Subject: INFORMATION: Slide Cold Soak Test Protocol Date: AUG 29, 1996

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To: See Distribution List

The purpose of this memorandum is to provide a simplified, standardized evacuation slide or slide/raft "cold soak" test protocol applicable to new Technical Standard Order (TSO) C69b applications and for use on new slide or slide/raft programs. This protocol addresses the issues of ambiguity in the TSO and the deployment of the slides or slide/rafts in ambient temperature conditions (65 to 85 degrees F) rather than in a cold soak chamber at -40 or -65 degrees F.

The issues were discussed among members of the Transport Airplane Directorate Standards Staff, the Aircraft Engineering Division, and the three aircraft certification offices (ACO), Los Angeles, New York, and Seattle, responsible for oversight of the two U.S. companies producing evacuation slides and the two U.S. manufacturers of large transport airplanes. These discussions highlighted the practicality of adopting a single cold soak test protocol which would adequately address the requirements of paragraph 4.2 in Appendix 1 of TSO C69b and § 25.1309(a) of the Federal Aviation Regulations (FAR). Section 25.1309(a) states that "The equipment, systems, and installations whose functioning is required by this subchapter, must be designed to ensure that they perform their intended functions under any foreseeable operating condition." The development of a single protocol will ensure standardization of the cold soak test for all manufacturers of escape slides and large transport category airplanes, including companies not currently manufacturing either product.

The protocol is as follows:

a. Stabilize the stored gas bottle to a temperature of 70 degrees F, plus or minus 5 degrees F, then reduce the stored gas bottle pressure to the minimum dispatch pressure.

b. For components of the slide or slide/raft system installed within the pressurized cabin of the airplane, cold soak the components for at least 16 hours at a maximum temperature of -40 degrees F. For components of the slide or slide/raft system installed outside of the pressurized cabin of the airplane, cold soak the components for at least 16 hours at a maximum temperature of -65 degree F.

c. Deploy the slide or slide/raft into ambient temperature conditions (typically 65 to 85 degrees F) from the appropriate airplane door or a suitable airplane door mock-up or module as soon as possible after removal from the cold soak chamber, with a target of five minutes, but not to exceed 10 minutes.

d. To be considered acceptable, the unit should achieve "minimum operating pressure" in all inflation chambers. Minimum operating pressure is the minimum pressure necessary to achieve the evacuation rate specified in paragraph 4.11 of Appendix 1 of TSO C69b. The pressure reading should be taken as soon as possible after deployment, with a target of one minute maximum. A time greater than one minute would be acceptable if the applicant can demonstrate that it is not feasible to get the pressure reading within the target time. In. this case, the change in pressure due to the longer time to take the reading should be taken into account.

Steps a, b, and d of this protocol are virtually identical to comparable steps in protocols in use for current and previous slide development programs in which the slides are/were deployed inside a large cold soak chamber rather than into ambient conditions. It is important to note that the conditions contained in steps a (minimum dispatch pressure) and d (minimum operating pressure) are considered necessary for compliance with the requirements in § 25.1309(a).

In summary, this protocol is intended for use on new TSO C69b applications and for all new slide or slide/raft programs. It is not intended to be implemented for minor changes to existing slide or slide/raft designs. The protocol specified above will be included in the next revision to TSO C69.

Alternative protocols (which may require more than one test) may be used, provided the requirements of both the TSO and part 25 are met for the specific installation. If an applicant desires to use an alternative protocol, the applicant should discuss the differences from the above protocol and the rationale for using an alternative protocol with the appropriate ACO and AIR-100 prior to conducting the test. If the ACO and AIR-100 agree to the use of the alternative, the differences and the rationale should be provided and highlighted in the substantiating data package.

If there are any question, please contact Frank Tiangsing, phone number 206-227-2121, or John Petrakis, phone number 202-267-9274.

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