NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 8900.307

National Policy

Effective Date:
6/23/15

Cancellation Date:
6/23/16

SUBJ: Electrical Requirements for Operation of Single-Engine Passenger-Carrying Aircraft under IFR—Title 14 CFR Part 135, § 135.163(f)

1. Purpose of This Notice. This notice provides guidance and information to aviation safety inspectors (ASI) responsible for oversight of Title 14 of the Code of Federal Regulations (14 CFR) part 135 certificate holders that operate single-engine passenger-carrying aircraft under instrument flight rules (IFR). This guidance will help ASIs determine the essential minimum equipment necessary for the safe operation of an aircraft to continue to a landing in the event it becomes necessary to deactivate electrical items in order to comply with part 135, § 135.163(f).

2. Audience. The primary audience for this notice is Flight Standards District Office (FSDO) ASIs with oversight of part 135 single-engine passenger-carrying aircraft operating under IFR. The secondary audience includes Flight Standards branches and divisions in the regions and headquarters (HQ).

3. Where You Can Find This Notice. You can find this notice on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices. Inspectors can access this notice through the Flight Standards Information Management System (FSIMS) at http://fsims.avs.faa.gov. Operators can find this notice on the Federal Aviation Administration's (FAA) Web site at http://fsims.faa.gov. This notice is available to the public at http://www.faa.gov/regulations_policies/orders_notices.

4. Cancellation. This notice cancels N 8900.284, Electrical Requirements for Operation of Single-Engine Passenger-Carrying Aircraft under IFR—Title 14 CFR Part 135, § 135.163(f), dated January 27, 2015.

5. Changes. N 8900.284 incorrectly referenced operations specification (OpSpec) D085 in subparagraph 7b. This notice corrects that reference from D085 to D103.

6. Background. The Flight Standards Air Transportation Division (AFS-200) has determined that some operators are unaware of the differences between requirements in 14 CFR part 23, § 23.1353(h) and in § 135.163, and have erroneously assumed that an aircraft certificated under part 23 automatically meets the requirements of part 135. However, § 135.163(f) requires greater electrical power capabilities.

7. Discussion.

a. Differences. The differences between the two sections are as follows:

(1) Section 23.1353(h) requires that: "In the event of a complete loss of the primary electrical power generating system, the battery must be capable of providing at least 30 minutes of electrical power to those loads that are essential to continued safe flight and landing. The 30-minute time period includes the time needed for the pilots to recognize the loss of generated power and take appropriate load shedding action."

(2) Section 135.163 specifies equipment requirements for aircraft carrying passengers under IFR, and § 135.163(f)(1) and (2) require that single-engine aircraft have:

(a) Two independent electrical power generating sources each of which is able to supply all probable combinations of continuous in-flight electrical loads for required instruments and equipment; or

(b) In addition to the primary electrical power generating source, a standby battery or an alternative source of electric power that is capable of supplying 150 percent of the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aircraft for at least 1 hour.

b. Section 135.163 Requirements. Whenever an operator applies for a part 135 operating certificate using single-engine aircraft or desires to add single-engine aircraft to an existing certificate, including their basis for determining that the requested aircraft meet § 135.163(f)(1) or (2). The principal inspectors (PI) involved must determine if the aircraft meets the requirements of § 135.163(f)(1) or (2). If electrical load-shedding procedures are required, the operator must submit its procedures and/or checklists demonstrating compliance to the certificate-holding district office (CHDO) PIs for review and acceptance, including any inflight electrical load analysis data and shedding procedures if required.

(1) Section 135.163(f)(1) Requirements. Section 135.163(f)(1) requires two independent electrical power generating sources, each able to supply all probable combinations of continuous in-flight electrical loads for required instruments and equipment. Probable combinations of continuous in-flight electrical loads include, but are not limited to, equipment required by §§ 135.163 and 135.141 and 14 CFR part 91, §§ 91.205 and 91.209. Probable combinations of continuous in-flight electrical loads also include instruments and equipment required to meet operational authorizations and requirements. For example, if an operator is authorized and uses an approved autopilot system under the § 135.105 exception to § 135.101 second-in-command (SIC) requirements, the autopilot system is required equipment. For aircraft equipped to operate in known or forecast icing (flight into known icing, or FIKI) conditions, anti-ice and/or deice equipment constitute required equipment, in addition to the pitot tube heat required for IFR by § 135.163(c). The independent electrical power generating sources must each be able to operate required instruments and equipment in accordance with procedures and/or checklists, Flight Manual, Flight Manual Supplement, pilot's operating handbook (POH), or Owner's Manual. If one of the two electrical sources is considered a primary source and the secondary source is not capable of independently supplying power to all instruments and equipment, then procedures

and/or checklists for load shedding of nonrequired equipment are required and must be submitted to the CHDO PI for review and acceptance.

(2) Section 135.163(f)(2) Requirements. Section 135.163(f)(2) requires that aircraft must have, in addition to the primary electrical generating source, a standby battery or alternative source of electrical power capable of supplying 150 percent of the electrical loads imposed by all required instruments and equipment essential for safe emergency operations for at least 1 hour. This normally requires electrical load shedding, accomplished through procedures and/or checklists (which must be submitted to the CHDO PI for review and acceptance), or by aircraft automatic load shedding systems. The instruments and equipment required for safe emergency operation is based on operational authorizations and equipment required to meet operational requirements. For example, if aircraft are equipped and certified to operate in FIKI conditions, then anti-ice and/or deice equipment constitutes required equipment for safe emergency operation. Minimum emergency equipment must include at least the following:

- Primary engine instruments;
- Primary flight instruments required for IFR flight or one primary flight display (PFD) and standby flight instruments;
- Sufficient permanently installed lighting to illuminate primary instruments or PFD and controls;
- One permanently installed communication radio;
- One permanently installed means of navigation sufficient for en route navigation and suitable instrument approaches;
- Full-authority digital engine control or electronic engine control, if installed;
- Autopilot, if a single-pilot operation;
- Position lighting;
- Anticollision light system;
- Landing light(s) sufficient for landing;
- Any fuel pumps which must remain on at all times;
- Equipment cooling fan (if applicable and required by Flight Manual or POH);
- Stall or angle of attack indication systems;
- Required engine parameter monitoring systems;
- Deicing systems if certified FIKI; and
- Any other required warning devices.

c. Calculating Load Requirements. Section 135.163(i) states that for the purpose of satisfying § 135.163(f), only equipment that draws power continuously during flight needs to be considered when calculating load requirements. Equipment that imposes occasional intermittent loads need not be included. Therefore, a landing gear extension motor or pump, a landing light that is turned on just prior to landing, a flap extension motor or pump, or a fuel pump that is not needed continuously may be omitted when calculating § 135.163(f) requirements.

8. Action. ASIs will review this notice and provide a copy to each part 135 certificate holder that operates, or is applying to operate, single-engine aircraft carrying passengers under IFR. If it is determined that the aircraft electrical power sources do not meet the requirements of § 135.163(f), the operator must bring their operation into compliance by either modifying their

aircraft or, if able, modifying their procedures. If this involves changes to procedures, these must be incorporated into an emergency or abnormal operating procedure checklist. PIs should require these procedures to be incorporated into the operator's approved training/checking program. All operators must be in compliance within 6 months of the effective date of this notice. It is the responsibility of the operator to determine the method of compliance; the FAA does not make that determination. The PIs assigned with oversight responsibilities will ensure the method chosen complies with this notice.

a. ASI Checklist Review. If an operator's method of compliance is accomplished by developing procedures, part of the PI's response will be based on whether the procedures have been incorporated into the applicable training material and checklists. The second part is whether the procedures are acceptable. PIs will review and accept these checklists and procedures in the same manner as other checklists (per FAA Order 8900.1, Volume 3, Chapter 32, Section 12, Aircraft Checklists for 14 CFR Parts 121/135), or as other procedures (per Volume 3, Chapter 32, Section 5, Flight Manuals for 14 CFR Parts 121/135). If any doubt remains with respect to the validity of the resulting checklists or procedures submitted, including the underlying data used to calculate total load, or identification of the equipment and systems which are required or which must be positively deactivated, consult with the Aircraft Certification Office (ACO). Once acceptable, these checklists and procedures will be accepted and incorporated as additions to the operator's Flight Operations Policy Manual (FOPM), Company Flight Manual (CFM), General Operations Manual (GOM), Standard Operating Procedures (SOP), and approved training program. If the submitted documents are not acceptable, the PI will notify the operator with discrepancies and enter a negative Program Tracking and Reporting Subsystem (PTRS), utilizing the appropriate PTRS codes in paragraph 9. Once acceptable, a PTRS record will be created per paragraph 9.

b. ASI Review of Compliance Through Aircraft Modification. If the operator's method of compliance was by modification to their aircraft, the status of these modifications, by tail number, within an aircraft type, will be tracked via the procedures outlined in paragraph 9.

c. Multiple Aircraft. PIs that oversee operators with multiple single-engine aircraft on their operating certificate that are conducting IFR passenger-carrying operations must distinguish between those aircraft that are in compliance with this notice and those that are not.

> **Note:** It is important to note that not all operators may choose to bring the noncompliant aircraft into compliance to meet the IFR requirements. If this happens, PIs must ensure the aircraft is limited to visual flight rules (VFR) operations only, if appropriate, or removed from the appropriate OpSpecs.

9. PTRS. Once an operator's compliance with § 135.163(f) has been determined, PIs will document the compliance status as follows:

- Open a PTRS record using code 1380/3390/5390 and complete all required (and any applicable optional) fields;
- Enter "YENSE" in the National Use field if all aircraft in the operator's fleet are in compliance;

- Enter “NENSE” in the National Use field if any aircraft in the operator’s fleet are not in compliance; and
- Close the PTRS record.

Note: It is not necessary for each principal assigned to the certificate to record this activity. To help ensure completeness of this task, office management may determine which discipline is responsible for recording this activity.

Example: If four out of five aircraft are in compliance, the PI’s response to this in the PTRS will be “NENSE” in the National Use field. Close the PTRS and create another PTRS for a future inspection to follow up a later date. The remaining four aircraft that are in compliance may continue to be used in IFR passenger-carrying operations. The PI will use the PTRS Comment field to identify any aircraft that are not in compliance, as well as other relevant information deemed necessary. PIs must then plan a followup inspection within the remaining 6 months of the issue date of this notice to determine whether the noncompliant aircraft was brought into compliance.

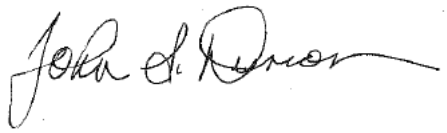
a. The Operator Has Brought the Noncompliant Aircraft into Compliance. Once the noncompliant aircraft has been brought into compliance, PIs will open a new PTRS record using code 1380, referencing the original PTRS record that was closed as a followup. PIs will enter “YENSE” in the National Use field, and will include a brief description in the PTRS Comment field of the actions taken by the operator.

b. The Operator Has Removed the Noncompliant Aircraft from the OpSpec. If the aircraft has not been brought into compliance and the operator has chosen to remove it from OpSpec D103, Additional Maintenance Requirements—Single Engine IFR, PIs will open a new PTRS record with code 1380, referencing the original PTRS record that was closed as a followup. The PI will enter “YENSE” in the National Use field, and will use the PTRS Comment field to annotate the removal of the aircraft from OpSpec D103.

c. The Operator Has Not Brought the Noncompliant Aircraft into Compliance. If the aircraft has not been brought into compliance and the operator has not provided clear direction to the PIs of their intentions, PIs will coordinate the removal of that aircraft from the operator’s OpSpecs, in accordance with 14 CFR part 119, § 119.51, supported by Order 8900.1, Volume 3, Chapter 18, Section 8, Amendment, Surrender, and Suspension of OpSpecs.

Note: The same method applies if written procedures are necessary for compliance. If the operator requires written procedures for load shedding and does not have any, the PI must enter “NENSE” in the National Use field. Depending on the actions taken by the operator, the PI follows the same procedures with regards to PTRS actions as above.

10. Disposition. We will incorporate the information in this notice into Order 8900.1 before this notice expires. Direct questions concerning the information in this notice to the Part 135 Air Carrier Operations Branch (AFS-250) at 202-267-8166.



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