Before the Department of Transportation

Federal Aviation Agency

Comments of the Coalition of Airline Pilots Associations **In Re: 207 Minute Extended Range Operations With Two Engine Aircraft (ETOPS)**	))))))))	**Docket__FAA-99-6717** **(prior process under FAA docket 29547)** **207 Minute Extended Range Operations With Two Engine Aircraft (ETOPS)**

Communications with respect to this document should be sent to:

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Comment and Petition

This comment contains recommendations that amount to a petition for rulemaking.

For that reason CAPA requests that it be processed as a petition as well as a comment on the FAA proposal.

Background

FAA docket 29547 was opened on April 27, 1999 by notice in the Federal Register . 64 Federal Register, 22667. That notice printed a proposal of the Air Transport Association (ATA) and other private parties to extend ETOPS beyond the current 180 minute limit set by an FAA in an Advisory Circular . AC120-42A. The FAA invited public comment on the ATA proposal and set a closing date for comments of June 11, 1999.

The Allied Pilots Association (APA), the Independent Pilots Association (IPA), and the Fedex Pilots Association (FPA) filed comments opposing the proposal as unwarranted by the circumstances and too sweeping and vague as to its application.

The FAA published a tentative decision to adopt the ATA proposal with some modification on January 21, 2000 and requested additional public comment.. 65 Federal Register 3520. This filing is CAPA's response to that notice. CAPA is a non-profit corporation incorporated in the District of Columbia. On this issue CAPA represents the views of all of its member organizations; APA, FPA (Fedex Pilots Association), IBT, IBT 1224 (Airborne Express), and SWAPA, over 25000 pilots in all. The prior comments of APA, FPA and IPA under FAA docket 29547 are hereby incorporated by reference.

Our conclusions and recommendations are presented first. Analysis and discussion follows.

Conclusions and Recommendations

Conclusions

1. CAPA remains opposed to the use of 207 minute authority simply because there is no demonstrable need for change. Evidence substantial of flight

cancellations due to the restrictions of 180 minute ETOPS is absent.

2. The FAA's decision is based on a faulty premise. The FAA apparently believes that 207-minute ETOPS is needed to enable the dispatch of flights precluded by 180 minute ETOPS. However, given the fact that there is nothing in the public record about canceled flights based on the restrictions of the 180 minute ETOPS, this is clearly incorrect. Instead, comments in the docket from the operators and the United Airlines study relied upon by the FAA indicate that the air carriers merely view 207 minute ETOPS as a track optimization tool to save fuel. The FAA's incorrect assumption and faulty analysis renders the agency's decision arbitrary and capricious.
3. While the FAA has clarified some aspects of the 207 minute proposal, some of the terms and conditions remain unclear. What specific set of weather or other conditions would justify 207 minute ETOPS?
4. The FAA proposal is actually an invitation to apply for exemption. The FAA plans to handle Petitions for exemption based on the proposed policy without public notice and opportunity to comment.
5. Whatever the risks of ETOPS are, they are increased by extending ETOPS diversion times. Such increased risks should be taken only if absolutely necessary and then only if other measures can't solve the problem. Need has not been established and other measures which might improve the situation have not been seriously examined.
6. There are things that could be done to avoid much of the cost associated with some 180 minute ETOPS flights that aren't able to operate on optimum tracks on some days. There are very viable and safe ways to use improved technology and increase the efficiency of operations without

extending ETOPS.

7. The current 207 minute proposal was developed without a harmonization effort.

Recomendations

1. That the FAA postpone indefinitely the introduction of 207 minute ETOPS in the North Pacific.
2. That the FAA harmonize ETOPS changes with the JAA and ICAO.
3. That the FAA require that petitions for exemption based on its proposed 207 minute ETOPS policy be handled through the normal notice and comment procedures generally used by the FAA for petitions for exemption and which are required by regulation.
4. That the FAA examine its “suitable enroute alternate” weather criteria in light of actual weather patterns in the North Pacific, and change if necessary to make these standards a more useful planning tool.
5. That the FAA consider installing CAT III equipment at one or more of the more important enroute alternates and basing alternate weather minimums on additives to CAT III minimums. This would take advantage of the 777's engine out autoland capability. The FAA has previously indicated in AC-120-42a that it would consider this step. FAA AC 120-42A, Appendix 3, par. 5, Dec. 30, 1988. With the 777 perhaps the time has come.
6. That the FAA require operators who wish to take advantage of item 5 to have engine out CAT III capability at departure and to conduct engine out CAT III training.

7. That the FAA seek to have weather forecasts for the North Pacific issued and updated more frequently and timed to fit with the most popular departure times for North Pacific ETOPS flights.

8. That the FAA use satcom and ADS capability to allow direct pilot to controller communications and enable ATC to approve more flexible routing to include decision points based on updated weather information. This would allow routings closer to optimum in many cases and without extending ETOPS beyond 180 minutes.

9. That the FAA publish preferred ETOPS tracks daily in the North Pacific. These tracks would be tailored to take advantage of the wind while complying with 180 minute ETOPS procedures and could include decision points with alternate down line routings which could be selected based on updated enroute alternate weather.

10. That the FAA develop weather standards appropriate for decision making at the decision points in the ETOPS tracks.

11. That the FAA convene an ARAC working group tasked to devise optimized 180 minute ETOPS procedures for the North Pacific. These procedures would then be available to all 180 minute ETOPS operators. The working group should include representatives from pilot groups, dispatch offices of major international operators, FAA Office of Rulemaking, FAA ATC, JAA and other interested foreign regulatory and ATS entities. This should be in addition to the ARAC working group already planned by the FAA to examine long range issues.

12. That the FAA require operators to consider forecast winds aloft when calculating acceptable distances from enroute alternates.

13. That the FAA task the ARAC working group it already plans to convene on long range flights to address improved fire suppression for freighter aircraft.

Scope of Proposal Narrowed

The FAA has substantially limited the scope of the ATA proposal by its action of January 21, 2000. Three hour and 27 minute ETOPS would now be limited to the B-777, North Pacific operations, only on routes underlain by adequate airports at all times within three hours of the route of flight. These operations may only be conducted by operators that already hold authority to conduct three hour ETOPS, "and then only when conditions prevent a 180 minute dispatch." 65 FR 3522. The CAPA is gratified that many of the concerns expressed by it and other commenters have been addressed.

In addition the FAA has given notice that it intends to convene an ARAC working group to examine standards for all long range over water operations. We believe this is prudent and timely and plan to participate in these deliberations. We are especially concerned about fire suppression issues on all aircraft involved in long range operations.

Primary Concern Not Addressed

Cape's principal concern is that there is no need to revise the existing 180-minute ETOPS limitation. The ATA failed to demonstrate any such need in its original proposal, and the FAA's stated reason for adopting the 207-minute proposal is contradicted by the very study it purports to rely on.

The FAA now says that "the 207-minute ETOPS operations are intended to apply only to the North Pacific area of operations, and then, only when conditions prevent a 180-minute dispatch." (emphasis added) 65 Federal Register 3522. The FAA goes on to quote extensively from a United Airlines study of North Pacific ETOPS operations and appears

to rely heavily on it. That study is quoted with approval as indicating that 10% to 15% of North Pacific ETOPS flights could "benefit" from 207-minute dispatch and "be dispatched on preferred ACT routes." 65 Federal Register 3522. However, nowhere does the study indicate that *any* flights were canceled because they could not meet the 180-minute ETOPS requirements. The assertion that flights would benefit from preferable (more economical) routing under the 207-minute ETOPS is a far cry from asserting that flights couldn't otherwise be conducted.

Elsewhere, the FAA states that "other limitations will specify the conditions and frequency that will apply to the use of 207-minute dispatch." 65 Federal Register 3522. However, CAPA is unable to find a clear statement of the conditions that would justify 207-minute ETOPS. This is not addressed adequately, either in the original ATA proposal or the current FAA adoption of the ATA proposal with modifications. For instance, FAA states that airlines utilizing the 207- minute dispatch must "consider" weather conditions, it does not set any standards for how the weather conditions must be factored into the decision to dispatch under the expanded ETOPS. Instead, the FAA says that it will review how airlines made their decisions. In essence, this amounts to delegating to the airlines the FAA's legal obligation to set standards.

FAA's failure to articulate the standards that will determine whether the 207-minute ETOPS will be allowed render the FAA's decision arbitrary and capricious. The failure of FAA to set forth its proposed standards in the two Federal Register notices also makes it extremely difficult for interested parties to comment on the FAA proposal, thus rendering the notice and comment proceedings inadequate.

The Reality of 207 Minute ETOPS

What is 207 minutes? It is actually a distance of 1500 nautical miles(1725 statute

miles). The minutes convert neatly to a distance because we need only consider the distance the aircraft can cover during that time. The FAA does not require wind to be considered. The airlines have adopted procedures which make the distance as large as possible. The common procedure in the event of engine failure would be to operate the remaining engine at maximum continuous thrust in order to obtain the maximum forward speed (.84 Mach and 320kias in the case of one major operator) and stretch the radius available within that 3 hours and 27 minutes as much as possible. The figure given here was calculated using those procedures. If, for any reason, the pilot in command elected not to use maximum continuous thrust, or if he were flying into a headwind, or both, the time to reach a suitable airport for landing could be much longer. Headwinds of 100 knots are easily possible in the North Pacific. The current standard of 180 minute ETOPS actually converts to a distance of about 1300 nautical miles. Wind is not considered under the current standard either. We see no reason to extend this distance and are unaware of any commercial operations precluded by this standard.

Enroute Alternates and Wind

Some operators already do consider enroute winds when calculating acceptable distances from enroute alternates, even though not required to do so. All operators should be required to do so. Computer aided flight planning makes this quite easy and there is no good reason not to require this very common sense use of computer technology. While it may have been reasonable not to require this years ago when allowable diversion distances were much smaller and the calculations would have to be made by hand, that time has long passed. With allowable diversion times of three hours or more in parts of the world where winds can easily exceed 100 kts, ignoring the wind when there technology readily available to perform the calculations can't be regarded as responsible. The FAA must not let inertia carry the day. This change should be made promptly.

Process Concerns

The 207 minute ETOPS proposal originated with an ATA sub committee. That group did hold meetings with other interested parties including Boeing, ALPA and APA. It turned out that APA was opposed to the extension of ETOPS and was not invited to the final meeting at which agreement between ATA and ALPA was reached. The FAA seems to consider this series of meetings as the equivalent of an ARAC process. We disagree. The checks and balances associated with a process conducted under the Federal Advisory Committee Act, such as public notice and opportunity to be heard and file dissenting views, were missing. In fact, the advocates of one result succeeded in excluding those who disagreed with them from the final and critical session which resulted in a meeting of the minds. ATA can advocate whatever it pleases and negotiate with whomever it pleases, but we object to the FAA sanctioning this process as equivalent to a public process.

Exemption from What?

The current ETOPS standards are in an advisory circular which spells out conditions for exemption from the existing regulations. AC 120-42a., and 14 CFR 121.161. That advisory circular has some appendixes which are approved and some that were proposed but not approved. Some of these latter are informally in use anyway. There is also a "policy letter 95-1" which applies to these procedures. We are unsure exactly what the current process is. It is not to be a new regulation, it is not to be a revision to the existing advisory circular, it is not to be a general grant of exemption from the regulations or from the advisory circular. The FAA has informally advised us that it is actually an invitation to apply for exemptions, and unlike ordinary petitions for exemption, these applications will not be published for comment in the federal register, nor will the FAA's response. There will be no opportunity for public comment after the end of this comment period on March 6th.

While FAA states that it would take too long to undertake a comprehensive review and evaluation of ETOPS and organize the rules in an orderly way, that is exactly the type of process that needs to be undertaken *before* more ETOPS extensions are granted. There is no need to short-circuit the regulatory process. The FAA never explains what is the rush - why the "need" to grant this extension and *then* undertake a comprehensive review. Given the fact that there is no evidence in this administrative record that flights have actually been canceled because of the 180-minute ETOPS limitation, FAA's apparent haste is all the more curious. Furthermore, had the FAA devoted its efforts to codifying ETOPS procedures as regulations, or even to revising the advisory circular in an orderly way, results might well have been achieved in less than the three years that have elapsed since ATA began pressing for extension through its ETOPS sub committee.

If the FAA is nonetheless determined to proceed without revising the regulations or the advisory circular, surely it should require that all applications for exemption be published in the Federal Register for comment. The Director of Flight Standards has recently reaffirmed the FAA's policy that petitions for exemption will be subject to the applicable public notice and comment requirements of 14 CFR Part 11. *See* Letter of L. Nicholas Lacey, Director, Flight Standards Service, to Captain Robert Miller of IPA, dated December 22, 1999 (copy attached). The FAA should adhere to this policy and follow the law.

It is essential that the individual petitions of the carrier be subject to public notice and comment, because the original ATA proposal consisted of little more than the rhetoric of advocacy, and the FAA decision has left serious doubts as to what was actually proposed and what was adopted. As CAPA and its member unions have repeatedly pointed out, the original proposal and the FAA's response are far too vague on the most fundamental points, such as why do airlines need 207-minute ETOPS, and under what

conditions may 207-minute ETOPS be used?

The United Airlines Study (Discussion)

The FAA has provided a copy of the United Airlines study on which it seems to rely. It is our belief that this study should be available to all. We attach a copy of this study to our comments, not because we endorse it, but merely so that it will be a part of the public docket. This document was circulated at a meeting of the ATA ETOPS subcommittee last year. We have no reason to challenge the facts collected in the study, but we recognize that the study was produced by a party with a vested interest in the outcome of this process. We fail to find in that document some of the things it is quoted as demonstrating.

The study is revealing for what it does not say. There is no indication that <u>any</u> planned ETOPS flight could not be conducted using 180 ETOPS procedures during the 20 month period of the study. This is not surprising as it is in line with our own experience. If the FAA statement about planning to authorize 207 minute ETOPS only when dispatch is not possible using 180 minute ETOPS, then 207 minute ETOPS will never be authorized. If 207 minute ETOPS procedures are to be used 10% to 15% of the time on this route, it can't be because “conditions prevent 180-minute dispatch.” It must be something else that the FAA sees as conditions warranting 207 minute dispatch.

The study does show that some flights were required to follow tracks that resulted in increased enroute time and fuel burn. Some of those flights could have benefited economically from 207 minute ETOPS.

The study seems to debunk some of the arguments advanced in favor of this change. It has been alleged by the ATA and now the FAA that allowing 207 minute ETOPS would keep routings closer to the northern enroute alternates which would be available for landing if needed even if they didn't meet alternate weather standards at

departure time. This could be true in some cases, but in other cases those northern airports might actually be unsuitable for landing, just as forecast. In that case the 207 minute procedure would be used merely to extend the distance from suitable alternates so that an optimum track could be flown. Also, the study shows that United often chose more southerly routings farther from the northern alternates and which relied on Midway as the mid route alternate, and they did this far more often than they were required to by the weather at other alternates. This more southerly routing is often the optimum between Tokyo and San Francisco and is chosen without hesitation when that is so. There is nothing wrong with this, but it illustrates the point that once a limit is accepted, be it 180 or 207 minutes, that limit will be used to optimize routings. Any other result is incidental only.

Discussions about the dangers of being forced to use these same routings when they are not optimum because of different wind patterns must be seen as somewhat subjective. Make no mistake about it: 207 minute ETOPS would be used as an economic tool to optimize routings. The asserted safety advantages are just that; assertions only, intended to justify a change desired for economic reasons.

Alternate Minimums

The FAA proposes that operators be permitted to fly the North Pacific remaining within a three hour and twenty seven minute no wind radius from the nearest suitable airport. The FAA would also require that these aircraft remain within three hours of an adequate airport. The only difference between an adequate and a suitable airport is weather. A suitable airport is an adequate airport which is forecast to have suitable weather. The FAA then insists that it does not intend to lower the weather standards which make an airport suitable. This cannot be; let us explain.

At present, ETOPS aircraft must remain within three hours of a suitable airport.

The FAA says it will be just as safe to extend the radius to 3 hours and 27 minutes so long as the route remains within three hours of adequate airports. The FAA says that this is so because the United Airlines study found that even when the thee hour enroute alternates were forecast to have less than suitable weather at the time of departure, they were found to have suitable weather after flight departure at the time they might be needed. The FAA has provided us with a copy of the United Airlines study and we are unable to find that statement. Such a statement could not be true, because it amounts to a statement that the weather at the airports in question is never below approach minimums. When the weather is forecast to be less than suitable, it can be anything from 0/0 to above approach minimums, but not enough above minimums to satisfy the current FAA suitable alternate weather standards. Sometimes pessimistic forecasts are accurate and sometimes optimistic forecasts are wrong. Sometimes the weather is below approach minimums. We apologize for a statement of the obvious, but it seems necessary.

This proposal does not change the weather standards for suitable enroute alternate airports. What it does instead is eliminate them altogether for the 180 minute airports and then make the rather surprising assertion that this is safer than requiring 180 minute alternates with suitable weather! If this is really so it would be proof that the current enroute alternate weather standards are a hindrance rather than a useful planning tool. And if that is the case those enroute alternate weather minimums should be changed rather than simply ignored for the 180 minute airports as is proposed here.

It could be that an appropriate study could show that the current suitable alternate weather standards are too conservative and fail to accurately forecast the availability of the enroute alternates. If this is so, the alternate minimums should be adjusted so that they are a useful predictive tool. It is simply unreasonable to ignore the alternate weather minimums and then assert that the alternates will <u>always</u> be available for landing anyway. That seems

to be what the ATA has urged and the FAA has accepted here.

We strongly suspect that the reason this approach has been taken is not because those advocating this new policy are unreasonable or unaware. Rather, they advance these largely rhetorical arguments because it is their goal to have the FAA extend ETOPS beyond 180 minutes. Refining the current 180 minute ETOPS standards so that the North Pacific routes can be flown more efficiently and economically would not help them achieve that goal. That may explain why other useful measures have not been urged. There has been no suggestion that the approach aids at the critical enroute alternates should be improved or that current weather reports made available through satcom be used to make routing decisions after departure. Satcom could be just as well used to provide more flexible ATC procedures as it could be to provide more up to date weather information. No one has proposed routings with enroute decision points based on updated weather information even though such a procedure has a real potential to reduce the number of flights required to use less than optimum tracks because of adverse weather forecasts at the enroute alternates. All these things; improved and more timely weather forecasts, strategic use of satcom for in-flight routing decisions, more realistic alternate weather minimums, could make 180 minute ETOPS more economic and efficient.

Increased Equipment Requirements

We are definitely in favor of improved equipment and requirements that such equipment be operational on ETOPS flights. The 777 has improved system redundancy in a number of areas, but it still has only two engines, and some of the systems are still having problems. There have been a number of ADs(Aeronautical Directives) published by the FAA since close of the prior comment period. Among other problems, the drive shafts for the back up generators have failed and had to be redesigned. All of these problems have been dealt with promptly and effectively. The point is simply that problems continue to

surface, and it may be too soon to consider ETOPS extensions for the 777.

A partial listing of the ADs issued during 1999 and which might affect the ETOPS capability of the 777 follows;

1. measures to deal with uncontained failure of critical rotating engine parts PW4000 series engines. 64 Federal Register 17947, April 13, 1999.
2. measures to deal with uncontained failure of critical rotating engine parts GE90 series engines. 64 Federal Register 17961, April 13, 1999.
3. replacement of engine driven pump shut off valve to avoid failures which in the event of an engine fire could result in an uncontained fire in the engine compartment. 64 Federal Register 39005, July 21, 1999.
4. replacement of back up generator drive shafts to avoid the possibility in required in flight engine shut down due to shearing of that drive shaft. 64 Federal Register 68618, December 8, 1999.

These are in addition to the ADs cited in the APA comments in June. 62 Fed. Reg. 23339, Apr. 30, 1997, and 63 Fed. Reg. 169, Jan. 5, 1998.

We fail to see how some of the proposed MEL requirements other than the redundant systems will aid in justifying 207 minute ETOPS. Autothrottle and autolanding are good examples. These are very nice to have available, but how do they justify 207 minute ETOPS? FAA regulations do not require autothrottle for any landing except CAT III. Of the potential enroute alternates in the North Pacific, only Anchorage, Fairbanks and Narita have CAT III capability. The others have only CAT I approaches. The difference between 180 minute ETOPS and 207 minute ETOPS is not the landing; it is the increased distance to suitable alternates. The use of autothrottle enroute is of only marginal benefit.

As much as we are in favor of better equipment which is actually in working order, it appears to us that what has happened is that other pilot groups have agreed to 207

minute ETOPS in exchange for an agreement to beef up MEL requirements on those flights, even though some of the items have no real relation to ETOPS operations and others should be required for all ETOPS flights. This proposal would make those changes effective only for 207 minute ETOPS. We think that was a bad bargain, and we did not agree to it. No other pilot group has any authority, express or implied, to represent our views.

Lack of Fire Suppression Capability in Cargo Aircraft

FAA responded to a concern raised by IPA about the lack of fire suppression systems in Class E compartments of cargo airplanes by stating that, because three and four engine aircraft are not subject to any time or distance limits from alternate airports, IPA's concern was not relevant to the ETOPS issue. First, CAPA notes the irony of FAA purporting to rely on its requiring irrelevant equipment such as autoland and autothrottle as safety enhancements that "justify" its decision to stretch the ETOPS limits, yet criticizing IPA's fire safety concern on the basis that it is not strictly an ETOPS issue.

Moreover, unlike FAA's reliance on autoland and autothrottle capability in its decision on ETOPS, IPA's comment *was* relevant, because the issue at hand was, whether two engine aircraft should be allowed to be dispatched along routes where the nearest alternate airport may be 207 minutes away. If there is a problem with the ability to contain or suppress a fire during this extended period, the operations should not be permitted. The fact that other aircraft with more engines may allowed to conduct operations with a risk of an in-flight fire disaster is no reason for the FAA to take action that would allow additional high fire-risk operations. In fact, FAA's response is like a child saying he should not have to wear a bike helmet because other kids are permitted to ride without one. Promoting the safety of one type of operation should not be held back because of lack of safety in another type of operation.

The simple fact is, the ETOPS extension allows aircraft to be up to 207 minutes from an alternate airport, when they otherwise could not. If applied to all-cargo operations, this would allow aircraft with cargo compartments with no fire suppression capability to be farther from an alternate airport than they otherwise could be.

CAPA is concerned that the margin of error provided by the Policy is razor thin, if not entirely illusory. It is not at all clear that cargo compartment fire resistance will be sufficient to avoid burnthrough before an alternate airport is reached. The ETOPS limit is 207 minutes from an alternate airport - assuming still winds and, in the case of an engine shutdown, maximum thrust by the remaining engine. As noted above, both of these assumptions are suspect. First, in the Aleutians, there are often very strong winds. If there is a head wind, this can extend the flight time to the alternate airport significantly. Secondly, if one engine is shut down, it may not be prudent to operate the remaining engine at maximum thrust. Finally, of course, we do not have great confidence in FAA's determinations of the fire resistance of cargo compartment liners. The FAA's track record in this area is less than stellar, and, unfortunately, the agency's overly optimistic view has resulted in air disasters. That experience should not, and need not, be repeated.

FAA is correct that the problem of lack of fire suppression in Class E compartments is broader than merely an ETOPS issue, and the agency should examine the issue of Class E cargo compartments with respect to all extended range operations. In fact, CAPA suggests that it would be advisable for FAA to examine the issue of lack of fire suppression capability in Class E cargo compartments throughout the entire range of flight operations, not just extended flight operations.

CAPA Requests That it Participate in the ARAC ETOPS Working Group

CAPA requests that it participate in the ARAC ETOPS Working Group that FAA

has announced it will establish. *See* Policy Statement, 65 Fed. Reg. at 3521, 3523-27. CAPA members have, through their comments submitted herein and in FAA Docket No. 29547, expressed views on various aspects of 207-minute ETOPS that FAA has acknowledged warrant further evaluation. Specifically:

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." *Id.* at 3521.

Federal Express Pilots commented that major policies such as those governing ETOPS should be codified in regulations, and FAA agrees that "more defined criteria for ETOPS should be placed in Part 121 through the rulemaking process." *Id.* at 3522-23.

IPA commented on the lack of fire suppression capability of Class E cargo compartments on board all-cargo aircraft, and FAA suggests that an appropriate forum for further discussion of Class E cargo compartments is the proposed ARAC ETOPS Working Group. *Id.* at 3525-26.

In light of the interest that CAPA members have already demonstrated in ETOPS and the experience that they would bring to the ARAC ETOPS Working Group, FAA should ensure that CAPA members are represented on the ETOPS Working Group.

United Airlines Study (Attachment)

PACIFIC ETOPS STUDY - UNITED AIRLINES B777 - 1998

An informal survey of ETOPS enroute alternate selection has been on-going since early 1998. The representative flights are planned roundtrip between San Francisco and Tokyo. Here are the parameters used:

SFO-NRT-SFO

777-222B with 180 Minute ETOPS 1262NM Area of Operations M.83/310 KIAS

ETD SFO 2015UTC ETA NRT 0645UTC

ETD NRT 1030UTC ETA SFO 1950UTC

Enroute alternates: SFO OAK PDX SEA YVR ANC FAI AKN CDB SYA HNL MDY PKC GDX KUH CTS HKD NRT HND KIX

Westbound Statistics:

Alternate selection: ANC FAI HNL AKN CDB SYA MDY GDX PKC CTS HND NRT

Month Total Flights

FEB	5	5				2	1		1	1	4		1
MAR	26	25	1			4	18	1	1	1	22		4
APR	22	21	1	2	1	2	14	2	1	2	21		1
MAY	22	15		2	2	6	14	4		2	18		4
JUN	21	18		1		11	5	3	1	3	20		1
JUL	17	11		1	4	1	3	11	1	3	12		5
AUG	16	13		1	2	2	3	11			16		
SEP	21	11		1	6	5	10	8		1	18		3
OCT	16	9		1	4	5	10	4		1	15		1
NOV	20	20				4	15		2		16		4
DEC	24	18	4	1	1	3	19	1	1		19		5
TTLS	210	166	6	10	21	45	111	45	8	14	181		29

Note: The Mid-Pacific enroute alternate availability was limited to a single enroute alternate on 96 flights, (westbound), due to forecast alternate weather minima.
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PACIFIC ETOPS STUDY - UNITED AIRLINES B777 - 1998

Eastbound Statistics:

Alternate selection: ANC FAI HNL AKN CDB SYA MDY GDX PKC CTS HND NRT

Month Total Flights

FEB	4			2		2		4			3		1
MAR	17	5		1		10	3	14			13	1	3

APR	23	8		4		5	17		1	10		4	9		
MAY	14	10		4		3	11			8			6		
JUN	17	9		4	5		17			7		8	2		
JUL	19	9		7	5	1	10	5		5		12	2		
AUG	12	10		2	2	1	4	1	4	6			6		
SEP	16	12	1	1	2	7	7	1		9		2	5		
OCT	10	5		2	5	2	6			7		1	2		
NOV	17	6	(1 YVR) 1	4	7		16			15			2		
DEC	17	2	1	8	6	3	14			10		2	5		
TTLS	166	76	1 1 YVR	5	36	43	25	120	7	5	93	30	43		

Note: The Mid-Pacfic enroute alternate availability was limited to a single alternate on 57 flights,(eastbound), due to weather forecasts below alternate minima.

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Note: August 6,1998 planned 207 Minute ETOPS NRT-SFO (Alternates: NRT MDY ANC) 207 Minute ETOPS permitted preferred ATC route.

Note: September 6,1998 planned 207 Minute ETOPS NRT-SFO (Alternates: CTS-ANC) on preferred route, no mid Pacific alternate available unless routing south to nominate Midway within 180 Minutes at a cost of 16 minutes.

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PACIFIC ETOPS STUDY - UNITED AIRLINES B777 - 1999

Westbound Statistics:

Alternate selection: ANC FAI HNL AKN CDB SYA MDY GDX PKC CTS HND NRT

Month	Total Flights												
JAN	23	16	2	1	6	15	3	1		20	1	2	
FEB	18	17	1	1	4	9	1	2		13		5	
MAR	20	18	1	1	4	11	1	2	1	17		3	

APR	24	20			7	11	8		2	23		1	
MAY	18	16		2	2	12	2	2		15		3	
JUN	12	9		3		7	2	3			10		2
JUL	10	5		1	3	2	1	7		1	8	(2 UUS)	
AUG	10	8			2	1	4	1	3	2	8		2
SEP	12	9	1			2	7	3		1	9	(2 UUS)	1
OCT													
NOV													
DEC													
1999 TTLS	147	118	5	6	8	35	72	37	7	8	123	(4 UUS) 1	17
TOTAL 98/99	357	284	11	16	29	80	163	81	18	20	296	(4 UUS) 1	46

Note: 1999 Mid-Pacific single enroute alternate availability 60
1998/99 TOTAL Mid-Pacific single enroute alternate availability 156

1/24/99 207 Minute ETOPS maintain preferred route nearest enroute airports reduced flying time 27 minutes and maintained desired payload
2/7/99 207 Minutes ETOPS maintain preferred route and eliminate pyld penalty 180 ETE 11:58 194.1 B/O 394.8 P69.0 207MIN 10:56 179.1 B/O P83.0
2/27/99 207 Minutes ETOPS maintain preferred route and eliminate pyld penalty 180 ETE 12:45 , 25.0 more B/O 22.0 Pyld...207 ETE 10:58
4/17/99 207 Minute ETOPS maintain route and avoid marginal airport saves 23mins and 8,800 pounds fuel

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PACIFIC ETOPS STUDY - UNITED AIRLINES B777 - 1999

Eastbound Statistics:

Alternate selection: ANC FAI HNL AKN CDB SYA MDY GDX PKC CTS HND NRT

Month	Total Flights											
JAN	24	5		7	12	1	23	(KIX 1)	16	6	1	
FEB	14	4		3	7		14		9	5		
MAR	17	3		12	2	2	15		12	4	1	
APR	23	14		7	3	3	18	1 (KIX 1)	14	3	5	

MAY	15	12	1	2	3	12	1 (KIX)	7	1	6
JUN	18	13	4	1	2	16		8	2	8
JUL	9	7	2	2		6	1	7	1	1
AUG	10	7	1	5	2	5	1 (UUS 3)	3	2	3
SEP	11	8	3			11	(UUS3)	6	1	1
OCT										
NOV										
DEC										
1999 TTL	141	73	40	34	13	120	2 (KIX 3) (UUS 6)	82	25	26
TOTAL 98/99	307	149	1 12	72	77	37	240	10 3 (UUS 6)	175	55	69

Note: Single Mid-Pacfic enroute alternate availability 1999 46
Total 1998/99 Mid-Pacific enroute alternatte availability 103

Note: August 6,1998 planned 207 Minute ETOPS NRT-SFO (Alternates: NRT MDY ANC) 207 Minute ETOPS permitted preferred ATC route.

Note: September 6,1998 planned 207 Minute ETOPS NRT-SFO (Alternates: CTS-ANC) on preferred route, no mid Pacific alternate available unless routing south to nominate Midway within 180 Minutes at a cost of 16 minutes.

Note: 1/23/99 207 Minute ETOPS desired for preferred route and multiple enroute alternates.

Note: 8/2/99 207 Minute ETOPS preferred rte NRT CDB Altns :11 mins 3.4 fuel saved

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FAA letter by L. Nicholas Lacey (attachment)