

December 12, 2019

The Honorable Stephen Dickson
Administrator
Federal Aviation Administration
Washington, DC 20591

The attached letter from the NTSB Chairman provides information about the NTSB's [Click HERE then type the report date.], report [Click HERE then type the Title of Report (in italics), City, State, Date of Accident, Report Number.]. The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number (for example, A-19-17 through -21). We encourage you to submit your response to ExecutiveSecretariat@nts.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.



Executive Secretariat-LRM
Office of the Managing Director
National Transportation Safety Board
490 L'Enfant Plaza SW
Washington, DC 20594
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Office of the Chairman

National Transportation Safety Board

Washington, DC 20594

December 12, 2019

The Honorable Stephen Dickson
Administrator
Federal Aviation Administration
Washington, DC 20591

Dear Administrator Dickson:

This letter provides information about the National Transportation Safety Board's (NTSB) November 19, 2019, report *Left Engine Failure and Subsequent Depressurization, Southwest Airlines Flight 1380, Boeing 737-7H4, N772SW, Philadelphia, Pennsylvania, April 17, 2018*, NTSB/AAR-19/03. The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of this investigation, we identified the following safety issues:

- Need to ensure the structural integrity of the fan cowl on Boeing 737 next-generation-series airplanes after a fan-blade-out event involving CFM56-7B engines.
- Need to determine whether other airframe/engine combinations have any critical fan blade impact locations and how an impact at those locations could affect nacelle components.
- Need to emphasize the importance of having flight attendants secured in a jumpseat during emergency landings.
- Need to mitigate hazards to passengers affected by an in-flight loss of seating capacity.

Accordingly, the NTSB makes the following safety recommendations to the Federal Aviation Administration. Additional information regarding these recommendations can be found in the noted sections of the report.

- Require Boeing to determine the critical fan blade impact location(s) on the CFM56-7B engine fan case and redesign the fan cowl structure on all Boeing 737 next-generation-series airplanes to ensure the structural integrity of the fan cowl after a fan-blade-out event. (A-19-17) (See section 2.2.3.)

- Once the actions requested in Safety Recommendation A-19-17 are completed, require Boeing to install the redesigned fan cowl structure on new-production 737 next-generation-series airplanes. (A-19-18) (See section 2.2.3.)
- Once the actions requested in Safety Recommendation A-19-17 are completed, require operators of Boeing 737 next-generation-series airplanes to retrofit their airplanes with the redesigned fan cowl structure. (A-19-19) (See section 2.2.3)
- Expand the Title 14 Code of Federal Regulations Part 25 and 33 certification requirements to mandate that airplane and engine manufacturers work collaboratively to (1) analyze all critical fan blade impact locations for all engine operating conditions, the resulting fan blade fragmentation, and the effects of the fan-blade-out-generated loads on the nacelle structure and (2) develop a method to ensure that the analysis findings are fully accounted for in the design of the nacelle structure and its components. (A-19-20) (See section 2.2.3.)
- Develop and issue guidance on ways that air carriers can mitigate hazards to passengers affected by an in-flight loss of seating capacity. (A-19-21) (See section 2.5.)

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendations by number. We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply, including attachments, exceeds 20 megabytes, please e-mail us at the same address for instructions. Please do not submit both an electronic copy and a hard copy of the same response.

Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

December 12, 2019

Mr. Gary C. Kelly
Chairman and Chief Executive Officer
Southwest Airlines Co.
2702 Love Field Drive
Dallas, TX 75235

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the November 19, 2019, report *Left Engine Failure and Subsequent Depressurization, Southwest Airlines Flight 1380, Boeing 737-7H4, N772SW, Philadelphia, Pennsylvania, April 17, 2018*, NTSB/AAR-19/03. The details of this accident investigation and the resulting safety recommendation may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendation by number (for example, [Click HERE then type a safety recommendation number.]). We encourage you to submit your response to ExecutiveSecretariat@nts.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

All communications regarding safety recommendations will be stored by the NTSB and viewable by the public. Please do not send privileged or confidential communications in response to this recommendation. Responses marked as confidential or privileged (or similar designations) will be considered nonresponsive. If you have concerns about this protocol, please contact us at ExecutiveSecretariat@nts.gov or call (202) 314-6290 and ask to be directed to the Safety Recommendations Division.



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December 12, 2019

Mr. Gary C. Kelly
Chairman and Chief Executive Officer
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2702 Love Field Drive
Dallas, Texas 75235

Dear Mr. Kelly:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge Southwest Airlines to act on the safety recommendation in this letter because we believe your organization can help reduce the risk of future accidents. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 19, 2019, report *Left Engine Failure and Subsequent Depressurization, Southwest Airlines Flight 1380, Boeing 737-7H4, N772SW, Philadelphia, Pennsylvania, April 17, 2018*, NTSB/AAR-19/03. The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of this investigation, we identified the following safety issues:

- Need to ensure the structural integrity of the fan cowl on Boeing 737 next-generation-series airplanes after a fan-blade-out event involving CFM56-7B engines.
- Need to determine whether other airframe/engine combinations have any critical fan blade impact locations and how an impact at those locations could affect nacelle components.
- Need to emphasize the importance of having flight attendants secured in a jumpseat during emergency landings.
- Need to mitigate hazards to passengers affected by an in-flight loss of seating capacity.

Accordingly, the NTSB makes the following safety recommendation to Southwest Airlines. Additional information regarding these recommendations can be found in the noted sections of the report.

Include the lessons learned from the accident involving Southwest Airlines flight 1380 in initial and recurrent flight attendant training, emphasizing the importance of being secured in a jumpseat during emergency landings. (A-19-22) (See section 2.5.)

The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement this recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation A-19-22). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply, including attachments, exceeds 20 megabytes, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

Robert L. Sumwalt, III
Chairman

Enclosure

cc: Mr. Scott Halfmann
Vice President Safety and Security

December 12, 2019

Mr. Patrick Ky
Executive Director
European Aviation Safety Agency
Postfach 10 12 53
D-50452 Cologne, Germany

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to provide assistance to victims and their family members affected by major transportation disasters.

The attached letter from the NTSB Chairman provides information about the NTSB's November 19, 2019, report *Left Engine Failure and Subsequent Depressurization, Southwest Airlines Flight 1380, Boeing 737-7H4, N772SW, Philadelphia, Pennsylvania, April 17, 2018*, NTSB/AAR-19/03. The details of this accident investigation and the resulting safety recommendation may be found in the attached report, which can also be accessed at <http://www.nts.gov>. For more information about NTSB and our recommendation process, please see the attached one-page summary.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement these recommendations. When replying, please refer to the safety recommendation by number (for example, A-19-23). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply exceeds 20 megabytes, including attachments, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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Office of the Chairman

December 12, 2019

Mr. Patrick Ky
Executive Director
European Aviation Safety Agency
Postfach 10 12 53
D-50452 Cologne, Germany

Dear Mr. Ky:

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—railroad, highway, marine, and pipeline. We determine the probable cause of the accidents and issue safety recommendations aimed at preventing future accidents. In addition, we carry out special studies concerning transportation safety and coordinate the resources of the federal government and other organizations to assist victims and their family members affected by major transportation disasters.

We are providing the following information to urge the European Aviation Safety Agency (EASA) to act on the safety recommendations in this letter because we believe your organization can help reduce the risk of future accidents. For more information about the NTSB and our recommendation process, please see the attached one-page summary.

This letter also includes information about our November 19, 2019, report *Left Engine Failure and Subsequent Depressurization, Southwest Airlines Flight 1380, Boeing 737-7H4, N772SW, Philadelphia, Pennsylvania, April 17, 2018*, NTSB/AAR-19/03. The details of this accident investigation and the resulting safety recommendations may be found in the attached report, which can also be accessed at <http://www.nts.gov>.

As a result of this investigation, we identified the following safety issues:

- Need to ensure the structural integrity of the fan cowl on Boeing 737 next-generation-series airplanes after a fan-blade-out event involving CFM56-7B engines.
- Need to determine whether other airframe/engine combinations have any critical fan blade impact locations and how an impact at those locations could affect nacelle components.
- Need to emphasize the importance of having flight attendants secured in a jumpseat during emergency landings.
- Need to mitigate hazards to passengers affected by an in-flight loss of seating capacity.

Accordingly, the NTSB makes the following safety recommendation to EASA. Additional information regarding these recommendations can be found in the noted sections of the report.

Expand your certification requirements for transport-category airplanes and aircraft engines to mandate that airplane and engine manufacturers work collaboratively to (1) analyze all critical fan blade impact locations for all engine operating conditions, the resulting fan blade fragmentation, and the effects of the fan-blade-out-generated loads on the nacelle structure and (2) develop a method to ensure that the analysis findings are fully accounted for in the design of the nacelle structure and its components. (A-19-23) (See section 2.2.3.)

The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives. We would appreciate a response within 90 days of the date of this letter, detailing the actions you have taken or intend to take to implement this recommendation. When replying, please refer to the safety recommendation by number (Safety Recommendation A-19-23). We encourage you to submit your response to ExecutiveSecretariat@ntsb.gov. If your reply, including attachments, exceeds 20 megabytes, please e-mail us at the same address for instructions on how to send larger documents. Please do not submit both an electronic copy and a hard copy of the same response.

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Sincerely,

Robert L. Sumwalt, III
Chairman

Enclosure

cc: Mr. Erick Ferrandez
Head of Safety Intelligence
and Performance Department



NTSB Recommendations and You

The National Transportation Safety Board (NTSB) is an independent federal agency charged with investigating and determining the probable cause of transportation accidents. We do not make regulations, but we do issue recommendations to organizations such as yours when we discover shortcomings in the transportation system that increase the risk of accidents. **As a result of our investigative activities, we have issued one or more safety recommendations that we believe you can act on to improve transportation safety.**

Why did the NTSB issue my organization a safety recommendation?

We issue safety recommendations to organizations that can bring about change to reduce the risk of accidents, either through their direct role in the transportation industry, their legislative or regulatory authority, or the significant influence they have among others in the industry. We believe your organization is able to make or influence such changes.

What does the NTSB expect of safety recommendation recipients?

First and foremost, we encourage you to promptly take the recommended action to improve safety. Because we're eager to see recommendations implemented before more accidents occur, we follow recipients' efforts to implement each recommendation. We ask that you update us any time you achieve a significant milestone in your progress toward implementing the attached recommendation(s), or at least annually. We will provide feedback on your efforts by classifying each recommendation as open or closed, acceptable or unacceptable.¹ Information about your actions associated with your recommendation(s) is available at our [website](https://www.nts.gov) so that the public can see our combined efforts to improve transportation safety.

¹ For a full description of our safety recommendation classifications, see the [Status Explanation](#) page on our website.

What should our response to the NTSB include?

Please respond to us within **90 days (30 for urgent recommendations)** explaining the specific actions you have taken or intend to take in response to the safety recommendation(s), and propose a timeline for completion. We understand organizations today are faced with competing priorities and limited resources, which can make implementing our recommendations a challenge. If, for any reason, you are not able to take the recommended action, or if you believe an alternate action would be more appropriate for your organization, please explain why. When you respond, please provide an e-mail address for future communications. We will review your response and provide feedback.

What if my organization doesn't believe the recommended action is the best way to improve safety?

We base our recommendations on the evidence, facts, and circumstances of the accidents we investigate. Sometimes industry leaders identify ways to attain the same safety objective more efficiently, and we encourage recipients to share their ideas with us. In these cases, we will evaluate the alternate means of achieving the safety objective and provide feedback. We believe safety is a collaborative effort, and we're happy to work with your organization to set goals and make improvements.

Why does the NTSB expect us to take action, even though our organization wasn't responsible for the accident that resulted in the safety recommendation?

Our goal is to prevent accidents. Often, the factors we identify as causing or contributing to an accident are not unique—they represent common practices or situations that may be accidents waiting to happen. In such instances, we may make recommendations intended to raise the minimum standard for safety throughout the industry.

How do we contact the NTSB to provide updates or obtain further information?

Please contact us electronically at executivesecretariat@ntsb.gov. If you wish to send us supporting documentation that, with your response, exceeds 10 megabytes, please contact us at the same e-mail address for instructions.

You can also reach our Safety Recommendations staff at **(202) 314-6290** (please ask to be directed to the Safety Recommendations Division).

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We look forward to working with you to prevent accidents and save lives!