

**Acting Chairman Christopher A. Hart
International Air Transport Association
Cabin Operations Safety Conference
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Thank you, Mike, for that gracious introduction. And I would like to thank IATA for inviting the National Transportation Safety Board to address this first-ever Cabin Operations Safety Conference. I applaud IATA for taking the initiative to organize this event and to raise this dialogue to a new level. Thank you for your leadership.

I am also excited to see that a delegation is here from ICAO, and I know that many of you took advantage of their sessions among yesterday's cabin crew safety workshops.

The reason I am excited about this first-ever conference, and about attendance by a delegation from ICAO, is that I believe that in the future, cabin safety will become an increasingly prominent component of overall aviation safety.

Conventional wisdom is that aviation accidents are not generally survivable. The reality, however, is quite the contrary. In 2001 the NTSB published a survivability study, looking at 568 accidents involving U.S. scheduled commercial airliners from 1983 through 2000. Contrary to conventional wisdom, 95 percent of the occupants in those accidents survived.

Of those 568 accidents, 26 were especially serious, meaning that there was at least one serious injury, substantial damage to the airplane, and a fire. Even in those accidents, more than half survived.

Of those 26 serious accidents, 19 were considered survivable. In those 19 survivable accidents, more than three-fourths of the occupants survived.

Although this high survivability rate might surprise the general public, it is no surprise to you in the international commercial aviation community. The likelihood of surviving the crash itself is the reason that you have put so much effort over the years into enhancements such as improved flammability standards, 16-G seats, and more robust overhead baggage bins. Before these improvements were widely deployed in commercial aviation, post-impact factors were more likely to cause fatalities even when the impact of the crash did not.

Let me suggest to you that the likelihood of surviving a crash is even greater today than it was in those accidents that we reviewed from 1983 to 2000. Today, technologies such as Traffic Collision Alert Systems (TCAS) and Enhanced Ground Proximity Warning Systems (EGPWS) are widely deployed in commercial aviation. Thanks to these and other advanced technologies, enroute accidents that are generally less likely to be survivable, such as midair collisions and Controlled Flight Into Terrain (CFIT), are less likely to happen.

Obviously the most effective safety improvements are those that prevent accidents in the first place. In the U.S., we have found that a very effective way to prevent accidents and fatalities is collaboration. It is a process called the Commercial Aviation Safety Team, or CAST – and there are similar models in other countries.

CAST brings together all the players in aviation – airlines, manufacturers, pilots, air traffic controllers, and the regulator, i.e., everyone who has any involvement in the operation – to work collaboratively.

These industry elements come together to identify potential safety issues; prioritize those issues – because they will identify more issues than they have resources to address; develop interventions to address the prioritized issues; and then evaluate whether the interventions are working.

The result has been a major win-win: The CAST process resulted in a reduction of the U.S. airline fatal accident rate by more than 80 percent in its first ten years. This amazing accident rate reduction was from a rate that, after declining for decades, had begun to stop declining and had been “stuck on a plateau” for several years. The win-win is that while safety was being improved, productivity was improved as well.

The moral of this collaborative win-win success story is very simple: Anyone who is involved in a problem should be involved in developing the solution.

For those accidents that may still occur in the future despite the variety and effectiveness of accident prevention efforts, I would submit that cabin safety improvements will become ever more important because an increasing percentage of crashes will be at or near an airport, and the fatality rate from the impact of the crash will be even less than for the accidents that we studied from 1983 to 2000.

Here are some recent examples of accidents in which no, or very few, fatalities resulted from impact forces:

- 2005: Airbus A340 runway excursion after landing in Toronto – no fatalities, even though three passengers were in wheel chairs and one was blind;
- 2008: Boeing 777 dual engine failure on approach to London Heathrow – no fatalities;
- 2008: Boeing 737 runway excursion during an aborted takeoff in Denver – no fatalities;
- 2009: Airbus A320 landing in the Hudson River in New York after ingestion of birds caused dual engine failure – no fatalities;

- 2009: Boeing 737 crash short of the runway in Amsterdam – nine fatalities out of 134 passengers and crew; and
- 2013: Boeing 777 crash short of the runway in San Francisco – three fatalities out of 307 passengers and crew.

The very high survival rates in these accidents are the result of improvements in engineering, crew training, safety risk management, and many other factors. We have made great headway in driving down the number of accidents. Now we must focus more on cabin safety improvements to further increase the survivability of the ever fewer accidents that do happen – more cases where everybody survives.

That's why I am very excited to see this attention being paid to improving cabin safety – because I think that improved cabin safety will play an increasing role in the survivability of future accidents.

At the NTSB we investigate accidents, determine the probable cause of those accidents, and make recommendations to prevent recurrences. We look at every aspect of aviation accidents – not just **why** an accident happened, but also the extent to which the accident was, or could have been, more survivable.

We are not a regulator, but it is a testament to the thoroughness of our investigators and analysts that more than 80% of our recommendations are responded to favorably.

The Boeing 777 crash last year in San Francisco, mentioned above in the examples, resulted in the first fatality in a scheduled commercial flight in the U.S. in four and a half years. Regrettably, as I noted, there were three fatalities in that accident. To their families and friends, we offer our deepest condolences. There was intense media attention about the crash and speculation about what caused that accident. But the key to that accident that is relevant to this conference, as I noted before, is that more than 99% of the occupants survived.

In that accident, the airplane struck a seawall short of the runway and the tail broke off at the aft pressure bulkhead. The airplane slid along the runway before the fuselage lifted into an approximate 30-degree nose-down angle and pivoted about 330 degrees before coming to rest off the runway. The aircraft's two engines were separated from the plane during the accident sequence, and oil came in contact with the right engine, resulting in a post-crash fire.

We are investigating not only what caused the accident, but also how to improve the survivability even further. Last December, we held a public hearing as part of our investigation. We had the opportunity to review some of the advances in crashworthiness with the experts. We asked a lot of questions not only about what did not work, but also about what did.

Our investigation of that accident is looking into how fire-resistant materials performed and how the 16-G seats performed. We are also investigating the performance of the evacuation slide/rafts because two of them were damaged and became inflated inside the airplane, pinning two flight attendants in their seats.

The efforts of the cabin manager, a flight attendant, and a passenger – the trapped flight attendant’s husband – were necessary to free one of the trapped flight attendants. The other one was freed when the cabin manager retrieved a knife from a galley and the first officer used it to puncture the slide/raft.

Elsewhere on the plane, once all the other passengers were evacuated, one flight attendant noticed that some had not left their seats. They, too, had become trapped. In a crew interview, she recounted staying behind in the burning plane trying to extricate trapped passengers until firefighters arrived. She was finally forced out by the smoke of the post-crash fire.

Many things had to go right in order for more than 300 passengers and crew to survive. But some things still went wrong, and could have made this accident worse.

In the case of the two slide/rafts that inflated inside of the airplane, the packboards were still on the doors after the crash. We sent the malfunctioning slides to the company that manufactures them for a

teardown. It was found that the release mechanisms had suffered catastrophic failures, causing the slide/rafts to deploy inside the airplane.

At the hearing, the slide/raft manufacturer's spokesman said that the release mechanisms for the slides were overwhelmed by the forces encountered in this accident – which he characterized as 3-4 times the forces they were built to withstand. As the spokesman explained, they had never seen anything like the forces on the release mechanisms in this crash.

In safety, that's not a cue to think "Don't worry, it's unlikely to happen again." To the contrary, it's a cue to think, "Some safety defenses were breached and there might be lessons to learn." Now the new data are there for analysis by the NTSB, by the regulators, and by industry to use for further improvement.

Largely because of the actions of the cabin crew, almost all of the passengers and crew, as well as the two flight attendants who were pinned by the slides, survived. Advances in crashworthiness, such as fire resistant materials, overhead bins that remained attached, and 16-G seats, were also factors.

Next month, we will issue our report on the San Francisco accident, with our probable cause determination and several safety recommendations. As I said, most of our recommendations are

responded to favorably, and I hope to be able to say the same about the recommendations in that report.

For those of you who work in the cabin, as you secure loose items and walk through the aisles to make sure every passenger have buckled their seatbelt, who is not in a seatbelt? Because of the inadvertent slide deployment in the accident, our report may contain recommendations on that issue.

Not related to this accident, another emerging cabin safety issue that we are keeping our eye on, and may issue recommendations on in the future if warranted by an event, is lithium-ion batteries that we bring onto the plane in our phones, pads, and laptops. Kudos to you for having this issue is on your agenda for later today. There is yet another cabin safety issue for which we have had to speak out more vigorously for change because the regulators and the industry have not responded favorably. That issue relates to restraints for children under 2.

In the U.S., and many other countries, it's lap-held children – children under 2 years of age who are not required to be secured in an appropriate restraint.

It's been said that we stow coffee pots and carry-on luggage, but we don't protect our most precious cargo – our children under age 2.

That's why, at the last General Assembly, the U.S. asked ICAO to establish an international recommended practice encouraging air carriers

to use CRS appropriate to each child's size and weight on airplanes; provide recommendations and guidance that address the use of different types of CRS and effective operator procedures; and accommodate innovations in CRS based on future research and design – a goal that will go a long way toward encouraging the adoption of CRS.

And we're looking not only for adoption, but also standardization and compatibility. A robust, age-and size-appropriate child restraint system that is approved for one leg of a flight should also be suitable and accepted on all connecting flights.

ICAO has included the issue of child safety restraints in its cabin safety group's 2012-2015 work program. By adopting the working paper at the General Assembly, ICAO will be tasking this group with taking the first steps toward international harmonization and standardization.

That means that every one of you needs to continue elevating the issue of CRS recommended practices within your airlines, championing their development with your executive management, and making CRS recommended practices a high priority in your organizations.

Your airlines are all in the business of safety, and they have recognized that cabin safety improvements can help reduce fatalities and improve safety. That's why you're here today, and that's why IATA has empowered you to start to make a difference today. And that's why you

and your airlines can lead the way to tomorrow's safer reality, when all passengers, of every age, are safely in their seat belts.

Thank you again for inviting the NTSB, and we look forward to working with you on these important initiatives.

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