U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **ACTION**: Request for Review and Concurrence with Associated Equivalent Level of Safety (ELOS) ACE-02-04, for the Grob-Werke Grob G120A, 14 CFR § 23.1337(b) and 23.1553.

Date: JAN 2 3 2002

From: Grob Project Officer, Project Support Branch, ACE-112

Reply to Attn. of: Karl Schletzbaum (816) 329-4146

To: Manager, Small Airplane Directorate, ACE-100

This memorandum documents concurrence for the subject ELOS. We request your office review and concur with the proposed ELOS findings to the Powerplant Instruments Installation, Fuel Quantity Indication, 14 CFR § 23.1337(b)(1) and 23.1553, Fuel Quantity Indicator.

Background: The Grob G120A airplane is a conventional empennage, low wing airplane with retractable landing gear, fabricated almost completely of composite materials. The airplane is designed to train airline pilots and has electronic displays and features consistent with this training mission. Part of this instrumentation includes the fuel level indication, which is directly addressed by 14 CFR Part 23.1337(b)(1) and 23.1553. The fuel level indication provided on the G120A includes a digital fuel quantity indicator for each tank. Such an indicator cannot literally comply with the regulatory requirement of 23.1553 that requires the fuel quantity indicator to be marked with a red radial line.

Applicable Regulations: The applicable regulations are 14 CFR Part § 23.1553, which states:

> § 23.1553 *Fuel Quantity Indicator* A red radial line must be marked on each indicator at the calibrated zero reading, as specified in 23.1337(b)(1).

The digital fuel quantity indicators are calibrated to read zero at the level of fuel determined to be unusable as required by 23.1337(b)(1). However, the Luftfahrt-Bundesamt (LBA) of Germany required that additional features be included on the airplanes to provide an equivalent level of safety for the requirements of 23.1553.

FAA Position:

The FAA concurs with the LBA position and will propose an ELOS based on the features required by the LBA.

Compensating Features: The applicant has incorporated a digital fuel quantity indicator for each fuel tank on the airplane. In addition to this, each fuel tank has a low fuel indicator light, which illuminates at nine pounds of fuel remaining in its respective tank. Concurrently with illumination of this caution light, an aural annunciator announces in the headphones and over the cockpit speaker, that the fuel level is low. The remaining fuel in the tanks at the low fuel warning, nine pounds, is considered adequate to ensure a reasonable amount of time to accomplish a safe landing. The circuitry for the low fuel annunciation is separate from that of the digital indicator.

The design was evaluated by a FAA test pilot in October 2001, and is considered to be a satisfactory method of dealing with fuel management.

Recommendation: We concur that the design of the Grob G120A fuel quantity indicating system provides an Equivalent Level of Safety (ELOS) as envisioned in paragraph 14 CFR § 23.1553.

Concurred by:

Manager, Project Support Branch, ACE-112 — Date 1/18/02

for Manager, Standards Office, ACE-110 — Date 1/18/02

Manager, Small Airplane Directorate, ACE-100 — Date 1/22/02