

COPA Response to Canada Gazette Volume 142, No. 32 Regulations Amending the Canadian Aviation Regulations (Parts I and VI — ELT)

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.

Comment: This statement does not differentiate between ELTs that automatically activated and those that functioned because a survivor manually activated the device after it failed to automatically do so. COPA's study of TSB reports where the ELT is mentioned indicated that in 78% of accidents, the ELT failed to automatically activate. This is a key issue because Transport Canada is putting a great deal of emphasize on automatic activation. A commitment to this solution should not be based on estimates but instead on facts and hard statistics.

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

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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-SARSAT 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 aircraft'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 ELT'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

Comment: This statement is overly simplistic and ignores some limitations of 406 MHz. Whereas the distress signal from current ELTs can be received immediately by the satellites, the new ELTs take up to one minute to send the first signal; a very long time in an accident sequence. Furthermore, COPA has recently learned from a SAR expert that the GEOSAR geostationary satellites that ... [1]

Comment: Over-flying aircraft will remain an important part of the system even if 406 MHz is mandated because the new ELT system still relies on the outdated Doppler technology for determining the location and there will continue to be ambiguities on initial passes of the satellites that will result in uncertainty about on which side of the satellite th ... [2]

Comment: This statement is at best incomplete and misleading in that it attributes this conclusion to the risk assessment exercise, in which COPA participated extensively. The risk assessment report states that "The risk assessment team recommends that all aircraft carry a 406 MHz ELT. However, if the aircraft owner chooses not to, or cannot o ... [3]

Comment: Canada is not unique and therefore this should not be used as justification for proceeding out of step with other similar countries. The United States has similar large areas that are sparsely settled, subject to weather extremes and have infrequent over-flying air traffic. Most notable are areas of the high plains of the desert southwest, where Ste ... [4]

Comment: Transport Canada places considerable emphasis on automatic activation as a key requirement. Dependence on a technology in which the device has to survive the crash in order to do its job has resulted in a high failure rate, thereby putting lives in jeopardy. The recent accident of a Grumman Goose in BC, where a cell phone was instrumenta ... [5]

Comment: The ICAO requirements for 406 ELTs are for international operations. ELTs are only recommended for domestic operations, so Canada is able to choose another route for domestic operations without violating its international obligations. It is misleading to imply that Canada would not be meeting its international commitments ... [6]

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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 121.5 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 121.5 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 121.5 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

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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,

Comment: Transport Canada based its cost figures on estimates. COPA has received several actual invoices for installations that have been performed and quotes from avionics installers. Transport Canada says that the average cost per installation is \$2167 for private aircraft and \$3667 commercial aircraft. Invoices received to date by COPA indicate for private aircraft that, installed costs ... [7]

Comment: The United States, with the largest general aviation fleet in the world and with several areas that are remote, harsh or mountainous, has no intention of changing their existing regulation. Instead, they are correctly letting owners decide what best suits their needs. Australia, with the th ... [8]

Comment: This statement does not mention private foreign aircraft. There is also no statement regarding the impact that this restriction on foreign aircraft will have on tourism and commerce. Currently, private foreign aircraft, particularly US aircraft, contribute considerably to our economy ... [9]

Comment: There are no statistics presented for the number of lives lost because of ELTs failing to automatically activate and get a signal up to the satellites. The cost-benefit statement therefore is flawed in that it does not include any negative cost due to lives lost.

Comment: The assumption made that 406 MHz ELTs will perform better is not based on any facts. Since TSB does not report on ELT performance for all accidents, and they fail to differentiate between C91 and C91a, there is no way to determine that 406 MHz ELTs will i ... [10]

Comment: There is no mention of the increased cost that will occur due to US aircraft in Canada that are not equipped, either because the owners failed to understand that our regulation applies to them, or they refuse to equip for the relatively short period that they will be he ... [11]

Comment: The reliability of the initial alert is in doubt. As mentioned earlier, GEOSAR satellite performance is degraded at latitudes above 70 north and mountainous terrain. Forty percent of Canada is either above 70 North or mountainous. Therefore, in many crashes where the E ... [12]

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- 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	<p>It is estimated that currently over 19 Canadians are saved each year because of the automatic activation feature of the 121.5 MHz ELT detected by the satellite system.</p> <p>It is estimated that currently 16 Canadians with serious injuries are saved each year because of the automatic activation of the 121.5 MHz ELT detected by the satellite. It is assumed, though not quantified, that the technological superiority of the 406 MHz system</p>
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Comment: While it is true that 406 MHz ELTs, when they survive a crash, can provide an indication of the maximum number of persons involved because of the ELT being matched to a particular aircraft, ELTs cannot provide any indication of level of distress. Consequently, SAR will have to commit to a full response in every situation. Several alternative devices that are not permitted by this regulation have features that can indicate levels of distress and hence can provide a better “measured response” than ELTs. These devices can also be matched to a particular aircraft, thereby providing the same and more features than an ELT.

Comment: This statement is untrue and misleading. The majority of private aircraft will likely equip with the least costly ELT; one that does not include the capability to interface with a GPS. Basic 406 MHz ELTs rely on the same outdated Doppler location technique as their predecessors for establishing location. Given the state of the satellite constellation, it can take 30 minutes or longer to process a 406 MHz signal. The initial transmission will provide an alert only and it will take time to determine location because... [13]

Comment: There is no proof of this statement. The same issues remain. ELTs fail to automatically activate because antennas break off, wreckage is inverted or sinks or the ELT is destroyed on impact or consumed by fire. A severe limitation of 406 MHz ELTs is that it takes up to one minute to... [14]

Comment: This assumes that the contact person is available. Otherwise, SAR will have no choice but to initiate a search.

Comment: It is logical to assume that there will be a degree of non-compliance, in particular from foreign owners who will either ignore or be ignorant of the requirement. This will most likely balance out the assumed benefit or actually put more SAR personnel at risk.

Comment: As explained in several comments, this statement is very flawed and therefore not acceptable as justification for the amended regulation.

Comment: Comments made above call most of the following statements into question.

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		<p>over the current 121.5/243 MHz system will allow more victims to be saved.</p> <p>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.</p>
Negative	Canadian civil aviation	<p>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.</p>
	Foreign civil aviation	<p>Foreign civil aviation will have to incur the cost of meeting these proposed amendments before travelling to Canada.</p>

C. Qualitative impacts

Benefits	Civil aviation	<p>Rapid confirmation of distress situation</p> <p>Measured relief respond</p> <p>Improved crash location accuracy on initial transmission</p> <p>Reduced search time</p> <p>Fortyfold reduction in</p>
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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 \$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 ICAO'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 18 000 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

Comment: This statement is inaccurate and misleading. The CARAC VI Technical Committee accepted NPA 2003-313 at its December 2003 meeting. That NPA did not mandate 406 MHz ELTs in Canadian domestic airspace. That NPA, which in no way resembles the amendments in the Gazette, was subsequently withdrawn after the CARC rejected it. CARAC VI did develop and fully agree on amendments at their November 2007 meeting but these were unilaterally amended in significant ways by the CARC. This statement implies that CARAC VI agrees with the current amendments because we apparently approved of this version of the amendments but this is not the case. What should be reflected in this Gazette statement is that after extensive consultation over many years, including a culminating meeting of C... [15]

Comment: This statement is not based on fact. Since the CARC's unilateral amendment has not been consulted within the CARAC Committee process, Transport Canada has no idea whether or not other stakeholders support this proposal. It is unfair and misleading to characterize COPA as being the only organization opposed to this amendment. Others who were not extensively involved or have followed the developments subsequent to the CARAC Committee meeting may be opposed to these developments.

Comment: As calculated above, the implementation costs are much higher than \$39 million for our sector. In addition, and very much more important, COPA firmly believes that because of the high failure rate of ELTs (devices that must survive an accident in order to start doing their job) and that most of the issues that cause ELTs to fail have not been addressed with 406 MHz ELTs, there is likely to be no improvement in the prospects of being found. Therefore, this significant cost burden on our sector of av... [16]

Comment: COPA opposed these proposed amendments for many more reasons, as detailed in our letter of dissent kp08011 dated 22 January 2008. It is unfair and misleading to downplay our extensive and reasoned opposition on behalf of the majority of private aircraft owners with such a simple statement.

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PROPOSED REGULATORY TEXT

Notice is hereby given that the Governor in Council, pursuant to section 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 (Parts I and VI — 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*, Part 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 — 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 (PARTS I AND VI — ELT)**

AMENDMENTS

1. The references “Subsection 605.41(1)” to “Subsection 605.41(4)” set out in column I of Subpart 5 of Part VI of Schedule II to Subpart 3 of Part I of the *Canadian Aviation Regulations* ([see footnote 3](#)) are replaced by the following:

Column I

Designated Provision

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Subsection 605.42(1)
Subsection 605.42(2)
Subsection 605.42(3)
Subsection 605.42(4)

2. Section 605.38 of the Regulations is replaced by the following:

605.38 (1) Subject to subsection (3) and section 605.41, no person shall operate an aircraft unless it is equipped with one or more ELTs in accordance with subsection (2) and each ELT meets the requirements of subsection (4).

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

TABLE

Column 1	Column 2	Column 3
Item Aircraft	Area of Operation	Minimum Equipment
1. All aircraft other than those referred to in subsection (3)	Over land	One ELT of Type 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 section 602.63	Two ELTs of Type W or S or one of each
3. All aircraft, other than those set out in item 2, that require an ELT	Over water at a distance from land that requires the carriage of life rafts in accordance with section 602.63	One ELT of Type P, W or S

(3) A person may operate an aircraft that is not equipped with one or more ELTs in accordance with subsection (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 25 nautical miles of the

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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 25 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 section 605.39.

(4) An ELT shall

(a) be capable of broadcasting simultaneously on the frequencies of 121.5 MHz and 406 MHz;

Comment: 406 MHz ELTs do not broadcast on 121.5 MHz simultaneously. During the burst transmission on 406, the 121.5 signal is shut down. Therefore, they do not meet this requirement. In addition, after 24 hours the 406 signal shuts down.

(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 Chapter 5 of Annex 10 to Volume 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. Section 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 subsection 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

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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 subsection (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 manufacturer's recommended procedures.

Comment: No device, including 406 MHz ELTs, is capable of immediate notification. Therefore, alternate devices and services are being held to a higher standard than ELTs, and effectively 406 ELTs are being mandated. COPA's letter of dissent provides considerable detail concerning this effective prohibition of alternate means.

Comment: Several alternate means provide much better accuracy than basic 406 ELTs. However, the only way they could qualify would be if they broadcast continuously, which is cost prohibitive for both private and commercial operators.

Comment: As explained above, immediate notification is not assured from any device, including 406 ELTs.

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 section 625.42 of the *Aircraft Equipment and Maintenance Standards* unless the aeroplane

(a) has a MCTOW of less than 5 700 kg (12,566 pounds); and

(b) was operated in Canada in a commercial air service on October 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 section 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

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manufactured before January 1, 1998; or

(c) is not operated under Part VII.

(3) No person shall conduct a take-off in a turbo-propeller-powered aeroplane that is operated under Part VII without a third attitude indicator that meets the requirements of section 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 3 402 kg (7,500 pounds) or less; and

(c) was manufactured before March 20, 1997.

(4) After December 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 Part VII, unless the aeroplane is equipped with a third attitude indicator that meets the requirements of section 625.42 of the *Aircraft Equipment and Maintenance Standards*.

4. The reference “[605.42 to 605.83 reserved]” after section 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 February 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](#)

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R.S., c. A-2

[Footnote 3](#)
SOR/96-433

This statement is overly simplistic and ignores some limitations of 406 MHz. Whereas the distress signal from current ELTs can be received immediately by the satellites, the new ELTs take up to one minute to send the first signal; a very long time in an accident sequence. Furthermore, COPA has recently learned from a SAR expert that the GEOSAR geostationary satellites that receive the 406 signal have limitations in latitude and mountainous terrain such that for 40% of Canada the ability to receive the 406 signal is degraded. Certainly, this degraded capability will make it very important for ELT antennas to be in the best possible condition and unobstructed in order to maximize the potential for detection. This limitation should be thoroughly investigated before a commitment is made to essentially mandate 406 MHz ELTs for our sector of aviation. In addition, Transport Canada places a great deal of emphasis on the improvement that the transmission of ownership information in the alert signal brings to reducing the resolution of false alerts. In fact, they believe that the number of false alerts will decrease. First of all, the number of false alerts will most likely not appreciably decrease because the same reasons for them will continue. It is hoped that false alerts will be resolved sooner because the first reaction will be to contact the owner. However, if no one is available at the contact number, SAR will have no choice but to initiate a search. Therefore, it is highly doubtful if the move to 406 will realize such dramatic improvement as Transport Canada assumes.

Over-flying aircraft will remain an important part of the system even if 406 MHz is mandated because the new ELT system still relies on the outdated Doppler technology for determining the location and there will continue to be ambiguities on initial passes of the satellites that will result in uncertainty about on which side of the satellite the ELT is located. Reports from over-flying aircraft will help resolve the ambiguity. In addition, over-flying aircraft will not be the only monitoring method. There are a number of locations, including all control towers and area control centre locations, where 121.5 will continue to be monitored in accordance with ICAO requirements.

This statement is at best incomplete and misleading in that it attributes this conclusion to the risk assessment exercise, in which COPA participated extensively. The risk assessment report states that "The risk assessment team recommends that all aircraft carry a 406 MHz ELT. However, if the aircraft owner chooses not to, or cannot outfit with a 406 MHz system, it is recommended that they be mandated to retain a 121.5 MHz and be required to have some other means of contacting a Rescue Coordination Centre (RCC) that can provide a more accurate location and a means of identifying the aircraft. Alternatively, the owner may be required to equip their aircraft with some other automatic means to signal an aircraft accident has occurred." It is wrong and unfair to convey the impression that the industry participants in the risk assessment process agreed with Transport Canada's chosen route.

Canada is not unique and therefore this should not be used as justification for proceeding out of step with other similar countries. The United States has similar large areas that are sparsely settled, subject to weather extremes and have infrequent over-flying air traffic. Most notable are areas of the high plains of the desert southwest, where Steve Fossett

disappeared in a small aircraft and was never found after extensive searching, and Alaska, with its very rugged terrain and weather extremes. Despite extensive aviation activity in Alaska and a very challenging SAR region in Alaska, which also has very extensive aviation activity, the US has indicated that it has no intention of changing its current ELT regulation, leaving it up to each owner to decide what is best for their operation and location. This is a reasonable way to go. This statement fails to mention Australia, a country with vast areas of harsh conditions and a large general aviation population, where a PLB is an acceptable alternative.

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Psutka

12/08/2008 7:44 AM

Transport Canada places considerable emphasis on automatic activation as a key requirement. Dependence on a technology in which the device has to survive the crash in order to do its job has resulted in a high failure rate, thereby putting lives in jeopardy. The recent accident of a Grumman Goose in BC, where a cell phone was instrumental to the rescue, is a case in point. The passengers in the rear of the aircraft survived. This is where the ELT would be located. It should have sent a signal but none was received. The new ELTs also must survive the crash and meet the same crash resistance requirements as their predecessors, so it can be expected that the high failure rate will continue. And the limitation of the GEOSAR satellites mentioned in an earlier comment may actually increase search time over the current system.

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Psutka

11/08/2008 6:50 PM

The ICAO requirements for 406 ELTs are for international operations. ELTs are only recommended for domestic operations, so Canada is able to choose another route for domestic operations without violating its international obligations. It is misleading to imply that Canada would not be meeting its international commitments should they choose to adopt another solution for domestic operations. Transport Canada has chosen, at great expense to our sector of aviation, to be in excess of ICAO requirements with no firm justification for this position.

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Psutka

11/08/2008 6:56 PM

Transport Canada based its cost figures on estimates. COPA has received several actual invoices for installations that have been performed and quotes from avionics installers. Transport Canada says that the average cost per installation is \$2167 for private aircraft and \$3667 commercial aircraft. Invoices received to date by COPA indicate for private aircraft that, installed costs range from \$2000 for a simple replacement of a C91a ELT to \$9000 for one incorporating a GPS interface to an aircraft-installed GPS. Since the majority of current installations are C91, as acknowledged by Transport Canada, these aircraft will require significant modifications in order to accept the new ELTs compared with the less plentiful C91a compliant aircraft. It will cost more to install a 406 MHz ELT in most aircraft because of the additional installation requirements including running wires to the cockpit and structural modifications to meet the C126 requirements. Therefore, based on actual invoices and the additional work for most aircraft to go from C91 to C126, the cost to private aviation is more realistically in the range from \$60 million to \$162 million, with an average of about \$100 million. Even if we assume that the majority of owners will go for the so-called low cost ELTs, the average cost for the fleet will be well in excess of the stated \$39 million. I cannot speak for commercial aviation but I can only estimate that their cost will be much higher than stated because

many will opt for higher priced systems and they will be installed in more complicated aircraft, including pressurized hulls. The cost is grossly understated by Transport Canada and therefore the cost-benefit statement is very misleading.

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Psutka

11/08/2008 6:57 PM

The United States, with the largest general aviation fleet in the world and with several areas that are remote, harsh or mountainous, has no intention of changing their existing regulation. Instead, they are correctly letting owners decide what best suits their needs. Australia, with the third largest fleet behind Canada, only requires a 406 PLB for the vast, harsh areas of its country. This is much more reasonable than the route chosen by Transport Canada. One issue that Transport Canada has failed to consider is the reality that, when faced with a mandatory requirement, people are less likely to comply if they do not believe that the requirement is justified. If that becomes the case in Canada, the SAR situation could actually be significantly degraded, thereby putting even more lives, both pilots, passengers and the SAR resources in jeopardy. Indications in the US are that voluntary compliance is already resulting in many owners equipping with 406. It remains to be seen how this will play out in Canada. It is not simply a matter of fines being a deterrent. COPA offered several compromise proposals that would have resulted in very high compliance and, in most cases, equipping aircraft with two devices thereby significantly increasing the probability of detection and location over the one-size-fits-all dependence on a device that must survive the crash.

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Psutka

11/08/2008 7:46 AM

This statement does not mention private foreign aircraft. There is also no statement regarding the impact that this restriction on foreign aircraft will have on tourism and commerce. Currently, private foreign aircraft, particularly US aircraft, contribute considerably to our economy when their occupants visit Canada for tourism or business reasons. Also, thousands of aircraft transit Canada each year to and from Alaska. With no requirement to equip in the US, many of these aircraft will avoid Canada, with a consequent cost to our economy. This economic impact, likely in the tens of millions of dollars, is not addressed in the cost-benefit analysis. Coupled with the understatement of the ELT cost presented in an earlier comment, the net benefits figure is most likely negative and therefore makes the unilateral move to 406 unjustified.

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Psutka

11/08/2008 7:56 AM

The assumption made that 406 MHz ELTs will perform better is not based on any facts. Since TSB does not report on ELT performance for all accidents, and they fail to differentiate between C91 and C91a, there is no way to determine that 406 MHz ELTs will in fact perform any better than their predecessors.

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Psutka

11/08/2008 7:00 PM

There is no mention of the increased cost that will occur due to US aircraft in Canada that are not equipped, either because the owners failed to understand that our regulation applies to them, or they refuse to equip for the relatively short period that they will be here. Also, there is no mention made of the cost to Canada in lost tourism and business for US aircraft owners who stay away because of the costly requirement to equip. This economic impact is most likely much higher than the benefits stated in this justification and therefore should be thoroughly examined before proceeding with any amendment to the regulation.

The reliability of the initial alert is in doubt. As mentioned earlier, GEOSAR satellite performance is degraded at latitudes above 70 north and mountainous terrain. Forty percent of Canada is either above 70 North or mountainous. Therefore, in many crashes where the ELT antenna is less than ideally positioned, the likelihood of detection is lower and may even be less than the older generation satellites. This limitation should be thoroughly examined.

This statement is untrue and misleading. The majority of private aircraft will likely equip with the least costly ELT; one that does not include the capability to interface with a GPS. Basic 406 MHz ELTs rely on the same outdated Doppler location technique as their predecessors for establishing location. Given the state of the satellite constellation, it can take 30 minutes or longer to process a 406 MHz signal. The initial transmission will provide an alert only and it will take time to determine location because of dependence on the same outdated Doppler technique.

There is no proof of this statement. The same issues remain. ELTs fail to automatically activate because antennas break off, wreckage is inverted or sinks or the ELT is destroyed on impact or consumed by fire. A severe limitation of 406 MHz ELTs is that it takes up to one minute to generate its first alert to the satellites, which is a very long time during a crash sequence. In crashes where the ELT will be affected very quickly in the crash sequence, there will be no satellite alert.

This statement is inaccurate and misleading. The CARAC VI Technical Committee accepted NPA 2003-313 at its December 2003 meeting. That NPA did not mandate 406 MHz ELTs in Canadian domestic airspace. That NPA, which in no way resembles the amendments in the Gazette, was subsequently withdrawn after the CARC rejected it. CARAC VI did develop and fully agree on amendments at their November 2007 meeting but these were unilaterally amended in significant ways by the CARC. This statement implies that CARAC VI agrees with the current amendments because we apparently approved of this version of the amendments but this is not the case. What should be reflected in this Gazette statement is that after extensive consultation over many years, including a culminating meeting of CARAC VI in which a consensus was achieved, CARC decided to change the amendments and this has not been further consulted through the CARAC process.

As calculated above, the implementation costs are much higher than \$39 million for our sector. In addition, and very much more important, COPA firmly believes that because of the high failure rate of ELTs (devices that must survive an accident in order to start doing their job) and that most of the issues that cause ELTs to fail have not be addressed with 406 MHz ELTs, there is likely to be no improvement in the prospects of being found. Therefore, this significant cost burden on our sector of aviation is not justified.