



REASSESSMENT OF THE RESPONSES TO AVIATION SAFETY RECOMMENDATION A12-01

Design and depiction of Canadian instrument approach procedures

Background

The Beech A100 (registration C-GPBA, serial number B-215) operated by Exact Air Inc. as flight ET822 was on an instrument flight rules flight between Val-d'Or and Chicoutimi/Saint-Honoré, Quebec, with 2 pilots and 2 passengers on board. At 2240 Eastern Standard Time, the aircraft was cleared for an RNAV (GNSS) Runway 12 approach and switched to the aerodrome traffic frequency. At 2250, the International satellite system for search and rescue detected the aircraft's emergency locator transmitter signal. The aircraft was located at 0224 in a wooded area approximately 3 nautical miles from the threshold of Runway 12, on the approach centreline. Rescuers arrived on the scene at 0415. The 2 pilots were fatally injured, and the 2 passengers were seriously injured. The aircraft was destroyed on impact; there was no post crash fire.

The Board concluded its investigation and released report A09Q0203 on 02 May 2012.

Board Recommendation A12-01 (02 May 2012)

Transport Canada's manual entitled *Criteria for the Development of Instrument Procedures (TP308)* states that the optimum descent path for a non-precision final approach segment is 318 feet per nm, or an angle of 3°, and its use is recommended. However, the design of the instrument approaches published in the *Canada Air Pilot (CAP)* is based primarily on obstacle clearance. This design does not incorporate the optimum 3° path to be flown, but rather a series of minimum obstacle clearance altitudes.

The depiction of the non-precision approach charts published in the CAP cannot display an optimum descent path because it is not factored into the design. The descent path depicted on the approach chart is a line connecting the minimum obstacle clearance altitudes, rather than the path to be flown.

Pilots misinterpret the line depicted in the CAP approach chart as the path to be flown. Depending on the obstacles present in the approach path, the resulting descent could be very shallow. Consequently, aircraft spend more time than necessary at altitudes that provide a minimum obstacle clearance, thereby increasing the risk of approach and landing accidents (ALA).

The instrument approach charts that incorporate the recommendations of the International Civil Aviation Organization (ICAO) Annex 4 provide a precise visual image of the path to be followed, while indicating the minimum obstacle clearance altitudes. These visual elements are

recognized for their beneficial effects on positional awareness relative to terrain, reduce the required cognitive effort and, by extension, workload when flying an approach.

Therefore, the Board recommends that:

The Department of Transport require that the design and depiction of the non-precision approach charts incorporate the optimum path to be flown.

TSB Recommendation A12-01

Response from Transport Canada to Recommendation A12-01 (23 July 2012)

Transport Canada (TC) agrees that the design and depiction of the non-precision approach charts should include the depiction of the optimum path to be flown and the regulatory framework already exists to address these recommendations. Part VIII of the *Canadian Aviation Regulations* (CARs) requires service providers to meet the requirements of International Civil Aviation Organization (ICAO) Annex 4. ICAO Annex 4 requires the depiction of the optimum path flown on approach plates.

TC filed a difference with ICAO on behalf of NAV CANADA because this information was not available. However, NAV CANADA has developed Constant Descent Angle depiction standards and these depictions will be applied to all fixed and rotary wing non-precision instrument procedures. These standards include descent angles between 3.0 degrees and 3.5 degrees for aeroplanes and 3.0 to 4.5 degrees for helicopters. In addition, TP 308 recommends that the design and depiction of non-precision approaches be at an angle of 3 degrees. It is expected that NAV CANADA will complete this action by April 2013. At this point, Transport Canada will request that the difference be removed and full compliance with the CARs and ICAO Annex 4 will be achieved.

Additionally, TC will write an official letter to NAV CANADA highlighting the benefits of including Constant Descent Angle information in non-precision approach charts and encouraging the continuation and prioritization of this work. TC will continue to monitor NAV CANADA's progress in this regard.

Board assessment of response to A12-01 (17 January 2013)

In its response to the recommendation, TC indicates that it agrees with the intent of the recommendation and stipulates that the regulatory framework exists in the *Canadian Aviation Regulations* to require the presence of the optimum path to be followed on the non-precision approach charts.

NAV CANADA indicates that the implementation of the new depiction of the non-precision approach charts should be completed during the summer of 2013. This new depiction that indicates the optimum path to be flown will eliminate the safety deficiency underlying Recommendation A12-01.

The Board assesses the response as **Satisfactory Intent**.

Next TSB action (17 January 2013)

The TSB will continue to monitor the progress of Transport Canada's and NAV CANADA's proposed actions.

Response from Transport Canada to Recommendation A12-01 (26 November 2013)

In the 2014 editions of the *Canada Air Pilot (CAP)* and *Restricted Canada Air Pilot (RCAP)* publications, the new products will be available as a result of a three-year initiative undertaken by NAV CANADA's aeronautical information services (AIS).

The results of this initiative are structured products with increased consistency and overall usability, and will include:

- a new, modernized format, and
- an improved product specification.

In October 2013, NAV CANADA published Aeronautical Information Circular 33/13 advising its readers of this initiative.

Board assessment of response to A12-01 (02 April 2014)

In its response to the recommendation, Transport Canada indicates that the new *Canada Air Pilot (CAP)* and *Restricted Canada Air Pilot (RCAP)* publications will be available in 2014.

According to Aeronautical Information Circular 33/13 published by NAV CANADA, the phased implementation of these new publications will begin on 06 February 2014, and should be complete on 24 July 2014.

The publication improvements focus on several key areas, and include introducing Flight Safety Foundation stabilized approach criteria into the depiction.

These new publications will indicate the optimum path to be flown, and therefore, will eliminate the safety deficiency underlying Recommendation A12-01.

The Board assesses the response as **Fully Satisfactory**.

Next TSB action

No further action is required.

This deficiency file is assigned a **Closed** status.