



Federal Aviation Administration

Memorandum

Date: May 14, 2007

To: See Distribution

From: Manager, Transport Airplane Directorate, Aircraft Certification Service,
ANM-100

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Subject: Policy Statement on Modifications Which Impact Airplane Exterior
Lighting

Memo No.: ANM-111-06-001

Regulatory Reference: § 25.1401

Summary

The purpose of this memorandum is to emphasize the effects of airplane modifications that impact exterior lighting or the dispatch deviation relief associated with the exterior lighting systems. Specifically, this policy highlights installations of satellite communication (SATCOM) and live television (TV) antennas on various airplane models that may compromise the effectiveness of the upper anticollision light and its associated dispatch deviation relief. Advisory Circular 20-74, "Aircraft Position and Anticollision Light Measurements," dated July 29, 1971, provides guidance regarding measurements for intensity, covering, and color of aircraft position and anticollision lights.

This policy specifies that applicants need to perform an analysis for airplane modifications involving external antenna installations in order to evaluate compliance to 14 Code of Federal Regulations (CFR) § 25.1401. The analysis should include an evaluation of the impact of the new installation on the anticollision light system and its associated master minimum equipment list (MMEL) dispatch relief. Coordination with the appropriate Flight Standards Aircraft Evaluation Group (AEG) may be required to address impacts to the MMEL.

Although modifications which impact airplane exterior lighting may not be specifically referred to by regulation, the regulations or requirements that apply are identified below in *italics*. It is our intent that each method of compliance tie back clearly to the requirement.

Definition of Key Terms

In the policy statement below, the formatting and terms used (“must,” “should,” or “recommend”) have a specific meaning that is explained in Attachment 1.

Current Regulatory and Advisory Material

Section 25.1401(a)(1) states that *“the airplane must have an anticollision light system that consists of one or more approved anticollision lights located so that their light will not impair the crew's vision or detract from the conspicuity of the position lights.”* Section 25.1401(b) says that the system *“must consist of enough lights to illuminate the vital areas around the airplane considering the physical configuration and flight characteristics of the airplane.”*

Section 25.1401 also specifies requirements for minimum illumination and other parameters.

To reduce the possibility of grounding airplanes with one wing strobe inoperative, several airplane manufacturers install redundant anticollision strobes as follows:

- One upper anticollision,
- One lower anticollision,
- One strobe light on the left wing and one on the right wing
- One in the tail of the airplane.

According to many MMELs (for example, Boeing Model 777 and 737-700), an airplane with one wing strobe inoperative may be dispatched for a night operation under the MMEL, provided the upper and lower anticollision lights are fully operational. This system redundancy allows for dispatch with inoperative equipment allowed by the MMEL, which reduces the risk of grounding airplanes due to the failure of one anticollision light.

Relevant Current Practice

Many supplemental type certificate (STC) holders are installing various types of antennas, such as SATCOM or live TV, in front of the upper anticollision light on various airplane models. Installation of various antennas in front of the upper anticollision light may interfere with the anticollision light illumination between 0 and 10 degrees above the horizontal plane. These installations could compromise compliance with § 25.1401 and the MMEL relief provision described in the previous section.

Section § 25.1401(f) specifies that the minimum effective intensity for anticollision lights is 400 candles between 0 and 5 degrees above or below the horizontal plane and 240 candles for 5-10 degrees above or below the horizontal plane.

For example, one applicant installed a SATCOM antenna in front of the upper anticollision light, creating an obstacle affecting the area of forward illumination and compromising compliance with § 25.1401(f). Another applicant installed an additional anticollision light in front of the SATCOM antenna to comply with § 25.1401(f). Installing antennas behind the upper anticollision light may also compromise compliance with § 25.1401(f).

In the past, some applicants had to either relocate the upper anticollision light to comply with § 25.1401(f) or show an equivalent level of safety by adding a second light. The second light acts as a compensating factor for the obstruction created by the additional antennas. Other applicants demonstrated that the obstruction was minimal and did not invalidate the original compliance finding.

Applicants should be required to provide data showing that installing any modification does not compromise compliance with § 25.1401(f). Applicants should also evaluate the modification's impact on the MMEL dispatch relief and coordinate any impact to the MMEL with the appropriate AEG.

Policy

In this memorandum, the Transport Airplane Directorate requests that all aircraft certification offices carefully review future STC applications involving airplane modifications which impact exterior lighting, including SATCOM and live TV antenna installations. The applicant should conduct an impact analysis/evaluation demonstrating that the airplane modification does not adversely affect any exterior lighting system, including the effects on the MMEL. If modifications to the MMEL are necessary, coordination with the appropriate AEG office is required.

Effect of Policy

The general policy stated in this document does not constitute a new regulation. The FAA individual who implements policy should follow this policy when it is applicable to a specific project. Whenever a proposed method of compliance is outside this established policy, that individual must coordinate it with the policy issuing office. The individual considering an alternate method should coordinate with the project officer and the technical specialists, jointly, to determine if an issue paper is needed or if an item of record is more appropriate. Similarly, if the implementing office becomes aware of reasons that an applicant's proposal should not be approved, the office must coordinate its response with the policy issuing office.

Applicants should expect that certificating officials would consider this information when making findings of compliance relevant to new certificate actions. In addition, as with all advisory material, this statement of policy identifies one means, but not the only means, of compliance.

Implementation

This policy discusses compliance methods that should be applied to type certificate, amended type certificate, supplemental type certificate, and amended supplemental type certification programs. The analysis for airplane modifications involving external antenna installations, specified in this policy, is applicable 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.

Conclusion

The FAA has concluded that it is necessary for future applicants for airplane antenna installations, such as fuselage mounted SATCOM and live TV, to evaluate the impact of the new modification/installation for compliance with § 25.1401(f) and the appropriate airplane MMEL. Where changes to the MMEL are necessary, coordination with the appropriate AEG would be required.

Signed by Ali Bahrami

Attachment: Definition of Key Terms

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Definition of Key Terms

Table A-1 defines the use of key terms in this policy statement. The table describes the intended functional impact, and the formatting used to highlight these items.

- The term “must” refers to a regulatory requirement that is mandatory for design approval. Text communicating a requirement is in *italics*.
- The term “should” refers to instructions for a particular method of compliance. If an applicant wants to deviate from these instructions, he must coordinate the alternate method of compliance with the Transport Standards Staff using an issue paper. There is no special text formatting used for methods of compliance.
- The term “recommend” refers to a recommended practice that is optional. Enclose recommendations in [] brackets.

Table A-1 Definition of Key Terms

	Regulatory Requirements	Acceptable Methods of Compliance	Recommendations
Language	Must	Should	Recommend
Format	<i>Italics</i>	Regular text (No special formatting)	[Square brackets]
Functional Impact	No Design Approval if not met	Alternative must be approved by issue paper.	None, because it is optional

Examples from policy on Power Supply Systems for Portable Electronic Devices (PSS for PED):

- *Even though PSS for PED systems may use wiring that is produced for the consumer market, the wiring must meet the flammability requirements of § 25.869.*
- Although multiple power control switches may be used (e.g., zonal control of system power), there should be a single master switch that allows for the immediate removal of power to the entire PSS for PED
- [We recommend that you provide a means of indication to enable the cabin crew to determine which outlets are in use or which outlets are available for use.]