accidents used to be written in blood, where you had to have an accident, and kill people to change procedures, or policy, or training. That is not the case anymore. We have a much more proactive approach to safety.” So one could say- we have all done a great job and we can go home….no need for any more safety departments or accident investigations. I say “not so fast.”

Since many accidents consist of a series of events which terminate in the actual impact, is it often difficult to segregate the cause from one of the events. Lately, the series of events have been due to more human factors such as a loss of control or situational awareness instead of a mechanical failure. The design and technology of modern day aircraft have contributed to the safety record we are seeing today in the western world. However, accident investigation is still needed more than ever in other parts of the world due to a lack of operational understanding of all the factors that affect reducing the risk. Modern aircraft have played a big role in reducing the risk and number of accidents. However, they are only as safe as the persons who operate them, including the management culture of the operator and the pilot who actually flies the plane.

Determination as to the probable cause of an accident is at best a controversial matter and as a matter of fact has been the subject of argument since 1935 when the Air Commerce act in the United States was amended to require reports on fatal accidents. Accident and operational data is being collected more than it has ever been before. Government and industry are sharing data like never before. Yet the risks in sharing the data are still there. ICAO convened a Safety Information Protection Task Force to help understand and move toward a resolution in how accident investigation and safety data will be used. Sensitive areas such as different state interpretations and local laws still cause a hesitancy to be forthcoming and share data. Family assistance groups and attorneys are factoring into accident investigations and potentially promote litigation which compounds the entire process of data sharing for the need to prevent future accidents for happening. The Foundation supports protection of voluntary safety information programs and not using accident investigation findings for litigation purposes. However, if obvious gross negligence is found, then there should be some accountability. It is a very thin line to walk for all that are involved.

Accident investigators must possess high moral values, and formal standardized investigation procedures are required in order to bring validity to an investigation. Accident investigation boards have more openness to data-mining methods pioneered by the airlines and civil aviation authorities. A few AIBs envision complimenting their own safety-intelligence resources by partnering with CAAs for access to aggregated, de-identified airline data.

This suggests that with today’s sophisticated data and tools, accident investigation could become a thing of the past. The reality is that using the data is the foundational tool but it can be more predictive. In real time, with thousands of flights, figuring out what the data is telling you needs to be further refined. Continuing to use the “tin-kicking” investigation and taking advantage of tools that mine data to map trends, will move us from the reactive to the predictive.

So long as accidents are possible, aircraft such as the Airbus 380 and the Boeing 787 and other advanced technology jets will be equipped with cutting edge devices that will faithfully capture what happens during each flight. A good example is the 787 which will incorporate dual enhanced airborne flight recorders (EAFRs). This design will reflect the world’s newest specifications for airplanes that have fiber-optic aircraft data networks as part of their digital structure.

The GE Aviation EAFR as currently configured can record approximately 2,000 parameters for 50 hours, verses older FDRs that have 88 parameters and 25 hours. (I can remember in my early investigation training learning about the silver tape models that had 20 parameters) Considering the nearly 23-fold increase in recorder parameters, this will enable accident investigators anywhere to have a consistent accessible, complete and accurate interpretation of flight data.

Essentially, EAFRs will position the industry to respond to many issues identified by the accident investigation community. Further proposals include an increase in recording durations, add data link message recording, increase the data-recording rate from sensor signals, and make more reliable the power supply to all recorders. Adding real time transmission capability outside of the normal ACARS will also become more prevalent as we move the technology forward.

Unmanned aircraft systems are evolving as fast at commercial jet airliners were in the late 1950s. According to Tom Farrier, a Principle Safety Analyst and Chair of the ISASI Unmanned Aircraft Systems Working Group, “the number of unmanned aircraft likely to be conducting civil operations in just a few years is completely out of proportion with the body of experience-based knowledge that has been assembled to date.” Previous aviation safety lessons were learned incrementally, now the UAS generation of safety challenges are potentially hidden within the established structure and not totally understood by the supplier and the operator.

The accident investigation community has some challenges. UAS accidents may not be investigated like aircraft accidents. Based on the size, nature of the event, and the damage created a UAS accident may not be investigated. Unmanned aircraft that malfunction (crash) with no resulting effect on manned aircraft around them, or significant loss/damage to property, will be low on the priority to be investigated and then by whom? There will most likely be a reluctance of the stakeholder to require unmanned aircraft and their pilots to meet the same standards as those expect of a manned aircraft and their pilots. UAS manufacturers with a lack of experience regarding safety issues and risk will need to become more aware of the current system and how it works.

One defining moment will be when a civilian aerial survey UAS does crash into a populated area. Who will conduct the investigation? What type of investigators will be used and what training have they had on this UAS? Will we see a split in the standards from manned aircraft processes and that of the unmanned operator being held accountable in a court of law? Through advance considerations of these factors, incorporation into a set of appropriate regulations will be important, and investigators will then have the parameters needed to effectively conduct an investigation.

Just looking at the nuts and bolts of this, the mechanic/technician will now become more of a focal point than ever before. They are the one closer to the UAS care and programming more than anyone else. Investigators will no doubt be interviewing them a lot.

As I look ahead and try to predict what the challenges will be for aviation accident investigators, I will agree with Frank Del Grandio, the president of ISASI. Looking at the metrics of the recent years, 77% of the westernized world will be focusing on data in order to “squeeze still more safety from the system.” The other parts of the world are still mired down with old technology and infrastructure that will continue to contribute to accidents. These are the parts of the world we will need to focus our efforts on. It is no secret that Africa, Russia, India and parts of Indonesia are accounting for the higher metrics in aircraft accidents.

Collaboration on the issues will be the only way we can mitigate this problem. It must start with ICAO continuing to be the organization that provides the standards and then the regulators within the states providing the oversight. Industry and organizations such as ISASI and the Flight Safety Foundation will facilitate solutions, along with institutions such as the Singapore Aviation Academy providing forums, such as this, and training, we will continue to make flying the safest form of travel today!

Thank You!