70886

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. FAA–99–6717]

207-Minute Extended Range Operations With Two-Engine Aircraft (ETOPS)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Disposition of comments; policy statement for 207-minute ETOPS; request for comments.

SUMMARY: This notice responds to comments received in response to a request for public comments that was published on April 27, 1999 in the **Federal Register** (64 FR 22667) pertaining to a proposed policy for 207-minute ETOPS operation approval criteria for the Boeing 777 airplane, informs the public of the FAA decision to establish the conditions for a limited authorization for up to 207-minute ETOPS operation, and informs the public of FAA intent to task the Aviation Rulemaking Advisory Committee (ARAC) in the near future to recommend safety standards and procedures for extended range operation of airplanes, regardless of the number of engines.

DATES: This policy is effective on March 21, 2000. Comments must be received on or before March 6, 2000.

ADDRESSES: Comments on this document should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA–99–6717, 400 Seventh Street, SW., Room Plaza 401, Washington, DC 20590. Comments may be filed and examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays, except Federal holidays. Comments also may be sent electronically and examined via the Docket Management System (DMS) at the following Internet address: http://*dms.dot.gov/* at anytime. Commenters who wish to file comments electronically, should follow the instructions on the DMS web site.

FOR FURTHER INFORMATION CONTACT: Eric A. van Opstal, Air Transportation Division (AFS–200), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591, telephone (202) 267–8166.

SUPPLEMENTARY INFORMATION:

Background

In a letter dated February 26, 1999, the Air Transport Association (ATA) requested the FAA to issue a policy letter establishing 207-minute ETOPS authority (See the ATA proposal that was published in the April 27, 1999 **Federal Register**). That letter stated that ATA member airlines determined that a need exists for expanded ETOPS authority beyond 180 minutes. The ETOPS Subcommittee of ATA established a process where associated airlines, the Pilots associations, Boeing, and other parties worked together to determine the criteria to support the establishment of a proposed 15 percent operational extension of 180 minutes ETOPS. That subcommittee prepared an ETOPS Policy Letter draft proposal dated February 4, 1999.

The FAA responded to the ATA letter by publishing the **Federal Register** a copy of the ATA letter and draft proposal, and requested public comment (64 FR 22667). This Notice responds to the comments received, provides notice of the FAA decision to allow an extension of ETOPS to 207 minutes, describes the criteria for a limited authorization for 207-minute ETOPS for the Boeing 777, and provides notice of the FAA's intent to task the ARAC to recommend safety standards and procedures for extended range operation of airplanes, regardless of the number of engines.

Additional Comment Period for Policy Decision

Very extensive comments were received on all the issues embodied in the ATA proposal. After careful review of the ATA proposal and those comments, the FAA is adopting, with some modification, the ATA proposal. Given the minor differences from the original ATA proposal, the FAA believes it is reasonable to proceed forward with a final decision.

However, because two commenters have expressed concerns about the FAA making a final decision on the ATA proposal without allowing additional public comment on the FAA final action and disposition of comments, the FAA is allowing an additional 45 days for interested persons to comment further on the 207-minute dispatch authorization described in this policy. This authorization is automatically effective on March 21, 2000 unless, after review of any new comments received, the FAA believes modification or additional action is required. The FAA will publish in the **Federal Register** a full disposition of all new comments received and, if required, any additional steps to stay or modify the limited 207-minute authorization.

Interested persons are invited to comment on this policy statement by submitting such written data, views, or arguments as they may desire. Comments that provide factual basis supporting the views and suggestions presented are particularly helpful. Comments must identify the regulatory docket or notice number and be submitted in duplicate to the address specified above.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-l, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267–9680. Communications must identify the notice number or docket number of this notice.

Discussion of Comments From Previous Notice

The FAA received 44 comments in response to the notice published on April 27, 1999 (64 FR 22667), including comments from individual members of the Joint Aviation Authorities (JAA) ETOPS Work Group. All commenters but 12 supported the ATA proposal for 207-minute ETOPS. The issues and concerns raised by the 12 commenters who opposed the proposed extension of ETOPS are discussed below.

1. No Justification for Change

The Allied Pilots Association (APA) and Airbus Industries (Airbus) expressed concern that the proposal is an attempt to generally extend ETOPS when no justification for changing the diversion limits has been shown. APA stated that only the South America-New Zealand market cannot be operated with the current three hour standards. They also pointed out that Boeing and operators have stated that there are only a few days a year when alternate routings would have to be considered for twin engine aircraft operating on the North pacific routes due to unsuitable weather at the preferred alternates. Airbus commented that there is no precedent for a 15 percent extension. APA suggested that the intent of the proposal appears to be to provide support for marketing the B–777 as a replacement for older, three and four engine aircraft. APA argued that economic desirability does not constitute need.

FAA Response

Most commenters (32 of 44) supported a 15 percent extension of the diversion limits for ETOPS. United Airlines stated that 207-minute ETOPS is a logical extension from 180-minute ETOPS that will serve the interests of the traveling public, the environment and the industry. The Air Line Pilots Association, International stated that

current requirements have an excellent safety record and the approval process has lead to safety enhancements for twin engine aircraft. The Rolls-Royce Airworthiness Department suggested that the proposed policy statement and reissue of Advisory Circular AC120–42A should be considered a first step towards a general tidying up to the ETOPS regulations. Continental Airlines supports the proposal because it would benefit the traveling public by reducing enroute times across the North Pacific with no degradation in safety. It would also positively impact the economics of the route, which will ultimately benefit the traveling public. The equipment and dispatch specifications detailed in the proposal are more conservative that those required by 180-minute diversion authority. Boeing suggested that the current proposal reflects the "safe, conservative, evolutionary nature of ETOPS, which is a fact-based industry program dependent on the gathering and analysis of operational data."

ETOPS conducted in the North Pacific (NOPAC) meets all of the conditions in AC 120–42A that define a "demanding area of operation". Today, 180-minute ETOPS in NOPAC is routinely conducted by several North American and Asian air carriers on a daily basis. There are sufficient adequate alternate airports available in the area of operation that allow for year round operations. The introduction of a 207-minute authorization would provide an air carrier with additional flexibility with the dispatch of an ETOPS flight, which may in fact position the flight closer to more enroute alternate airports. This would be both an operational and safety benefit.

ETOPS operations in a 'demanding area of operation' began with a limited 75-minute authority for North Atlantic crossings. As service experience was gained and the safety of the operations validated, the FAA granted an increase to 120-minute diversion limit. This allowed ETOPS flights access to some of the established North Atlantic navigational tracks. The original ETOPS Advisory Circular, AC 120–42 dated 1985, included a provision that the FAA would allow an operator on a 'case-by-case' basis up to a 15 percent increase to the 120-minute maximum diversion time. The extension granted a 138-minute diversion limit which ideally suited North Atlantic ETOPS, as it now allows use of all available NAT navigational tracks. The extension provision was removed when the Advisory Circular was revised as AC 120–42A in 1988. AC 120–42A introduced the means by which the FAA would approve 180-minute ETOPS, and the conventional wisdom at that time considered the allowable extension to 138-minutes as no longer necessary. However as Airbus and other commenters have noted, the FAA reinstated the 138-minute diversion limit by policy letter EPL 95–1 in 1994, designating its use only for North Atlantic ETOPS operations.

In response to the comment by APA that ETOPS requirements would be eased so that Boeing could more effectively market the B–777 in place of older 3- and 4-engine airplanes, the FAA rejects the notion that the safety decisions to be made for 207-minute ETOPS operations are related to the marketing of airplanes. The FAA considers operations meeting the ETOPS standards of reliability and the operational requirements to have proven themselves well over the years. The increased safety standards for ETOPS airplanes and associated maintenance practices have found their way into other airplanes routinely used in non-ETOPS commercial air transport. Thus, ETOPS principles have "raised the safety bar" for all types of operations.

The ATA 207-minute proposal specifies particular airplane systems design as well as additional equipment requirements. The ATA ad-hoc work group that drafted the 207-minute proposal considered the proposed area of operation and operating environment with the additional diversion time, and considered the additional requirements to be necessary to maintain existing safety standards, which is based on a conservative approach. It was a collective recommendation that was made with a diverse group comprised of representatives from operators, manufacturers, and pilot associations. This was agreed upon with full knowledge that the added requirements would not be met by some other airplanes that already hold ETOPS type design approval, and have provided the remarkable safe ETOPS operating experience to date.

The FAA agrees with APA that a review should be conducted on the requirements for all long range operations, including 3- and 4-engine airplanes, and that there should be a more uniform application of those requirements. The FAA therefore proposes the formation of an ARAC group appropriately tasked to provide the FAA with recommendations concerning all long range operations. See the statement of intent at the end of this notice.

2. Some Diversion Airports May Become Redundant and Risk Closure

APA and Airbus expressed concern that the proposed extension of ETOPS authority may cause some diversion airports that are currently relied on to become redundant. They may then risk closure.

FAA Response

The FAA agrees that North Pacific alternate airports play an important role in the safety of all commercial aviation in the region. Any airplane may have to divert due to reasons such as passenger illness, system failures, decompression, or fuel leaks. In fact, 3- and d-engine airplanes have a higher rate of diversion, for all causes, than ETOPS airplanes. Boeing has provided data that shows that less than 10 percent of diversions with their two-engine ETOPS airplanes were due to an inflight engine shutdown (IFSD). The remaining diversion of twin engine ETOPS airplanes were due to other causes that may affect any airplane. The issue of sufficient alternate airports is much broader than just related to the conduct of ETOPS.

The FAA does not believe that a 207-minute diversion authority in the North Pacific would result in the closure of airports designated as enroute alternates for 180-minutes ETOPS operations. Some of the same airports that are available for 207-minute ETOPS are also used with 180-minute ETOPS. The ATA proposal also limited the use of the 207-minute ETOPS extension so much of the time the airlines would be using the normal diversion airports for 180-minute ETOPS operations. A United Airlines Dispatch Office study showed that 10 percent of the flights would benefit from a 207-minute dispatch, while the remaining 90 percent would still be dispatched at 180-minutes.

The FAA also agrees with APA that solutions are needed to ensure the continued availability of airports for use as enroute alternates for the benefit of the entire industry. It is an international problem that needs attention and long term solutions. The issue is related to far more issues that just the ETOPS diversion time and requires broader solutions involving other countries.

3. The Proposal Is Too Broad

APA and Airbus pointed out that the proposal is too broad in that it does not establish requirements such as limited routes and specific conditions that would justify 207-minutes ETOPS as the safest available alternative.

FAA Response

The FAA agrees that the ATA proposal might be too broad in that it could be viewed as having a wider application than intended. For the proposal at hand, the 207-minute ETOPS operations are intended to apply only to the North Pacific area of operation, and then, only when conditions prevent a 180-minute dispatch. A general 207-minute policy would give the illusion that a higher ETOPS threshold has been accepted that could be applied to all geographical areas of operation and all airplanes that have ETOPS type design approval. The FAA believes that much further discussion would be needed to develop general standards for ETOPS beyond 180-minutes, and that it is important to have international participation so that global standards are achieved. To this end, the FAA intends to solicit recommendations through the ARAC for the development of general ETOPS standards for operations beyond the 180-minute limit. This is discussed in more detail at the last section of this notice.

The FAA recognizes the benefit of a route of flight that positions an airplane closer to airports that meet the criteria of "adequate" for the purpose of ETOPS enroute alternates. This is understood to be the basis for the ATA proposal. The FAA recognizes that an ARAC approach that deals with all airplanes and all routes will be years away from regulatory adoption, and thus should be viewed as a long-term solution. In the interim, the FAA believes that with the conditions and limitations specified in this document, 207-minute ETOPS authorizations can be issued for use in the North Pacific area of operation for airlines that have previous 180-minute ETOPS experience, and be limited to airplanes like the B–777. Such authorizations can be issued without any decrease in safety. In addition, other limitations will specify the conditions and frequency that will apply to the use of the 207-minute dispatch. The reason for limiting the approval to airplanes like the B–777 will be discussed further.

4. The Proposal Reduces Weather Standards for Diversion Airports

APA stated that the real, though indirect, result of the proposed 207-minute ETOPS is to reduce weather standards for diversion airports. Airbus comments that the longer the flight the more unlikely the weather at a designated alternate corresponds to that forecast at the beginning of the flight. Airbus also suggests that climatological data for the area should be analyzed to determine the frequency with which flexibility will be increased.

FAA Response

There is not relaxation of weather criteria of any difference in required weather standards to determine the "suitability" of a adequate enroute alternates for a 207-minute dispatch compared to any other ETOPS diversion limit. Airlines are required to apply the standard or otherwise approved alternate airport weather minima criteria that are contained in their operations specifications.

The FAA has reviewed a study prepared by United Airlines Dispatch Center that collected and analyzed meteorological forecast and actual weather data at airports that meet "adequate" criteria as enroute alternates in the North Pacific. The purpose of the study was to determine if and when a 207-minute dispatch would be beneficial when the forecast at "adequate" alternate airports within 180-minutes distance were below the ***dispatch*** alternate minima requirements. The study looked at more than a years worth of data and shows that a 207-minute ETOPS dispatch would mostly benefit Eastbound operations from Japan to the United States because those departures generally occur at night. The weather forecasts during night hours tend to be worse than during daylight. The study also showed that those "adequate" alternate airports within the 180-minute distance that did not meet the pre-departure alternate weather criteria, did in fact stay at or above the operational approach minima for the expected times of arrival of the flight (if the flight had to divert to the alternate airport). Operational approach minima is the weather minima needed to execute an approach and landing. After flight departure and while enroute, those "adequate" airports that meet operational approach minima are re-classified as "suitable" enroute alternates. The study also showed that the frequency of a 207-minute dispatch in lieu of a 180-minute dispatch would be in the area of 10 percent to 15 percent of the total departures. Finally, the 207-minute dispatch allowed a routing consistent with ATC preferred routes. The conclusions drawn from the study are: The use of a 207-minute dispatch would be infrequent; the flight could be dispatched on preferred ATC routes; and, the resulting route would place the airplane closer to more enroute alternates that after flight departure would meet "suitable" criteria. This offers the possibility that the flight crew, when faced with the need to initiate an in-flight diversion, could be closer to a suitable alternate airport than compared on an off-track route that was based on a 180-minute dispatch. This would clearly provide for enhanced safety.

The FAA acknowledges the difficulty in establishing accurate forecasts for alternate airports that may be 12 or more hours away. This difficulty is faced by all crews regardless of the airplanes they are flying on extended range flights. It is also obvious that the further out the forecast period is, the more likely that lower TEMPO (temporary) and PROB (probability) conditions will be included in the forecast that the dispatcher and flight crew must take into account. This is where the ATA's proposed requirement for SATCOM and SATCOM datalink capability gives greater assurance that once airborne and enroute, the flight crew will receive continuing updates on the forecast weather for all of the available enroute alternates, and will allow closer monitoring of weather trends. The enhanced communication capability that SATCOM provides aids in the transmission of relevant data to the flight crew.

5. ETOPS Should Be Formalized in Regulations Rather Than Administered Through Advisory Circulars and Policy Letters

Airbus and APA said that ETOPS should be formalized through the rulemaking process rather than by policy and Advisory Circulars. Additional comments suggested that it was time for the FAA to bring the FARs up to date. These commenters are well as AECMA, ALPA, Federal Express Pilots, and DGAC France all stated that major policies such as those that govern ETOPS should be in regulatory form. ALPA commented that "there is a need to develop a new set of regulations which would apply to all long-range operations regardless of the number of engines".

FAA Response

Extended range, twin-engine operations are authorized by the FAA under 14 CFR § 121.161(a), "based on the character of the terrain, the kind of operation, or the performance of the airplane to be used * * ● ." The FAA issued Advisory Circular 120–42, and has revised it several times, to incorporate the standards for ETOPS up to and including 180-minute dispatch authorizations. The FAA publishes in the **Federal Register a** notice of availability of each proposed revision, solicits comments, and then issues a revision to AC 120–42 only after

consideration of all the public comments. Thus, the public has always participated fully in the development of ETOPS standards. Furthermore, the FAA has ensured that ETOPS operators comply with those standards by applying them through operations specifications. The result has been that ETOPS authorizations have been established as they would have been established through a more structured codification.

Because of the limited scope of the 207-minute dispatch described in this document, the FAA is not proposing a corresponding revision to AC 120–42.

The FAA agrees that ultimately more defined criteria for ETOPS should be placed in Part 121 through the rulemkaing process. ETOPS over the years has been well served with the standards and requirements of AC 120–42A, but formal regulatory objectives should be developed for the extended range operation of any airplane. As more fully outlined later, the FAA will initiate tasking of an ARAC Working Group to start with the codification of the existing ETOPS requirements, and to make recommendations for standards for ETOPS beyond 180-minutes. The ARAC Working Group will also be tasked to look at the requirements for all long-range operations in order to recommend airplane safety requirements for all airplanes.

6. ETOPS Regulations Should Be Driven by Safety

For the type design approval criteria, the UK CAA suggests that "The ETOPS significant systems should be re-assessed to ensure their suitability for the extended diversion time (207 minutes). Systems Safety Analyses (SSA) should be carried out based on the extended diversion time and longest flight time. The re-analysis required (SSA) is to ensure that overall safety objectives are still achieved with the extended diversion time and flight times." They also suggest alternative wording for the type design approval criteria to state that "any one of the engine or APU driven generator sources shall be capable of powering all main essential and standby (emergency) AC and DC buses." This, in effect, would require a "non-time limited emergency power source capable of continuously supplying essential functions". They suggested that the list of services that need to be supplied should be re-assessed for 207 minute diversion times, and listed fifteen services that should be re-assessed as a minimum.

FAA Response

The FAA agrees that all ETOPS approvals should be granted only on the basis of safety. Industry need and operational desirability are important issues to those wanting to make a business case for certain operations, but they are not the key drivers for the FAA. The FAA must make its decisions based upon safety.

The FAA does not agree that a 15 percent extension for this limited special authorization warrants a re-assessment in a Systems Safety Assessment of all ETOPS significant systems. The original assessment conducted for original compliance with the B–777 ETOPS special conditions and for basic type certification is adequate. However, it is appropriate to update original numerical probability analyses, as the ATA proposed in Item 7–1, to ensure that the safety objectives are still met with the longer diversion times. Also, this update will allow the FAA to review these numerical probability analyses with actual in-service component reliabilities considered in the analyses, which were not available at the time of the original submittals.

For the CAA comment on Item 7–9 in the ATA proposal, the FAA agrees that the item could be better stated, and will incorporate the recommended wording change. The FAA also agrees that this item effectively requires a non-time limited emergency power source This is the FAA's intent for this requirement. The FAA does not agree that the recommended list of services should be included. This list is the same list of services that are included in the Joint Aviation Authorities (JAA) Information Leaflet IL–20 paragraph 8.b.(7), which is a non-harmonized equipment with the corresponding paragraph of the FAA ETOPS Advisory Circular (AC) 120–42A. This issue can be addressed, as appropriate, by the ARAC working group, along with other items that will bring harmonization to the FAA and the JAA regulations. The FAA does not believe that the lack of harmonization with the JAA regulations is a reason to not proceed with this action.

Comment

Airbus states "type certificate limits are regulatory", and asserts that the ETOPS maximum diversion time is a limit on the Type Certificate Data Sheet for the B–777.

FAA Response

The ETOPS approval statement in the Type Certificate Data Sheet is a finding of suitability based on a review of the type design and reliability of the airframe/engine combination. The statement is the reflection of what was approved as a part of the type certification process and does not prohibit additional FAA approvals. The certification of the B–777 for initial ETOPS operation was on the basis of special conditions that constitute part of the certification basis of the airplane. There was no intention that the special conditions, being issued for 180-minute operational considerations, would limit the B–777 to that operation for the life of the airplane. It is further important to recognize that the type design approval finding does not constitute approval to conduct ETOPS operations. Limits on ETOPS operational diversion time are contained within an individual operator's operations specification. As an example, an operator may be limited to 120 minute ETOPS in its operations specification even though the airplane it is operating has been approved for 180 minute ETOPS and those operations are being successfully conducted by other operators. In addition, current ETOPS operating requirements contained in AC 120–42A already recognize that deviations from the approved diversion time may occur based on unforeseen conditions during a given diversion. The Configuration, Maintenance, and Procedures (CMP) standard is a FAA approved document and is a required type design incorporation that establishes the suitability of an airplane for extended range operations, and is considered a limitation.

Comment

Airbus states in its comments titled "Increased risk of additional hardware failure" that risk assumptions and models used in ETOPS risk management need public review.

FAA Response

Technical matters, like risk assumptions and analyses, considered by the FAA during the type certification process are normally not public information because they contain information of a proprietary nature. The FAA agrees, though, that there is some merit to better defining the type of risk analyses that should be conducted for extended range operations in order to ensure a uniform application world-wide. For that reason it will task the ARAC to evaluate the current risk assumptions and models and make recommendations to the FAA. In the mean time, the FAA is confident that the risk assumptions and analyses conducted in past ETOPS approvals are sufficient to proceed with an extension to 207 minutes for the B–777.

Another reason the FAA is confident in proceeding with the 207-minute approval is the basic manner in which the B–777 was type certificated. It is the only airplane that was designed from the start for ETOPS operation on its first day of service. This required Boeing to address all possible failure modes of past airplanes and engines and demonstrate that the B–777 was designed to preclude those failures. This extensive safety analysis has produced an airplane that exceeds the dispatch reliability of any previous airplane, which is as measure of the reliability of the airplane design and air carrier maintenance programs. The FAA believes the operational history of the airplane has proven the validity of this approach and the uniqueness of the B–777 for consideration of 207-minute ETOPS operations. Should other airplanes be presented for approval to operate to 207 minutes, the FAA would assess their design and operational experience in the same way as it has for the B–777.

Comment

AECMA states that the proposed IFSD of .019/1000 is not sufficient to comply with FAR 25.1309.

FAA Response

For this special limited authorization to operate at 207 minute ETOPS, the FAA does not agree that it is necessary to specify a different in-flight shutdown rate requirement than the .02/1000 engine hours, defined in AC 120–42A. Since the ATA proposal for .019/1000 is a conservative value relative to the .02/1000 requirement, the FAA is accepting this coordinated industry position as one of the factors that establishes the Agency finding of equivalent safety. This reliability evaluation tool in the ETOPS criteria was not intended to compensate for "non-compliance" with FAR 25.1309. The ETOPS IFSD rate requirement is not related to FAR 25.1309 compliance as implied in the AECMA comment, but is derived from the baseline engine IFSD rate used in the development of the 180-minute ETOPS approval criteria as a measure of an acceptable ETOPS engine reliability. However, the FAA agrees that the reliability of state of the art engines is much better than the current .02/1000 standard, and supports a review of the ETOPS inflight shutdown rate requirement as part the overall ARAC rulemaking activity. The B–777 has clearly established an in-flight shut down rate far better than the .02/1000 standard and is one of the reasons the FAA is confident in proceeding with the 207-minute ETOPS approval.

Comment

Airbus encouraged the FAA to reconsider the "still air" provisions. Airbus proposes that oil, fire suppression, and other time limited systems should be capable for the entire length of maximum anticipated diversion time based on actual winds, not "still air."

FAA Response

The FAA does not intend to change basic premises used with ETOPS in calculating distances using "still air". The operational regulatory reference in the FAR addresses the distance in "still air" and the FAA sees no reason to change this basic assumption merely because of the 15 percent extension in allowable diversion time. The global application of ETOPS is also based on "still air" criteria. The FAA will consider any recommendations by the ARAC ETOPS Working Group if they determine that time limited components should be based on forecast and actual winds as Airbus proposes. What must be applied to every EROPS departure, is the fuel load that meets or exceeds the critical fuel scenario analysis, which is based on forecast and actual winds.

7. ETOPS Rules Should Be Harmonized With In terna tional Rules

Some commenters suggested that the ETOPS rules should be harmonized with international rules and should not discriminate against non-U.S. manufacturers and operators.

FAA Response

The FAA has been and remains committed to harmonization of regulatory requirements to the extent possible with international rules. That will always be a goal of the FAA but that goal must be balanced with other issues the FAA must respond to. In this case, there has been a proposal to extend the ETOPS approved operations for the B–777 up to 207 minutes. It is not appropriate for the FAA to delay action on the proposal in order to harmonize its position with other regulations, when appropriate regulatory action has been determined. Again, the FAA places a high priority on harmonization of standards world-wide, but not at the cost of reasonable action in response to any request by those it directly regulates.

A lot of effort has gone into the harmonization of ETOPS requirements and standards, and although there are specific areas of difference, its general application is uniformly applied worldwide. The 207-minute ETOPS is being accepted because it adds a safety benefit to the ETOPS conducted in the North Pacific, and U.S. airlines presently operating ETOPS in that area can benefit from this. The FAA will further pursue harmonization through intended tasking of an ARCA ETOPS Working Group that will provide recommendations for codifying ETOPS standards and requirements. The FAA welcomes participation by foreign regulatory authorities, manufacturers, and operators in this development to harmonize requirements, and to develop international standards. Interested persons should review the intended ARAC tasking published elsewhere in this edition of the **Federal Register.**

8. 207-Minute Proposal Specifies Equipment Requirement

The ATA 207-minute proposal contained specific system configurations. It specifies that at least one fuel crossfeed valve and one fuel boost pump in each main tank must be able to be powered by a backup electrical power source. It specifies time related cargo fire limitations, and all other time limited systems to be not less than 222 minutes. For the electrical system, any one of the engine of APU driven generator sources must be capable of powering the main AC and main DC electrical buses. To enhance pilot communications, the airplane must have SATCOM voice and/or SATCOM datalink installed, and for pilot work load consideration, the airplane must have single-engine autoland capability. The ATA proposal also specified MEL restrictions that would apply to the 207-minute dispatch. It proposes the operability of autoland capability, SATCOM voice and/or SATCOM datalink, autothrottle system, the fuel quantity indicating system (FQIS), and the APU (that includes the electrical and pneumatic supply to its designed capability) at time of dispatch.

Continental Airlines states that the equipment and dispatch specifications detailed in the proposal are more conservative than those required by 180-minute diversion authority, and that the specifications detailed in the proposal define a level of sophistication in the aircraft design that goes far beyond the aircraft that were originally approved for 180-minute diversion authority. In their opinion extending the diversion authority beyond 180-minutes with the added conservatism and narrow scope presents benefits to the traveling public with no degradation in safety. Another commentator, although in favor of 207-minute ETOPS, argues against the additional equipment requirements in the ATA proposal because it would eliminate most of the world ETOPS fleet

from 207-minutes ETOPS consideration. DGAC France and the United Kingdom CAA both expressed the view that if SATCOM was a requirement for communication capability, then it must be capable of being powered through a back-up source.

FAA Response

The FAA has considered the additional systems capability, equipment, and serviceability requirements in the ATA proposal. The FAA does not consider these airplane requirements as the final determination of generally applicable 'standards' for ETOPS beyond 180-minutes, but does consider the added ATA criteria are in line with the basic conservation embodied in present ETOPS operations. The added requirements were developed through a coordinated effort between airlines, manufacturers and pilot associations and the result represents an agreement among those parties. The FAA therefore accepts all the proposed added requirements as an integral part of a "special 207-minute authorization" except the monthly reporting requirements. As such, the FAA has information that the B–777 would qualify for 207-minute ETOPS. The FAA wants to make it clear that by its acceptance of the ATA proposal that an equivalent level of safety is found. The FAA has not made a determination that the proposal by the ATA is the only proposal that would allow all 207 minute ETOPS operations, or is the minimum level of safety for all operations. The FAA intends to task the proposed ARAC ETOPS Working Group to make recommendations on standards and requirements for ETOPS beyond 180-minutes. This may lead to standards of system configuration and requirements that would enable other existing airframe/engine combinations to be used. The FAA will be looking for ARAC to set forth recommendations that define minimum standards and develop the proper technical justification for those being the minimum standards. Once those minimum standards are proposed by ARAC, the FAA will review all ETOPS approvals to decide if the ARAC proposed standards should be applied to all ETOPS operations. In making that decision it will rely to a great extent on the service history of the fleet operating under today's standards, which so far has been excellent.

The FAA considers the proposal for SATCOM and/or SATCOM datalink to be an additional communication requirement beyond that which is presently required. It is therefore not to be considered as a replacement communication system. The value of SATCOM is recognized and its importance as an aid to rapid and efficient communication for the flight crew is supported by the requirement for the SATCOM to be operative for a 207-minute dispatch. The development of standards and requirements for ETOPS beyond 180-minutes that will be addressed by the ARAC Work Group may define other communication requirements and standards of operability for future approvals.

9. An Industry/Government ETOPS Working Group Should Be Formed to Review 207-Minute Operations

ALPA suggests that an Industry/Government ETOPS group be formed for the purpose of ensuring that airlines comply with the intent of the ATA 207-minute ETOPS proposal. They suggest that the group should meet on a regular basis to review operational information regarding all ETOPS operations, particularly those operations where 207-minute authority was exercised. Airbus expresses concern with the current state of FAA monitoring of ETOPS operations, citing that the FAA relies on the industry to be alerted to trends that threaten the safety of ETOPS operations. Airbus suggests that the review of 207-minute data contained in the ATA 207-minute proposal should be more specific in delineating precisely what will be reviewed and the control limits for each review item.

FAA Response

The FAA intends to monitor the frequency of use of a 207-minute dispatch and the terms of its application by airlines that have been granted the authority to exercise the 15 percent extension. Airlines will be required to record and document necessary information that substantiates the use of the 207-minute dispatch for each flight that it is applied. The airline will retain copies of these records for at least three months, and make them available to the FAA upon request (OMB control No. 2120–0008). The data will be reviewed and collected by the airline's FAA Certificate Holding District Office (CHDO). The CHDO will provide usage reports for their assigned airlines on a monthly basis to the FAA Flight Standards Air Transportation Division, AFS–200, so that a comparative review and analysis can be conducted. Results of the review can then be made available to the public, with all proprietary data removed or de-identified. Operators should note that the regular monthly reports specified in the ATA proposal are ***not*** being required by the FAA at this time.

The FAA disagrees with the Airbus comment that there is insufficient ongoing surveillance by the Flight Standards organization on monitoring compliance with ETOPS operations and maintenance requirements. The FAA constantly monitors the application of ETOPS requirements, and the airlines performance to maintain acceptable standards. Other FAA organizations are tasked specifically to track and respond to trends that may indicate areas of concern of a specific ETOPS operator, or global trends that may affect the entire industry. The FAA does rely on the collation and reporting of ETOPS related data by industry sources. The FAA maintains oversight of the data, and conducts continuous analysis to detect any adverse trends.

10. Extended Range Operations for "All Cargo" Airplanes Are Not Safe and Should Not Be Allowed

The Independent Pilots Association (IPA) opposes the ATA 207-minute proposal because cargo aircraft are not equipped with fire suppression systems. IPA states that "extended range operations for all-cargo aircraft are not safe and should not be allowed by FAA".

FAA Response

Class E cargo compartments apply only to airplanes used solely for the carriage of cargo and are not restricted or pertinent to the number of engines installed on the airplane. Class E requirements are contained in 14 CFR Part 25, and those requirements do not specify a fire suppression system. The issue is therefore not related to ETOPS, or to an extension to 207-minutes that may apply to the B–777 airplane. Three and 4 engine all-cargo airplanes with Class E cargo compartments are not limited to routes based on time or distance limits from alternate airports. Two-engine airplanes are restricted to a maximum diversion time, including all-cargo airplanes that are operating with an ETOPS approval. AC 120–42A, paragraph 8(c)(6) requires that the design of the cargo compartment fire protection system integrity and reliability should be suitable for the intended operation considering fire detection sensors, liner material, etc. It also addresses fire protection system capability, if necessary by the certification standards. As already stated, the Class E requirements do not require a fire suppression system. For additional information regarding the distinction between cargo compartments in all-cargo airplanes and those in passenger-carrying airplanes, see the publication of the FAA's final rule on

Revised Standards for Cargo or Baggage Compartments in Transport Category Airplanes (63 FR 8040–41; February 17, 1998).

An appropriate forum for further discussion of Class E cargo compartments would be with the proposed ARAC Working Group that will be tasked to review the requirements for all extended range operations, regardless of the type of operation.

Announcement of FM Decision

The FAA has determined that it would be premature to extend the ETOPS threshold to 207 minutes without specifying limits on its application and use. The FAA agrees that measurable standards must be developed and harmonized, in order to adopt an extended diversion threshold across the board. One of the tasks the FAA intends to includes in the ARAC ETOPS initiative is for the ARAC to develop the standards for airplane ETOPS type design approval as well as operational requirements and procedures for ETOPS beyond 180 minutes. The FAA also agrees that these standards should be developed jointly for global application, and adopted as an ICAO standard and recommended practice.

As mentioned previously, the FAA has reviewed a study prepared by United Airlines Dispatch Center that looked at meteorological forecast and actual weather data at airports that meet "adequate" criteria for enroute alternates in the North Pacific. The study shows that a 207-minute ETOPS dispatch would mostly benefit Eastbound operations from Japan to the United States because those departures generally occur at night. The conclusions drawn from the study are: The use of a 207-minute dispatch would be infrequent; the flight could be dispatched on preferred ATC routes; and, the resulting route would place the airplane closer to more enroute alternates that after flight departure would meet "suitable" criteria. The FAA recognizes the merits and potential safety benefit of such conditions.

The FAA also recognizes that ETOPS operations in the North Pacific (NOPAC) present certain operational difficulties that are minimized with airplanes that incorporate the latest technology and systems design to specifically meet ETOPS needs. An airplane such as the B–777 fits this category.

The B–777 was designed from the beginning as a 180-minute ETOPS capable airplane. Instead of meeting the minimum service experience requirements defined by FAA Advisory Circular 120–42A, the B–777 ETOPS type design suitability was based on Early ETOPS special condition requirements for proof of reliability. This was the main reason for Boeing to develop an improved design. The B–777 design has systems redundancy to meet reliability goals with consideration of Minimum Equipment List (MEL) restrictions for 180-minute ETOPS. For example, the electrical system has a main and back-up generator on each engine, an APU generator, a Ram Air Turbine (RAT) generator, a main battery, and an APU battery. The fuel system design provides for a fuel boost pump in each main tank to be powered by a back-up electrical source, making the need for fuel suction feed an unlikely event. Boeing conducted a B–777 systems reliability analysis and Numerical Probability Analysis to assess the suitability of the B–777 airplane to a higher diversion limit The analysis indicates the B–777 airplane design and reliability capability is well in excess of the proposed extension to 207-minutes. Today there are over 200 B–777's in service around the world. The fleet has accumulated more than two million engine hours with a combined rolling average in-flight shutdown rate of .007/1000 engine hours. That is almost one third of the maximum allowed shutdown rate for 180 minutes ETOPS operation.

The ATA 207-minute proposal contained nine items to be applied to the review of the proposed airframe-engine combination to determine if there were any factors that would affect safe conduct of 207-minute operations. The B–777 has been proposed as satisfactorily meeting the condition of all the listed items in the Approval Basis section. The FAA considers these additional type design and systems' operational requirements to provide conservatism in reliability performance and diversion capability for 207 minute ETOPS operation. In addition to MEL restrictions for 180-minute operations, the ATA proposal also included four additional system and equipment requirements that must be operational prior to dispatch for 207-minute ETOPS. The items are: Fuel Quantity Indicating System (FQIS), Auxiliary Power Unit (APU) that included the electrical and pneumatic supply to its design capability, the Autothrottle system, and SATCOM voice and/or SATCOM datalink.

The FAA has accepted the ATA proposal as providing an equivalent level of safety for ETOPS operations up to 207 minutes in the North Pacific. The FAA may approve a special ETOPS operational authorization that will allow limited application of a diversion limit of 207-minutes flying time at the approved one-engine inoperative cruise speed (under standard conditions in still air). This will be a narrow focused authorization based on specific eligibility and qualification criteria, fixed geographical area of operation, specific equipment, limited application, and recording requirements and the additional criteria contained in the ATA proposal. Presently, the FAA has enough information on the B–777 series with all engine configurations as listed on the Type Certification Data Sheet T00001SE, to tentatively find that it is the only model that currently meets the additional criteria contained in the ATA proposal and that the FAA has adopted. A final finding may be issued after the Boeing Company submits substantiation data for each of the type design criteria items listed in paragraph 7 of the proposal's "Approval Basis" section and the updated Numerical Probability Analysis (NPA) to the FAA Transport Airplane Directorate for evaluation. If the FAA's evaluation is favorable the "finding of suitability" to the additional criteria for 207-minute ETOPS can be made. The FAA will task the Flight Operations Evaluation Board (FOEB) to begin the process to amend the B–777 MMEL to require operational status for dispatch of the airplane for operations beyond 180-minutes to the four items mentioned above (FQIS, APU, Autothrottle system, and SATCOM). Air carriers approved to use the special 207-minute authorization must amend their MEL and receive FAA approval of the amendment, prior to exercising the special authorization.

Application for the special authorization will only be considered from air carriers that currently hold 180-minute ETOPS operational approval. The authorization will only apply and be valid for use in the North Pacific area of operation. The special authorization can only be applied to a route where adequate enroute alternate airports exist and are available that, if defined as 'suitable' for dispatch as per paragraph 10(d)(5) of AC 120–42A, the route would be flown at 180-minute ETOPS authority. When applying the 207-minute dispatch, consideration must also be given to those "adequate" airports within 180-minutes of the proposed airplane routing to have a weather forecast that gives probability of having operational approach minima (minima necessary to execute an instrument approach) during the expected times of arrival. The window of arrival to be considered for these "adequate" airports is that period from

the earliest planned arrival time to the latest planned arrival time, for the anticipated airplane routing. This increases the possibility on a 207-minute ETOPS dispatch that the flight crew when faced with the need to initiate an in-flight diversion, could be closer to a suitable alternate airport in Russia, the Aleutians, or elsewhere in Alaska than compared to an off-track route (more Southerly route) that was based on a 180-minute ETOPS dispatch. All other ETOPS planning requirements specified in AC 120–42A continue to apply to the 207-minute ETOPS dispatch.

The air carrier will record the dispatch considerations when applying this special authorization for each use, and retain such records for review by the FAA for at least three months.

In the April 27, 1999 **Federal Register** notice, the FAA stated that it did not endorse the ATA proposal, per se. The April 27 notice outlined, in great detail, the issues involved in determining whether an appropriate level of safety could be established for 207-minute dispatch ETOPS. Public comments were also in great detail, and reflected that the commenters appreciated all of the issues. After careful review of the proposal and comments received, the FAA has decided to proceed with a policy to allow the limited 207-minute dispatch authorization described in this notice.

Summary

The FAA supports a collaborative effort to produce policy and rules that incorporate the best information available from operators, manufacturers, and others who may be affected. The FAA also supports the rulemaking process that assures that the issues are thoroughly examined in a public forum. The FAA does not believe, though, that approval of a limited 207-minute North Pacific ETOPS operation must await further ETOPS rulemaking.

The FAA recognizes the potential safety benefit that is provided with an extension to 180-minute ETOPS as it applies to operations in the North Pacific. The equipment and dispatch requirements that are specified in this limited 207-minute diversion authority are more conservative than those required for 180-minutes. The B–777 systems design and demonstrated service reliability indicate that the airplane can meet these requirements, and the FAA will evaluate Boeing's data and the updated Numerical Probability Analysis to make its finding of suitability for XV-minute ETOPS. In order for airlines to exercise the 207-minute ETOPS authority, additional Minimum Equipment List (MEL) requirements will apply, as well as dispatch planning to consider the availability of other enroute airports along the proposed route that do not meet alternate weather criteria at time of dispatch. This is intended to limit the frequency of a 207-minute use, and to provide an equivalent level of safety for those flights that are dispatched with a 207-minute diversion limit. The FAA will closely monitor the application of these requirements by airlines that have received approval to use the limited 207-minute ETOPS.

Intent To Task ARAC

The FAA intends to initiate ETOPS rulemaking through the ARAC process by separate notice in the near future. The ARAC ETOPS Working Group would be tasked to provide their recommendation to the FAA for:

- Codification of existing ETOPS standards and requirements in the appropriate certification and operational regulations
- Development of objective standards and requirements for ETOPS beyond 180-minutes, for codification in appropriate certification and operational regulations, and
- Review the requirements for ETOPS and all other extended range operations for all airplanes regardless of the number of engines, and provide recommendations to standardize the requirements for such operations.

The FAA will draw from the working group recommendations to subsequently issue ETOPS and for long range operations regulations through the rulemaking process. It is desirable to have international regulatory, manufacturer, and operator participation in the ARAC ETOPS Working Group to provide harmonized positions that may be a basis for international ETOPS standards.

Issued in Washington, DC on January 18, 2000.

Thomas E. McSweeny,

Associate Administrator for Regulations and Certification.

[FR Doc. 00–1505 Filed 1–18–00 3:17 pm)

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[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. FAA-99-6717]

207-Minute Extended Range Operations With Two-Engine Aircraft (ETOPS)

AGENCY: Federal Aviation Administration (FAA), DOT

ACTION: Disposition of comments; policy statement for 207-minute ETOPS; request for comments.

SUMMARY: This notice responds to comments received in response to a request for public comments that was published on April 27, 1999 in the Federal Register (64 FR 22667) pertaining to a proposed policy for 207-minute ETOPS operation approval criteria for the Boeing 777 airplane, informs the public of the FAA decision to establish the conditions for a limited authorization for up to 207-minute ETOPS operation, and informs the public of FAA intent to task the Aviation Rulemaking Advisory Committee (ARAC) in the near future to recommend safety standards and procedures for extended range operation of airplanes, regardless of the number of engines.

DATES: This policy is effective on [insert date 60 days after publication in the Federal Register]. Comments must be received on or before [insert date 45 days after publication in the Federal Register.

Display time → 3:17 p.m. Jan. 18, 2000
Published on Jan. 21, 2000
Comment Close Date → March 6, 2000
Effective Date → March 21, 2000

ADDRESSES: Comments on this document should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA-99-6717, 400 Seventh Street, SW., Room Plaza 401, Washington, DC 20590. Comments may be filed and examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays, except Federal holidays. Comments also may be sent electronically and examined via the Dockets Management System (DMS) at the following Internet address: http://dms.dot.gov/ at anytime. Commenters who wish to file comments electronically, should follow the instructions on the DMS web site.

FOR FURTHER INFORMATION CONTACT: Eric A. van Opstal, Air Transportation Division (AFS-200), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591, telephone (202) 267-8166.

SUPPLEMENTARY INFORMATION

Background

In a letter dated February 26, 1999, the Air Transport Association (ATA) requested the FAA to issue a policy letter establishing 207-minute ETOPS authority (See the ATA proposal that was published in the April 27, 1999 Federal Register). That letter stated that ATA member airlines determined that a need exists for expanded ETOPS authority beyond 180 minutes. The ETOPS Subcommittee of ATA established a process where associated airlines, the Pilots associations, Boeing, and other parties worked together to determine the criteria to support the establishment of a proposed 15 percent operational extension of 180 minutes ETOPS. That subcommittee prepared an ETOPS Policy Letter draft proposal dated February 4, 1999.

The FAA responded to the ATA letter by publishing in the Federal Register a copy of the ATA letter and draft proposal, and requested public comment (64 FR 22667). This Notice responds to the comments received, provides notice of the FAA decision to allow an extension of

ETOPS to 207 minutes, describes the criteria for a limited authorization for 207-minute ETOPS for the Boeing 777, and provides notice of the FAA's intent to task the ARAC to recommend safety standards and procedures for extended range operation of airplanes, regardless of the number of engines.

Additional Comment Period for Policy Decision

Very extensive comments were received on all the issues embodied in the ATA proposal. After careful review of the ATA proposal and those comments, the FAA is adopting, with some modification, the ATA proposal. Given the minor differences from the original ATA proposal, the FAA believes it is reasonable to proceed forward with a final decision.

However, because two commenters have expressed concerns about the FAA making a final decision on the ATA proposal without allowing additional public comment on the FAA -- final action and disposition of comments, the FAA is allowing an additional 45 days for interested persons to comment further on the 207-minute dispatch authorization described in this policy. This authorization is automatically effective on [insert date 60 days after publication in the Federal Register] unless, after review of any new comments received, the FM believes modification or additional action is required. The FAA will publish in the Federal Register a full disposition of all new comments received and, if required, any additional steps to stay or modify the limited 207-minute authorization.

Interested persons are invited to comment on this policy statement by submitting such written data, views, or arguments as they may desire. Comments that provide factual basis supporting the views and suggestions presented are particularly helpful. Comments must identify the regulatory docket or notice number and be submitted in duplicate to the address specified above.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-l, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9680. Communications must identify the notice number or docket number of this notice.

Discussion of Comments From Previous Notice

The FAA received 44 comments in response to the notice published on April 27, 1999 (64 FR 22667), including comments from individual members of the Joint Aviation Authorities (JAA) ETOPS Work Group. All commenters but 12 supported the ATA proposal for 207-minute ETOPS. The issues and concerns raised by the 12 commenters who opposed the proposed extension of ETOPS are discussed below.

1. No Justification for change. . .

The Allied Pilots Association (APA) and Airbus Industries (Airbus) expressed concern that the proposal is an attempt to generally extend ETOPS when no justification for changing the diversion limits has been shown. APA stated that only the South America-New Zealand market cannot be operated with the current three hour standards. They also pointed out that Boeing and operators have stated that there are only a few days a year when alternate routings would have to be considered for twin engine aircraft operating on the North pacific routes due to unsuitable weather at the preferred alternates. Airbus commented that there is no precedent for a 15 percent extension, APA suggested that the intent of the proposal appears to be to provide support for marketing the B-777 as a replacement for older, three and four engine aircraft. APA argued that economic desirability does not constitute need.

FAA Response:

Most commenters (32 of 44) supported a 15 percent extension of the diversion limits for ETOPS. United Airlines stated that 207-minute ETOPS is a logical extension from 180-minute ETOPS that will serve the interests of the traveling public, the environment and the industry. The Air Line Pilots Association, International stated that current requirements have an excellent safety record and the approval process has lead to safety enhancements for twin engine aircraft. The Rolls-Royce Airworthiness Department suggested that the proposed policy statement and reissue of Advisory Circular AC 120-42A should be considered a first step towards a general tidying up of the ETOPS regulations. Continental Airlines supports the proposal because it would benefit the traveling public by reducing enroute times across the North Pacific with no degradation in safety. It would also positively impact the economics of the route, which will ultimately benefit the traveling public. The equipment and dispatch specifications detailed in the proposal are more conservative than those required by 180-minute diversion authority. Boeing suggested that the current proposal reflects the "safe, conservative, evolutionary nature of ETOPS, which is a fact-based industry program dependent on the gathering and analysis of operational data."

ETOPS conducted in the North Pacific (NOPAC) meets all of the conditions in AC120-42A that define a "demanding area of operation". Today, 180-minute ETOPS in NOPAC is routinely conducted by several North American and Asian air carriers on a daily basis. There are sufficient adequate alternate airports available in the area of operation that allow for year round operations. The introduction of a 207-minute authorization would provide an air carrier with additional flexibility with the dispatch of an ETOPS flight, which may in fact position the flight closer to more enroute alternate airports. This would be both an operational and safety benefit.

ETOPS operations in a 'demanding area of operation' began with a limited 75-minute authority for North Atlantic crossings. As service experience was gained and the safety of the operations validated, the FAA granted an increase to 120-minute diversion limit. This allowed ETOPS flights access to some of the established North Atlantic navigational tracks. The original ETOPS Advisory Circular, AC 120-42 dated 1985, included a provision that the FAA would allow an operator on a 'case-by-case' basis up to a 15 percent increase to the 120-minute maximum diversion time. The extension granted a 138-minute diversion limit which ideally suited North Atlantic ETOPS, as it now allows use of all available NAT navigational tracks. The extension provision was removed when the Advisory Circular was revised as AC 120-42A in 1988. AC 120-42A introduced the means by which the FAA would approve 180-minute ETOPS, and the conventional wisdom at that time considered the allowable extension to 138- -- minutes as no longer necessary. However as Airbus and other commenters have noted, the FAA reinstated the 138-minute diversion limit by policy letter EPL 95-1 in 1994, designating its use only for North Atlantic ETOPS operations.

In response to the comment by APA that ETOPS requirements would be eased so that Boeing could more effectively market the B-777 in place of older 3- and 4-engine airplanes, the FAA rejects the notion that the safety decisions to be made for 207-minute ETOPS operations are related to the marketing of airplanes. The FAA considers operations meeting the ETOPS standards of reliability and the operational requirements to have proven themselves well over the years. The increased safety standards for ETOPS airplanes and associated maintenance practices have found their way into other airplanes routinely used in non-ETOPS commercial air transport. Thus, ETOPS principles have "raised the safety bar" for all types of operations.

The ATA 207-minute proposal specifies particular airplane systems design as well as additional equipment requirements. The ATA ad-hoc work group that drafted the 207-minute proposal considered the proposed area of operation and operating environment with the additional diversion time, and considered the additional requirements to be necessary to maintain existing safety standards, which is based on a conservative approach. It was a collective recommendation that was made with a diverse group comprised of representatives from operators, manufacturers, and pilot associations. This was agreed upon with full knowledge that the added requirements would not be met by some other airplanes that already hold ETOPS type design approval, and have provided the remarkable safe ETOPS operating experience to date.

The FAA agrees with APA that a review should be conducted on the requirements for ail long range operations, including 3- and 4-engine airplanes, and that there should be a more uniform application of those requirements. The FAA therefore proposes the formation of an ARAC group appropriately tasked to provide the FAA with recommendations concerning all long range operations. See the statement of intent at the end of this notice.

2. Some diversion airports may become redundant and risk closure.

APA and Airbus expressed concern that the proposed extension of ETOPS authority may cause some diversion airports that are currently relied on to become redundant. They may then risk closure.

FAA Response:

The FAA agrees that North Pacific alternate airports play an important role in the safety of all commercial aviation in the region. Any airplane may have to divert due to reasons such as passenger illness, system failures, decompression, or fuel leaks. In fact, 3- and 4-engine airplanes have a higher rate of diversion, for all causes, than ETOPS airplanes. Boeing has

provided data that shows that less than 10 percent of diversions with their two-engine ETOPS airplanes were due to an inflight engine shutdown (IFSD). The remaining diversion of twin engine ETOPS airplanes were due to other causes that may affect any airplane. The issue of sufficient alternate airports is much broader than just related to the conduct of ETOPS.

The FAA does not believe that a 207-minute diversion authority in the North Pacific would result in the closure of airports designated as enroute alternates for 180-minute ETOPS operations. Some of the same airports that are available for 207-minute ETOPS are also used with 180-minute ETOPS. The ATA proposal also limited the use of the 207-minute ETOPS extension so much of the time the airlines would be using the normal diversion airports for 180-minute ETOPS operations. A United Airlines Dispatch Office study showed that 10 percent of the flights would benefit from a 207-minute dispatch, while the remaining 90 percent would still be dispatched at 180-minutes.

The FAA also agrees with APA that solutions are needed to ensure the continued availability of airports for use as enroute alternates for the benefit of the entire industry. It is an international problem that needs attention and long term solutions. The issue is related to far more issues than just the ETOPS diversion time and requires broader solutions involving other countries.

3. The Proposal is Too Broad.

APA and Airbus pointed out that the proposal is too broad in that it does not establish requirements such as limited routes and specific conditions that would justify 207-minutes ETOPS as the safest available alternative.

FAA Response:

The FAA agrees that the ATA proposal might be too broad in that it could be viewed as having a wider application than intended. For the proposal at hand, the 207-minute ETOPS operations are intended to apply only to the North Pacific area of operation, and then, only when conditions prevent a 180-minute dispatch. A general 207-minute policy would give the illusion that a higher ETOPS threshold has been accepted that could be applied to all geographical areas of operation and all airplanes that have ETOPS type design approval. The FAA believes that much further discussion would be needed to develop general standards for ETOPS beyond 180-minutes, and that it is important to have international participation so that global standards are achieved. To this end, the FAA intends to solicit recommendations through the ARAC for the development of general ETOPS standards for operations beyond the 180-minute limit. This is discussed in more detail at the last section of this notice.

The FAA recognizes the benefit of a route of flight that positions an airplane closer to airports that meet the criteria of "adequate" for the purpose of ETOPS enroute alternates. This is understood to be the basis for the ATA proposal. The FAA recognizes that an ARAC approach that deals with all airplanes and all routes will be years away from regulatory adoption, and thus should be viewed as a long-term solution. In the interim, the FAA believes that with the conditions and limitations specified in this document, 207-minute ETOPS authorizations can be issued for use in the North Pacific area of operation for airlines that have previous 180-minute ETOPS experience, and be limited to airplanes like the B-777. Such authorizations can be issued without any decrease in safety. In addition, other limitations will specify the conditions and frequency that will apply to the use of the 207-minute dispatch. The reason for limiting the approval to airplanes like the B-777 will be discussed further.

4. The proposal reduces weather standards for diversion airports.

APA stated that the real, though indirect, result of the proposed 207-minute ETOPS is to reduce weather standards for diversion airports. Airbus comments that the longer the flight the more unlikely the weather at a designated alternate corresponds to that forecast at the beginning of the flight. Airbus also suggests that climatological data for the area should be analyzed to determine the frequency with which flexibility will be increased.

FAA Response:

There is no relaxation of weather criteria or any difference in required weather standards to determine the "suitability" of adequate enroute alternates for a 207-minute dispatch compared to any other ETOPS diversion limit. Airlines are required to apply the standard or otherwise approved alternate airport weather minima criteria that are contained in their operations specifications.

The FAA has reviewed a study prepared by United Airlines Dispatch Center that collected and analyzed meteorological forecast and actual weather data at airports that meet "adequate" criteria as enroute alternates in the North Pacific. The purpose of the study was to determine if and when a 207-minute dispatch would be beneficial when the forecast at "adequate" alternate airports within 180-minutes distance were below the dispatch alternate minima requirements. The study looked at more than a years worth of data and shows that a 207-minute ETOPS dispatch would mostly benefit Eastbound operations from Japan to the United States because those departures generally occur at night. The weather forecasts during night hours tend to be worse than during daylight. The study also showed that those "adequate" alternate airports within the 180-minute distance that did not meet the pre-departure alternate weather criteria, did in fact stay at or above the operational approach minima for the expected

times of arrival of the flight (if the flight had to divert to the alternate airport). Operational approach minima is the weather minima needed to execute an approach and landing. After flight departure and while enroute, those "adequate" airports that meet operational approach minima are re-classified as "suitable" enroute alternates. The study also showed that the frequency of a 207-minute dispatch in lieu of a 180-minute dispatch would be in the area of 10 percent to 15 percent of the total departures. Finally, the 207-minute dispatch allowed a routing consistent with ATC preferred routes. The conclusions drawn from the study are: The use of a 207-minute dispatch would be infrequent; the flight could be dispatched on preferred ATC routes; and, the resulting route would place the airplane closer to more enroute alternates that after flight departure would meet "suitable" criteria. This offers the possibility that the flight crew, when faced with the need to initiate an in-flight diversion, could be closer to a suitable alternate airport than compared to an off-track route that was based on a 180-minute dispatch. This would clearly provide for enhanced safety.

The FAA acknowledges the difficulty in establishing accurate forecasts for alternate airports that may be 12 or more hours away. This difficulty is faced by all crews regardless of the airplanes they are flying on extended range flights. It is also obvious that the further out the forecast period is, the more likely that lower TEMPO (temporary) and PROB (probability) conditions will be included in the forecast that the dispatcher and flight crew must take into account. This is where the ATA's proposed requirement for SATCOM and SATCOM datalink capability gives greater assurance that once airborne and enroute, the flight crew will receive continuing updates on the forecast weather for all of the available enroute alternates, and will allow closer monitoring of weather trends. The enhanced communication capability that SATCOM provides aids in the transmission of relevant data to the flight crew.

5. ETOPS should be formalized in regulations rather than administered through Advisory Circulars and Policy Letters.

Airbus and APA said that ETOPS should be formalized through the rulemaking process rather than by policy and Advisory Circulars. Additional comments suggested that it was time for the FAA to bring the FARs up to date. These commenters as well as AECMA, ALPA, Federal Express Pilots, and DGAC France all stated that major policies such as those that govern ETOPS should be in regulatory form. ALPA commented that "there is a need to develop a new set of regulations which would apply to all long-range operations regardless of the number of engines".

FAA Response:

Extended range, twin-engine operations are authorized by the FAA under 14 CFR §121.161 (a), "based on the character of the terrain, the kind of operation, or the performance of the airplane to be used....." The FAA issued Advisory Circular 120-42, and has revised it several times, to incorporate the standards for ETOPS up to and including 180-minute dispatch authorizations. The FAA publishes in the Federal Register a notice of availability of each proposed revision, solicits comments, and then issues a revision to AC 120-42 only after consideration of all the public comments. Thus, the public has always participated fully in the development of ETOPS standards. Furthermore. the FAA has ensured that ETOPS operators comply with those standards by applying them through operations specifications. The result has been that ETOPS authorizations have been established as they would have been established through a more structured codification.

Because of the limited scope of the 207-minute dispatch described in this document, the FAA is not proposing a corresponding revision to AC 120-42.

The FAA agrees that ultimately more defined criteria for ETOPS should be placed in Part 121 through the rulemaking process. ETOPS over the years has been well served with the standards and requirements of AC 120-42A, but formal regulatory objectives should be developed for the extended range operation of any airplane. As more fully outlined later, the FAA will initiate tasking of an ARAC Working Group to start with the codification of the existing ETOPS requirements, and to make recommendations for standards for ETOPS beyond 180-minutes. The ARAC Working Group will also be tasked to look at the requirements for all long-range operations in order to recommend airplane safety requirements for all airplanes.

6. ETOPS regulations should be driven by safety.

For the type design approval criteria, the UK CAA suggests that "The ETOPS significant systems should be re-assessed to ensure their suitability for the extended diversion time (207 -- minutes). Systems Safety Analyses (SSA) should be carried out based on the extended diversion time and longest flight time. The re-analysis required (SSA) is to ensure that overall safety objectives are still achieved with the extended diversion time and flight times." They also suggest alternative wording for the type design approval criteria to state that "any one of the engine or APU driven generator sources shall be capable of powering all main essential and standby (emergency) AC and DC buses." This, in effect, would require a "non-time limited emergency power source capable of continuously supplying essential functions". They suggested that the list of services that need to be supplied should be re-assessed for 207 minute diversion times, and listed fifteen services that should be re-assessed as a minimum.

FAA Response:

The FAA agrees that all ETOPS approvals should be granted only on the basis of safety. Industry need and operational desirability are important issues to those wanting to make a

business case for certain operations, but they are not the key drivers for the FAA. The FAA must make its decisions based upon safety.

The FAA does not agree that a 15 percent extension for this limited special authorization warrants a re-assessment in a Systems Safety Assessment of all ETOPS significant systems. The original assessment conducted for original compliance with the B-777 ETOPS special conditions and for basic type certification is adequate. However, it is appropriate to update original numerical probability analyses, as the ATA proposed in Item 7-1, to ensure that the safety objectives are still met with the longer diversion times. Also, this update will allow the FAA to review these numerical probability analyses with actual in-service component reliabilities considered in the analyses, which were not available at the time of the original submittals.

For the CAA comment on Item 7-9 in the ATA proposal, the FAA agrees that the item--could be better stated, and will incorporate the recommended wording change. The FAA also agrees that this item effectively requires a non-time limited emergency power source. This is the FAA's intent for this requirement. The FAA does not agree that the recommended list of services should be included. This list is the same list of services that are included in the Joint Aviation Authorities (JAA) Information Leaflet IL-20 paragraph 8.b.(7), which is a non-harmonized requirement with the corresponding paragraph of the FAA ETOPS Advisory Circular (AC) 120-42A. This issue can be addressed, as appropriate, by the ARAC working group, along with other items that will bring harmonization to the FM and the JAA regulations. The FAA does not believe that the lack of harmonization with the JAA regulations is a reason to not proceed with this action.

Comment:

Airbus states "type certificate limits are regulatory", and asserts that the ETOPS maximum diversion time is a limit on the Type Certificate Data Sheet for the B-777.

FAA Response:

The ETOPS approval statement in the Type Certificate Data Sheet is a finding of suitability based on a review of the type design and reliability of the airframe/engine combination. The statement is the reflection of what was approved as a part of the type certification process and does not prohibit additional FAA approvals. The certification of the B-777 for initial ETOPS operation was on the basis of special conditions that constitute part of the certification basis of the airplane. There was no intention that the special conditions, being issued for 180-minute operational considerations, would limit the B-777 to that operation for the life of the airplane. It is further important to recognize that the type design approval finding does not constitute approval to conduct ETOPS operations. Limits on ETOPS operational diversion time are contained within an individual operator's operations specification. As an example, an operator may be limited to 120 minute ETOPS in its operations specification even though the airplane it is operating has been approved for 180 minute ETOPS and those operations are being successfully conducted by other operators. In addition, current ETOPS operating requirements contained in AC 120-42A already recognize that deviations from the approved diversion time may occur based on unforeseen conditions during a given diversion. The Configuration, Maintenance, and Procedures (CMP) standard is a FAA approved document and is a required type design incorporation that establishes the suitability of an airplane for extended range operations, and is considered a limitation.

Comment:

Airbus states in its comments titled "Increased risk of additional hardware failure" that risk assumptions and models used in ETOPS risk management need public review.

FAA Response:

Technical matters, like risk assumptions and analyses, considered by the FAA during the type certification process are normally not public information because they contain information of a proprietary nature. The FAA agrees, though, that there is some merit to better defining the type of risk analyses that should be conducted for extended range operations in order to ensure a uniform application world-wide. For that reason it will task the ARAC to evaluate the current risk assumptions and models and make recommendations to the FAA In the mean time, the FAA is confident that the risk assumptions and analyses conducted in past ETOPS approvals are -- sufficient to proceed with an extension to 207 minutes for the B-777.

Another reason the FAA is confident in proceeding with the 207-minute approval is the basic manner in which the B-777 was type certificate& It is the only airplane that was designed from the start for ETOPS operation on its first day of service. This required Boeing to address all possible failure modes of past airplanes and engines and demonstrate that the B-777 was designed to preclude those failures. This extensive safety analysis has produced an airplane that exceeds the dispatch reliability of any previous airplane, which is a measure of the reliability of the airplane design and air carrier maintenance programs. The FAA believes the operational history of the airplane has proven the validity of this approach and the uniqueness of the B-777 for consideration of 207-minute ETOPS operations. Should other airplanes be presented for approval to operate to 207 minutes, the FAA would assess their design and operational experience in the same way as it has for the B-777.

Comment:

AECMA states that the proposed IFSD of .019/1000 is not sufficient to comply with FAR 25.1309.

FAA Response:

For this special limited authorization to operate at 207 minute ETOPS, the FAA does not agree that it is necessary to specify a different in-flight shutdown rate requirement than the .02/1000 engine hours, defined in AC 120-42A. Since the ATA proposal for .019/1000 is a conservative value relative to the .02/1000 requirement, the FAA is accepting this coordinated industry position as one of the factors that establishes the Agency finding of equivalent safety. This reliability evaluation tool in the ETOPS criteria was not intended to compensate for "non-compliance" with FAR 25.1309. The ETOPS IFSD rate requirement is not related to FAR -- 25.1309 compliance as implied in the AECMA comment, but is derived from the baseline engine IFSD rate used in the development of the 180-minute ETOPS approval criteria as a measure of an acceptable ETOPS engine reliability. However, the FAA agrees that the reliability of state of the art engines is much better than the current .02/1000 standard, and supports a review of the ETOPS inflight shutdown rate requirement as part the overall ARAC rulemaking activity. The B-777 has clearly established an in-flight shut down rate far better than the .02/1000 standard and is one of the reasons the FAA is confident in proceeding with the 207-minute ETOPS approval.

Comment:

Airbus encouraged the FAA to reconsider the "still air" provisions. Airbus proposes that oil, fire suppression, and other time limited systems should be capable for the entire length of maximum anticipated diversion time based on actual winds, not "still air".

FAA Response:

The FAA does not intend to change basic premises used with ETOPS in calculating distances using "still air". The operational regulatory reference in the FAR addresses the distance in "still air" and the FAA sees no reason to change this basic assumption merely because of the 15 percent extension in allowable diversion time. The global application of ETOPS is also based on "still air" criteria. The FAA will consider any recommendations by the ARAC ETOPS Working Group if they determine that time limited components should be based on forecast and actual winds as Airbus proposes. What must be applied to every ETOPS departure, is the fuel load that meets or exceeds the critical fuel scenario analysis, which is based on forecast and actual winds.

7. ETOPS rules should be harmonized with international rules.

Some commenters suggested that the ETOPS rules should be harmonized with international rules and should not discriminate against non-U.S. manufacturers and operators.

FAA Response:

The FAA has been and remains committed to harmonization of regulatory requirements to the extent possible with international rules. That will always be a goal of the FAA but that goal must be balanced with other issues the FAA must respond to. In this case, there has been a proposal to extend the ETOPS approved operations for the B-777 up to 207 minutes. It is not appropriate for the FAA to delay action on the proposal in order to harmonize its position with other regulations, when appropriate regulatory action has been determined. Again, the FAA places a high priority on harmonization of standards world-wide, but not at the cost of reasonable action in response to any request by those it directly regulates.

A lot of effort has gone into the harmonization of ETOPS requirements and standards, and although there are specific areas of difference, its general application is uniformly applied worldwide. The 207-minute ETOPS is being accepted because it adds a safety benefit to the ETOPS conducted in the North Pacific, and U.S. airlines presently operating ETOPS in that area can benefit from this. The FAA will further pursue harmonization through intended tasking of an ARAC ETOPS Working Group that will provide recommendations for codifying ETOPS standards and requirements. The FAA welcomes participation by foreign regulatory authorities, manufacturers, and operators in this development to harmonize requirements, and to develop international standards. Interested persons should review the intended ARAC tasking published elsewhere in this edition of the Federal Register.

8. 207-minute proposal specifies equipment requirements.

The ATA 207-minute proposal contained specific system configurations. It specifies that at least one fuel crossfeed valve and one fuel boost pump in each main tank must be able to be powered by a backup electrical power source. It specifies time related cargo fire limitations, and all other time limited systems to be not less than 222 minutes. For the electrical system, any one of the engine or APU driven generator sources must be capable of powering the main AC and main DC electrical buses. To enhance pilot communications, the airplane must have SATCOM voice and/or SATCOM datalink installed, and for pilot work load consideration, the airplane must have single-engine autoland capability. The ATA proposal also specified MEL restrictions that would apply to the 207-minute dispatch. It proposes the operability of autoland capability, SATCOM voice and/or SATCOM datalink, autothrottle system, the fuel quantity indicating

system (FQIS), and the APU (that includes the electrical and pneumatic supply to its designed capability) at time of dispatch.

Continental Airlines states that the equipment and dispatch specifications detailed in the proposal are more conservative than those required by 180-minute diversion authority, and that the specifications detailed in the proposal define a level of sophistication in the aircraft design that goes far beyond the aircraft that were originally approved for 180-minute diversion authority. In their opinion extending the diversion authority beyond 180-minutes with the added conservatism and narrow scope presents benefits to the traveling public with no degradation in safety. Another commentator, although in favor of 207-minute ETOPS, argues against the additional equipment requirements in the ATA proposal because it would eliminate most of the world ETOPS fleet from 207-minutes ETOPS consideration. DGAC France and the United -- Kingdom CAA both expressed the view that if SATCOM was a requirement for communication capability, then it must be capable of being powered through a back-up source.

FAA Response:

The FAA has considered the additional systems capability, equipment, and serviceability requirements in the ATA proposal. The FAA does not consider these airplane requirements as the final determination of generally applicable 'standards' for ETOPS beyond 180-minutes, but does consider the added ATA criteria are in line with the basic conservatism embodied in present ETOPS operations, The added requirements were developed through a coordinated effort between airlines, manufacturers and pilot associations and the result represents an agreement among those parties. The FAA therefore accepts all the proposed added requirements as an integral part of a "special 207-minute authorization" except the monthly reporting requirements. As such, the FAA has information that the B-777 would qualify for 207-minute ETOPS. The

FAA wants to make it clear that by its acceptance of the ATA proposal that an equivalent level of safety is found. The FAA has not made a determination that the proposal by the ATA is the only proposal that would allow all 207 minute ETOPS operations, or is the minimum level of safety for all operations. The FAA intends to task the proposed ARAC ETOPS Working Group to make recommendations on standards and requirements for ETOPS beyond 180-minutes. This may lead to standards of system configuration and requirements that would enable other existing airframe/engine combinations to be used. The FAA will be looking for ARAC to set forth recommendations that define minimum standards and develop the proper technical justification for those being the minimum standards. Once those minimum standards are proposed by ARAC, the FAA will review all ETOPS approvals to decide if the ARK proposed standards should be applied to all ETOPS operations. In making that decision it will rely to a great extent on the service history of the fleet operating under today's standards, which so far has been excellent.

The FAA considers the proposal for SATCOM and/or SATCOM datalink to be an additional communication requirement beyond that which is presently required. It is therefore not to be considered as a replacement communication system. The value of SATCOM is recognized and its importance as an aid to rapid and efficient communication for the flight crew is supported by the requirement for the SATCOM to be operative for a 207-minute dispatch. The development of standards and requirements for ETOPS beyond 180-minutes that will be addressed by the ARAC Work Group may define other communication requirements and standards of operability for future approvals.

9. An industry/government ETOPS working group should be formed to review 207-minute operations.

ALPA suggests that an Industry/Government ETOPS group be formed for the purpose of ensuring that airlines comply with the intent of the ATA 207-minute ETOPS proposal. They suggest that the group should meet on a regular basis to review operational information regarding all ETOPS operations, particularly those operations where 207-minute authority was exercised. Airbus expresses concern with the current state of FAA monitoring of ETOPS operations, citing that the FAA relies on the industry to be alerted to trends that threaten the safety of ETOPS operations. Airbus suggests that the review of 207-minute data contained in the ATA 207-minute proposal should be more specific in delineating precisely what will be reviewed and the control limits for each review item.

FAA response:

The FAA intends to monitor the frequency of use of a 207-minute dispatch and the terms of its application by airlines that have been granted the authority to exercise the 15 percent extension. Airlines will be required to record and document necessary information that substantiates the use of the 207-minute dispatch for each flight that it is applied. The airline will retain copies of these records for at least three months, and make them available to the FAA upon request (OMB control No. 2120-0008). The data will be reviewed and collected by the airline's FAA Certificate Holding District Office (CHDO). The CHDO will provide usage reports for their assigned airlines on a monthly basis to the FAA Flight Standards Air Transportation Division, AFS-200, so that a comparative review and analysis can be conducted. Results of the review can then be made available to the public, with all proprietary data removed or de-

identified. Operators should note that the regular monthly reports specified in the ATA proposal are not being required by the FAA at this time.

The FAA disagrees with the Airbus comment that there is insufficient ongoing surveillance by the Flight Standards organization on monitoring compliance with ETOPS operations and maintenance requirements. The FAA constantly monitors the application of ETOPS requirements, and the airlines performance to maintain acceptable standards. Other FAA organizations are tasked specifically to track and respond to trends that may indicate areas of concern of a specific ETOPS operator, or global trends that may affect the entire industry. The FAA does rely on the collation and reporting of ETOPS related data by industry sources. The FAA maintains oversight of the data, and conducts continuous analysis to detect any adverse trends.

10. Extended range operations for "all cargo" airplanes are not safe and should not be allowed.

The Independent Pilots Association (IPA) opposes the ATA 207-minute proposal because cargo aircraft are not equipped with fire suppression systems. IPA states that "extended range operations for all-cargo aircraft are not safe and should not be allowed by FAA".

FAA response:

Class E cargo compartments apply only to airplanes used solely for the carriage of cargo and are not restricted or pertinent to the number of engines installed on the airplane. Class E requirements are contained in 14 CFR Part 25, and those requirements do not specify a fire suppression system. The issue is therefore not related to ETOPS, or to an extension to 207-minutes that may apply to the B-777 airplane. Three and 4 engine all-cargo airplanes with Class

E cargo compartments are not limited to routes based on time or distance limits from alternate airports. Two-engine airplanes are restricted to a maximum diversion time, including all-cargo airplanes that are operating with an ETOPS approval AC 120-42A, paragraph 8(c)(6) requires that the design of the cargo compartment fire protection system integrity and reliability should be suitable for the intended operation considering fire detection sensors, liner material, etc. It also addresses fire protection system capability, if necessary by the certification standards. As already stated, the Class E requirements do not require a fire suppression system. For additional information regarding the distinction between cargo compartments in all-cargo airplanes and those in passenger-carrying airplanes, see the publication of the FAA's final rule on Revised Standards for Cargo or Baggage Compartments in Transport Category Airplanes (63 FR 8040-41; February 17, 1998).

An appropriate forum for further discussion of Class E cargo compartments would be with the proposed ARAC Working Group that will be tasked to review the requirements for all extended range operations, regardless of the type of operation.

Announcement of FAA decision

The FAA has determined that it would be premature to extend the ETOPS threshold to 207 minutes without specifying limits on its application and use. The FM agrees that measurable standards must be developed and harmonized, in order to adopt an extended diversion threshold across the board. One of the tasks the FAA intends to include in the ARAC ETOPS initiative is for the ARAC to develop the standards for airplane ETOPS type design approval as well as operational requirements and procedures for ETOPS beyond 180-minutes. The FAA also agrees that these standards should be developed jointly for global application, and adopted as an ICAO standard and recommended practice.

As mentioned previously, the FAA has reviewed a study prepared by United Airlines Dispatch Center that looked at meteorological forecast and actual weather data at airports that meet "adequate" criteria for enroute alternates in the North Pacific. The study shows that a 207-minute ETOPS dispatch would mostly benefit Eastbound operations from Japan to the United States because those departures generally occur at night. The conclusions drawn from the study are: The use of a 207-minute dispatch would be infrequent; the flight could be dispatched on preferred ATC routes; and, the resulting route would place the airplane closer to more enroute alternates that after flight departure would meet "suitable" criteria. The FAA recognizes the merits and potential safety benefit of such conditions.

The FAA also recognizes that ETOPS operations in the North Pacific (NOPAC) present certain operational difficulties that are minimized with airplanes that incorporate the latest technology and systems design to specifically meet ETOPS needs. An airplane such as the B-777 fits this category.

The B-777 was designed from the beginning as a 180-minute ETOPS capable airplane. Instead of meeting the minimum service experience requirements defined by FAA Advisory Circular 120-42A, the B-777 ETOPS type design suitability was based on Early ETOPS special condition requirements for proof of reliability. This was the main reason for Boeing to develop an improved design. The B-777 design has systems redundancy to meet reliability goals with consideration of Minimum Equipment List (MEL) restrictions for HO-minute ETOPS. For example, the electrical system has a main and back-up generator on each engine, an APU generator, a Ram Air Turbine (RAT) generator, a main battery, and an APU battery. The fuel system design provides for a fuel boost pump in each main tank to be powered by a back-up electrical source, making the need for fuel suction feed an unlikely event. Boeing conducted a B-

777 systems reliability analysis and Numerical Probability Analysis to assess the suitability of the B-777 airplane to a higher diversion limit. The analysis indicates the B-777 airplane design and reliability capability is well in excess of the proposed extension to 207-minutes. Today there are over 200 B-777's in service around the world. The fleet has accumulated more than two million engine hours with a combined rolling average in-flight shutdown rate of .007/1000 engine hours. That is almost one third of the maximum allowed shutdown rate for 180 minutes ETOPS operation.

The ATA 207-minute proposal contained nine items to be applied to the review of the proposed airframe-engine combination to determine if there were any factors that would affect safe conduct of 207-minute operations. The B-777 has been proposed as satisfactorily meeting the condition of all the listed items in the Approval Basis section. The FAA considers these -- additional type design and systems' operational requirements to provide conservatism in reliability performance and diversion capability for 207 minute ETOPS operation. In addition to MEL restrictions for 180-minute operations, the ATA proposal also included four additional system and equipment requirements that must be operational prior to dispatch for 207-minute ETOPS. The items are: Fuel Quantity Indicating System (FQIS), Auxiliary Power Unit (APU) that included the electrical and pneumatic supply to its design capability, the Autothrottle system, and SATCOM voice and/or SATCOM datalink.

The FAA has accepted the ATA proposal as providing an equivalent level of safety for ETOPS operations up to 207 minutes in the North Pacific. The FAA may approve a special ETOPS operational authorization that will allow limited application of a diversion limit of 207-minutes flying time at the approved one-engine inoperative cruise speed (under standard conditions in still air). This will be a narrow focused authorization based on specific eligibility

and qualification criteria, fixed geographical area of operation, specific equipment, limited application, and recording requirements and the additional criteria contained in the ATA proposal Presently, the FAA has enough information on the B-777 series with all engine configurations as listed on the Type Certification Data Sheet T0000 1 SE, to tentatively find that it is the only model that currently meets the additional criteria contained in the ATA proposal and that the FAA has adopted. A final finding may be issued after the Boeing Company submits substantiation data for each of the type design criteria items listed in paragraph 7 of the proposal's "Approval Basis" section and the updated Numerical Probability Analysis (NPA) to the FAA Transport Airplane Directorate for evaluation. If the FAA's evaluation is favorable the "finding of suitability" to the additional criteria for 207-minute ETOPS can be made. The FAA will task the Flight Operations Evaluation Board (FOEB) to begin the process to amend the B-777 MMEL to require operational status for dispatch of the airplane for operations beyond 180-minutes to the four items mentioned above (FQIS, APU, Autothrottle system, and SATCOM). Air carriers approved to use the special 207-minute authorization must amend their MEL and receive FAA approval of the amendment, prior to exercising the special authorization.

Application for the special authorization will only be considered from air carriers that currently hold 180-minute ETOPS operational approval. The authorization will only apply and be valid for use in the North Pacific area of operation. The special authorization can only be applied to a route where adequate enroute alternate airports exist and are available that, if defined as 'suitable' for dispatch as per paragraph 1 0(d)(5) of AC 120-42A, the route would be flown at 180-minute ETOPS authority. When applying the 207-minute dispatch, consideration must also be given to those "adequate" airports within 180-minutes of the proposed airplane routing to have a weather forecast that gives probability of having operational approach minima (minima

necessary to execute an instrument approach) during the expected times of arrival. The window of arrival to be considered for these "adequate" airports is that period from the earliest planned arrival time to the latest planned arrival time, for the anticipated airplane. routing. This increases the possibility on a 207-minute ETOPS dispatch that the flight crew when faced with the need to initiate an in-flight diversion, could be closer to a suitable alternate airport in Russia, the Aleutians, or elsewhere in Alaska than compared to an off-track route (more Southerly route) that was based on a 180-minute ETOPS dispatch. All other ETOPS planning requirements specified in AC 120-42A continue to apply to the 207-minute ETOPS dispatch.

The air carrier will record the dispatch considerations when applying this special authorization for each use, and retain such records for review by the FAA for at least three months.

In the April 27, 1999 Federal Register notice, the FAA stated that it did not endorse the ATA proposal, *per se.* The April 27 notice outlined, in great detail, the issues involved in determining whether an appropriate level of safety could be established for 207-minute dispatch ETOPS. Public comments were also in great detail, and reflected that the commenters appreciated all of the issues. After careful review of the proposal and comments received, the FAA has decided to proceed with a policy to allow the limited 207-minute dispatch authorization described in this notice.

Summary

The FAA supports a collaborative effort to produce policy and rules that incorporate the best information available from operators, manufacturers, and others who may be affected. The FAA also supports the rulemaking process that assures that the issues are thoroughly examined

in a public forum. The FAA does not believe, though, that approval of a limited 207-minute North Pacific ETOPS operation must await further ETOPS rulemaking.

The FAA recognizes the potential safety benefit that is provided with an extension to 180-minute ETOPS as it applies to operations in the North Pacific. The equipment and dispatch requirements that are specified in this limited 207-minute diversion authority are more conservative than those required for 180-minutes. The B-777 systems design and demonstrated service reliability indicate that the airplane can meet these requirements, and the FAA will evaluate Boeing's data and the updated Numerical Probability Analysis to make its finding of suitability for 207-minute ETOPS. In order for airlines to exercise the 207-minute ETOPS authority, additional Minimum Equipment List (MEL) requirements will apply, as well as dispatch planning to consider the availability of other enroute airports along the proposed route that do not meet alternate weather criteria at time of dispatch. This is intended to limit the frequency of a 207-minute use, and to provide an equivalent level of safety for those flights that are dispatched with a 207-minute diversion limit. The FAA will closely monitor the application of these requirements by airlines that have received approval to use the limited 207-minute ETOPS.

Intent to Task ARAC

The FAA intends to initiate ETOPS rulemaking through the ARAC process by separate notice in the near future. The ARAC ETOPS Working Group would be tasked to provide their recommendation to the FAA for:

- Codification of existing ETOPS standards and requirements in the appropriate certification and operational regulations
- Development of objective standards and requirements for ETOPS beyond 180-minutes, for codification in appropriate certification and operational regulations, and
- Review the requirements for ETOPS and all other extended range operations for all airplanes regardless of the number of engines, and provide recommendations to standardize the requirements for such operations.

The FAA will draw from the working group recommendations to subsequently issue ETOPS and for long range operations regulations through the rulemaking process. It is desirable to have international regulatory, manufacturer, and operator participation in the ARAC ETOPS Working Group to provide harmonized positions that may be a basis for international ETOPS standards.

Issued in Washington, DC on January 18, 2000.

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