

May 13, 2021

Mr. Stephen Dickson
Administrator
Federal Aviation Administration
Washington, DC 20591

The attached letter from the NTSB Chairman provides information about the NTSB's April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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-21-15 thru -20 and A-16-36). 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
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Washington, DC 20594
Email: ExecutiveSecretariat@nts.gov



National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. Stephen Dickson
Administrator
Federal Aviation Administration
Washington, DC 20591

Dear Mr. Dickson:

This letter provides information about the National Transportation Safety Board's (NTSB) April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's (FAA) post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

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

- Identify high-traffic air tour areas and require, through a special federal aviation regulation or other means, that Title 14 *Code of Federal Regulations* Parts 91 and 135 air tour operators that operate within those areas be equipped with an Automatic Dependent Surveillance-Broadcast Out- and In-supported traffic advisory system that 1) includes both visual and aural alerts, 2) is driven by an algorithm designed to minimize nuisance alerts, and 3) is operational during all flight operations. (A-21-15) (See section 2.4)
- In the high-traffic air tour areas identified in Safety Recommendation A-21-015, require that all non-air tour aircraft operating within the airspace be equipped with Automatic Dependent Surveillance-Broadcast Out. (A-21-16) (See section 2.4)

- Require the installation of Automatic Dependent Surveillance-Broadcast Out- and In-supported airborne traffic advisory systems that include aural and visual alerting functions in all aircraft conducting operations under Title 14 *Code of Federal Regulations* Part 135. (A-21-17) (See section 2.5)
- Review current and future supplemental type certificate installation instructions and flight manual supplements to ensure they provide provisions to prevent the inadvertent disabling of the broadcast of pressure altitude data, by design, where practicable. (A-21-18) (See section 2.6.2)
- Ensure that checklists for all Capstone Program (phase 2) aircraft include verification that the Garmin GSL 71 control head selector knob is in the ON position and that the unit is in ALT mode before takeoff. (A-21-19) (See section 2.7)
- Update the Aeronautical Information Manual and the Pilot's Handbook of Aeronautical Knowledge to include the limitations inherent in visual scans for traffic and the benefits and best practices of using cockpit displays of traffic information to supplement visual scans to help overcome these limitations. (A-21-20) (See section 2.8)

In addition, the NTSB reiterates the following recommendations to the FAA:

- Require all 14 *Code of Federal Regulations* Part 135 operators to establish safety management system programs. (A-16-36) (See section 2.9)

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 (Safety Recommendations, A-21-15 through -20). 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

May 13, 2021

Mr. Tyson Weihs
Chief Executive Officer
ForeFlight
2323 South Shepherd Drive
Houston, TX 77019

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.

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Office of the Chairman

May 13, 2021

Mr. Tyson Weihs
Chief Executive Officer
ForeFlight
2323 South Shepherd Drive
Houston, Texas 77019

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We are providing the following information to urge ForeFlight 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.

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- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to ForeFlight. Additional information regarding this recommendation can be found in the noted section of the report.

- Update your traffic alerting algorithms so that traffic targets for which there is no altitude information are assumed to be at the same altitude as the ownship (that is, the aircraft receiving the target data). (A-21-21) (See section 2.6.1.)

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 recommendations by number (Safety Recommendation A-21-21). 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,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Brien Salazar
Chief Executive Officer/President
Taquan Air
4085 Tongass Avenue
Ketchikan, AK 99901

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Office of the Chairman

May 13, 2021

Mr. Brien Salazar
Chief Executive Officer/President
Taquan Air
4085 Tongass Avenue
Ketchikan, Alaska 99901

Dear Mr. Salazar:

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We are providing the following information to urge Taquan Air 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

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- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
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- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to Taquan Air. Additional information regarding this recommendation can be found in the noted section of the report.

- Revise the checklists for your fleet of aircraft to ensure they include verification that the Garmin GSL 71 control head selector knob is in the ON position and that the unit is in ALT mode before takeoff. (A-21-22) (See section 2.7)

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-21-22). 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,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Mark Baker
Chief Executive Officer/President
Aircraft Owners and Pilots Association
421 Aviation Way
Frederick, MD 21701

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May 13, 2021

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Chief Executive Officer/President
Aircraft Owners and Pilots Association
421 Aviation Way
Frederick, MD 21701

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We are providing the following information to urge the Aircraft Owners and Pilots Association (AOPA) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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>.

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- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to AOPA. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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-21-23). 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,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Jack Pelton
Chief Executive Officer
Experimental Aircraft Association
EAA Aviation Center
3000 Poberezny Rd.
Oshkosh, WI 54903

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May 13, 2021

Mr. Jack Pelton
Chief Executive Officer
Experimental Aircraft Association
EAA Aviation Center
3000 Poberezny Rd.
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We are providing the following information to urge the Experimental Aircraft Association (EAA) 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.

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- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to EAA. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8)

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. James A. Viola
President/Chief Executive Officer
Helicopter Association International
1920 Ballenger Avenue
Alexandria, VA 22314-2898

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Mr. James A. Viola
President/Chief Executive Officer
Helicopter Association International
1920 Ballenger Avenue
Alexandria, Virginia 22314-2898

Dear Mr. Viola:

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 Helicopter Association International (HAI) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to HAI. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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-21-23). 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.

All communications regarding safety recommendations are 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. In the likely event that your company uses auto-generated and/or preformatted confidentiality statements on letterhead or outgoing e-mails, please include a statement in your letter indicating that the information can be publicly released. If you have concerns about this protocol, please contact us at ExecutiveSecretariat@ntsb.gov.

Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Ed Bolen
President/Chief Executive Officer
National Business Aviation Association
1200 G Street NW
Suite 1100
Washington, DC 20005

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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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-21-23). 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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Washington, DC 20594
Email: ExecutiveSecretariat@ntsb.gov



National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. Ed Bolen
President/Chief Executive Officer
National Business Aviation Association
1200 G Street NW
Suite 1100
Washington, DC 20005

Dear Mr. Bolen:

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 National Business Aviation Association (NBAA) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to NBAA. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Dave Doyon, Jr.
Chairman
Tongass Aircraft Pilots Association
1716 S. Tongass Highway
Ketchikan, AK 99901

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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-21-23). 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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National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. Dave Doyon, Jr.
Chairman
Tongass Aircraft Pilots Association
1716 S. Tongass Highway
Ketchikan, Alaska 99901

Dear Mr. Doyon:

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 Tongass Aircraft Pilots Association (TAPA) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to TAPA. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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-21-23). 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,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Christopher Young
Executive Director
Tour Operators Program of Safety

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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04.. 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-21-23). 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.

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National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. Christopher Young
Executive Director
Tour Operators Program of Safety

Dear Mr. Young:

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We are providing the following information to urge the Tour Operators Program of Safety (TOPS) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to TOPS (additional information regarding this recommendation can be found in the noted section of the report):

- Inform your members about the circumstances of this accident and encourage them to take the following actions: (1) become familiar with the traffic display equipment installed in their aircraft; (2) if their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and (3) remind pilots to include the traffic display when scanning for traffic through the aircraft's windows. (A-21-23) (See section 2.8.)

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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--1-23). 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,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. David St. George
Executive Director
Society of Aviation and Flight Educators
8030 Kirkpatrick Road
Sweet, ID 83670

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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-21-24). 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.

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National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. David St. George
Executive Director
Society of Aviation and Flight Educators
8030 Kirkpatrick Road
Sweet, ID 83670

Dear Mr. St. George:

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 Society of Aviation and Flight Educators (SAFE) 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.

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

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- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to SAFE (additional information regarding this recommendation can be found in the noted section of the report):

- Inform your members of the circumstances of this accident and incorporate instruction on including the traffic display when scanning for traffic through an aircraft's windows in both initial and recurrent pilot training. (A-21-24) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

May 13, 2021

Mr. Robert Meder
Chairman
National Association of Flight Instructors
3101 East Milham Avenue
Portage, MI 49002

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National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

May 13, 2021

Mr. Robert Meder
Chairman
National Association of Flight Instructors
3101 East Milham Avenue
Portage, MI 49002

Dear Mr. Meder:

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 National Association of Flight Instructors (NAFI) 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 April 20, 2021, report *Midair Collision over George Inlet, de Havilland DHC-2, N952DB, and de Havilland DHC-3, N959PA, Ketchikan, Alaska, May 13, 2019*, NTSB/AAR-21-04. 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:

- The inherent limitations of the see-and-avoid collision avoidance concept.
- The benefit of Automatic Dependent Surveillance-Broadcast (ADS-B) Out- and In-supported traffic advisory systems in high-traffic tour areas.
- The lack of an ADS-B In requirement for Title 14 *Code of Federal Regulations* Part 135 operations.
- The lack of cockpit display of traffic information alerting on both aircraft.
- The loss of alerting capabilities with ADS-B systems installed as part of the Federal Aviation Administration's post-Capstone upgrade program.
- An inadequate checklist used in Taquan Air's operation.
- Lack of a requirement for safety management systems in Part 135 operations.

Accordingly, the NTSB makes the following safety recommendation to NAFI. Additional information regarding this recommendation can be found in the noted section of the report.

- Inform your members of the circumstances of this accident and incorporate instruction on including the traffic display when scanning for traffic through an aircraft's windows in both initial and recurrent pilot training. (A-21-24) (See section 2.8)

To aid you in implementing this recommendation, we are also attaching an article regarding our investigation of this accident that you may use, either in its entirety or modified to fit the length and style considerations of your publication and/or website. We ask that you publish it, or similar content, in the next issue of your newsletter and/or website, and that you send us a copy of the newsletter or a link to the website article once it has been published.

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-21-24). 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.

All communications regarding safety recommendations are 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. In the likely event that your company uses auto-generated and/or preformatted confidentiality statements on letterhead or outgoing e-mails, please include a statement in your letter indicating that the information can be publicly released. If you have concerns about this protocol, please contact us at ExecutiveSecretariat@ntsb.gov.

Sincerely,

[Original Signed]

Robert L. Sumwalt, III
Chairman

Reducing the Risk of Midair Collisions

Midair collisions in the United States accounted for about 2% of all fatal aircraft accidents between January 1982 and August 2020 but 7% of fatal Part 135 sightseeing accidents. The higher percentage of midair collisions involving sightseeing aircraft could stem from a concentration of aircraft in some scenic areas and from an overreliance on the “see-and-avoid” approach to aircraft separation. There are inherent limitations to see-and-avoid, including the limited field of view from the cockpit (such as “blind spots” similar to those in vehicles), limitations of human attention (such as vigilance decrements or sub-optimal scanning patterns), and visual performance (difficulty perceiving small targets that lack apparent motion and may be masked by complex backgrounds). These limitations, which have been noted in U.S. civil aircraft accident reports dating back as far as the 1950s, spurred the development of the modern air traffic control system and a 1991 requirement for larger commercial aircraft to be equipped with traffic collision avoidance systems.

The National Transportation Safety Board’s (NTSB’s) final report on a fatal May 13, 2019, midair collision between a de Havilland DHC-2 Beaver and a de Havilland DHC-3 Otter near Ketchikan, Alaska, which occurred at 1221 local time in visual meteorological conditions, has highlighted once again the limitations of see-and-avoid. An analysis of the visibility of each airplane from the cockpit of the other indicated that the Otter was obscured from the Beaver pilot by the Beaver’s cockpit structure, right wing, and the passenger in the right front seat. Similarly, the Beaver was intermittently obscured from the Otter pilot’s field of view by a window post, most critically during the last 11 seconds before the collision. The pilot of the Beaver and all four passengers were killed. One passenger on the Otter was killed, the pilot sustained minor injuries, and nine passengers sustained serious injuries. A good samaritan operating a private vessel was located near the spot where the Otter crash-landed in a remote ocean inlet, and he was able to assist the survivors. Without his help, additional fatalities may have occurred.

Over the last 2 decades, automatic dependent surveillance-broadcast (ADS-B)-supported collision avoidance technologies featuring displays of traffic and aural and visual alerting features have become widely available and increasingly affordable in the United States. Such technologies, if widely adopted, could substantially reduce the occurrence of midair collisions like this one. Surprisingly, the pilots of both aircraft involved in the Ketchikan accident had ADS-B-supported cockpit displays of traffic information (CDTI) available to them, but the systems installed in each airplane had certain limitations, and they were not effectively utilized. The ADS-B system on the Otter was not broadcasting pressure altitude information because an ADS-B control head that relayed pressure altitude information to the ADS-B transceiver was not switched on. The NTSB’s investigation determined that this device was turned off during a maintenance inspection performed 2 weeks earlier on the Otter, and its deactivation was not noticed by three different pilots (including the accident pilot) who subsequently operated the airplane. Pilots did not normally manipulate the ADS-B control head, and it was not listed on company checklists for the airplane. As a result, information about the Otter’s pressure altitude was not transmitted to the Beaver’s ADS-B system.

The Beaver’s ADS-B system supplied traffic information to a ForeFlight mobile application that could provide a CDTI on the Beaver pilot’s Apple iPad. The version of ForeFlight on the iPad had the ability to produce both visual and aural alerts but required the altitude of relevant traffic targets to do so. Because the Otter was not broadcasting pressure altitude and though it was transmitting GPS-based

altitude, the transceiver on the Beaver was configured to only transmit pressure altitude, not geometric altitude, to the iPad. As a result, the ForeFlight application on the Beaver did not have altitude information about the Otter and so would not have identified the Otter as a collision threat or produced an alert as the airplanes converged. Additionally, if the Beaver's ForeFlight "Hide Distant Traffic" option had been enabled, the Otter would not have been displayed at all (the lack of altitude data for the Otter would have resulted in the ForeFlight application treating it as a "distant" target). Simulations performed by the NTSB indicated that, if the Otter had been broadcasting pressure altitude, the ForeFlight application could have generated aural and visual alerts concerning the Otter 1 minute 44 seconds before the collision.

The Otter was equipped with a Chelton electronic flight instrumentation system that provided a CDTI on a display mounted on the instrument panel. The Chelton system was designed to produce aural and visual traffic alerts but, to do so, required that the relevant traffic messages it received from the transceiver (a FreeFlight RANGR 978) be in "alert status." Although the Otter was originally equipped with a transceiver that could place targets in "alert status," in 2015, the transceiver was replaced with a newer model that did not have, and was not required to have, such an algorithm. After this change, the alerting features available on the CDTI could not be activated. Therefore, although the Beaver was displayed on the CDTI, the Otter pilot did not receive any visual or aural alerts concerning the Beaver as the airplanes converged. Simulations performed by the NTSB indicated that a CDTI with alerting capability might have generated an alert concerning the Beaver 37 seconds before the collision. According to the Otter pilot, the last time he looked at the CDTI was about 4 minutes before the accident. At that time, he saw "two groups of blue triangles," or aircraft targets, several miles away; but his experience with common patterns of flight operations in the local area led him to believe that the targets would not intercept his intended flightpath. If the Otter pilot had subsequently been alerted to the approaching Beaver, he would likely have looked for the Beaver and maneuvered to avoid it.

The NTSB determined that the probable cause of this accident was the inherent limitations of the see-and-avoid concept, which prevented the two pilots from seeing the other airplane before the collision, and the absence of visual and aural alerts from both airplanes' traffic display systems, while operating in a geographic area with a high concentration of air tour activity. Contributing to the accident were (1) the Federal Aviation Administration's (FAA's) provision of new transceivers that lacked alerting capability to Capstone Program operators without adequately mitigating the increased risk associated with the consequent loss of the previously available alerting capability and (2) the absence of a requirement for airborne traffic advisory systems with aural alerting among operators who carry passengers for hire.

This accident highlights how CDTI with traffic alerting can help pilots to overcome the limitations of the see-and-avoid concept and can mitigate the risk of midair collisions. As demonstrated in this accident, the presence of a CDTI in the cockpit does not by itself guarantee the effectiveness of the technology. Pilots must be familiar with ADS-B equipment installed in their aircraft and ensure that it is always fully operational in flight. Pilots should know whether their equipment includes a conflict-alerting feature and, if so, what types of alerts will be given under different scenarios. Because of the variety of CDTIs available and the different capabilities of these systems, pilots might not be aware of the aural or visual information their system can provide. Understanding the potential differences between CDTIs is particularly important for pilots who fly multiple aircraft with different systems. If a CDTI with aural and visual alerting is not installed, one should be installed and consistently used. Pilots must continue to

visually scan outside for conflicting traffic in visual flight rules conditions, but the circumstances of this accident underscore the importance of combining an effective visual scan with CDTIs and alerting in the cockpit.

Existing information published in the *Aeronautical Information Manual* and the *Pilot's Handbook of Aeronautical Knowledge* does not adequately address the limitations of human visual monitoring, the benefits of incorporating CDTIs in a pilot's traffic scan, and the importance of traffic alerting. Therefore, the NTSB has recommended that the FAA update these publications to include this information. In the meantime, we believe aviation industry groups can help to inform pilots about the lessons that can be learned from this accident. Specifically, the NTSB has recommended that industry groups take the following actions to proactively reduce the risk of midair collisions:

Inform your members about the circumstances of this accident and encourage them to:

- Become familiar with the traffic display equipment installed in their aircraft
- If their equipment does not provide an aural alert concerning proximate targets that might pose a collision threat, encourage pilots/operators to supplement the equipment with devices that provide both an aural and visual alert; and
- Remind pilots to include the traffic display when scanning for traffic through the aircraft's windows.

Additional information about the midair collision involving two sightseeing aircraft that occurred near Ketchikan, including the full accident report, can be found on the NTSB website at www.NTSB.gov, aviation accident report NTSB/AAR-21-04. An animation of the accident can be found on the NTSB's YouTube channel at: [NTSB Ketchikan Animation - YouTube](#)

Additional NTSB information and publications regarding midair collisions and the benefits of CDTI:

- Safety Alert – “Prevent Midair Collisions – Don't Depend on Vision Alone”: [SA 058.pdf \(ntsb.gov\)](#)
- NTSB Safety Compass blog – “Do we See and Avoid or Avoid Seeing?": [Inside the NTSB's General Aviation Investigative Process | NTSB Safety Compass \(wordpress.com\)](#)



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.

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

Safety Recommendation Reiteration List

SR Number	Reiteration Number	Report Number	Report Date	Accident Description	Accident City	Accident State	Accident Date
A-21-015	1	AIR-22-05	5/26/2022	Collision into Terrain Safari Aviation Inc. Airbus AS350 B2, N985SA	Kekaha	HI	12/26/2019