Senator John Thune
Senate Commerce Committee on Commerce, Science, and Transportation
Nominations Hearing
June 8, 2017

Question 1. Mr. Sumwalt, your distinguished 11-year career at the National Transportation Safety Board (NTSB) as well as your background as a commercial pilot gives you substantial perspective regarding the challenges and opportunities at this agency. One of the issues you cited in your questionnaire mentions the challenges associated with integrating new technologies such as self-driving vehicles, unmanned aerial systems, and commercial space vehicles.

How will the agency, from an investigative standpoint, deal with safety challenges affiliated with these rapidly advancing technologies and what is the agency's strategy for addressing any knowledge or skill gaps NTSB employees currently face in the context of these technologies?

> **Self-driving vehicles.** As you well are aware, this technology is advancing extremely rapidly.
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> The NTSB is involved with our first investigation of a crash involving an automobile being operated in the autopilot mode. This crash involved a Tesla colliding with a 18-wheeler truck in Williston, Florida in May 2016. Although this vehicle is not a completely autonomous vehicle, this crash is allowing NTSB's investigative staff to explore aspects associated with self-driving cars. We are also engaging with auto manufacturers, including their participation as party members in our investigations. We expect to have the report of this crash completed this fall and will keep your staff apprised of the precise date of the board meeting, as well as the findings and recommendations that emerge from the investigation.
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> **Unmanned Aerial Systems**. The NTSB completed our first investigation of a UAS in 2007. That crash involved a General Atomics Predator B, operated by U.S. Customs and Border Protection (CBP), which crashed into a sparsely populated neighborhood in Nogales, Arizona. As a result of this investigation, the NTSB issued 22 safety recommendations to the Federal Aviation Administration and CBP, all of which have been satisfactorily closed.
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> We have kept abreast of technological and regulatory developments in the UAS industry since 2007, and have a very thorough and robust capability and knowledge base in order to conduct an investigation of any accident or incident regarding UAS that comes under our authority.
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> In August 2010, we revised our regulations to clarify that our aviation accident and incident notification requirements also apply to UAS. We released an advisory to operators in July 2016 to clarify requirements for reporting—for example, if there is death or serious injury, the aircraft weighs more than 300 pounds and sustains substantial damage, or other specific serious incidents occur. To date, we have investigated 35 events involving UAS.

In addition, we have implemented a plan for technical and procedural training for staff who will participate in UAS accident and incident investigations. The agency's lead investigator for UAS has training and experience operating various types of UAS, including the MQ-9 Predator-B, Insitu Scan Eagle, and numerous small UAS. Training continues to focus on technical areas such as air traffic procedures and technologies, vehicle performance, recorded data logging, battery technology, operational training, and maintenance. We are also conducting outreach with other investigative agencies and industry stakeholders to become aware of best practices and techniques and lessons learned from their experiences, and also to explain and clarify our role and safety initiatives.

Finally, we have deployed UAS as an investigation tool in aviation and rail accidents to provide aerial imagery and other technical capabilities.

Commercial space vehicles. The NTSB has the authority to investigate commercial space launch accidents under its general authority to conduct transportation accident and incident investigations for the purpose of improving transportation safety for the public.

In July 2015, we completed the investigation of the October 31, 2014, accident involving SpaceShipTwo, a reusable suborbital rocket which was operated by Scaled Composites LLC. The spaceship broke up into multiple pieces during a rocket-powered test flight and impacted terrain over a 5-mile area near Koehn Dry Lake, California.

We issued eight safety recommendations to FAA and two to the Commercial Spaceflight Federation. NTSB staff has established relations with numerous commercial space stakeholders and key government agencies and we will continue to work to develop the necessary expertise.

While the NTSB believes it has general authority to conduct investigations of commercial space accidents, that authority is not expressly spelled out in NTSB's enabling legislation. To relive such ambiguity in the event of future commercial spaceflight accidents, it would be useful for Congress to consider specifically granting that authority.

Question 2. Mr. Sumwalt, as you know, the NTSB has a meticulous investigatory process for discerning the primary causes and contributing factors to accidents.

Could you speak to your approach as a Board Member to publicly speaking or publicly identifying a particular cause or contributing factor, or a recommendation for addressing the cause or factor, prior to the results of the investigation?

The NTSB's ultimate goal is to prevent similar accidents from occurring in the future. If we focus only on the obvious error, we miss valuable accident prevention opportunities because systemic flaws may remain undetected and thus, uncorrected.

I have a sign posted in my office that states: “The discovery of the human error should be considered as the starting point of the investigation, not the ending point.” I use these words as a constant reminder that our investigations must examine the entire system and not just focus on errors of front line personnel.

When preparing for board meetings, I firmly believe it is my responsibility to be fluent with the facts, circumstances, and conditions surrounding that accident; studying these issues is a duty I take seriously. I carefully study the report and meet with staff to outline my concerns and areas where I have questions. As a quality check on the draft report, I draft my own version of the probable cause to ensure that the analysis is supported by the facts, the analysis supports the findings and probable cause, and these support the recommendations. I then compare my draft probable cause with that of what staff has drafted. I typically delve into the public docket and party submissions to understand more than is just presented in the draft report. I encourage parties to the investigation to meet with me so I can better understand their perspective. I then take all of this into account when I vote on an accident product.

Question 3. Mr. Sumwalt, in some instances, as a result of limited technical capacity and budget constraints, the development process or expenditure of resources on a particular safety improvement may divert attention or resources from another type of safety improvement.

To what extent does the NTSB consider these types of trade-offs that may have unintended consequences for safety?

I believe our job, as an accident investigation agency, is to determine what led to the accident and then look for ways that could prevent future similar accidents. The NTSB does not consider cost vs. benefit when issuing safety recommendations. This does not mean we are unconcerned about the practicality of our recommendations.

I believe we must challenge industry and government to raise the bar on safety by issuing recommendations that sometimes may be considered to be “stretch goals” for the recommendation’s recipient. I believe unless we push the envelope on some issues, we won’t achieve breakthrough safety improvements.

As an example, as a result of the TWA 800 crash, a Boeing 747 that crashed into the Atlantic Ocean shortly after departure from John F. Kennedy International Airport, NTSB issued a recommendation in 1996 calling for improved fuel tank flammability standards. Most in the industry believed that this could not be accomplished cost effectively for transport category aircraft. FAA initially responded to the recommendation, stating that such a recommendation would have “little benefit” and would have “significant economic implications.” However, because of NTSB’s recommendation – indeed a stretch goal – FAA and industry pursued ways to develop affordable, practical, and effective flammability reduction systems. Based on its success of this undertaking, on July 21, 2008, the FAA adopted a requirement for certain

transport category aircraft to have fuel tank inerting systems. I believe had NTSB not issued this recommendation in 1996, these requirements may not have been implemented.

Senator Dan Sullivan
Senate Commerce Committee on Commerce, Science, and Transportation
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Question 1. The Medallion Foundation was founded in Alaska in 2001 to improve pilot safety awareness. One of its goal is to get operators to voluntarily train and commit to higher standards of operational safety through audits, simulator training and classroom training. Do you agree that voluntary participation, in conjunction with normal regulatory oversight, is an effective approach to increasing aviation operational safety?

I firmly believe that voluntarily submitted safety information is key to uncovering safety deficiencies. From 1991 through 2009, I was an outside consultant to NASA's Aviation Safety Reporting System (ASRS). ASRS is a government-funded and operated program that collects voluntarily submitted incident and safety reports from aviation industry employees. These reports often contain rich narratives and explanations of information that would not otherwise be known. Through analyzing such information, we were able to identify intervention measures to improve safety.

Additionally, as an airline pilot who worked in the airline's safety department, I can state with authority the importance of having voluntary nonpunitive safety reporting systems. Through these programs, the airline was able to learn of safety-related issues that may not have been highlighted until after an accident or serious incident.

Before being appointed to the NTSB in 2006, I ran the small flight department for a Fortune 500 company. There I put in place the elements for a confidential nonpunitive safety reporting system, as well as the practice of internal and external audits. Now at the NTSB, when speaking at safety conferences, I encourage the practice of internal and external audits, as well as confidential nonpunitive safety reporting systems.

NTSB has protections in our enabling legislation (49 USC 1114) and regulations (49 USC 831.6) to protect voluntarily submitted safety information. If confirmed, I will fight to ensure we do everything we possibly can to encourage collection of such information, and that the protections granted by the legislation and regulations remains in force.

Question 2. The FAA and the Medallion Foundation have created a partnership that has constituted a paradigm shift in public policy that has resulted in dramatic improvements in aviation safety. Do you think the NTSB would be interested in establishing a partnership with the Medallion Foundation to help improve aviation safety?

I am familiar with the Medallion Foundation and appreciate the work they have done to improve safety in Alaska. I believe in order for the Medallion Foundation to be effective, a partnership with the regulator (FAA) is essential. As the regulator, the FAA has the ability to encourage such programs, and in my opinion, programs such as the Medallion Foundation should be part of the FAA's "safety tool box."

On the other hand, the NTSB is not the regulator. Through the Independent Safety Board Act of 1974, as amended, Congress intended for us to be independent accident investigation agency, free from outside influences. Keeping with that line of thinking, I believe the NTSB must not compromise our independence by partnering with outside organizations or agencies.

This does not mean, however, that we should not work with organizations such as the Medallion Foundation, and government agencies, to encourage their endeavors to continue working diligently to improve safety.