



TSB Recommendation A20-02

Landing minima in Canada

The Transportation Safety Board of Canada recommends that the Department of Transport introduce a mechanism to stop approaches and landings that are actually banned.

Air transportation safety investigation report	A18Q0030
Date the recommendation was issued	21 May 2020
Date of the latest response	January 2023
Date of the latest assessment	March 2023
Rating of the latest response	Satisfactory Intent
File status	Active

Summary of the occurrence

On 26 February 2018, a Beechcraft King Air A100 (registration C-GJXF, serial number B-159) operated by Strait Air (2000) Ltd. was conducting charter flight NUK107 under instrument flight rules, from the Sept-Îles Airport, Quebec, to the Havre St-Pierre Airport, Quebec, with 2 crew members and 6 passengers on board. The aircraft conducted an approach to Runway 08, which was snow-covered, while visibility was reduced due to heavy snow showers, and landed approximately 3800 feet beyond the threshold, at approximately 700 feet from the end of the runway. It continued its landing roll beyond the runway until it came to rest in a snowbank, approximately 220 feet beyond the end of the runway. The accident occurred in daylight, at 1120 Eastern Standard Time. The emergency locator transmitter, transmitting on 406 MHz, did not activate following the occurrence. The aircraft sustained substantial damage. Four of the occupants received minor injuries.

The Board concluded its investigation and released report A18Q0030 on 21 May 2020.

Rationale for the recommendation

In designing instrument approaches, the published minimum visibility represents the minimum visibility at which a pilot on approach at the decision height (DH) or the minimum descent altitude (MDA) should be able to establish and maintain the visual reference required up until landing.

International Civil Aviation Organization (ICAO)¹ standards and recommended practices stipulate that an instrument approach shall not be continued unless the reported visibility is at or above the specified minima. These minima are published on approach charts based on the approach type and lighting.

Various civil aviation authorities throughout the world (such as the U.S. Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA)) have established that the authorized visibility minima are those specified and published for the approach. Therefore, to determine whether an approach is authorized, it is simply a matter of comparing the reported visibility with the visibility published on the approach chart. Consequently, air traffic control (ATC) will not clear an aircraft for approach if the reported visibility is less than what is published on the approach chart.

In Canada, visibilities published on approach charts are provided for information purposes only.

To determine whether an aircraft can legally land at an aerodrome in Canada, consideration must first be given to the operational restrictions that apply to the aerodrome in question to ensure that the aerodrome is suitable for the manoeuvre being executed.² One of the determining factors is the aerodrome's operating visibility, which is defined in the *Canada Air Pilot* (CAP 5) in the general pages pertaining to operating minima.³ This operating visibility limit is published in the *Canada Flight Supplement* (CFS), specifically in the box reserved for runway information. If an aerodrome's operating visibility limit is not published in the CFS, it means that operations are not authorized when visibility is less than ½ statute mile (SM).

Next, the minimum visibility for an approach ban must be calculated to determine whether the approach can continue to the DH or the MDA. This minimum visibility is calculated based on the visibility published on the approach chart, and varies depending on the type of operations:

- ¾ of the published visibility for commercial operators;
- ½ of the published visibility for commercial operators who have Operations Specification 019 regarding reduced visibility;
- ¼ SM for private operators, regardless of the approach being conducted.

According to this calculation, the minimum visibility for an approach ban in Canada is less than the visibility published on the approach chart in every case. Consequently, it is likely that, once at the DH or MDA, pilots are not able to establish the required visual reference that will help them make a safe landing.

¹ International Civil Aviation Organization, Annex 6 to the Convention on International Civil Aviation, Eleventh Edition (July 2018), *Operation of Aircraft*, Part I, Chapter 4.

² Transport Canada, SOR/96-433, *Canadian Aviation Regulations*, paragraph 602.96(2)(b).

³ NAV CANADA, *Canada Air Pilot* (CAP), CAP 5: Quebec (in effect from 01 February to 29 March 2018), p. 16-18.

Between December 2006⁴ and December 2019, 31 incidents occurred following approaches conducted below the MDA with few visual references. Of these 31 incidents, 17 occurred during a landing in weather conditions where visibility was below what is published on the approach chart.⁵ Furthermore, this situation continues to occur today: 9 of the 17 incidents have occurred within the past 5 years.

In Canada, due to the complexity and variations in minima based on the type of operations, it is difficult for ATC to determine whether the planned approach is banned. It will clear an aircraft for approach regardless of the published minima, contrary to what is done elsewhere in the world. Therefore, it is up to the captain to interpret the approach ban, and it is the captain who decides whether or not to continue with the approach.

In this occurrence, the approach ban in effect in Canada did not prevent the captain from continuing with the approach in weather conditions that were one third of the authorized visibility minima and one quarter of the visibility published on the approach chart. During the approach, when the aircraft arrived at the MDA, it was up to the pilot alone to determine whether or not he had established the visual reference required to continue the descent and landing. Therefore, it is reasonable to conclude that the approach ban was ineffective in stopping this approach while visibility on the ground was below the minimum required for an approach ban, which contributed to the runway overrun.

As this occurrence demonstrates, if there is no mechanism to stop an approach that is in fact banned, then pilots may choose to continue their approach, which increases the risk of an approach-and-landing accident.

Therefore, the Board recommended that

the Department of Transport introduce a mechanism to stop approaches and landings that are actually banned.

TSB Recommendation A20-02

Previous responses and assessments

August 2020: response from Transport Canada

The two recommendations are related and will be addressed in a single response.

TC agrees with Recommendation A20-01 and, as outlined below, has already initiated work to implement improvements to the regulations governing approaches and landings at Canadian aerodromes.

⁴ Implementation date for landing minima regulations (CARs section 602.128) and approach ban regulations (CARs section 602.129).

⁵ After these 17 occurrences, the TSB published the following aviation investigation reports: A08W0237, A08O0333, A09Q0203, A12Q0216, A14A0067, A15O0015, A15H0002, A16A0041, and A18Q0030.

TC also agrees with Recommendation A20-02. While recognizing that it may be difficult to stop all approaches and landings that are prohibited through the regulations, introducing simpler regulations in keeping with Recommendation A20-01 will make them easier to follow and to enforce. Furthermore, TC will investigate possible improvements to education and enforcement as part of its upcoming work in this area.

The safety issues raised by the two recommendations are not unknown to TC. The complexity of the current approach ban regulations, promulgated in 2006, are the result of multiple compromises following consultations with industry to reflect the diverse realities facing Air Operators. As such, TC has already carried out significant work on this issue in the past five years:

- In 2015, TC developed an issue paper that was presented to the National Civil Aviation Management Executive Committee (NCAMX) recommending that the regulations should be revised to harmonize with international standards, and to update standards for calculating approach visibility.
- In November 2017, TC developed, and circulated through the Canadian Aviation Regulation Advisory Council (CARAC), a Preliminary Issue and Consultation Assessment (PICA) to establish a better understanding of industry concerns and to assist with regulatory development.
- In January 2018, the Assessment concluded that there was a need for consultation with all stakeholders through focus groups and to support to [sic] the harmonization with international standards and best practices.

Due to the complexity of the issue, stakeholders raised specific concerns related to the workload associated with implementation; potential service impacts in the North if changes to the approach ban are not done alongside infrastructure improvements; applicability of the changes to the approach ban to helicopter operations; and the need to harmonize proposed changes to the approach ban with changes to lighting standards.

Due to other competing priorities, this was the most recent work carried out by TC on this issue.

TC recognizes that more work needs to be done to mitigate the risks. To this end, revisions to the approach ban regulations (A20-01) must precede steps to ensure the new regulations are followed (A20-02). Building on the aforementioned work and comments received from stakeholders, TC is forming, and will lead, an industry working group on this issue. The working group will have the mandate to deliver on the following:

- Update to TP308/GPH209 - Criteria for the Development of Instrument Procedures⁶ to support new regulations with approach visibility calculations that account for runway approach lighting systems;

⁶ TP 308 can be accessed by following in Section 6 of AC 803-001 – *Transport Canada Publication TP308/GPH209 – Change 7.2 Criteria for the Development of Instrument Procedures* (Available at: <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-803-001#6>)

- Notice of Proposed Amendment (NPA) to update approach ban regulations as well as the supporting documentation and guidance; and,
- Review of potential measures to encourage and enforce compliance with updated approach ban regulations considering all tools in the regulatory toolbox and the experience of other jurisdictions.

In order to produce the deliverables above, the work will be divided into two phases:

- The first phase will involve a Policy review of the situation and will culminate with a Policy Discussion Paper and a Focus Group(s) with industry.
- During the second phase, the working group will begin the regulatory development that includes an NPA to be completed by January 2021 and have the draft instructions and the pre-publication of the new regulation in *Canada Gazette* Part I by the end of 2021. The final publication in *Canada Gazette* Part II will be approximately one year after Part I.

November 2020: TSB assessment of the response (Satisfactory Intent)

In its response, Transport Canada (TC) indicated that it agrees with Recommendation A20-02 and recognizes that introducing simpler regulations governing approaches and landings at Canadian aerodromes will make the regulations easier to follow and to enforce.

To that end, TC will lead an industry working group that will draft a Notice of Proposed Amendment to update approach ban regulations, as well as the supporting documentation and guidance. TC expects to publish the proposed regulations in the *Canada Gazette*, Part I, by the end of 2021.

This working group will also review various methods available to encourage and enforce compliance with the updated approach ban regulations.

The Board is encouraged by TC's planned actions to address the safety issues associated with the complexity of the landing minima in Canada. These actions, when fully implemented, have the potential to substantially mitigate the risks associated with the safety deficiency identified in Recommendation A20-02.

Therefore, the Board considers the response to Recommendation A20-02 to show **Satisfactory Intent**.

December 2021: response from Transport Canada

Transport Canada (TC) agrees with the recommendation.

In our initial response in August 2020, the Department recognized that more work needs to be done to mitigate the risks and committed to review potential measures to encourage and enforce compliance with updated approach ban regulations considering all tools in the regulatory toolbox and the experience of other jurisdictions. As noted in TC's update to Recommendation A20-01 above, TC is working closely with NAV CANADA and other

stakeholders to review and simplify operating minima for approaches and landings at Canadian aerodromes.

There are safety benefits anticipated with the introduction of prescribed approach visibility minima in Canada. The regulations will be more clear and easier for pilots to apply. The scientifically derived visibility minima will be clearly indicated on the instrument approach plate and will take into account approach lighting systems and aerodrome operating visibility minima (at baseline, the advisory visibility minima published on the approach plate does not consider these elements).

As mentioned in TC's previous response, work to resolve A20-01 is preceding work related to A20-02. In carrying out the work required to update the regulations, TC will continue to work closely with all stakeholders to look at ways to encourage and enforce compliance with the new approach ban regulations.

March 2022: TSB assessment of the response (Satisfactory Intent)

In its response, Transport Canada (TC) states that it agrees with Recommendation A20-02 and indicated that the work to amend the *Canadian Aviation Regulations* to address Recommendation A20-01 precedes the work related to the safety issues associated with Recommendation A20-02.

As noted in its latest response to Recommendation A20-01, TC highlighted that a Notice of Proposed Amendment (NPA-2021-011 - *Approach Ban*) to update approach ban regulations underwent an extensive consultation process and that publication in the *Canada Gazette*, Part I is anticipated for the fall of 2022.

In the interim, TC will continue to work closely with all stakeholders to examine ways to encourage and enforce compliance with the new approach ban regulations.

The Board is pleased with the regulatory developments made by TC. These actions, when fully implemented, have the potential to substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A20-02.

Therefore, the response to Recommendation A20-02 is assessed as **Satisfactory Intent**.

Latest response and assessment

January 2023: response from Transport Canada

Transport Canada (TC) agrees with the recommendation.⁷

⁷ All responses are those of the stakeholders to the TSB in written communications and are reproduced in full. The TSB corrects typographical errors in the material it reproduces without indication but uses brackets [] to show other changes or to show that part of the response was omitted because it was not pertinent.

As discussed in our December 10, 2021 response, there are safety benefits anticipated with the introduction of prescribed approach visibility minima in Canada. The proposed regulations will be more clear and easier for pilots to apply. The scientifically derived visibility minima will be clearly indicated on the instrument approach plate and will consider approach lighting systems and aerodrome operating visibility minima (at baseline, the advisory visibility minima published on the approach plate does not consider these elements). The proposed *Regulations Amending the Canadian Aviation Regulations (Approach Ban)* would make it much easier for the pilot to understand if the conditions allow (or ban) an approach.

TC continues to look at ways to encourage and enforce compliance with the proposed new sections of the CARs-*Approach Ban*. This includes a review and proposed increase of the Administrative Monetary Penalties (AMPs) associated with non-compliance.

As mentioned in TC's previous response, work to resolve A20-01 is preceding work related to A20-02. In carrying out the work required to update the regulations, TC will continue to work closely with all stakeholders to look at ways to encourage and enforce compliance with the new proposed approach ban regulations.

March 2023: TSB assessment of the response (Satisfactory Intent)

In its response, Transport Canada (TC) reiterated that it agrees with Recommendation A20-02 and stated that:

- The proposed regulations will be more clear and easier for pilots to apply;
- The scientifically derived visibility minima will be clearly indicated on the instrument approach plate and will consider approach lighting systems and aerodrome operating visibility minima (at baseline, the advisory visibility minima published on the approach plate does not consider these elements); and
- The proposed Regulations Amending the *Canadian Aviation Regulations (CARs) (Approach Ban)* would make it much easier for the pilot to understand if the conditions allow (or ban) an approach.

TC will continue to look at ways to encourage and enforce compliance with the proposed new sections of the CARs on approach bans, including a review and proposed increase of the administrative monetary penalties associated with non-compliance.

TC has also stated that work to resolve Recommendation A20-01 is preceding work related to Recommendation A20-02, and that, in carrying out the work required to update the regulations, TC will continue to work closely with all stakeholders to look at ways to encourage and enforce compliance with the new proposed approach ban regulations.

The Board is pleased with the regulatory developments made by TC. These actions, when fully implemented, have the potential to substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A20-02. The Board further believes that full implementation of these actions will address Recommendation A02-02's safety issue with low ceiling approaches.

Therefore, the Board considers the response to Recommendation A20-02 to show **Satisfactory Intent**.

File status

The TSB will continue to monitor the progress of TC's planned actions to mitigate the risks associated with the safety deficiency identified in Recommendation A20-02, and it will reassess the deficiency on an annual basis or when otherwise warranted. The TSB will also reassess Recommendation A20-02 once the planned actions have been fully implemented.

This deficiency file is **Active**.