U.S. Department of Transportation
Federal Aviation Administration

Policy Statement

Subject: Night Testing Requirements for Reflection or Glare in the Pilot Compartment

Date: XX/XX/XX **Policy No:** PS-AIR-25.773-01

Initiated By:
AIR-626B

1 SUMMARY

1.1 This policy statement describes a means of compliance to Title 14, Code of Federal Regulations (14 CFR) 25.773 (a)(2), *Pilot Compartment View*. Section 25.773(a)(2) states that each pilot compartment must be free of glare and reflection that could interfere with normal duties of the minimum flightcrew.

1.2 Pilot compartment glare and reflections can be introduced from a variety of sources and under varying conditions internal and external to the airplane. The level of safety intended by § 25.773 is to ensure that no glare or reflections are introduced which could interfere with the normal duties of the minimum flightcrew as established under § 25.1523. Section 25.773 applies to any installed equipment that might obstruct the pilots' view or produce glare and reflection within the pilot compartment. Examples of external conditions include sunlight reflecting from flightdeck windscreens, displays, instruments, or even the flightcrew's clothing. At night, such sources may include airfield and other external lighting in addition to actual flightdeck displays and installed equipment.

1.3 For an applicant of a previously certificated airplane, seeking a change or new installation in the airplane design, the prescriptive night flight test requirement of § 25.773 may not be required for new installations that may not have an appreciable effect concerning the introduction of glare or reflection to the pilot compartment. These changes or installations may be a reconfiguration of, or changes to, internal lights, alerts/annunciations, hardware, or head down displays. For these types of changes or installations, the applicant may be able to show compliance by conducting a ground test instead of a night flight test. If unacceptable glare or reflections in the pilot compartment are found during the ground test, or if the FAA requires additional testing, then the applicant must conduct a night flight test to determine compliance. For those installations where it would be impractical or impossible to accurately determine compliance through ground test, a flight test must be conducted to determine compliance.

2 CURRENT REGULATORY AND ADVISORY MATERIAL

The following regulations and guidance are related to the installation and approval concerning Pilot Compartment View (PCV):

- 14 CFR 25.1121(e), Power Plant Exhaust System
- AC 25.773-1, *Pilot Compartment View Design Considerations*, dated January 8, 1993. This guidance material discusses methods for showing compliance to pilot compartment views such as windshield properties, and clear areas of vision.
- AC 25-11B, *Electronic Flight Displays*, dated October 7, 2014. This guidance material addresses visual display characteristics and the necessity for the pilot compartment to be free of glare and reflection that could interfere with normal flight duties as it pertains to installed equipment in the flightdeck.

2.1 Definition of Key Terms

	Regulatory Requirements	**Acceptable Methods of Compliance (MOC)**	**Recommendations**
Language	Must	Should	Recommend
Meaning	Refers to a regulatory requirement that is mandatory for design approval. The functional impact of the term "must" is that the requirement has to be met to achieve design approval.	Refers to instructions for a particular MOC. The functional impact of the term "should" is that any alternative MOC has to be approved by issue paper.	Refers to a recommended practice that is optional
Functional Impact	No Design Approval if not met	Alternative MOC is approved by issue paper.	None, because it is optional

3 RELEVANT PAST PRACTICE

In the past, when an applicant sought to show compliance to the night flight test requirement by means of a ground test, the FAA evaluated the proposed installation to determine the acceptability, and then issued criteria that would be used to find compliance. The FAA issued an equivalent level of safety (ELOS) to § 25.773(a)(2) if the applicant met the established criteria to simulate a nighttime environment, observed no unacceptable glare or reflections in the pilot compartment, and found no impact on flightcrew duties.

4 POLICY

4.1 This policy applies when an applicant seeks to perform a ground test in lieu of a night flight test for changes to a previously certificated airplane, where the changes are expected to have no appreciable effect concerning the introduction of glare or reflection in the pilot compartment. Such installations could include reconfiguration of or changes to internal lights, alerts/annunciations, hardware, or head down displays.

4.2 This policy does not relax night flight test requirements for changes where it would be impractical or impossible to find compliance to the rule using a ground test. Such installations or changes include modifications to flightdeck glass/windscreen, transparent displays, external lighting, night vision imaging system installations, exhaust signature that has the potential to impact view, or those installations where the change is expected to result in an appreciable change to reflection or glare in the pilot compartment.

4.3 The following test criteria may be used for FAA approval of a satisfactory ground test in lieu of a night flight test for changes to a previously certificated airplane:

1. The test must be conducted in a production configured airplane. Simulator, bench tests, or tests in non-production representative flightdeck airplane configurations will not be accepted.
2. The applicant must provide a detailed description of test procedures, specifying the means used to darken exterior ambient lighting and provide low light levels equivalent to night conditions, to include total darkness.
3. The evaluation must be accomplished from each pilot position, if applicable, with seats adjusted to the design eye position. The applicant should provide the criteria to determine unacceptable glare (e.g., an evaluation made by a qualified designated engineering representative (DER) test pilot).
4. All flightdeck displays, systems, and lighting expected for use during actual night operations must be on and adjusted to their normal/useable brightness and contrast to determine possible secondary or combination effects on pilot compartment view with the newly installed equipment.

If a reflection's effect on the pilots' ability to see outside the aircraft is uncertain, a night flight test may be required. Additionally, if the FAA requires more testing, then the applicant must conduct a night flight test to determine compliance. Since the outcome of a ground night evaluation is not known, applicants should have a contingency plan to evaluate lighting during a night flight test.

5 EFFECT OF POLICY

5.1 The contents of this policy statement do not have the force and effect of law and are not meant to bind the public in any way. This policy statement is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

5.2 The policy contained in this document does not constitute a new regulation. Agency employees and their designees and delegations should not depart from this policy statement without the concurrence of the policy issuing office. The authority for FAA employees and designees to deviate from this policy statement is delegated to the Director of the Policy and Standards Division.

5.3 If a proposed method of compliance appears to differ from the guidance expressed in this policy statement, the project aircraft certification office should coordinate any proposed approval or compliance finding with the policy issuing office. Conversely, if a proposed method of compliance that appears to follow this policy statement should, in the opinion of the reviewing office, not be approved, then the reviewing office should coordinate any proposed denial with the policy issuing office.

5.4 Additional information on the effect of FAA policy statements may be found in FAA Order IR 8100.16, *Aircraft Certification Service Policy Statement, Policy Memorandum, and Deviation Memorandum Systems,* dated May 13, 2011.

6 IMPLEMENTATION

This policy discusses compliance methods that should be applied to amended type certificate, supplemental type certificate, and amended supplemental type certification programs. The compliance methods apply to those programs with an application date that is on or after the effective date of the final policy. If the date of application precedes the effective date of the final policy, and the methods of compliance have already been coordinated with and approved by the FAA or its designee, the applicant may choose to either follow the previously acceptable methods of compliance or follow the guidance contained in this policy.

7 CONCLUSION

The FAA has concluded that the proposed ground test is an acceptable means of compliance for § 25.773(a)(2) for a previously certificated airplane for those changes where ground test may be warranted in lieu of night flight test. If unacceptable glare or reflections in the pilot compartment are found during the ground test, or if the FAA requires additional testing, then the applicant must conduct a night flight test to determine compliance.

Patrick R Mullen,
Manager, Technical Policy Branch,
Aircraft Certification Service.