Vol. 142, No. 32 — August 9, 2008

Regulations Amending the Canadian Aviation Regulations (Parts I and VI 2014; ELT)

Statutory authority

Aeronautics Act

Sponsoring department

Department of Transport

REGULATORY IMPACT ANALYSIS STATEMENT

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

Executive summary

Issue: The COSPAS-SARSAT Council (see footnote 1) decided in 2000 to stop monitoring distress signals transmitted by Emergency Locator Transmitters (ELTs) on the frequencies of 121.5 MHz and 243 MHz as of February 1, 2009, because of inherent limitations associated with these wavelengths. As a result of that decision, the surviving victims of aviation crashes will no longer benefit from the rapid alert provided by the satellite relay of distress signals unless aircraft operators replace their 121.5/243 ELTs with ELTs able to broadcast on the frequency of 406 MHz, or with an alternate means of emergency location that meets the performance criteria of a 406 MHz ELT. Currently, the Department of National Defence (DND) Search and Rescue (SAR) operations estimate that approximately 60% of aviation crash survivors are located through the satellite system coverage.

Description: These proposed amendments will require that aircraft operated in Canadian airspace be equipped with ELTs able to broadcast simultaneously on the frequencies of 406 MHz and 121.5 MHz or with an alternate means of emergency location that meets the performance criteria of a 406 MHz ELT.

Cost-benefit statement: The total cost to equip the Canadian civil aviation fleet is estimated at approximately $61 million. An analysis of the summaries of accidents that happened between the years 2004 to 2007 indicates that approximately 100 Canadian survivors of aviation crashes were saved by means of 121.5/243 MHz ELTs. It is anticipated that the technologically superior 406 MHz ELT will result in the saving of more lives through a faster relief response to surviving victims of aviation crashes.

Business and consumer impacts: After February 1, 2009, the future surviving victims of aviation crashes will benefit from the improved response time provided by the 406 MHz ELT. The annual compliance cost of operating a 406 MHz ELT will approximate the cost of operating the current 121.5/243 MHz ELT. The 406 MHz ELTs are less susceptible to false alerts than the first and second generation 121.5/243 MHz ELTs, which are currently in use, resulting in resources being utilized for actual emergencies.

Domestic and international coordination and cooperation: These proposed amendments comply with recommendations made by the International Civil Aviation Organization (ICAO), which requires that ELTs be operated on the frequencies of 406 MHz and 121.5 MHz simultaneously after January 2005. These proposed amendments will apply to all aircraft operated in Canada, including foreign aircraft travelling to Canada.

Issue

First generation ELTs, which operate on the frequencies of 121.5 MHz (civil aviation) and 243 MHz (military aviation) and are based on the performance standards of Technical Standard Order (see footnote 2) (TSO) C91, had high activation failure and false alert rates. Second generation ELTs, which also operate on the frequencies of 121.5 MHz and 243 MHz and are based on the performance

standards of TSO C91a, have improved activation rates and reduced false alert rates but come short of what the 406 MHz technology can deliver. Currently, the majority of Canadian civil aviation aircraft are equipped with first generation 121.5/243 MHz ELTs.

In recognition of these limitations, the ICAO and the International Maritime Organization (IMO) made recommendations to the COSPAS-SARCAT Council to switch from a 121.5/243 MHz satellite-based system to a 406/121.5 MHz satellite-based system. In response to these representations, the COSPAS-SARSAT Council announced in October 2000 that, as of February 1, 2009, its satellite system will no longer process distress signals broadcast by crashed aircraft2019;s ELTs on the frequencies of 121.5 MHz or 243 MHz to monitor only distress signals broadcast on the frequency of 406 MHz. After February 1, 2009, distress signals broadcast on the frequencies of 121.5 MHz and 243 MHz will only be detected by over-flying traffic monitoring that frequency. As a consequence, SAR will only be advised of a potential emergency after multiple relays of the distress information, a process much lengthier than that of the satellite system.

Transport Canada conducted an Issue Analysis/Risk Assessment in 2007 with partners and stakeholders to identify and evaluate alternative means of alerting and locating aircraft in distress situations, following the satellite processing cessation of distress signals broadcast on the frequencies of 121.5 MHz and 243 MHz (the full risk assessment is available by contacting the Transport Canada Civil Aviation Acting Chief of Regulatory Affairs). After confirmation by SAR that close to 75% of crashes result from controlled flight into terrain (CFIT) and close to 95% of the surviving victims of these crashes are unable to manually activate an emergency distress signal device, only options including automatic activation with interface ability with the satellite system were retained.

The Canadian emergency detection situation is unique in the world. No other country has the combined terrain, population distribution, cold weather extremes and civil aviation development that are unique to Canada. Unlike many countries that are more densely populated than Canada (i.e. the United States and most European countries), there are large areas of Canadian territory that are not on well-traveled air routes, making detection of a 121.5/243 MHz distress signal by over-flying traffic unlikely. The increased search time resulting from an ELT2019;s inability to interface with the satellite system will jeopardize the chances of survival of the victims of aviation crashes who have survived the crash.

Objectives

To meet its international commitment and provide faster relief response to distress situations, the Government objective is to ensure that all aircraft operated in Canada are equipped with ELTs that can broadcast on the frequencies of 406 MHz and 121.5 MHz (the frequency of 121.5 MHz ability will facilitate homing to the crashed aircraft in difficult terrain or weather), or be equipped with an alternate means of emergency location that meets the performance

criteria of a 406 MHz ELT.

Description

Currently, the *Canadian Aviation Regulations* (CARs) mandate the use of ELTs. These proposed amendments to Part VI, General Operating and Flight Rules, of the CARs will include

- requirements for aircraft operated in Canada [not including gliders, balloons, airships, ultra-light aeroplanes, unmanned air vehicles, gyroplanes and aircraft engaged in the operations described in proposed paragraphs 605.38(3)(*b*) to (*f*)] to be equipped with registered ELTs capable of broadcasting simultaneously on the frequencies of 406 MHz and 121.5 MHz; and
- criteria that define alternate means of emergency location that meet the performance of a 406 MHz ELT.

Regulatory and non-regulatory options considered

Private and commercial aviation have been aware of the 121.500A0;MHz and 243 MHz frequencies satellite coverage cessation since COSPAS-SARSAT made its announcement in 2000. COSPAS-SARSAT, the Government and the aviation industry have circulated information to advise stakeholders of the incoming satellite processing cessation of the 121.500A0;MHz and 243 MHz frequencies. To date, information has not induced stakeholders to equip with 406 MHz ELTs or motivated the development of alternative technologies that would allow other means of compliance to be available before satellite coverage cessation of the 121.500A0;MHz and 243 MHz frequencies. There is no alternative to regulatory action by which to achieve the desired safety outcome.

Benefits and costs

These proposed amendments will not impact commercial aircraft operated on long-range over-water flights, as they are already required by Annex 6 to the Convention on International Civil Aviation to be equipped with 406 MHz ELTs. They will also not impact military aircraft, as these aircraft are not governed by the CARs. These proposed amendments will impact approximately 24 000 civil aviation aircraft, 18 000 of which are used by private operators (i.e. personal aviation) and 6 000 by commercial operators.

Costs

It is estimated that the cost of installing ELTs that comply with these proposed Regulations to the Canadian civil aviation fleet will be approximately $61 million ($39 million for private aviation, not including the aircraft described above, and $22 million for commercial aviation, not including commercial aircraft operated on long-range over-water flights).

At present, several countries require, or are in the process of developing requirements, to use ELTs that can broadcast on 406 MHz frequency. Traffic inbound from the United States will have to

comply with these proposed amendments before entering Canadian airspace. It is assumed that the cost of compliance will not dissuade foreign commercial operators from equipping with systems that meet the requirements of these proposed amendments, as the cost of compliance has not dissuaded them in the case of long-range over-water flights.

Benefits

Based on casualty statistics collected between 2002 and 2007 (these statistics are available on the Transportation Safety Board of Canada Web site), it is estimated that the automatic activation feature of a 121.5/243 MHz ELT interfacing with the satellite system currently saves approximately 19 Canadian lives each year, which translates into an annual value of $116 million (based on a value of $6,110,000 per life in 2007 dollars as proposed by the Canadian Cost-Benefit Analysis Guide). It is also estimated that the automatic activation feature of an ELT interfacing with the satellite system currently permits SAR to reach approximately 16 aviation crash victims that have received serious injuries (it is assumed, but not quantified, that these proposed amendments will allow SAR to reach these victims more rapidly, resulting in a decreased frequency of permanent disability or death).

The majority of foreign private aircraft visiting Canada come from the United States. It is assumed that the benefits resulting from the decrease in lost lives, in serious injuries and in expenditure resulting from longer SAR searches are greater than the financial burden to both private operators that will have to meet these proposed requirements and the Canadian travel industry that caters to their needs (based on casualty statistics measured between 2002 and 2007). (It is estimated that the lives of approximately six non-Canadian aviation crash victims are currently saved each year because of ELT automatic activation detected by the satellite system.)

According to information provided by COSPAS-SARSAT, the following are other benefits of the 406 MHz frequency:

- rapid confirmation of a distress situation (distress signal includes the name, address and telephone numbers of the aircraft owner, permitting SAR to rapidly confirm the validity of distress signal);
- measured relief response (distress signal also includes type of aircraft, hence potential number of victims requiring assistance);
- improved crash location accuracy on initial transmission (3 NM precision with the 406 MHz frequency compared to 15 NM with the 121.5 MHz frequency);
- reduced search time (a greater proportion of 406 MHz ELTs will survive crash forces than first generation 121.5 MHz ELTs);
- 40-fold reduction in false alerts (compared to first generation 121.5 MHz ELTs); and
- reduced SAR personnel exposure to risks associated with low

flying.

Cost-Benefit Statement		Base Year	Final Year (10)	Present Value (Years 1 to 10)	Average Annual
A. Quantified impacts $					
Benefits	Civil aviation	$116,090,000	$58,073,903	$841,281,318	$84,128,131
Costs	Private aviation	$38,850,000	nil	$38,850,000	$3,885,000
	Commercial aviation	$22,330,000	nil	$22,330,000	$2,233,000
Net benefits		$54,910,000	$58,073,903	$777,037,415	$77,957,599

B. Quantified impacts in non-$

Positive	Civil aviation	It is estimated that currently over 19 Canadians are saved each year because of the automatic activation feature of the 121.500A0;MHz ELT detected by the satellite system. It is estimated that currently 16 Canadians with serious injuries are saved each year because of the automatic activation of the 121.500A0;MHz ELT detected by the satellite. It is assumed, though not quantified, that the technological superiority of the 406 MHz system over the current 121.5/243 MHz system will allow more victims to be saved. It is estimated that currently 6 foreign crash victims are saved each year because of the

		automatic activation of the 121.5 MHz ELT detected by satellite. It is assumed, though not quantified, that the technological superiority of the 406 MHz system over the current 121.5/243 MHz system will allow more victims to be saved.
Negative	Canadian civil aviation	It is not possible to quantify the impact to the Canadian travelling industry catering to the needs of the owners of foreign aircraft travelling to Canada resulting from the loss of the segment of their market that chooses not to equip with complying ELTs.
	Foreign civil aviation	Foreign civil aviation will have to incur the cost of meeting these proposed amendments before travelling to Canada.

C. Qualitative impacts

Benefits	Civil aviation	Rapid confirmation of distress situation
		Measured relief respond
		Improved crash location accuracy on initial transmission
		Reduced search time
		Fortyfold reduction in false alerts
		Reduced SAR personnel exposure to risks associated with low flying

Rationale

The potential benefits of these proposed amendments greatly surpass their cost (19 lives saved each year B4; $6,110,000/life over 10 years = over 1 billion dollars vs. $61 million for the Canadian civil aviation

fleet to meet the requirements of these proposed amendments). These proposed amendments will bring Canada into compliance with ICAO2019;s ELT recommendations.

Consultation

These proposed amendments were developed through the General Operating and Flight Rules Committee of the Canadian Aviation Regulation Advisory Council (CARAC). Members of this committee include representatives of government (Department of National Defence [DND], National Search and Rescue Secretariat [NSS], including the Joint Rescue Coordination Centre [JRCC], and the Department of National Defence Search and Rescue [DND SAR]); pilot associations (e.g. the Canadian Air Line Pilots Association [CALPA]; the Canadian Owners and Pilots Association [COPA]; the Ultralight Pilots Association of Canada [UPAC]; the Aircraft Owners and Pilots Association [AOPA]); unions (e.g. Teamsters Canada), airlines (e.g. Air Canada), and operators associations (e.g. Air Transport Association of Canada [ATAC]). This committee recommended these proposed amendments during their meeting of December 2003.

Stakeholders support this proposal with the exception of COPA who has advised Transport Canada that it would oppose these proposed amendments on the grounds that the implementation costs are too high for their segment of the industry ($36,850,000 to equip 1800A0;000 private aviation aircraft). COPA also opposed these proposed amendments on the grounds that the alternate means of emergency location criteria (i.e. automatic activation, capacity of 2.7 nautical miles search radius) do not allow the use of less expensive technologies that are currently available.

Implementation, enforcement and service standards

These proposed Regulations will be enforced through the assessment of monetary penalties imposed under sections 7.6 to 8.2 of the *Aeronautics Act*, as well as suspension in the case of a Canadian aviation document related non-compliance, or through prosecution under section 7.3 of the *Aeronautics Act*.

Contact

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PROPOSED REGULATORY TEXT

Notice is hereby given that the Governor in Council, pursuant to

section00A0;4.9 (see footnote a) and subsection 7.6(1) (see footnote b) of the *Aeronautics Act* (see footnote c), proposes to make the annexed *Regulations Amending the Canadian Aviation Regulations (Parts00A0;I and VI 2014; ELT)*.

Interested persons may make representations concerning the proposed Regulations to the Minister of Transport, Infrastructure and Communities within 75 days after the date of publication of this notice. All such representations must cite the *Canada Gazette*, Part00A0;I, and the date of publication of this notice. Each representation must be in writing and be sent to the Chief, Regulatory Affairs (AARBH), Civil Aviation, Safety and Security Group, Department of Transport, Place de Ville, Tower C, 330 Sparks Street, Ottawa, Ontario K1A 0N5 (general inquiries 2014; tel.: 613-993-7284 or 1-800-305-2059; fax: 613-990-1198; Internet address: http://www.tc.gc.ca).

Ottawa, July 28, 2008

MARY PICHETTE
Assistant Clerk of the Privy Council

REGULATIONS AMENDING THE CANADIAN AVIATION REGULATIONS (PARTS00A0;I AND VI 2014; ELT)

AMENDMENTS

1. The references 201C;Subsection00A0;605.41(1)201D; to 201C;Subsection00A0;605.41(4)201D; set out in column00A0;I of Subpart00A0;5 of Part00A0;VI of Schedule00A0;II to Subpart00A0;3 of Part00A0;I of the *Canadian Aviation Regulations* (see footnote 3) **are replaced by the following:**

Column I

Designated Provision

Subsection00A0;605.42(1)

Subsection00A0;605.42(2)

Subsection00A0;605.42(3)

Subsection00A0;605.42(4)

2. Section00A0;605.38 of the Regulations is replaced by the following:

605.38 (1) Subject to subsection00A0;(3) and section00A0;605.41, no person shall operate an aircraft unless it is equipped with one or more ELTs in accordance with subsection00A0;(2) and each ELT

meets the requirements of subsection00A0;(4).

(2) An aircraft set out in column00A0;1 of the table to this subsection shall, in an area of operation set out in column00A0;2, be equipped with the number and type of ELTs set out in column00A0;3.

TABLE

Item	Column 1 Aircraft	Column 2 Area of Operation	Column 3 Minimum Equipment
1.	All aircraft other than those referred to in subsection00A0;(3)	Over land	One ELT of Type00A0;AD, AF, AP, A or F
2.	Large multi-engined turbo-jet aeroplanes engaged in an air transport service and carrying passengers	Over water at a distance from land that requires the carriage of life rafts in accordance with section00A0;602.63	Two ELTs of Type00A0;W or S or one of each
3.	All aircraft, other than those set out in item00A0;2, that require an ELT	Over water at a distance from land that requires the carriage of life rafts in accordance with section00A0;602.63	One ELT of Type00A0;P, W or S

(3) A person may operate an aircraft that is not equipped with one or more ELTs in accordance with subsection00A0;(2) if the aircraft

(*a*) is a glider, balloon, airship, ultra-light aeroplane, unmanned air vehicle or gyroplane;

(*b*) is operated by the holder of a flight training unit operating certificate, engaged in flight training and operated within 2500A0;nautical miles of the aerodrome of departure;

(*c*) is engaged in a flight test;

(*d*) is a new aircraft engaged in flight operations incidental to manufacture, preparation or delivery of the aircraft;

(*e*) is operated for the purpose of permitting a person to conduct a parachute descent within 2500A0;nautical miles of the aerodrome of departure;

(*f*) is a small aircraft engaged in aerial application for agricultural purposes within 25 nautical miles of the aerodrome of departure; or

(*g*) is operated in accordance with section00A0;605.39.

(4) An ELT shall

(*a*) be capable of broadcasting simultaneously on the frequencies of 121.500A0;MHz and 40600A0;MHz;

(*b*) be armed, if so specified in the aircraft flight manual, the aircraft operating manual, the pilot operating handbook or any other equivalent document provided by the manufacturer;

(*c*) meet the specifications set out in Chapter00A0;5 of Annex00A0;10 to Volume00A0;III of the Convention; and

(*d*) be registered with

(i) the Canadian Beacon Registry of the National Search and Rescue Secretariat, or

(ii) the appropriate authority of the country identified in the coded message transmitted by the ELT.

3. Section00A0;605.41 of the Regulations and the heading before it are replaced by the following:

Alternate Means of Emergency Location

605.41 (1) A person may operate an aircraft that is not equipped with one or more ELTs in accordance with subsection00A0;605.38(2) if

(*a*) the aircraft is operated using an alternate means of emergency location; and

(*b*) the alternate means of emergency location is identified in the information section of the flight plan or flight itinerary.

(2) The alternate means of emergency location shall

(*a*) be capable of providing immediate notification of an aircraft distress situation to either

(i) a rescue coordination centre, or

(ii) a third party that is able to receive and transmit the information to a rescue coordination centre; and

(*b*) allow the aircraft to be located with an accuracy of 2.7 nautical miles.

(3) If the alternate means of emergency location is a system that uses an emergency locator device carried on board the aircraft, the device shall, in addition to meeting the requirements of subsection00A0;(2),

(*a*) be capable of providing immediate notification of an aircraft distress situation without activation by a crew member;

(*b*) be registered in the database established for this purpose by the

Department of Transport; and

(*c*) be carried and operated in accordance with the manufacturer2019;s recommended procedures.

Third Attitude Indicator

605.42 (1) No person shall conduct a take-off in a turbo-jet-powered aeroplane that is operated under Part VII without a third attitude indicator that meets the requirements of section00A0;625.42 of the *Aircraft Equipment and Maintenance Standards* unless the aeroplane

(*a*) has a MCTOW of less than 500A0;70000A0;kg (12,566 pounds); and

(*b*) was operated in Canada in a commercial air service on October00A0;10, 1996.

(2) No person shall conduct a take-off in a transport category aircraft without a third attitude indicator that meets the requirements of section00A0;625.42 of the *Aircraft Equipment and Maintenance Standards* unless the aircraft

(*a*) is a transport category helicopter not operated in IFR flight;

(*b*) is a transport category aeroplane powered by reciprocating engines that was manufactured before January00A0;1, 1998; or

(*c*) is not operated under Part00A0;VII.

(3) No person shall conduct a take-off in a turbo-propeller-powered aeroplane that is operated under Part00A0;VII without a third attitude indicator that meets the requirements of section00A0;625.42 of the *Aircraft Equipment and Maintenance Standards* unless the aeroplane

(*a*) has a passenger seating configuration, excluding pilot seats, of 30 or fewer;

(*b*) has a payload capacity of 300A0;40200A0;kg (7,500 pounds) or less; and

(*c*) was manufactured before March00A0;20, 1997.

(4) After December00A0;20, 2010, no person shall conduct a take-off in a turbo-propeller-powered aeroplane having a passenger seating configuration, excluding pilot seats, of 10 or more, and operated under Part00A0;VII, unless the aeroplane is equipped with a third attitude indicator that meets the requirements of section00A0;625.42 of the *Aircraft Equipment and Maintenance Standards*.

4. The reference 201C;[605.42 to 605.83 reserved]201D; after section00A0;605.42 of the Regulations is replaced by the following:

[**605.43** to **605.83** reserved]

COMING INTO FORCE

5. These Regulations come into force on February00A0;1, 2009.

Footnote 1
The COSPAS-SARSAT satellite system is an international, humanitarian search and rescue system, independent from Transport Canada. It was established by the United States, the former Soviet Union, France and Canada in 1979.

Footnote 2
Technical Standard Orders prescribe the minimum performance standards of aviation equipment.

Footnote a
S.C. 1992, c. 4, s. 7

Footnote b
S.C. 2004, c. 15, s. 18

Footnote c
R.S., c. A-2

Footnote 3
SOR/96-433

00A0;

NOTICE:
The format of the electronic version of this issue of the *Canada Gazette* was modified in order to be compatible with hypertext language (HTML). Its content is very similar except for the footnotes, the symbols and the tables.

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Important notices

Updated: 2008-08-08