



WORKING PAPER

**ICAO/IMO JOINT WORKING GROUP
ON HARMONIZATION OF AERONAUTICAL
AND MARITIME SEARCH AND RESCUE (ICAO/IMO JWG-SAR)**

THIRTEENTH MEETING

Singapore, 28 August to 1 September 2006

Agenda Item 7: SAR communications:

7.2: status of aeronautical communications systems for distress and SAR, including:

- establishment of IBRD;
- suitability of PLBs for carriage by ships and aircraft; and
- registration of PLBs

PERSONAL LOCATOR BEACON (PLB) SPLINTER GROUP REPORT

(Presented by the Secretary)

SUMMARY

This paper summarizes discussion and findings of a splinter group convened during Cospas-Sarsat Joint Committee 20, on 15 and 16 June 2006, at ICAO Headquarters, Montreal, Canada.

Action by the ICAO/IMO JWG is in paragraph 3.

1. INTRODUCTION

1.1 At the ICAO/IMO Joint Working Group on SAR, Stockholm, September 2005, it was decided to establish a correspondence group tasked with researching various aspects of PLB usage as it concerned ICAO provisions for carriage by aircraft of Emergency Locator Transmitters (ELTs). The Terms of Reference were:

- a) investigate the current practices adopted by SAR administrations for the management of PLB data;

- b) consider additional measures that would be required to efficiently manage an increase in PLB beacon data;
- c) discuss current and future trends of PLB usage, taking into account the experiences of those countries where PLBs are regularly activated over land; and
- d) report to the ICAO/IMO JWG on SAR at its 13th Session findings of best working practices adopted by States. These may include:
 - 1) PLB data management;
 - 2) Distress alert management and notification practices, including record of false alarm rates;
 - 3) Education of manufacturers and users with respect to suitable employment of beacons and appropriate registration; and
 - 4) Suitability of 406 MHz PLBs for meeting 406 MHz ELT carriage requirements for general aviation aircraft.

1.2 At the Twentieth Cospas-Sarsat Joint Committee (JC-20) Meeting, Montreal, the ICAO and Cospas-Sarsat Secretariats agreed that the gathering of expertise in Montreal was a good opportunity to canvas views on the above topics across a broad spectrum. Accordingly, it was agreed that as an extension of the correspondence group established by ICAO/IMO JWG/13, a splinter group would be convened outside the meeting hours of Cospas-Sarsat JC-20. In the event, the splinter group met early on the mornings of 15 and 16 June.

2. **DISCUSSION**

2.1 **PLB Registration**

2.1.1 Two key issues were identified

- a) the manner of registration of PLBs, taking into account operational requirements, ease of administration, available tools and State responsibilities; and
- b) the suitability of PLBs as a means of compliance with regulations for carriage of ELTs by general aviation (GA) aircraft.

2.1.2 The group noted that there was an urgency about the issue given the high current growth in PLB usage, the relatively unregulated nature of their use and the imminent date for cessation of Cospas-Sarsat satellite monitoring at 121.5 MHz (February 2009). It was noted that various States had taken differing approaches to both the method of registering PLBs and the acceptability of their use as a means of compliance with ELT carriage requirements.

2.1.3 Information concerning the establishment of the International Beacon Registration Database (IBRD) and options available for the process of registration of PLBs within the IBRD was provided by the Cospas-Sarsat Secretariat. It was noted that when the IBRD was being developed, it was intended that it would provide a registration capability for all emergency beacons, including PLBs, regardless of individual State registration policies. It was further noted, further, that it was not possible for the Cospas-Sarsat Secretariat to take into account of all States' policies concerning registration of the various classes of beacons when implementing the IBRD software.

2.1.4 Some States had recently approached the Cospas-Sarsat Secretariat about the possibility of the IBRD hosting only PLBs owned and used within their States while they, the States, would provide registration facilities for ELTs and EPIRBs. This request was reportedly prompted by there being neither a current national policy covering PLB registration nor a designated entity within the State for its administration.

2.1.5 The Cospas-Sarsat Secretariat advised that while there were no technical difficulties involved in registering PLBs on the IBRD, it should be noted that management of PLB matters was a State responsibility, still requiring attention even if PLBs were registered in the IBRD. It was suggested that a disadvantage in registering PLBs in the IBRD would be that it would create another point of registration. In many countries, there are already two separate databases: one for ELTs and one for EPIRBs. Having a separate PLB database could result in inconsistencies or compromise.

2.1.6 It was noted that a splintered registration mechanism could be a concern for SAR providers whereas a single, consolidated database managed by a single entity and amenable to access by all legitimate SAR-providing enquirers regardless of beacon type would seem to be a simpler solution, more convenient and likely to offer time savings, and thus give prospect of more timely and effective SAR response. The group expressed wide support for this position although it was also noted that domestic considerations of competing or overlapping agency functions and priorities sometimes necessitated the registration of differing beacon types by separate State entities. Consequently, it was observed that those Administrations constrained to the establishment of separate databases on account of internal imperatives might consider using the IBRD to synchronise them and provide a consolidated point of contact.

2.1.7 It was agreed by the group that States should be reminded of their responsibility to manage the use of PLBs within their territories; this would include the establishment of a mechanism for registration of PLBs, just as for EPIRBs and ELTs. It was noted that in terms of process, there was no essential difference in registering PLBs, EPIRBs or ELTs. The group agreed that it was good practice for States to manage their beacon registries centrally.

2.1.8 Notwithstanding this, the group noted that State administrations had their own interests and needs with respect to registration data. Moreover, the IBRD was only a tool and not a complete management system. The responsibility for determining a method for managing beacon registration belonged to each State. The IBRD was simply a tool whereby States' needs and those of the international SAR community could be assisted. Accordingly, the IBRD should not be looked upon as a means of satisfying all States' responsibilities with respect to registration and management of PLBs. States should be aware of the importance of having PLBs registered, especially if PLBs were to be used to satisfy ELT carriage requirements.

2.1.9 The Cospas-Sarsat Secretariat advised that the Cospas-Sarsat web site and operational documentation notified users both how and where to register 406 MHz beacons. When a beacon's 15-digit hexadecimal identifier was entered into the IBRD by a user, the database programme automatically ascertained its country code and, thus, determined whether that beacon was eligible for IBRD registration. If not eligible, the IBRD web site prompted the user to contact the appropriate Administration and provided appropriate contact information.

2.2 Carriage by General Aviation Aircraft

2.2.1 The group noted that when the 406 MHz ELT carriage requirements were first adopted by ICAO in 1999, there was intense debate within the aviation industry with respect to the most suitable ELT types, their respective cost-benefit, appropriate areas for carriage, the most economic means of retrofitting and, particularly, the time frame in which fitment was required. This led to an unprecedented need for reconsideration of existing provisions and, in the first instance, the establishment of a task force to research the degree of lack of compliance across the industry, the reasons for it and the most satisfactory options for ensuring closer compliance in the future.

2.2.2 Subsequent to the findings of a task force convened to make relevant findings and those findings' advancement through the ICAO process to the point, of being proposed as amended Standards, there has been increasing interest in the industry with respect to the suitability of PLBs as a means of ELT carriage compliance by general aviation (GA) aircraft.

2.2.3 While the advantages of the 406 MHz technology are widely known, the group gave consideration to the pros and cons of PLB usage in GA aircraft. The following were listed:

Pros

- Generally less expensive than ELTs;
- Portable;
- Flexible; and
- No installation costs.

Cons

- No automatic activation;
- No designed crash survivability or operating ability in environmental extremes; and
- 121.5 MHz homer output power is less than that of an ELT.

2.2.4 The group heard that a recent study into the effectiveness of PLBs when activated inside general aviation (GA) aircraft had indicated that a PLB was quite effective with respect to both LEO and GEO satellite detection when activated within GA aircraft. The study focused on three types of aircraft: high-wing, low-wing, and fabric-skinned.

2.2.5 While the power output from a PLB was viewed by the group to be sufficient, the lack of an automatic activation facility was a concern; an unconscious pilot could have no assurance of PLB activation. Crash survivability and reduced operating specifications were also noted to be a concern.

2.2.6 It was noted that regardless of present carriage requirements, pilots were purchasing 406 MHz PLBs in ever greater numbers with a view to carrying them after 2009. This reality might require acknowledgement by regulators and service providers by way of amenable legislation and service response procedures.

2.2.7 It was observed that responses to PLBs by SAR service providers might differ from responses to other types of beacons. In particular, alert messages might not be directed to an ARCC and that this aspect should be sufficiently resolved before PLBs were allowed as meeting ELT carriage requirements.

2.2.8 It was noted that a solution to that shortcoming could be to have PLBs coded as personal ELTs. In that case, the "PELT" would enable the alert to be routed to an ARCC and the ARCC's response to be appropriate.

2.2.9 Evidence was taken that the automatic activation of ELTs had been instrumental in saving many pilots' lives. It was reported that there had been many cases in Canada in which pilots had been rendered unconscious in a crash but were saved because of an automatic ELT's activation.

2.2.10 It was observed that while it was widely accepted that ELTs were the most appropriate alerting tool, PLBs were designed to provide a distress alert and were proven to be effective in doing so. The question to be resolved, in essence, was whether this means of alerting was acceptable to SAR services, even if it was less effective than ELTs in some respects. In principle, it needed to be asked whether "something was better than nothing". The group agreed that this was key.

2.2.11 There was strong opinion that SAR Providers should accept the fact of the widespread usage of PLBs, make provision for their use and promote their further carriage by GA aircraft. The group noted that PLBs were readily and economically available at 406 MHz; these were more effective in most respects than ELTs functioning on 121.5 MHz. Further, 121.5 MHz ELTs would no longer be monitored by satellites after February 2009 and while there had been a widespread education campaign aimed at motivating users to change-over to 406 MHz ELTs, it was likely that unless users were allowed use of PLBs there would be large numbers of 121.5 MHz ELT users still carrying this obsolete and impractical equipment beyond 2009.

2.2.12 It was noted that it was a responsibility of State administrations to determine how best to implement provisions for PLB carriage by GA aircraft and manage their use. The ICAO provisions, which had application to international operations only, required, for GA aircraft for which the certificate of airworthiness was first issued after 1 July 2008, carriage of at least one automatic ELT. This precluded carriage of a PLB as a means of compliance.

2.2.13 There was discussion about the feasibility of PLBs being designed and manufactured with some type of a G-switch "harness" which would enable a PLB to activate automatically in a crash. However, the operational benefit of such a device would need to be weighed against its cost and it was observed that manufacturers seemed reluctant to develop these type of devices or, even, another class of beacon, perhaps in consideration of the negative effect it could have on the sale of ELTs.

2.2.14 It was argued that the market might well look at the practicality of added-value PLB features because automatic-fixed ELTs were not likely to be widely accepted by the GA community and the approach of February 2009 suggested the urgent need for availability of a low-cost alternative to 406 MHz ELTs.

2.2.15 Still, it was countered that there was unlikely to be sufficient time before February 2009 for manufacturers to respond to any legislation that allowed use of PLBs with added features. The time required for the development of technical standards was long.

2.2.16 An opinion was expressed, with strong support, that a means should be found to avoid any further prescriptive carriage requirements while allowing for PLB carriage, given that there was an urgency about the issue.

2.2.17 The ICAO Secretary expressed gratitude to the participants for their time and noted that agreement had been reached with the Cospas-Sarsat Secretariat for the inclusion of a report from the splinter group as a supplement to the Cospas-Sarsat JC-20 Meeting Report. He also advised that the findings of the group would be included in a Working Paper to be submitted to the ICAO/IMO/JWG on SAR, due to be convened in Singapore in August/September 2006.

2.3 Findings:

2.3.1 The group agreed that there were distinct benefits for States, users and SAR service providers in States making arrangements for a consolidated database for registration of all emergency beacons. Just as the IBRD was available as a tool for State use in the registration of ELTs and EPIRBS, so was it available for PLB registration. The same principles governed registration of ELTs, EPIRBS and PLBs on the IBRD. At the same time, States should acknowledge that registration and management of emergency beacons for use within their areas of jurisdiction was a State responsibility and make arrangements accordingly. Further, it was acknowledged that some States may have had compelling reasons for proceeding with separate systems for separate beacon types. The group was anxious to assert that operational considerations affecting the timeliness of SAR response should be paramount in determining PLB management issues.

2.3.2 The group agreed that there was a strong case for the allowance of PLBs as a means of compliance with requirements for non-automatic ELT carriage by GA aircraft. This was in consideration of the presently extensive and rapidly expanding use of PLBs by users within all transport domains, including the aeronautical. While 406 MHz ELTs were recognised as providing more effective service, and automatic 406 MHz ELTs even more so, it was recognised that despite best efforts to educate users in the insufficiencies of 121.5 MHz ELTs, it was likely that without having access to 406 MHz PLBs for general aviation aircraft use, many owners/operators would continue to use 121.5 MHz ELTs. In time, it was recognised that 406 MHz ELTs would become more widespread in their use by virtue of lowering costs and inclusion in aircraft equipment at the time of their manufacture.

3. ACTION BY THE ICAO/IMO JWG

3.1 The ICAO/IMO JWG is invited to:

- a) consider the information provided; and
- b) recommend to ICAO that these findings be accepted as appropriate or, alternatively, additional or contrary findings.