mcmurdo
KANNAD marine

KLS-PLB-4 Exhibit 02a – Compliance Rationale

The evidence assembled in this Technical Construction File is itemised in Exhibit 1:

KLS-PLB-4 Exhibit 01 - Index of TCF

McMurdo Limited manufactures a family of Personal Locator Beacon (PLB) products, including brand variants, intended for use in distress alerting via the Cospas-Sarsat system. The family members are designated as follows:

McMurdo Fastfind McMurdo Fastfind Max	non-GPS variants
McMurdo Fastfind Plus McMurdo Fastfind MaxG Kannad Marine Safelink Pro PLB Kannad Aviation XS-ER GPS	GPS variants

All family members use the same PCB, but the non-GPS variants are sub-equipped by the non-fitment of the relevant components. All family members are otherwise technically identical, varying only in branding and labelling.

In its current build standard this product family is covered by FCC Grants of Equipment Authorization identified by:

FCC ID: KLS-PLB-2 - non-GPS variant
FCC ID: KLS-PLB-2-GPS - GPS variants

With this current build standard (PLB-2 build) these beacons transmit on 406.037 MHz to the satellite link. At the request of Cospas-Sarsat they are being re-engineered to shift transmission to 406.040 MHz. We understand this change of frequency requires a new equipment authorization filing and a new FCC ID.

The frequency shift for Cospas-Sarsat requires change of the TCXO frequency determining component. Frequency stability requirements are covered by the Beacon Specification (C/S T.001) and Type Approval Standard (C/S T.007) and compliance with these has been addressed by a submission to Cospas-Sarsat.

Approval by the Cospas-Sarsat organisation of the updated product family is attested by their Reports copied at:

> KLS-PLB-4 Exhibit 02c - Cospas-Sarsat Report 184-1
>
> KLS-PLB-4 Exhibit 02d - Cospas-Sarsat Report 184-2

(these reports can be viewed on-line at the Cospas-Sarsat website - the updated product is identified in these reports by the transmit frequency parameter)

The opportunity of the Cospas-Sarsat frequency change is also being used to carry out a more general mid-life product update:

o   this product family is a mature design, and the GPS module is changed to take advantage of recent developments in the component technology which benefit both cost and performance;

o   there is a component obsolescence issue with a transistor in the 121.5 MHz oscillator stage, which is addressed with a like-for-like component replacement;

o   the audio buzzer component will no longer be fitted.

In the PLB-4 build standard the GPS Module is changed as follows:

> PLB-2 build.............. uBlox TIM-4P   changes to ...
>
> PLB-4 build............. uBlox NEO-6M

This GPS module change requires corresponding PCB track changes to interface the new GPS Module to the Microcontroller, and also requires firmware changes appropriate to drive the new Module (which operates at a different data rate). Since all members of the product family use the same PCB and the same firmware, the non-GPS variants are also affected by these changes.

Taken in isolation these GPS-related changes have nothing to do with the transmitters in the device, and do not affect the characteristics required to be reported to the Commission.

The component replacement in the 121.5 MHz oscillator, taken in isolation, corresponds to a Class I permissive change: this modification does not degrade the characteristics formerly accepted by the Commission.

This filing reprises evidence submitted for earlier assessment of this product family at PLB-2 build by FCC.

A general description of the form and function of the products is provided in the User Manuals (see Exhibit 3).

The enclosure of the device is unchanged from the PLB-2 build. Apart from branding the external appearance of the products is unchanged (see Exhibit 4).

The technical description of the product is essentially unchanged from the PLB-2 build (Exhibits 5 and 6).

The set of design documentation (Exhibit 7) defines the build standard of the updated product family through the following elements:

- o 'Family Tree' - top level composition
- o 'PLB Assembly Schematic'
- o 'Circuit Schematic'
- o 'Bill of Material'.

The product firmware version is detailed on the first page of the Bill of Material.

The set of design documentation also details the product labelling:

KLS-PLB-4 Exhibit 07e - PLB Inner Label
KLS-PLB-4 Exhibit 07f - Battery Outer Label
KLS-PLB-4 Exhibit 07g - Battery Inner Label

Once a beacon is programmed, the program information is added to the PLB Inner Label. An example is provided at:

KLS-PLB-4 Exhibit 04c - PLB Inner Label programmed

All relevant radio test suites have been carried out, with results provided in various test reports at Exhibit 10. This is primarily the original test data, wherein the GPS product is fully tested, and the basic or non-GPS product, as a sub-equipped variant of the GPS product, is subjected to limited testing.

The original test data is augmented with a supplementary test report covering limited testing of the updated product to the requirements of Cospas-Sarsat:

KLS-PLB-4 Exhibit 10f - Test Report TUV 75909629-01 Iss6

The PLB is a mobile intentional radiator, and the RF Maximum Permitted Exposure evaluation is unchanged, since radiated power levels and frequency bands are unchanged:
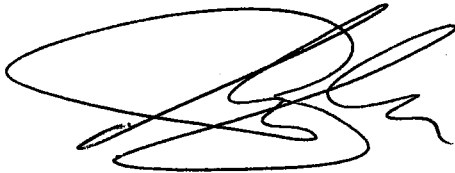
KLS-PLB-4 Exhibit 11 - RF Exposure Evaluation

These products are subject to 47 CFR Part 95K: these products are factory-tuned, operate only on fixed frequencies, and do not contain any user-tunable components.

The Quality Management System applicable to all aspects of development and manufacture of these products is subject to external approval by an accredited body as shown by:

KLS-PLB-4 Exhibit 02e - QMS ISO 9001 LRQA

We propose that the evidence presented in this Technical Construction File justifies a presumption of compliance of the updated product family (PLB-4 build) with the requirements of the Commission.

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