

Applicable regulation(s)

§§ 25.1309 and 25.1457(d)(5)

Regulation(s) requiring an ELOS

§ 25.1457(d)(5)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

ATR believes that this new CVR requirement implies an installation of a Recorder Independent Power Supply (RIPS), which is described by ARINC Characteristic 777. ATR considers that, with the current aircraft design (electrical architecture & “start/stop” recording logic) it is possible to guarantee recording 10 minutes in flight, in case of both engines loss, without use of RIPS.

ATR considers that with an appropriate aircraft definition (electrical architecture & start/stop” recording logic) it is possible to guarantee recording 10 minutes in flight, in case of both engines loss, without use of a RIPS.

The ATR equivalency demonstration is based on:

- SSCVR power supply electrical architecture.
- SSCVR “Start/Stop” logic design.

ATR SSCVR ELECTRICAL POWER SUPPLY

The ATR Electrical Generation is identical for ATR 42-500 and ATR 72-21 2A models.

ATR SSCVR is already supplied through DC Essential Bus Bar (DC Power), so that means in case of loss of Electrical Power, SSCVR is automatically supplied by Main Battery:

In case of the loss of the 2 DC Generators, DC Power to battery bars is required to be provided by TRU using ACWF alternators (ref EMERGENCY PROCEDURE 4-04 - DUAL DC GEN LOSS). Main Battery provide more than 20 minutes of power supply for CVR operation (ref emergency electrical load analysis 420.0238/95 ed 1).

There is no time limitation with TRU in operation.

SSCVR RECORDING START AND STOP LOGIC

The SSCVR “Start/Stop” logic is realized by the 2 MFC (channel 1 A & channel 2A). The internal MFC logic controls an aircraft relay which allows uninterrupted power to the SSCVR.

ATR position regarding §25.1457(d)(5)(ii) requirement is detailed in Technical note DO/TY 1377/10 which defines an equivalency based on the following design characteristics:

- ATR requirement analysis
- SSCVR power supply architecture
- Reliability analysis
- Operational experience
- Aircraft Procedure (QRH)

ATR understands that the requirement to locate a power source as close as practicable to the cockpit voice recorder is based on the assumption that such a solution would minimize the distance of wiring between SSCVR and that independent power source, which will minimize then the possibility of inadvertent power disconnects from the SSCVR. ATR analyzed all aspects and comes to the result that the existing aircraft power supply, and usage of the aircraft main battery, which is located close to the electronic bay, is the most optimal solution.

ATR in-service fleet has cumulated more than 17 million flight hours without any loss of wiring to the recorders. ATR considers the very low probability of the failure case associated with the loss of main battery wire to SSCVR to be a strong case for the equivalency.

ATR also has in place, operational procedures for the testing of the SSCVR prior to first flight of the day, following a crew change, or after maintenance actions.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper (IP) SE-101 titled “Cockpit Voice Recorder – Equivalent Level of Safety for 10 minute independent backup power requirement of § 25.1457(d)(5).” This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Transport Airplane Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TCs & ATCs) or in the Limitations and Conditions Section of the STC Certificate in accordance with the statement below:

Equivalent Level of Safety Findings have been made for the following regulation: 14 CFR part 25.1457(d)(5), Cockpit voice recorders (documented in TAD ELOS Memo TD0778IB-T – SE-101).

Original signed by Steve Boyd

 Manager, TSS, Airplane & Flight Crew Interface
 ANM-111

4/12/2010

 Date

ELOS Originated by A/P & Flight Crew:	Project Engineer Forrest Keller	Routing Symbol ANM-111
--	------------------------------------	---------------------------