




CANADA  
PRIVY COUNCIL • CONSEIL PRIVÉ

P.C. 2012-858  
June 19, 2012

His Excellency the Governor General in Council, on the recommendation of the Minister of Transport, pursuant to section 4.9 of the *Aeronautics Act*, hereby makes the annexed *Regulations Amending the Canadian Aviation Regulations (Parts I, VI and VII)*.

<b>REGISTRATION - ENREGISTREMENT</b>	
NO. <u>2012/2012-136</u>	DATE <u>June 20, 2012</u>
	
REGISTRAR OF STATUTORY INSTRUMENTS CANADA REGISTRAIRE DES TEXTES REGLEMENTAIRES	

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CLERK OF THE PRIVY COUNCIL—LE GREFFIER DU CONSEIL PRIVÉ

REGULATIONS AMENDING THE CANADIAN AVIATION REGULATIONS (PARTS I, VI  
AND VII)

AMENDMENTS

1. Subsection 101.01(1) of the *Canadian Aviation Regulations*<sup>1</sup> is amended by adding the following in alphabetical order:

“TAWS” or “Terrain Awareness Warning System” means an aircraft system that is intended to provide a flight crew with both aural and visual alerts to aid in preventing controlled flight into terrain, obstacles or water; (*TAWS ou système d’avertissement et d’alarme d’impact*)

2. Subpart 5 of Part VI of Schedule II to Subpart 3 of Part I of the Regulations is amended by adding the following after the reference “Subsection 605.41(4)”:

Column I Designated Provision	Column II Maximum Amount of Penalty (\$)	
	Individual	Corporation
Subsection 605.42(1)	5,000	25,000

3. Subpart 3 of Part VII of Schedule II to Subpart 3 of Part I of the Regulations is amended by adding the following after the reference “Subsection 703.70(2)”:

Column I Designated Provision	Column II Maximum Amount of Penalty (\$)	
	Individual	Corporation
Subsection 703.71(1)	5,000	25,000

4. The references “Subsection 704.71(1)” to “Subsection 704.71(3)” in column I of Subpart 4 of Part VII of Schedule II to Subpart 3 of Part I of the Regulations are replaced by the following:

Column I Designated Provision
Subsection 704.70(1)
Subsection 704.70(2)
Subsection 704.70(3)

<sup>1</sup> SOR/96-433



**5. Subpart 4 of Part VII of Schedule II to Subpart 3 of Part I of the Regulations is amended by adding the following after the reference “Subsection 704.70(3)”:**

Column I Designated Provision	Column II Maximum Amount of Penalty (\$)	
	Individual	Corporation
Subsection 704.71(1)	5,000	25,000
Subsection 704.71(2)	5,000	25,000

**6. Subpart 5 of Part VII of Schedule II to Subpart 3 of Part I of the Regulations is amended by adding the following after the reference “Subsection 705.83(3)”:**

Column I Designated Provision	Column II Maximum Amount of Penalty (\$)	
	Individual	Corporation
Subsection 705.84(1)	5,000	25,000

**7. Subsection 602.31(3) of the Regulations is replaced by the following:**

(3) The pilot-in-command of an aircraft may deviate from an air traffic control clearance or an air traffic control instruction to the extent necessary to carry out a collision avoidance manoeuvre, if the manoeuvre is carried out

- (a) in accordance with a resolution advisory generated by an ACAS; or
- (b) in response to an alert from a TAWS or a Ground Proximity Warning System (GPWS).

**8. The heading before section 605.37 of the Regulations is replaced by the following:**

GPWS

**9. (1) Subsections 605.37(1) to (3) of the Regulations are amended by replacing “Ground Proximity Warning System” with “GPWS”.**

**(2) Section 605.37 of the Regulations is amended by adding the following after subsection (3):**

- (4) This section
  - (a) applies only in respect of aeroplanes manufactured on or before the day on which this subsection comes into force; and
  - (b) shall cease to apply on the expiry of two years after that day.

**10. The reference “[605.42 to 605.83 reserved]” after section 605.41 of the Regulations is replaced by the following:**



## TAWS

**605.42** (1) Subject to subsection (2), no operator shall operate a turbine-powered aeroplane that has a seating configuration, excluding pilot seats, of six or more, unless the aeroplane is equipped with an operative TAWS that

- (a) meets the requirements for Class A or Class B equipment set out in CAN-TSO-C151b;
- (b) meets, effective on the day that is five years after the day on which this section comes into force, the altitude accuracy requirements set out in section 551.102 of Chapter 551 of the *Airworthiness Manual*; and
- (c) has a terrain and airport database compatible with the area of operation.

(2) The operator may operate the aeroplane without its being equipped with an operative TAWS if

- (a) the aeroplane is operated in day VFR only;
- (b) in the event that a minimum equipment list has not been approved by the Minister and subject to subsection 605.08(1), the operation takes place within the three days after the day on which the failure of the TAWS occurs; or
- (c) it is necessary for the pilot-in-command to deactivate, in the interests of aviation safety, the TAWS or any of its modes and the pilot-in-command does so in accordance with the aircraft flight manual, aircraft operating manual, flight manual supplement or minimum equipment list.

(3) This section does not apply in respect of aeroplanes manufactured on or before the day on which this section comes into force until the day that is two years after that day.

[605.43 to 605.83 reserved]

**11. The reference “[703.71 to 703.81 reserved]” after section 703.70 of the Regulations is replaced by the following:**

## TAWS

**703.71** (1) Subject to subsection (2), no air operator shall operate an aeroplane that has a seating configuration, excluding pilot seats, of six or more, unless the aeroplane is equipped with an operative TAWS that

- (a) meets the requirements for Class A or Class B equipment set out in CAN-TSO-C151b;
- (b) meets, effective on the day that is five years after the day on which this section comes into force, the altitude accuracy requirements set out in section 551.102 of Chapter 551 of the *Airworthiness Manual*; and
- (c) has a terrain and airport database compatible with the area of operation.

(2) The air operator may operate the aeroplane without its being equipped with an operative TAWS if



- (a) the aeroplane is operated in day VFR only;
  - (b) in the event that a minimum equipment list has not been approved by the Minister and subject to subsection 605.08(1), the operation takes place within the three days after the day on which the failure of the TAWS occurs; or
  - (c) it is necessary for the pilot-in-command to deactivate, in the interests of aviation safety, the TAWS or any of its modes and the pilot-in-command does so in accordance with the aircraft flight manual, aircraft operating manual, flight manual supplement or minimum equipment list.
- (3) This section does not apply in respect of aeroplanes manufactured on or before the day on which this section comes into force until the day that is two years after that day.

[703.72 to 703.81 reserved]

**12. The reference “[704.71 to 704.82 reserved]” after section 704.70 of the Regulations is replaced by the following:**

#### TAWS

**704.71** (1) Subject to subsection (3), no air operator shall operate an aeroplane that has a seating configuration, excluding pilot seats, of six to nine inclusive, unless the aeroplane is equipped with an operative TAWS that

- (a) meets the requirements for Class A or Class B equipment set out in CAN-TSO-C151b;
- (b) meets, effective on the day that is five years after the day on which this section comes into force, the altitude accuracy requirements set out in section 551.102 of Chapter 551 of the *Airworthiness Manual*; and
- (c) has a terrain and airport database compatible with the area of operation.

(2) Subject to subsection (3), no air operator shall operate an aeroplane that has a seating configuration, excluding pilot seats, of ten or more, unless the aeroplane is equipped with an operative TAWS that

- (a) meets the requirements for Class A equipment set out in CAN-TSO-C151b;
- (b) meets, effective on the day that is five years after the day on which this section comes into force, the altitude accuracy requirements set out in section 551.102 of Chapter 551 of the *Airworthiness Manual*; and
- (c) has a terrain and airport database compatible with the area of operation and a terrain awareness and situational display.

(3) The air operator may operate the aeroplane without its being equipped with an operative TAWS if

- (a) the aeroplane is operated in day VFR only;



(b) in the event that a minimum equipment list has not been approved by the Minister and subject to subsection 605.08(1), the operation takes place within the three days after the day on which the failure of the TAWS occurs; or

(c) it is necessary for the pilot-in-command to deactivate, in the interests of aviation safety, the TAWS or any of its modes and the pilot-in-command does so in accordance with the aircraft flight manual, aircraft operating manual, flight manual supplement or minimum equipment list.

(4) This section does not apply in respect of aeroplanes manufactured on or before the day on which this section comes into force until the day that is two years after that day.

[704.72 to 704.82 reserved]

**13. The reference “[705.84 to 705.88 reserved]” after section 705.83 of the Regulations is replaced by the following:**

#### TAWS

**705.84** (1) Subject to subsection (2), no air operator shall operate an aeroplane unless the aeroplane is equipped with an operative TAWS that

(a) meets the requirements for Class A equipment set out in CAN-TSO-C151b;

(b) meets, effective on the day that is five years after the day on which this section comes into force, the altitude accuracy requirements set out in section 551.102 of Chapter 551 of the *Airworthiness Manual*; and

(c) has a terrain and airport database compatible with the area of operation and a terrain awareness and situational display.

(2) The air operator may operate the aeroplane without its being equipped with an operative TAWS if

(a) in the event that a minimum equipment list has not been approved by the Minister and subject to subsection 605.08(1), the operation takes place within the three days after the day on which the failure of the TAWS occurs; or

(b) it is necessary for the pilot-in-command to deactivate, in the interests of aviation safety, the TAWS or any of its modes and the pilot-in-command does so in accordance with the aircraft flight manual, aircraft operating manual, flight manual supplement or minimum equipment list.

(3) This section does not apply in respect of aeroplanes manufactured on or before the day on which this section comes into force until the day that is two years after that day.

[705.85 to 705.88 reserved]



**COMING INTO FORCE**

**14. These Regulations come into force on the day on which they are published in the *Canada Gazette*, Part II.**



## REGULATORY IMPACT ANALYSIS STATEMENT

*(This statement is not part of the Regulations.)*

### *1. Executive summary*

**Issue:** From 1977 to 2009, thirty-five airworthy aeroplanes have been flown into the ground while under pilot control. The aviation industry refers to these as controlled flight into terrain (CFIT) accidents. There have been one hundred fatalities and forty-six serious injuries as a result. To date, risk information alone has not motivated all of the Canadian aviation industry to voluntarily equip key passenger aeroplanes with existing technologies that would help mitigate risks associated to CFITs.

**Description:** These regulatory amendments introduce requirements for the installation of Terrain Awareness Warning Systems (TAWS) equipped with an Enhanced Altitude Accuracy (EAA) function in private turbine-powered aeroplanes configured with six or more passenger seats, excluding pilot seats, and in commercial aeroplanes configured with six or more passenger seats, excluding pilot seats. Operators will have two years from the date on which the regulations come into force to equip their aeroplanes with TAWS and five years to equip with EAA.

**Cost-benefit statement:** The majority of Canadian passenger aeroplane operators already comply with these amendments. The present value cost of equipping and retrofitting the remainder of the fleet with TAWS and EAA that currently do not comply with the amendments is estimated to be approximately \$57M (\$42M for TAWS and \$15M for EAA). The present value benefit (e.g., avoidance of fatalities, serious injuries, & material loss) is estimated to be approximately \$216M. These amendments should yield a net benefit of approximately \$159M over a 10-year period from full implementation.

**Business and consumer impacts (if applicable):** There will be some cost associated with the implementation of these amendments, but the risks associated with CFIT accidents will be considerably reduced, resulting in fewer deaths, serious injuries and material loss. As a result, businesses and consumers will benefit from an increased safety in the operations of aeroplanes. Moreover, airlines travelling to the United States and to the European Union will be in compliance with similar regulations in those jurisdictions, strengthening Canada's ability to compete economically in those markets.

**Domestic and international coordination and cooperation (if applicable):** These amendments align the Canadian regulation with those of other jurisdictions. The United States, the European Aviation Safety Agency (EASA) and the International Civil Aviation Organization (ICAO) have all introduced legal requirements and standards regarding TAWS. Canadian aeroplanes being operated in other jurisdictions are expected to comply with the more restrictive regulations of these jurisdictions. Impacts on imports of new aircraft will be minimal.



## ***2. Background***

Controlled flight into terrain (CFIT) is a type of accident where a flight crew loses its awareness of its proximity to terrain, and flies an airworthy aircraft into terrain or an obstacle, while under complete control.

The *Canadian Aviation Regulations* (CARs) have required since the mid 1980's that aircraft operated under Subpart 705 *Airline Operations* be equipped with a Ground Proximity Warning System (GPWS), a system that gives flight crews minimal early warning of impending collision with terrain.

The technology on which GPWS was based has evolved and offers increased mitigation to the risks associated to environment conducive to CFITs. The new generation of GPWS, known as Terrain Awareness Warning Systems (TAWS), improves on existing GPWS systems by:

- providing earlier aural and visual warnings of an impending collision with terrain or obstacles under conditions GPWS cannot;
- providing a “forward-looking” terrain display, based on real-time comparison of an aircraft's location coordinates with stored terrain data;
- enabling development of a terrain clearance “floor”, based on calculated distance to a specified runway threshold location, which provide alerts and warnings independent of landing gear or flap settings.

There are two Classes of TAWS equipment available, Class A and Class B. Class A TAWS is intended for larger aeroplanes, while Class B is intended for smaller aeroplanes. Both classes have the terrain look-ahead functions called Forward Looking Terrain Avoidance (FLTA) and the unsafe terrain clearance function called Premature Descent Algorithm (PDA) in addition to the basic GPWS function. Because Class B TAWS is intended for smaller aeroplanes, it has reduced GPWS modes compared to Class A TAWS and is simpler and less expensive to install.

TAWS require an accurate input of altitude to function correctly. Most current TAWS equipment has an altitude accuracy function that can be referred to as an Enhanced Altitude Accuracy (EAA) function. The EAA function uses various sources of altitude information including the Global Positioning System (GPS), radio altimeter readings, and static air temperature readings to compute a very accurate altitude input, despite various atmospheric conditions of temperature and pressure that can lead to altitude errors. The EAA function also protects against flight crew errors by automatically setting altitude references necessary for accurate altitude measurements.

## ***3. Issue***

From 1977 to 2009, thirty-five airworthy aeroplanes have been flown into the ground while under pilot control, resulting in one hundred fatalities and forty-six serious injuries. The Canadian industry has been aware of the limitation of GPWS and of the technologies available to mitigate the risks associated to environment conducive to CFITs. To date,

risk information alone has not motivated all aircraft operators to equip with existing technologies.

#### ***4. Objectives***

These amendments further Transport Canada's mission to serve the public interest through the promotion of a safe and secure transportation system in Canada. In particular, these amendments address key policy issues:

##### *Transportation Safety Board Recommendations*

These amendments respond to a recommendation of the Transportation Safety Board of Canada (TSB), made following an accident in February 1995, for a requirement for the installation of GPWS on all turbine-powered instrument flight rules (IFR)-approved commuter and airline aeroplanes carrying 10 or more passengers. The intent of the recommendation was that the enhanced safety provided by GPWS not be limited to turbo-jet powered aircraft but rather should be based on the role in which the aircraft was being used and on its passenger-carrying capacity.

##### *International Alignment*

The Federal Aviation Administration (FAA) introduced in March 2001 requirements for turbine-powered aeroplanes configured with six or more seats, excluding pilots, to equip with TAWS.

The International Civil Aviation Organization (ICAO) introduced in 2003 a standard for international commercial aviation requiring that turbine-powered aeroplanes with a maximum certificated take-off weight (MCTOW) of more than 5,700 kg, and authorized to carry more than 9 passengers, be equipped with a Class A TAWS. Smaller turbine-powered aeroplanes in international commercial aviation, although not the subject of an ICAO standard, are recommended to have a Class A TAWS.

The European Aviation Safety Agency or EASA (which now incorporates the European Joint Aviation Authority (JAA)) has adopted the ICAO standard and the individual States that are signatories to their agreement are in the process of adopting TAWS requirements.

#### ***5. Description***

Part VI *General Operating and Flight Rules* of the CARs deals with the general operating and flight rules which apply to all aircraft operations, private and commercial. Part VII *Commercial Air Services* of the CARs governs the use of airplanes and helicopters in commercial air services, including airworthiness rules relating specifically to commercial operations.

These regulatory amendments apply to private turbine-powered aeroplanes configured with six or more seats, excluding pilot seats and to commercial aeroplanes configured

with six or more seats, excluding pilot seats. Companies will have two years from the date on which the regulations come into force to equip their aeroplanes with TAWS and five years from the same date to equip with EAA.

These amendments introduce new sections in Subpart 605 *Aircraft Requirements*, Subpart 703 *Air Taxi Operations*, Subpart 704 *Commuter Operations*, and Subpart 705 *Airline Operations* as summarized in the following table:

<b>CAR Subparts</b>	<b>Regulatory Requirements</b>
Subpart 605	Private turbine-powered aeroplanes and commercial aircraft configured with six or more seats, excluding pilot seats, except when operated DAY Visual Flight Rules, will be required to be equipped with Class A or B TAWS with EAA functionality.
Subpart 703	Aeroplanes configured with six or more seats, excluding pilot seats, except when operated DAY Visual Flight Rules, will be required to be equipped with Class A or B TAWS with EAA functionality.
Subpart 704	Aeroplanes configured with six to nine passenger seats, except when operated DAY Visual Flight Rules, will be required to be equipped with Class A or B TAWS with EAA functionality.
	Aeroplanes configured with ten or more passenger seats, exclusive of pilot seats, except when operated DAY Visual Flight Rules, would be required to be equipped with Class A TAWS with EAA functionality, a terrain awareness and situational display.
Subpart 705	Aeroplanes will be required to be equipped with Class A TAWS with EAA functionality, a terrain awareness and situational display.

### ***6. Regulatory and non-regulatory options considered***

A number of regulatory and non-regulatory options were considered to reduce the risk to Canadians of CFIT accidents in passenger-carrying aircraft.

#### *Status Quo*

The status quo was rejected because it would leave passengers and crew in aircraft not currently required to have GPWS without the protection against CFIT accidents provided by this equipment. These amendments extend the safety benefits already being generated by the existing requirement in section 605.37 *Ground Proximity Warning System* for GPWS on larger aeroplanes to passengers and crew in smaller aeroplanes and in aeroplanes not powered by turbine engines. The introduction of more sophisticated technology embodied in TAWS and of enhanced altitude alerting accuracy will increase the protection provided by all such installations.

#### *Alignment with Other Jurisdictions*

The FAA and ICAO requirements apply only to turbine-powered aeroplanes. When this version of the proposal was discussed during consultation, it was noted by stakeholders

that, for the Subpart 703 operators and for some of the Subpart 704 operators, it was possible they would choose to discontinue use of turbine-powered aeroplanes in favor of piston-powered to eliminate the cost of installing TAWS. Since piston-powered engines are less reliable than turbine-powered engines, this was considered an undesirable consequence from a safety standpoint. Therefore, these amendments include all passenger-carrying aeroplanes in commercial operations.

#### *Enhanced Altitude Accuracy (EAA)*

No other jurisdiction currently requires the EAA provision. The computational procedure used to integrate data from an onboard navigation system and the TAWS terrain data base in determining the risk of collision with terrain requires precise altitude information at all times. Incorrect altimeter settings, operations in standard pressure regions<sup>1</sup> or operations at extremely cold temperatures may result in altitude errors sufficient to prevent the appropriate warnings from being generated by TAWS equipment. It is estimated that a TAWS without an EAA can give deviations up to as much as 500 feet. Without the enhanced altitude accuracy provisions included in these amendments, TAWS may, under the conditions described above, fail to provide the required alerts to allow for the avoidance of a CFIT event.

The FAA acknowledged in its final rule on TAWS that it would amend its regulation as new avionics technology is developed and proven to include other classes or subclasses of TAWS:

*'... An example of a new subclass could be a Class B, level 1 that could include geometric calculation of altitude using GPS/WAAS (Global Positioning System/Wide Area Augmentation System) when that system is operational...'*<sup>2</sup>

#### **7. Benefits and costs**

The majority of aeroplanes operated under Subpart 705 – *Airline Operations* are already equipped with TAWS A. The estimated present value of equipping and installing TAWS on the remainder of the affected fleet (i.e., 1047 aeroplanes vs. 1084 that already comply) is approximately \$42M. The estimated present value of equipping EAA on the affected fleet is approximately \$15M. The total cost of installing and equipping the remaining fleet with TAWS and EAA is estimated at \$57M (see Table below).

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<sup>1</sup> In Canadian airspace, the low-level standard pressure region encompasses that remote area in the far North where few ground observation stations are available to provide updated altimeter settings for transiting aircraft. Except upon landing and takeoff, pilots in the standard pressure region are required to keep their altimeters set at the International Standard Atmosphere (ISA) sea level standard setting of 29.92 inches of mercury.

<sup>2</sup> Final rule p. 51 [4910-13]Federal Aviation Administration14 CFR Parts 91, 121, 135 [Docket No. 29312; Amendment No. 91-263; 121-273; 135-75] RIN 2120-AG46 Terrain Awareness and Warning System

Benefits from these regulatory amendments will include the avoidance of fatalities, serious injuries and plane crashes due to CFIT accidents - a potential benefit to the Canadian economy of \$216M over 10 years from full implementation and a net benefit of approximately \$158.7M over the 10-year period. Moreover, it has been estimated that this amendment will potentially result in the avoidance of 11 CFIT accidents, 31 deaths and 14 serious injuries in the 10-year period from full implementation.

***Cost-Benefit Statement***

<b>Cost-Benefit Statement (Millions of \$)</b>		<b>Base Year</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Final Year (10)</b>	<b>Present Value (Years 1 to 10)</b>	<b>Avg. Annual</b>
<b>A. Quantified Impacts (Millions of \$)</b>							
I. Quantified Benefits	Fatalities avoided	24.6	22.7	20.9	11.6	174.2	17.4
	Serious Injuries avoided	5.17	4.75	4.37	2.44	36.5	3.65
	Aircraft crashes avoided	0.76	0.70	0.64	0.36	5.37	0.54
Total Estimated Benefits		30.53	28.15	25.91	14.4	216.07	21.59
<b>II. Quantified Costs</b>							
Cost to equip fleet with TAWS by class of aeroplane (acquisition & installation)	Class 705 (226 aircraft)	7.9	7.6	-	-	15.5	1.55
	Class 704 (375 aircraft)	8.6	8.3	-	-	16.9	1.69
	Class 703 (277 aircraft)	3.3	3.2	-	-	6.5	0.65
	Class 604 (140 aircraft)	1.3	1.3	-	-	2.6	0.26
	Class 605 (5 aircraft)	0.5	0.5			1.0	0.1

Cost-Benefit Statement (Millions of \$)		Base Year	Year 2	Year 3	Final Year (10)	Present Value (Years 1 to 10)	Avg. Annual
Cost to equip fleet with EAA by class of aeroplane (acquisition & installation)	Class 705 (640 aircraft)	2.6	2.5	2.4	-	11.8	1.18
	Class 704 (172 aircraft)	0.54	0.52	0.49	-	2.5	0.25
	Class 703 (0 aircraft)	0	0	0	-	0	0
	Class 604 (261 aircraft)	0.12	0.12	0.11	-	0.56	0.06
	Class 605 (0 aircraft)	0	0	0	-	0	0
Total Estimated Cost		24.86	24.04	3.0	-	57.36	5.74
Net Benefits		5.67	4.11	22.91	14.4	158.71	15.85
Cost to equip With TAWS & EAA - Small Businesses		2.64	2.5	0.07	-	5.2	0.52

<b>B. Quantified impacts (non-monetary)</b>		
Positive	Number of fatalities & serious injuries avoided	Over the 10-year period from full implementation, it is estimated that, with the implementation of TAWS, 31 lives would be saved and 14 cases of serious injuries would be avoided.
	Aircraft loss avoidance	It is estimated that approximately 11 crashes could be avoided in the 10-year period after TAWS is implemented.
	Search and Rescue (SAR)	The Department of National Defence would expect to see its SAR cost to come down as a result of a lower number of search and rescue missions.
Negative	EAA	Could be a negative effect in other jurisdictions that do not mandate EAA.

<b>C. Qualitative Impacts in non-\$</b>		
Benefits	Civil Aviation and SAR	Flight crew onboard aeroplane will be warned of impending CFIT incident.
	Harmonization with ICAO	Harmonization with other jurisdictions will result in the Canadian fleet being able to fly into jurisdictions that require aircraft to be equipped with TAWS, resulting in positive externalities to the Canadian economy.
	Travelling Public	Increased safety level when using TAWS equipped aircraft
	SAR	Reduced SAR personnel exposure to risks associated with low flying

### ***8. Small Business Lens***

Small businesses, represented by industry associations (e.g., the Air Transport Association of Canada (ATAC), the Aerospace Industries Association of Canada), were consulted on an initial option at the Commercial Air Service Operations Technical Committees of the Canadian Aviation Regulation Advisory Council (CARAC) held in February 2003 and June 2003.

Overall consensus was reached, with the exception of concerns raised by the Air Transport Association of Canada (ATAC) and Air Canada over the requirement for an EAA function. They were concerned that the proposed changes would penalize those who had already begun installing TAWS systems without an EAA function.

In October 2003, the Civil Aviation Regulatory Committee (CARC) considered the above stakeholder concerns and proposed a more flexible option to all affected operators and owners where a longer implementation time would be proposed for the installation of an EAA function (i.e., five years from the date on which the regulations come into force).

### ***9. Consultation***

The members of the General Operating and Flight Rules and the Commercial Air Service Operations Technical Committees of the Canadian Aviation Regulation Advisory Council (CARAC), which include representatives of government, aeronautical associations (e.g. Air Transport Association of Canada (ATAC), Air Line Pilots Association – Canada (ALPA) and Aerospace Industries Association of Canada), unions (e.g. Teamsters Canada), operators and airlines (e.g. Air Canada) were consulted at meetings held in February and June 2003.

Since 2003, Transport Canada has continued to provide updates and information to stakeholders of the aviation industry regarding the proposed TAWS amendment as part of the CARAC Technical Committee which meet twice annually. On November 16 and 17, 2010 a Technical Committee Meeting took place during which

stakeholders had an opportunity to provide comments regarding the proposed amendments.

Furthermore, a CARAC Plenary meeting is held every 18 months to 2 years - the latest one was held in May 2010 at which stakeholders were offered an update regarding the progression of the proposed TAWS regulatory amendment.

The proposed amendment to the CARs was pre-published in the *Canada Gazette*, Part I on December 3, 2011, followed by a 75-day comment period. Two (2) comments were received. Transport Canada reviewed these comments and maintains the proposed amendments as published in the *Canada Gazette*, Part I.

One commenter firstly disagreed with the concept of basing a safety requirement on the number of seats in an aeroplane and secondly suggested that the proposed regulation be modified to include uncertified systems. The use of the number of seats as a criterion harmonizes the Canadian regulation with ICAO standards and the FAA requirements. The use of uncertified systems, whose minimum performance capabilities are unknown and may vary widely depending on different factors, cannot be supported as the accuracy of the information they provide cannot be ensured.

The Canadian Owners and Pilots Association (COPA) submitted comments opposing the proposed amendments (TAWS + EAA) on the basis that the burden to privately registered small aircraft is not justified in terms of accidents and that the justification as provided was not robust enough to subject these aircraft to a level of safety as applies to commercial operations. The inclusion of these aeroplanes in this regulation harmonizes the *Canadian Aviation Regulations* with the FAA Part 91.223 TAWS and complies with ICAO recommendations in Annex 6 Part II.

The word "exploitant" used to designate the aircraft operator in the French version of the amendments for Subpart 605 *Aircraft Requirements* has been replaced with "utilisateur" in order to include owners as well as operators.

## ***10. Rationale***

As demonstrated in the *Benefits and Costs* section, the potential benefits of these amendments surpass their costs. Additionally, these amendments bring the affected Canadian fleet into compliance with ICAO's standards and the equivalent FAA regulation.

An analysis of the CFIT accidents that happened in Canada from 1977 to 2009 revealed that non-turbine air taxi aeroplanes that are currently exempted from TAWS compliance under ICAO's standards and FAA regulation were responsible for approximately 60% of the CFIT accidents and 46% of the ensuing fatalities. As a result of this analysis, Transport Canada decided to go beyond what was called for to harmonize with ICAO and the FAA by also requiring Canadian non-turbine aeroplanes configured with six or more



passenger seats, excluding pilot seats, operated under Subpart 605 *Aircraft Requirements* and Subpart 703 – *Air Taxi Operations* to be equipped with a Class B TAWS.

### ***11. Implementation and enforcement***

These amendments will be enforced through the assessment of monetary penalties imposed under sections 7.6 to 8.2 of the *Aeronautics Act* which carry a maximum fine of \$5,000 for individuals and \$25,000 for corporations, as well as suspension in the case of Canadian aviation document related non-compliance, or through prosecution under section 7.3 of the *Aeronautics Act*.

Operators will have two years from date of publication of the regulations to equip with the appropriate TAWS and five years to equip with the EAA. This timeframe will allow the industry the flexibility to plan the necessary aircraft downtime required to retrofit/equip their fleet to coincide with required maintenance cycles.

### ***12. Contact***

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