

personnel. This document need not be inclusive but should at least reference the maintenance program and other requirements, and clearly indicate where they are located in the certificate holder's document system. The ETOPS program document would have to be submitted to the CHDO for approval at least 60 days before beginning ETOPS flights and be subject to revision control.

(7) ETOPS Parts Control

Under this proposal, the certificate holder would have to develop a parts control program that ensures the proper parts and configurations are maintained for ETOPS airplanes. The program should include procedures to verify that the parts installed on ETOPS airplanes during parts borrowing or pooling arrangements, as well as those parts used after repair or overhaul, maintains the necessary ETOPS configuration. In many cases, certificate holders utilize the Illustrated Parts Catalog (IPC) as the ETOPS parts controlling document. However, other methods may be used provided that the configuration standard of the airplane and engine is maintained.

(8) Enhanced Continuing Analysis and Surveillance (CAS)

The certificate holder would have to enhance their existing CAS in order to achieve ETOPS reliability goals. This program should be designed to identify and prevent ETOPS related problems. The program would be event-oriented and incorporate reporting procedures for critical events detrimental to ETOPS flights. Reliability data would have to be readily available for use by the certificate holder and the FAA to ensure that an acceptable level of reliability is achieved and maintained.

In addition to the reporting requirements in section 135.415, the following items would have to be reported within 72 hours to the CHDO.

- (a) In-flight shutdowns.
 - (b) Diversions or turnback.
 - (c) Uncommanded power changes or surges.
 - (d) Inability to control the engine or obtain desired power.
 - (e) Problems with systems critical to ETOPS.
 - (f) Any other event detrimental to ETOPS.
- (2) Certificate holders would also be required to furnish the following information:
- (a) Airplane identification (type and N-number)
 - (b) Engine identification (make and serial number)
 - (c) Total time, cycles and time since last shop visit.

(d) For systems, time since overhaul or last inspection of the discrepant unit.

(e) Phase of flight.

(f) Corrective action

This proposed regulation would require certificate holders to conduct an investigation into the cause of the occurrence of any event listed above in addition to any event described in section 135.415. The certificate holder would have to submit findings and description of corrective action taken to the CHDO. The FAA expects certificate holders to investigate events above in conjunction with manufacturers. The report must be submitted in the manner prescribed by section 135.415(e).

(c) Propulsion System Monitoring

Propulsion system monitoring is vital to ensure safe ETOPS flights. A propulsion system-monitoring program is intended to detect adverse trends, to identify potential problems, and to establish criteria for when corrective action may be necessary.

Propulsion system problems and IFSD may be caused by type design deficiencies, ineffective maintenance, or operational procedures. It is very important to identify the root cause of events so that corrective action may be determined.

The diverse causes of propulsion system problems require different solutions. For example, type design problems may affect an entire fleet of aircraft. If an individual certificate holder experiences a problem caused by a type design issue, it may not be appropriate for the FAA to withdraw ETOPS authority. The FAA will normally address by an Airworthiness Directive fundamental design problems that require an effective hardware (or software) final fix. Inspections may be satisfactory as an interim solution but long-term design solutions are required for terminating action. However, maintenance or operational problems may be wholly, or partially, the responsibility of the certificate holder. In these cases, the cause would be specific to that certificate holder and may require changes to their operational, dispatch or maintenance procedures.

(d) Engine Condition Monitoring

The certificate holder would have to monitor the condition of engines on ETOPS airplanes. The monitoring program would describe the engine performance parameters to be tracked, method of data collection, and corrective action processes. It would detect deterioration in engine performance by tracking parameters such as rotor speeds, exhaust gas

temperatures, and fuel flow and allow for corrective action before safe operation is affected. The program should reflect the manufacturer's instructions and industry practices. Engine limit margins must be maintained so that prolonged engine inoperative diversions may be conducted without exceeding approved engine limits at all approved power levels and expected environmental conditions. Engine margins are maintained through this program to account for the effects of additional engine loading demands such as electrical and pneumatic systems that may be required during a diversion. If oil analysis such as Spectrographic Oil Analysis Program (SOAP) is meaningful, it should be included.

(e) Oil Consumption Monitoring

The certificate holder would have to establish an engine oil consumption-monitoring program to ensure that there is enough oil to complete any ETOPS flight. The certificate holder's consumption limit would not be allowed to exceed the manufacturer's recommendations, and would have to be sensitive to oil consumption trends. The program would have to track the amount of oil added at the departing ETOPS station with reference to the running average consumption. The monitoring must be continuous up to and including the oil added at the ETOPS departure station. For example, after servicing, the oil consumption may be calculated by maintenance personnel as part of the pre-departure check or may be automatically calculated by a computer program. The amount of oil added could also be reported to centralized maintenance control for calculation prior to the ETOPS flight. If an Auxiliary Power Unit (APU) is required for ETOPS, then its oil consumption must be included in the program.

(f) APU In-Flight Start Program

If APU in-flight start capability is required for ETOPS, the certificate holder would be required to establish an in flight start and run monitoring program. The primary function of an APU is to provide backup electrical power in the event of a main system failure such as engine in-flight shut down or generator loss. This program would have to ensure that the APU in-flight start capability will continue at a level of performance and reliability established by the manufacturer or the FAA. The program would have to be acceptable to the Administrator and include periodic sampling of each ETOPS airplane's APU in-flight starting