

tracking system. The content of this data must be adequate to evaluate the specific cause of all service incidents reportable under § 21.3(c) of part 21, in addition to any occurrences that could affect the safety of ETOPS operations and must be reported, including:

(i) In-flight shutdown events, and for twin-engine ETOPS airplanes, in-flight shutdown rates;

(ii) Inability to control the engine or obtain desired power;

(iii) Precautionary thrust reductions (except for normal troubleshooting as allowed in the aircraft manual);

(iv) Degraded propulsion in-flight start capability;

(v) Inadvertent fuel loss or fuel unavailability, or uncorrectable fuel imbalance in flight;

(vi) Technical air turn backs or diversions associated with an ETOPS Group 1 Significant System;

(vii) Inability of an ETOPS Group 1 Significant System, designed to provide backup capability after failure of a primary system, to provide the required backup capability in-flight;

(viii) A complete loss of any electrical power generating system or hydraulic power system during an operation of the aircraft;

(ix) Any event that would jeopardize the safe flight and landing of the airplane on an ETOPS flight;

(x) Unscheduled engine removals for conditions that could result in one of the reportable items listed above.

(b) ETOPS operational service reliability reporting for two-engine airplanes.

(1) *Two engine reliability reporting.* Type Certificate Holder of engines and airplanes used in ETOPS service must report monthly on the reliability of their two-engine airplane fleets in service. The Administrator may approve reporting on a quarterly basis if the airplane and engine demonstrate sustained IFSD rates below those identified in paragraph (b)(2) of this section. This reporting may be combined with the reporting requirements of § 21.3. Causes of propulsion system in-flight shutdown must be investigated by the manufacturer(s), and where appropriate for the safety and airworthiness of ETOPS operations, FAA approved corrective action must be implemented. Reporting must include:

(i) Propulsion system in-flight shutdown events (excluding normal training events)

(ii) In-flight shutdown rates for all causes (excluding normal training events).

(iii) ETOPS fleet utilization, including a list of operators, their ETOPS

diversion time authority, flight hours, and cycles.

(2) *ETOPS World Fleet In-Flight Shutdown Rate Requirements.* Type Certificate Holders of engines and airplanes approved for ETOPS service must monitor and report the worldwide fleet in-flight shutdown rates by airplane-engine type combinations to ensure appropriate rates are maintained. ETOPS 12 month rolling average in-flight shutdown rates must be maintained at the following levels:

(i) A threshold rate of 0.05 per 1,000 fleet engine hours for two-engine airplanes in ETOPS for initial approval up to 120 minutes, with continuing improvement toward a rate of 0.02 per 1,000 fleet engine hours;

(ii) A rate of 0.02 per 1,000 fleet engine hours for two-engine airplanes in ETOPS up to 180 minutes, and as provided for flight by flight exception based operations up to 207 minutes maximum diversion time in the North Pacific area of operation as defined in 14 CFR Part 121;

(iii) A rate of 0.01 per 1,000 fleet engine hours for twin-engine airplanes in ETOPS beyond 180 minutes, except as provided for flight by flight exception based operations up to 207 minutes maximum diversion time in the North Pacific area of operation as defined in 14 CFR Part 121.

PART 25—AIRPLANE TYPE DESIGN

5. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702 and 44704.

6. Amend § 25.857 by revising paragraph (c)(2) to read as follows:

§ 25.857 Cargo compartment classification.

* * * * *

(c) * * *

(2) There is an approved built-in fire extinguishing or suppression system controllable from the cockpit. For ETOPS approval, the certified time capability of the system must be provided as required by § 25.1581(a)(2).

* * * * *

7. Add § 25.1535 to read as follows:

§ 25.1535 ETOPS approval.

Each applicant seeking type design certification for ETOPS must:

(a) Comply with the requirements of this part considering the maximum mission time and the longest diversion time for which approval is being sought.

(b) Consider crew workload and operational implications and the flight crew's and passengers' physiological needs of continued operation with

failure effects for the longest diversion time for which approval is being sought, and

(c) Comply with the requirements of Appendix L of this part.

8. Add Appendix L to read as follows:

Appendix L to Part 25—Extended Operations (ETOPS)

This appendix defines additional airworthiness requirements for the approval of an airplane-engine combination for Extended Operations (ETOPS) in accordance with § 25.1535. Two engine airplanes must comply with Sections I and II of this appendix. Airplanes with more than two engines must comply with Sections I and III of this appendix.

Section I—Design Requirements

(a) *Airplane Systems.* (1) Operation in icing conditions. (i) The airplane must be certificated for operation in icing conditions in accordance with § 25.1419.

(ii) The airframe and propulsion system ice protection must be capable of continued safe flight and landing at engine inoperative and decompression altitudes in icing conditions.

(iii) The applicant must show that the unprotected areas of the airplane will not collect a load of ice that would make the airplane uncontrollable or create too much drag to safely complete a diversion in icing conditions.

(2) *Electrical power supply.* The electrical power supply system must be designed so that—

(i) The occurrence of any failure condition which would prevent the continued safe flight and landing of the airplane on an ETOPS flight is extremely improbable, and

(ii) The occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions on an ETOPS flight is improbable.

(iii) For airplanes to be certificated for usage on routes further than 180 minutes from a suitable airport, the airplane must be equipped with at least three independent electrical generation sources.

(3) *Time limited systems.* For each ETOPS Significant System that is time limited, the system capability must be defined. The most limiting ETOPS Significant System capability must be stated in the Airplane Flight Manual per the requirements of paragraph (e)(4) of Section I of this appendix.

(b) *Propulsion systems.* (1) Fuel system design. Fuel necessary to complete an ETOPS mission, including a diversion for the longest time for which approval is being sought, must be available to the operating engine or engines at the pressure and flow required by § 25.955 under any airplane failure condition not shown to be extremely improbable. Examples of the types of failures to be considered include crossfeed valve failures, automatic fuel management system failures, and normal electrical power generation failures.

(i) For two engine airplanes to be certificated for usage on routes further than 180 minutes from a suitable airport, one fuel boost pump in each main tank and actuation