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Speech to IATA Cabin Operations Safety Conference
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Thank you for that kind introduction, and thank you for inviting me back to address this conference for a second year. I am Christopher Hart, Chairman of the National Transportation Safety Board, and I'm happy to say that I have spoken at every IATA Cabin Operations Safety Conference. I regard that as a high honor, because what you are doing here is some of the most important work being done in aviation safety today.

Let me start, first and foremost, by giving kudos to the IATA Cabin Safety Task Force. Recognizing that cabin safety will become increasingly important in aviation safety, you have had the vision and the persistence to work within your airlines to put the spotlight on cabin safety and to make this conference an annual event. I look forward to the presentation following mine, in which we will hear about the Task Force's recommendations since the last conference.

Kudos as well to the ICAO Cabin Safety Group for helping to enhance government-industry collaboration regarding cabin safety and passenger safety issues.

And thanks to all of you for attending. You've come from manufacturers, suppliers, airlines, regulators – from throughout the world of aviation. That in itself is encouraging, because the principle of collaboration has proven its worth in aviation safety, and has abundantly demonstrated that everyone who is involved in a problem should be involved in developing the solution.

It was gratifying to see that one of yesterday's workshops was on Cabin Accident and Incident Investigation.
I hope that many of you attended, for two reasons. One is that the workshop was about incidents as well as accidents. We can learn lessons from both, and I am a staunch supporter of the value of incident investigation as well as accident investigation.

I was also glad to see this workshop listed because the more that the aviation community knows about the accident and incident investigation process, the more welcome investigators will be – such as my agency, the NTSB.

Why is it important that safety investigators are welcomed? Because investigations of accidents and incidents are instrumental to moving aviation safety forward. The purpose of accident and incident investigations is to prevent, rather than to punish, and we do that by determining the probable causes, and then making recommendations to prevent recurrences. Safety investigators around the world share this same basic model to learn from unintentional accidents and incidents in transportation.

I stress "unintentional" because the mission of safety investigators does not extend to intentional criminal acts, such as the recent Germanwings crash – although I would like to take this opportunity to convey my deepest condolences to those who lost loved ones and colleagues in that tragedy.

And even within safety, my agency, the NTSB, is not a regulator. We only make recommendations. We cannot require anyone to do anything. Notwithstanding our inability to require, however, the recipients of our recommendations do what we recommend, or something similar, more than 80% of the time. That is a testament to an amazing staff, which I am proud to represent here. It is also a testament to the value of thorough investigations to bring about continuous improvements in safety.

Those of you who saw me speak here last year may remember that I talked about the Asiana flight 214 accident in San Francisco in 2013 -- in which 99% of the passengers and crew on board survived. You might remember that I recounted some of the heroic actions of cabin-crew members, whose quick thinking and dedication helped to save lives. I also gladly credited the aviation industry for advances in crashworthiness such as fire resistant materials, overhead bins that remained attached, and 16-G seats.

So kudos again to that particular cabin crew. But in the public's mind, Asiana flight 214 was not an accident in which "99% of the passengers and crew survived." Asiana flight 214 was a tragedy in which 3 passengers died. This should stand as a reminder of the absolute need for continuous improvement in aviation safety.

In this accident, you may recall, 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.

Shortly after last year's conference, the NTSB released the report on Asiana flight 214. Let me talk a little about what we found from a cabin safety perspective.

I talked last year about the cabin crew's efforts to free two flight attendants who were trapped by slide rafts that inflated inside the cabin. We performed tear-downs of the slide-raft mechanisms and found that they had encountered forces far in excess of their certification limits.

In our report, we recommended evaluation of the adequacy of slide/raft inertia load certification testing, beginning with the information gathered in this accident. Depending on the results of this evaluation, we have called for changes to certification standards, if appropriate.

I also talked last year about the role of 16-G seats in preventing greater loss of life on this flight. But other crashworthiness issues emerged. For example, we found a high number of thoracic spine injuries – especially to passengers in the rear of the airplane - on Asiana flight 214, and called for research into the mechanism that resulted in these injuries.

Finally, when I talked to you last year, I focused on the actions of cabin crew to evacuate the airplane. But according to both flight and cabin crew members, this evacuation was delayed significantly.

Once the airplane came to rest, the lead flight attendant came to the cockpit and asked the pilots whether to evacuate. One of the pilots told her to wait. That command, plus the general disorientation and confusion in the moment, resulted in a delay of about 90 seconds, but the flight attendants acted appropriately when they initiated an emergency evacuation upon determining there was a fire outside door 2R.

As this audience understands all too well, seconds count in an evacuation, and the accuracy and completeness of information gained through assessment of the situation are critical in making the evacuation decision.

In Asiana 214, disorientation and confusion delayed the evacuation. In other accidents, crew coordination and communication issues have surfaced.

For example, in September 2007, an in-flight fire in the left engine of American Airlines flight 1400 during departure from Lambert-St. Louis International Airport resulted in a return to the airport. After the nose gear failed to extend, the flight crew executed a go-around, and then a successful landing. Nobody died or reported injuries due to this accident, but it did result in significant damage to the airplane.

However, in our investigation, we found multiple coordination issues.

While in flight, the captain told the cabin crew that they would be landing and that an evacuation would probably not be necessary.

A cabin crew member told us that after the briefing from the captain, she heard two pops and a swooshing sound. But upon looking out and seeing that everything appeared normal, she decided not to report the sounds to the captain.

After landing, the pilots did not actively seek information from the flight attendants because they believed that the flight attendants would pass any significant information to them. However, during the debriefing on the ground, a flight attendant stated that she had smelled fuel earlier, but she did not pass this information to the cockpit.

Once on the ground, according to the flight attendants, there was no sense of urgency to get the passengers off the airplane.

The NTSB concluded that, during the emergency situation, the flight attendants did not relay potentially pertinent information to the captain in accordance with company guidance and training, and recommended that the FAA revise AC 120-48 to update guidance and training on communications during emergency and unusual situations, for both flight and cabin crews. Although the FAA has taken actions toward revising the circular, we still await the revised circular's publication.

We are also looking into whether delays in evacuations happened in several ongoing accident investigations, and if so, what caused them.

Last year I predicted that we will continue to see far more survivable accidents than catastrophic failures, bringing cabin safety to the fore. The delayed evacuation in Asiana flight 214 and communications lapses in American Airlines flight 1400 raise a question related to performance in survivable accidents: How can we ensure that evacuations are as timely as possible, are conducted as effectively as possible, and do not suffer from coordination and communications lapses?

I am pleased that Paula Gaudet and Elise May of Southwest Airlines will touch on communications issues during and after evacuations, and much more, in "Evacuations: Lessons Learned," based on Southwest's experiences in the past two years.

Another issue I would like to discuss today is what we have learned about in-flight fires, the safety gaps remaining, and what your airlines can do to address them.

In 2001, the NTSB issued recommendations about in-flight fires, to address safety gaps identified in numerous in-flight fire investigations from 1983-2000.

We found that the depth and quality of in-flight firefighting training, among other areas, still needed attention. We recommended that the FAA amend the regulations to require firefighting drills that involve actual or simulated fires during crewmember recurrent training and to require that those drills include realistic scenarios related to recognizing potential signs of, locating, and fighting hidden fires.

The FAA did not change the regulation, but in 2004, it issued advisory circular AC 120-80, in part in response to these NTSB recommendations. AC 120-80 contained good information, but the regulation still did not require robust firefighting drills in recurrent training.

In 2011, the NTSB made other recommendations in relation to the fatal crash of UPS-6 in Dubai. These recommendations also called for changes in regulations – although they affected flight crew rather than cabin crew.

I mention these recommendations because in lieu of regulations, the FAA again revised its advisory circular on fighting in-flight fires, resulting in a new AC, AC120-80A, in December 2014.

The updated AC is relevant here because it also now addresses the unique characteristics of lithium battery fires.

AC 180-20A also makes several recommendations to flight attendants about in-flight firefighting.

Since its first appearance, the FAA advisory circular has recommended “skill based objectives” for the training of crew members. Skill-based objectives must be practiced. But in both versions of the AC, the depth and quality of the training are left relatively unspecified.

At the NTSB, we are happy to spread the word about these safety education products. And there are others as well: In 2009 the FAA issued a SAFO on fighting fires caused by lithium batteries in portable electronic devices. For those of you who may not know, SAFO is Americanese for Safety Alert for Operators. And, they have developed a video called “Extinguishing In-Flight Laptop Computer Fires” containing specific guidance relating to Lithium battery fires.

Probably some of you here have viewed this video. It does a good job of covering the phenomenon of thermal runaway, in which a fire starts in one cell, and causes adjacent cells to overheat and ignite. The video demonstrates the need to both knock down the initial fire and cool the battery with water or non-alcoholic liquids (for example, from the drink cart).

But as I viewed the video, I had to ask myself, how often is this information being practiced in drills?

Along with all of their other duties, cabin crew members are on-call firefighters. They are the airplane’s first line of defense if an onboard fire occurs. In the age of portable electronic devices, virtually every passenger comes on board carrying a potential source of a fire or smoke event: that is, the lithium and lithium ion batteries that power their devices.

The risk of in-flight lithium and lithium ion battery fires increases as these batteries proliferate. These batteries have a failure rate of 1 in 10 million – and more than three billion passengers fly every year worldwide. It doesn’t take very advanced math on those numbers to conclude that there will be smoke, and there will be fires on airplanes.
What is your airline’s requirement for cabin crew training in fighting in-flight fires? By contrast, think about how often Airport Rescue and Firefighting personnel, or in other fire departments, participate in drills.

ARFF doesn’t fight in-flight fires; cabin crew members do. So when considering recurrent crew training in firefighting, let me suggest that hands-on training should be comprehensive and rigorous. With every portable electronic device brought onboard -- including those now used by crew members themselves -- the chance of an in-flight fire increases; and even though the increase is small for each device, a small increase times large numbers means that we need to consider the possibilities.

And that’s to say nothing of the lithium-ion batteries that are built into aircraft, such as the Boeing 787s that underwent a series of battery fires in 2013.

The NTSB investigated a fire on a Japan Airlines 787 parked at a gate at Logan Airport in Boston in January of that year. That event, coupled with a similar in-flight fire on a 787 a week later, led to the temporary grounding of the U.S. 787 fleet. Before the 787s were returned to service, the FAA required a stainless steel enclosure for the battery case and a duct that vents from the interior of the enclosure to the exterior of the airplane to prevent smoke from entering the occupied space of the airplane.

In the Boston event, the airplane was unoccupied and was being readied for the next flight when the fire was discovered by a cleaning crew. Our investigation, along with a forum on lithium ion batteries in transportation, provided the impetus for NTSB staff to learn about the many chemistries used in lithium ion batteries.

The report on the 787 accident included recommendations to improve the certification process for lithium ion batteries and other emerging technologies, and to enhance that process by going to industries other than aviation that have worked with the technologies. Lithium ion batteries, for example, had already been in use by the military in several applications and are increasingly being used in automobiles.

I hope these glimpses into how accident investigations have informed crew communication and coordination and in-flight firefighting have helped us all to think of cabin safety as a fast-moving field – because it is.

And because of the absolutely critical role that cabin safety will play in future advances in aviation safety, I hope that the IATA Cabin Safety Task Force will continue to focus attention on such issues, and contribute to making progress toward solving them.

I thank you once again for the opportunity to address personnel from the airlines, regulators, suppliers, and manufacturers. As with many previous advances in aviation safety, this collaborative approach can yield safety improvements before a regulator requires the improvement. We already have regulations that tell us to be safe, and new regulations that tell us to be more safe aren’t necessarily the best solution.

As I said earlier, anybody who is involved in the problem should be involved in the solution.

Thank you. It would be my pleasure to take any questions.

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