



WELLINGTON NEW ZEALAND

PURSUANT to Section 28 of the Civil Aviation Act 1990

I, HARRY JAMES DUYNHOVEN, Associate Minister of Transport,

HEREBY MAKE the following ordinary rules.

SIGNED AT Wellington

This 24th day of FEBRUARY 2004

by **HARRY JAMES DUYNHOVEN**

Associate Minister of Transport

Civil Aviation Rules

Part 125, Amendment 4

Air Operations - Medium Aeroplanes

TAWS

Docket 2/CAR/8

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Rule objective

The objective of this rule is to—

- (1) clarify the purpose statement for Part 125; and
- (2) require holders of air operator certificates conducting air operations under Part 125 with specified aeroplanes after the effective date of this rule, to progressively equip those aeroplanes with a terrain awareness and warning system (TAWS) with effect from various dates prescribed in the rule; and
- (3) specify which types of aeroplanes are exempt from the requirement to be equipped with a GPWS; and
- (4) specify which types of aeroplanes are exempt from the requirement to be equipped with a TAWS.

Extent of consultation

In August 2001 the Civil Aviation Industry Rules Advisory Group (CIRAG) Executive accepted the terms of reference for the establishment of a Technical Study Group (TSG) to participate in a rule making project to upgrade the New Zealand requirements for ground proximity warning systems in accordance with the ICAO standards. The details of this proposal have been developed in consultation with the TSG under the CIRAG consultative process.

Participants on the TSG were drawn from the following sectors of the aviation industry:

- (a) Air traffic services (ATS);
- (b) New Zealand Air Line Pilots Association (NZALPA);
- (c) Part 121 operators;
- (d) Part 125 operators;
- (e) Operators of freighter aeroplanes.

In addition, operators of sightseeing aircraft in the Queenstown area were briefed on the rule proposals and given the opportunity to provide feedback.

A total of four TSG meetings were held from August 2001 to November 2001. Two further TSG meetings were held early in 2002 to specifically discuss Part 125 TAWS rule development. In addition, several informal meetings with TSG participants at which Part 125 TAWS issues were discussed were held in February 2002.

A Notice of Proposed Rulemaking, NPRM 03-03, containing the proposed rule to require some Part 125 aeroplanes to be equipped with TAWS was issued for public consultation under Docket 2/CAR/8 on 12 September 2002.

The publication of this NPRM was notified in the Gazette on 12 September 2002 and advertised in the daily newspapers in the five main provincial centres on 14 September 2002. The NPRM and its associated cost-benefit analysis (CBA) were published on the CAA web site and mailed to identified stakeholders including representative organisations who were considered likely to have an interest in the proposal.

A period of 32 days was provided for comment on the proposed rule.

Summary of comments

Four written submissions were received on the NPRM.

The Aviation Industry Association (AIA) considered the NPRM to be acceptable and had no further comment.

Great Barrier Airlines were happy with the proposed rule.

Vincent Aviation agreed in general with the NPRM but questioned the requirement for turbine powered aeroplanes with more than 5 passenger seats to be fitted with TAWS.

NZALPA commented on the requirements in the rule regarding IFR turbine powered aeroplanes over 5700 kg MCTOW that are on the NZ Register of Aircraft at the effective date of the rule and the requirements regarding other Part 125 aeroplanes, the consistency of the rule in relation to the requirements of the Civil Aviation Act regarding the

consideration to be given to the ICAO Standards and Recommended Practices, and the integrity of the CBA in relation to the statistical value of a human life and the assumed fatality rate associated with aircraft accidents.

The CAA considered the proposals and submissions and concluded that no changes were required to achieve the intent of the proposed rule. A detailed summary of comments received and responses by CAA are contained in the Consultation Details attached to these rules.

A copy of the collated comments on the proposed rule and CAA's responses was circulated to all commenters and the TSG members on 3 December 2002. No further responses were received.

The rule was then referred to Parliament's Regulations Review Committee before being considered by the Associate Minister of Transport.

The Minister was concerned that the proposed rules did not include retrofitting of TAWS Class A to existing 10 to 20 seat aeroplanes. He was mindful of the significant improvement in the exchange rate for the New Zealand dollar that had occurred since the NPRM was published and of a lowering of equipment costs and requested that the cost benefit analysis for this group of aeroplanes be reviewed.

After considering the outcome of the revised cost benefit analysis and following further meetings and correspondence with the affected air operators and the CAA, the Associate Minister accepted an amendment to the rule proposal to require all existing aeroplanes over the specified weight break, with the exception of Embraer EMB-110P1 series aeroplanes and aeroplanes configured to carry less than 10 passengers, to be retrofitted with TAWS Class A from 1 January 2007.

During the additional consultation on the existing 10 to 20 seat aeroplanes, it was established that the Embraer EMB-110P1 series of aeroplanes could be certificated to the standards of FAR Part 23 or SFAR 41. Under FAR Part 23 these aeroplanes are certificated with a MCTOW of 5670 kg but if certificated under SFAR 43 the MCTOW is 5900 kg. The CAA had previously accepted that the EMB-110P1 series of aeroplanes should be treated as "one type" and that the small

deviations from the 5700 kg MCTOW limit would be ignored for the purpose of applying the airworthiness and operating requirements.

It was therefore appropriate to reflect this “one type” acceptance of the Embraer EMB-110P1 series of aeroplanes into the GPWS and TAWS rules.

Rules 125.375 and 125.379 were amended to exclude the Embraer EMB-110P1 series of aeroplanes from the requirement for all turbine powered aeroplanes above 5700 kg MCTOW to be fitted with GPWS and TAWS A respectively.

With these changes incorporated the rule was then signed by the Associate Minister of Transport.

Examination of comments

Comments may be examined by application to the Docket Clerk at Aviation House between 8:30 am and 4:30 pm on weekdays, except statutory holidays.

Insertion of Amendments

The amendments to the rules in this Part are reflected by:

- (a) the revocation and replacement of existing rules; and
- (b) the insertion of new rules.

Effective date of rule

Amendment 4 to Part 125 comes into force on 25 March 2004.

Availability of rules

Civil Aviation Rules are available from—

CAA web site: <http://www.caa.govt.nz/>

Freephone: 0800 GET RULES (0800 438 785)

Subpart A — General

125.1 Purpose

Rule 125.1 is revoked and the following new rule is inserted

(a) Subject to paragraph (b), this Part prescribes rules governing air operations using an aeroplane—

- (1) having a passenger seating configuration of 10 to 30 seats; or
- (2) with a payload capacity of 3410 kg or less and a MCTOW greater than 5700 kg; or
- (3) to perform a SEIFR passenger operation.

(b) If either the seat numbers or payload capacity of the aeroplane falls into the purpose for Part 121, then the operation must be conducted under Part 121.

Subpart F—Instruments and Equipment

Rule 125.375 is revoked and the following new rule is inserted

125.375 Ground proximity warning system

(a) Except as provided in paragraph (b), a holder of an air operator certificate must ensure that each turbine powered aeroplane with a MCTOW greater than 5700 kg, being operated under that certificate under IFR, is equipped with a GPWS.

(b) A holder of an air operator certificate is not required to comply with paragraph (a) if—

- (1) the aeroplane is equipped with a TAWS Class A; or
- (2) the aeroplane is an Embraer EMB-110P1 that has a MCTOW greater than 5700 kg and the details specified under 47.55(b) in respect to that aeroplane already appear in the New Zealand Register of Aircraft on 25 March 2004.

The following new rule is inserted:

125.379 Terrain awareness and warning system (TAWS)

(a) A holder of an air operator certificate must ensure that each turbine powered aeroplane manufactured on or after 1 April 2002 with a MCTOW greater than 5700 kg and being operated under that certificate under IFR is equipped with a TAWS Class A.

(b) Except as provided in paragraph (c), a holder of an air operator certificate must ensure that each turbine powered aeroplane manufactured before 1 April 2002 with a MCTOW greater than 5700 kg and being operated under that certificate under IFR is equipped with a TAWS Class A—

- (1) by 1 July 2005 if the details specified under 47.55(b) in respect of that aeroplane first appear in the New Zealand Register of Aircraft after 25 March 2004; or
- (2) by 1 January 2007 if the details specified under 47.55(b) in respect of that aeroplane already appear in the New Zealand Register of Aircraft on 25 March 2004.

(c) A holder of an air operator certificate is not required to comply with paragraph (b)(2) if—

- (1) the aeroplane is an Embraer EMB-110P1 that has a MCTOW greater than 5700 kg and the aeroplane is equipped with a TAWS Class B; or
- (2) the aeroplane is already being operated by the holder under that certificate on 25 March 2004; and
- (3) the aeroplane is configured to carry less than 10 passengers; and
- (4) the aeroplane is equipped with a GPWS; and
- (5) the operation of that aeroplane after 1 January 2007 is conducted in accordance with a terrain collision risk assessment and mitigation programme that is acceptable to the Director.

(d) Except as provided in paragraph (e), a holder of an air operator certificate must ensure that—

- (1) each turbine powered aeroplane with a MCTOW of 5700 kg or less and with a passenger seating configuration of more than 5 seats being operated under that certificate under IFR is equipped with a TAWS Class B; and
- (2) each piston powered aeroplane with a MCTOW greater than 5700 kg or with a passenger seating configuration of more than 9 seats being operated under that certificate under IFR is equipped with a TAWS Class B.

(e) A holder of an air operator certificate is not required to comply with paragraph (d) until 1 January 2007 if that aeroplane is already being operated by the holder under that certificate on 25 March 2004.

Appendix B – Instruments and Equipment Airworthiness Design Standards

The following new provision is inserted into Appendix B:

B9 Terrain awareness and warning system (TAWS)

TAWS Class A must meet the requirements of TSO C151a or TSO C151b for Class A equipment.

TAWS Class B must meet the requirements of TSO C151a or TSO C151b for Class B equipment.

Consultation Details

(This statement does not form part of the rules contained in Part 125. It provides details of the consultation undertaken in making the rules.)

Notice of Proposed Rule Making

An NPRM was published under Notice of Proposed Rule Making 03-03 (Docket Number 2/CAR/8) on 12 September 2002. This notice proposed amendments to Part 125 *Air Operations – Medium Aeroplanes*. Four written submissions were received on the NPRM.

Summary of Comments on NPRM Docket Number 2/CAR/8

General comments on the NPRM

The AIA submission simply stated that the AIA had no further comment to make on the NPRM over comments already made during Part 121 and 125 TAWS rule development.

Great Barrier Airlines submitted that they were happy with the proposed rule.

Vincent Aviation submitted that they were in overall agreement with the NPRM but questioned the requirement that Part 125 turbine powered aeroplanes with more than 5 passenger seats be fitted with TAWS as it seemed inconsistent with the 9 passenger seats threshold for piston powered aeroplanes.

NZALPA submitted that: (1) all IFR turbine powered aeroplanes over 5700 kg MCTOW on the NZ register at the effective date of the rule should be equipped with TAWS Class A by 1 July 2005; (2) the rule as proposed by the NPRM does not meet ICAO Annex 6 TAWS Standards and Recommended Practices and is therefore inconsistent with the Civil Aviation Act; (3) the cost benefit analysis (CBA) is deficient in that outdated values for the statistical value of a human life and the assumed fatality rate have been used; and (4) that all Part 125 aeroplanes should be equipped with TAWS.

Specific comments on the NPRM

The AIA and Great Barrier Airlines submissions require no further comment.

Vincent Aviation submitted that 9 seats was recognised throughout the rules system as a break point and this should also apply to the TAWS rule i.e. only turbine powered aeroplanes over 9 passenger seats should be required to be equipped with TAWS.

CAA Comment: The CAA extended the requirement for TAWS to turbine powered aeroplanes with 5 to 9 seats because: (1) that is consistent with ICAO Annex 6 Part II recommendations and US FAA rules; (2) these aeroplanes will almost certainly be single engined and therefore would operate under Part 125 single-engine IFR rules rather than under Part 135; and (3) there is no burden on any existing New Zealand operator as there are no Part 125 turbine powered aeroplanes with 6-9 passenger seats operating under IFR.

As there is no burden on any existing operator the CAA believes adopting this ICAO recommended practice is in line with the Minister's function under section 14 of the Act to promote safety at a reasonable cost. Requiring these aeroplanes to be equipped with TAWS also provides consistency in that all Part 125 aeroplanes conducting IFR operations will be required to be equipped with TAWS or GPWS.

For these reasons the CAA does not consider it appropriate to change the proposed rule in the way suggested by Vincent Aviation.

NZALPA submitted that the proposed rule would be improved if 125.379(b) was deleted in its entirety and replaced with:

“A turbine powered aeroplane manufactured prior to 1 April 2002 and entered in the New Zealand Register of Aircraft before [*effective date of final rule*] does not need to comply with paragraph (a) until 1 July 2005.”

NZALPA also submitted that Section 33(1) of the Civil Aviation Act requires that ordinary rules made by the Minister shall not be inconsistent with ICAO standards and, as the NPRM does not require retrofit of existing aeroplanes, the NPRM is contrary to the intent of the Act.

CAA Comment: Adopting NZALPA's proposed change to 125.379(b) would result in: (1) turbine powered aeroplanes over 5700 kg MCTOW with 20 to 30 passenger seats already on the NZ Register of Aircraft at the effective date of the rule being required to retrofit TAWS Class A 18 months earlier than proposed by the NPRM; and (2) turbine powered aeroplanes over 5700 kg MCTOW with 19 or fewer passenger

seats already on the NZ Register of Aircraft at the effective date of the rule being required to retrofit TAWS Class A.

As stated in the NPRM, the date specified in ICAO Annex 6 amendment 27 by which aeroplanes in excess of 5700kg MCTOW or authorised to carry more than nine passengers are to be equipped with TAWS Class A is 1 January 2007. As explained in the NPRM, the CAA considered this to be an appropriate date by which Part 125 turbine powered aeroplanes with 20 to 30 passenger seats already on the Register should be retrofitted with TAWS Class A. This date also corresponds with the date for Part 121 aeroplanes with 40 or fewer passenger seats to be retrofitted.

The NZALPA proposal for 20 to 30 seat aeroplanes to be equipped with TAWS by 1 July 2005 would therefore be 18 months ahead of both the corresponding ICAO requirement and the date by which the Part 121 aeroplanes with 40 or fewer passenger seats require to be retrofitted.

The CAA does not see any justification for this proposal and therefore proposes to retain the date of 1 January 2007 as the retrofit compliance date for these 20-30 passenger seat aeroplanes.

With regard to NZALPA's reference to Section 33(1) of the Civil Aviation Act, the CAA points out that section 33(1) requires that ordinary rules made by the Minister...shall not be inconsistent with...the standards of ICAO in relation to aviation safety, **to the extent adopted by New Zealand** (emphasis added). It is therefore open to New Zealand and the Minister to adopt standards of ICAO to a greater or lesser extent.

In making a rule the Minister must, under section 33(2)(f) of the Act, have regard to the costs of implementing aviation safety measures. Section 14(1) of the Act also states that one of the two the principal functions of the Minister under the Act is to promote safety in civil aviation **at reasonable cost** (emphasis added).

The starting point for the CAA in developing Part 125 TAWS rule requirements was to determine the costs and benefits of adopting ICAO Standards in total. It was found that, on balance, there was insufficient benefit in relation to cost to require Part 125 aeroplanes with a MCTOW greater than 5700 kg and with less than 20 passenger seats, already on the New Zealand Register of Aircraft, to be equipped with TAWS Class

A but that there was sufficient benefit to require aeroplanes added to the Register in the future to be equipped.

The CAA considers that the CBA provides a rational basis for determining safety at reasonable cost and for these reasons does not agree that the proposed rule 125.379 should be deleted and replaced as proposed by NZALPA.

NZALPA submitted that the validity of the CBA becomes questionable as up-to-date figures have not been used for the statistical value of a life and the expected fatality rate in CFIT accidents. NZALPA submitted that using up-to-date figures of \$4.0m and 84% respectively for these two variables would produce a medium scenario benefit:cost ratio of 3.08.

CAA Comment: The CAA understands that the benefit:cost ratio of 3.08 that NZALPA refers to was contained in an earlier indicative CBA and was based on a statistical value of life of \$4.0m, 100% fatalities and 1600 hours of annual utilisation. The benefits and costs were also not discounted to present-day values.

As stated in the NPRM, the CAA is required by Government directive to use a statistical value of life of \$2.56m¹.

The CAA has reviewed the other assumptions made in the CBA and has calculated the benefit:cost ratio for the medium scenario of retrofitting TAWS Class A to existing Part 125 aeroplanes over 5700 kg MCTOW and with 20 or less passenger seats. The revised assumptions are: (1) fatality rate 84%; and (2) annual utilisation 1130 hours. The corresponding figures used in the CBA that accompanied the NPRM were 50% and 1600 hours respectively.

The utilisation was reduced to 1130 hours from 1600 hours based on a review of the actual utilisations of typical Part 125 aeroplanes in this size range. This review indicated that the utilisation of these aeroplanes has fallen approximately 26% over the last 2 years.

For reasons explained above, the statistical value of life was retained at \$2.56m.

¹ NZ Gazette, 16 May 1991, No 72, p 1602

Using these revised assumptions, the resulting cost:benefit ratio of retrofitting Part 125 turbine powered aeroplanes over 5700 kg MCTOW and with less than 20 passenger seats with TAWS Class A is 0.84 for the medium scenario.

The CAA is also mindful that this group of aeroplanes will progressively reduce in both numbers, seating capacity (with greater freight use) and utilisation. On this basis, the CAA remains of the view that requiring these Part 125 aeroplanes to be retrofitted with TAWS Class A cannot be justified.

Additional Consultation

The Associate Minister of Transport met with CAA staff on 2 April 2003 to receive a briefing on the proposed Part 121 and 125 TAWS rules. At this meeting the Associate Minister expressed concern that the draft Part 125 TAWS rule did not include a requirement for existing turbine powered aeroplanes over 5700kg MCTOW with 19 or fewer passenger seats to be fitted with TAWS Class A.

Additional consultation – May 2003 to August 2003

At a meeting with industry representatives on 21 May, the Minister requested feedback on a proposal to include existing² turbine powered IFR aeroplanes over 5700kg MCTOW and seating 10-19 passengers in the TAWS rule. The industry representatives expressed concern at this proposal on the grounds of equipment cost, the unwillingness of aircraft leasing companies to fund equipment, and the marginal operating economics of this size of aeroplane.

The Minister advised he would consider the matter further and requested the CAA to update the CBA to reflect the changes in equipment cost and in the foreign exchange rate that had occurred since the CBA was prepared.

² “Existing” in this context means aeroplanes already on the New Zealand Register of Aircraft at the effective date of the rule.

Revised CBA

CAA reviewed the CBA during August 2003 and prepared an addendum³ to the original CBA. The only changes from the original CBA were the cost of retrofitting TAWS equipment and the US dollar exchange rate assumed.

Extensive consultation was held with industry representatives through the AIA to determine the appropriate values of exchange rate and retrofit cost. As a result of the consultation, and its own research, the CAA decided to use a range of exchange rate and retrofit cost values in the revised CBA to reflect differences between the industry and CAA estimates.

The revised CBA indicated that it would be cost-beneficial on the medium accident scenario to retrofit TAWS Class A equipment to existing 10 to 19 seat aeroplanes. The original CBA indicated that this would not be cost-beneficial.

Additional consultation – September 2003 to December 2003

The Minister requested a further consultation meeting with affected industry operators on 25 September 2003 to solicit their feedback on the revised CBA. The industry representatives commented that in their view - (1) there is no safety case to support the retrofit of existing 10-19 seat aeroplanes with TAWS; (2) the cost assumed for the retrofit of TAWS was too low; (3) alternative lower cost equipment specifications should be permitted; and (4) a requirement to fit TAWS would make it more attractive for operators to use smaller piston powered aeroplanes instead.

Further discussions took place between the CAA and industry during October 2003 to enable the industry to finalise its position.

On 4 November 2003 the Aviation Industry Association, on behalf of the affected operators, wrote to the Minister reiterating its previously stated concerns and requesting that additional time beyond 1 January

³ *Proposed Part 125 Terrain Awareness and Warning System – Cost Benefit Analysis [of] Retrofitting Aeroplanes [with] less than 20 Seats, Addendum, 8 September 2003.*

2007 be provided for some existing aeroplanes to be equipped with TAWS.

Further discussions occurred between the Minister, the AIA and the operator of the Embraer EMP-110P1 aeroplane in December 2003.

Embraer EMP-110P1 (Bandeirante) aeroplanes

In its letter to the Minister the AIA requested that the one remaining Bandeirante aeroplane⁴ that is operating under a Part 119 air operator certificate in the 10-19 seat aeroplane group should be excluded from the requirement to fit TAWS Class A on the basis that it had previously been accepted by CAA as being below 5700kg MCTOW.

As explained in the Summary of Comments section of the final rule, the CAA has agreed that all Embraer EMP-110P1 aeroplanes on the New Zealand Register of Aircraft at the effective date of the rule should be treated as the one type with an MCTOW below 5700 kg regardless of whether they are certificated to FAR Part 23 of SFAR 41. Therefore the one remaining Bandeirante aeroplane that is certificated to SFAR 41 should be excluded from the existing Rule 125.375 requirement to be equipped with GPWS but, consistent with other aeroplanes at or under 5700kg MCTOW, it should be required to be equipped with TAWS Class B from 1 January 2007.

Aeroplanes with fewer than 10 passenger seats

Approximately six existing aeroplanes over 5700kg MCTOW are routinely operated with a passenger seating configuration of less than 10 seats. After reviewing Australian and United States TAWS requirements the CAA concluded that it would be reasonable to also exclude these aeroplanes from the requirement to be equipped with TAWS Class A from 1 January 2007. These aeroplanes, which are all equipped with GPWS, are approaching the end of their economic lives and are not expected to remain operating long after 2007. To ensure that all reasonable steps are taken to protect these aeroplanes from CFIT accidents the final rule includes a requirement that operations beyond 1 January 2007, without TAWS Class A fitted, must be conducted in accordance with a terrain collision risk assessment and mitigation programme that is acceptable to the Director.

⁴ This aeroplane has a MCTOW of 5900kg.

Alternative equipment specifications

In its letter to the Minister the AIA requested that provision be made for alternative, lower cost, equipment to TAWS Class A for terrain warning and avoidance.

The CAA considered this proposal but does not believe that it is necessary to make specific provision in the final rule for alternative equipment. The TAWS specifications contained in TSO C151a and C151b are “open” specifications in that they prescribe the *performance requirement* of TAWS equipment but not the *method* by which the requirement must be met. The TSO was written this way by the FAA specifically to enable new technology and alternative means of compliance to be developed.

Compliance date

After further discussions, the AIA agreed that all existing 10-19 seat turbine powered aeroplanes, with the exception of the Bandeirante, should be equipped with TAWS Class A from 1 January 2007. It was agreed that proposals to allow a later compliance date for some aeroplanes, as initially requested by the AIA, would not be equitable to all operators.