

Aeronautics Act

there was a need for changes to be made we could go to them and get a sympathetic ear. But today it is my understanding from COPA and others who deal with the department on a regular basis that such a situation no longer exists.

In dealing with the amendment I want to concentrate on an area in which I am particularly interested, the regulations having to do with emergency locator transmitters. I have spoken on the subject of ELT's in this House for four or five years, ever since I came here.

Before making a few suggestions I want to go into the history of ELT's. The use of emergency locator transmitters was first considered as a matter for legislation about five years ago in the state of California. An attempt to introduce legislation there on a state-wide basis failed because in the United States, as in Canada, this is a federal matter. The U.S. Congress later passed a bill, TSO C-61, making the use of ELT's mandatory in certain types of light aircraft. The Canadian Department of Transport followed suit, introducing legislation with some differences so as to be more in tune with our climatic and geographic conditions.

The original regulation was issued as air navigation order series II, No. 17. The Department of Transport outlined the specifications in RSS.147. RSS.147 was issued three times—issues two and three were put out with different specifications. The difference was marginal, though, and I intend to come back to this point in a few moments. A notice was issued to maintenance engineers and aircraft owners saying that all ELT's had to comply with issue two or three by the time of annual certification or in six months, whichever came first. But a later clause stated that after six months the ELT must comply with the specifications in issue three.

About that time, Mr. Speaker, I was asking questions in the House having to do with specifications, cost and quality of this instrument, in addition to its Canadian content, but I could not get answers to those questions. It was not until the specifications were issued that we found out what we were faced with. The specifications for issue two were basically the same as those required in the United States, as I have just mentioned—48 hours and minus 20° centigrade. That is the length of time and temperature range. More stringent specifications were cited in the issue three—100 hours duration and a working range down to minus 40° centigrade.

The day before the issue three specifications became mandatory for ELT's another notice was issued withdrawing the clause and stating that issue two specifications were in order. Mr. Speaker, I have a strong feeling that this notice was put out very quietly and, I am constrained to say, with some slyness, if not with dishonesty. Because people were still led to believe until the last minute that issue three contained the regulations to which they were required to conform. I suggest the notice was snuck through because DND had planes fitted with ELT's which complied with the earlier issue but which could not be converted to conform with issue three.

Until August, 1974 reliability had never been defined in scientific terms and used as a criterion in assessing ELT's. As a result, some problems cropped up. The first was quality

[Mr. Ellis.]

control. Since these instruments were now mandatory in aircraft, everyone got into the business and quality depreciated. The second was more complicated. A phenomenon known as inadvertent activation caused planes to appear to crash. It came about when the amplitude and duration of shock were reduced on the recommendation of Arizona State University where it was determined that many small aircraft could not sustain the amplitude of between five and seven Gs and duration of 55 milliseconds.

Mr. Benjamin: You have just lost me there. I just took off.

Mr. Ellis: I lose the hon. member for Regina-Lake Centre (Mr. Benjamin) quite easily on a subject of this sort, I appreciate that. I go into this history purposefully to show that these specifications were laid down and then broken by the department; they were laid down without the department really knowing what it was doing and 17,000 private aircraft owners were forced to put this apparatus in their airplanes.

The crash considerations to which I have referred were then changed and a duration of 11 milliseconds was introduced. When this happened, manufacturers began converting to high impedance electrical latches instead of mechanical latches. They found that the latches they had been using were activated by impact; there was a rash of such occurrences. To overcome some of these difficulties the industry turned to the use of lithium batteries which had already been introduced by a number of manufacturers. Widespread, indeed, almost exclusive use of lithium batteries was adopted. However, it was found that lithiums leaked sulphur dioxide.

If I am going to lose the hon. member for Regina-Lake Centre, I shall lose him completely now because I am putting into the record the fact that while sulphur dioxide is chemically inert it becomes quite corrosive when combined with moisture. Or, to put it in another way, $\text{SO}_2 + \text{H}_2\text{O} = \text{H}_2\text{SO}_3$ and this becomes sulphur dioxide. It becomes even worse in the presence of oxygen, H_2SO_4 results, and even though the cell manufacturers realized this and tried to prevent it with the installation of a safety vent, cells not sealed properly would seep gas and corrosion would take place, damaging the electronically printed circuit board and causing accidents or disabling the instrument.

There was one unit which was immune because of the excellent seals which had been put in, but the firm concerned subsequently went out of the business. If a pilot or aircraft owner had one of these instruments and it would not work, he usually went to the Director General of Civil Aeronautics in Ottawa who gave him a waiver enabling him to fly without any ELT as long as a sign was placed on the side. If the pilot really wanted to comply he had to buy one of the other types.

But the problems surrounding the use of lithium persisted, resulting in explosions and at least one serious crash. The cause of this is not totally known. We know that experts from NASA in the United States and the U.S. army have been looking into this problem and they are coming up with some answers.