

adequately protect the passengers and crew from the elements and see to their welfare.

**Proposed Change to Section 121.625  
Alternate Airport Weather Minimums  
Explanation**

The purpose of the proposed amendment to section 121.625 is to clarify the intent of this regulation as being applicable to destination and takeoff alternates only and not to ETOPS alternates requirements. ETOPS alternate requirements are the subject of proposed new regulation, section 121.624 ETOPS Alternates.

**Proposed Change to Section 121.631  
Original Dispatch or Flight Release,  
Redispatch or Amendment of Dispatch  
or Flight Release**

The FAA proposes to modify section 121.631 to specify weather requirements for ETOPS alternates while a flight is en route and the availability of the option to amend the dispatch or flight release to add another ETOPS alternate if a required ETOPS alternate becomes unavailable.

**Explanation**

The FAA proposes to modify section 121.631 to address weather conditions required at designated ETOPS alternates while a flight is en route. This regulation is consistent with the standards and practices of AC 120-42A, the advisory circular that provided guidance for ETOPS since 1985.

The proposed regulation also specifies the action required of the pilot in command and, in the case of flag operations, the dispatcher, in the event a required, designated alternate becomes unavailable and no other qualifying airport is available. In that event, the flight may not continue as an ETOPS flight unless another track that qualifies is available. The FAA recognizes that this may sometimes cause disruptions in scheduled operations and anticipates that carriers will adjust the enroute alternate weather minimums upward on routes on which this becomes more than a very infrequent problem.

**Proposed New Section 121.633  
Planned ETOPS Diversion Time  
Limitations**

The FAA proposes to add new regulation section 121.633 to require that planned ETOPS diversion times not exceed the time limit specified in the Airplane Flight Manual (AFM) for the airplanes most time-limited system minus 15 minutes. For airplanes with more than two engines and type certificated before the effective date of this regulation, the effective date for

compliance with paragraph 121.633(b) is proposed to be not later than six years following the date on which this rule becomes effective.

**Explanation**

Section 121.633 has been developed to codify the two-engine airplane operating practices with regard to diversion time and time critical systems and to expand those regulations to include airplanes with more than two engines in long-range operations.

The premise of ETOPS has been to preclude a diversion and, if it were to occur, to have programs in place that protect the diversion. Under this concept, propulsion systems are designed and tested to assure an acceptable level of in-flight shutdown; other airplane systems are designed and tested to ensure their reliability. However, despite the best design/testing, and maintenance practices, situations have occurred which required an airplane to divert. In-service data has also shown that all airplanes, regardless of the number of engines, divert from time to time for various causes.

Airplanes with more than two engines currently are operated in areas where there are a limited number of enroute airports, where the support infrastructure is marginal or with challenging weather conditions. All such operations should adopt the same 'preclude and protect' concept.

Under the 'preclude and protect' concept, various failure scenarios need to be considered. For example, during the design of the airplane, time limited systems such as cargo compartment fire suppression/containment capability are considered. The fuel planning process accounts for the possibility of decompression and/or the failure of an engine with considerations for icing.

If airplanes with more than two engines plan to operate in areas where en route airports are farther than 180 minutes or in north polar areas where weather conditions can be challenging at certain times of the year, these operations should be required to meet the standards to ensure that all efforts are made to preclude a diversion and, if a diversion were to occur, procedures are in place to protect that diversion. This would include systems capability to protect the aircraft and its occupants during the entire length of the diversion. As such, for ETOPS operations less than 180 minutes the one engine inoperative cruise speed maximum diversion time to any ETOPS alternate may not exceed the time specified in the Airplane Flight Manual (AFM) for the airplane's most time-limited system, minus 15 minutes. The 15 minutes allows time for

approach and landing. The cruise speed is calculated as if in still air under standard temperature conditions.

In ETOPS operations wind becomes an increasingly significant factor with increasing diversion times and should be considered in ETOPS operations beyond 180 minutes to assure that AFM system time limits are not exceeded. For example, while diverting with an engine inoperative, it is essential to ensure that there is sufficient amount of oil in the tank for continuous operation of the remaining engines at Maximum Continuous Thrust for the actual duration of divert. As a result, for ETOPS operations with approved diversion times greater than 180 minutes the one engine inoperative cruise speed (approved) maximum diversion time is calculated by taking into account forecast wind and temperature. The maximum diversion time may not exceed the time specified in the airplane flight manual for the airplane's most time-limited system, minus 15 minutes for approach and landing.

However, there are some other time limited systems, like cargo fire suppression, which may not have as much relevance to the one engine inoperative diversion time. The FAA believes that the likelihood of an engine failure at the critical point followed by cargo fire to be extremely remote. Thus ETOPS beyond 180 minutes, cargo fire suppression requirement would be based on covering the diversion distance authorized (maximum diversion time authorized at the approved one engine inoperative speed) at the all engine operating speed. It has already been stated that for ETOPS operations beyond 180 minutes wind becomes an increasingly significant factor with increasing diversion times and should be considered. Therefore this proposed rule requires that for ETOPS beyond 180 minutes, cargo fire suppression time required be based on the airplane operating at all engine operating speed with actual wind. For ETOPS at or below 180 min, there is precedent in AC 120-42, for cargo fire suppression for the maximum diversion time based on one engine inoperative speed. This proposal would codify that practice. The cargo fire suppression time in all cases shall also include 15 minutes allowance for holding, approach and landing.

During development of their recommendation the ARAC ETOPS Working Group had much discussion regarding aircraft utilized in long haul operations. Some three and four-engine airplanes routinely operate on routes with diversion times that exceed aircraft