

SUBJECT: Determining Extended Operations (ETOPS) Applicability for 14 CFR 135 Turbine Powered Aircraft

Purpose: The following methodology has been developed to assist Part 135 operators in determining their need to comply with the new ETOPS regulations contained in 14 CFR 135.

Background

14 CFR 135.364 of the regulations now requires that all airplanes (to include both turbojet and turboprop aircraft) with two-engines and all passenger-carrying airplanes with two or more engines, hold ETOPS authority, granted in their operations specifications, if they perform a flight in which the airplane will be more than 180 minutes from an adequate airport. The 180 minute calculation is based on an airplane's one engine inoperative cruise speed, selected by the certificate holder and approved by the FAA, in standard conditions in still air and under normal operating conditions. The following steps demonstrate the methodology an operator may use to determine the applicability of the ETOPS rule.

Note: It is crucial to recognize that the calculations made to determine applicability of the ETOPS rule are separate from actual operational flight planning.

Step 1: Identify potential airplanes, routes of flight, and ETOPS applicability

The critical first step is to determine whether a proposed routing is defined as an ETOPS route. This analysis will determine whether a subsequent planned flight over the proposed routing is subject to the ETOPS regulations.

The operator should first consider the flights you typically perform, or may perform, where the routing could place the aircraft more than 180 minutes from an adequate airport.¹ The operator should then, select a one-engine inoperative cruise speed² from a range of manufacturer published speeds

Calculate the number of miles the aircraft can fly with one-engine inoperative, in still air, using the aforementioned criteria, in 180 minute (3 hours). Once you have determined the number of miles the aircraft can fly, draw a ring around the departure, any enroute, and the arrival airport.³

¹ For the purposes of ETOPS operations conducted under part 135, an adequate airport is defined not as a part 139 or similar airport, but rather an airport that meets the landing limitations of 14 CFR Part 135.385 or is a military airport that is active and operational. These airports need not be listed in the operators approved operations specifications for non-ETOPS. However, if the certificate holder is authorized for ETOPS and is performing an ETOPS flight, all adequate airports used as ETOPS alternates must be listed and approved in OpSpec B342 and B344, as applicable.

² When making the applicability calculation, the selected speed(s) must be obtained from a manufacturer produced document (e.g. an airplane flight manual or operational supplement) or any other document produced by the manufacturer and approved, or accepted, by the FAA. To the extent that the information is available, the selected speed(s) should take into consideration reasonable one-engine inoperative operating altitudes (this calculation can include aircraft drift-down), and aircraft weight.

³ The operator need not add any additional time for approach or landing as this is *only* an ETOPS applicability calculation.

The radius should reflect the distance the aircraft can fly in 180 minutes in still air, with one engine inoperative, from a point located at the center of each applicable airport using the predetermined one-engine inoperative cruise speeds.

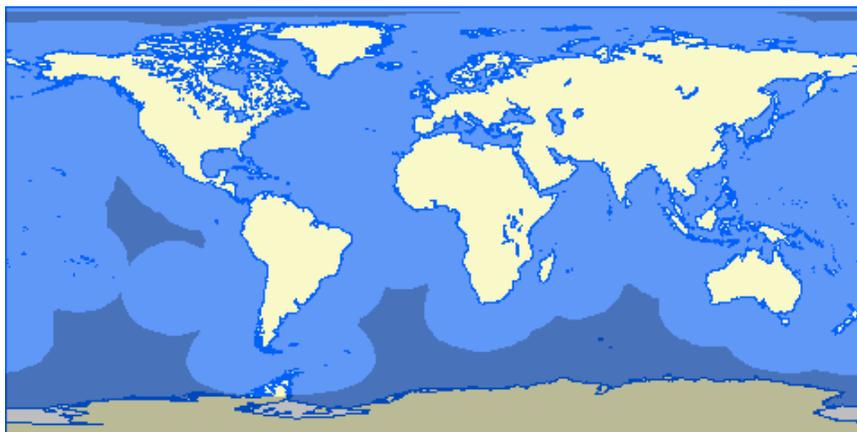
Once the rings are drawn around each applicable airport, if the proposed routing remains within the area of the circles at every point, then 135 ETOPS does **NOT** apply to your operation and you need not proceed any further with this process. However, if any point along the proposed routing is outside these circles, then ETOPS does apply and the operator must seek ETOPS authority before conducting the flight on that particular route or must plan the routing of the flight so the aircraft can remain within 180 minutes of an adequate airport using the same previously discussed criteria. Procedures for gaining ETOPS authority are contained in Advisory Circular AC135-42, as amended.

Keep in mind that the part 135 ETOPS rule is not just an “over-water” rule, but applies anytime the operator is conducting ETOPS operations *outside the continental United States, whether over land or water.*

Caution: *Caution: If you fly to/from Hawaii and the continental U.S., or any other location, the aircraft area of ETOPS applicability may apply to your operation.*

For example, a selected one-engine inoperative cruise speed of 400 knots will result in an ETOPS area of applicability of 1200 NM (ie. 400 knots x 3 hours= 1200 NM). Any flight whose route will take the airplane more than 1200 NM from an adequate airport would require the certificate holder to have ETOPS authorization. Any flight that remains within 1200 NM of an adequate airport at all times would not require the certificate holder to have ETOPS authorization.

For each aircraft, the operator should draw an inclusive map of all adequate airports depicting one-engine inoperative distance circles as shown below in figure 1. Any flight that occurs within those circles does not require ETOPS authority. Any flight or portion of a flight that is outside of those circles would require ETOPS authority.



Light shaded areas represent the area where ETOPS authority is not required.

Dark shaded areas represent the area of ETOPS applicability.

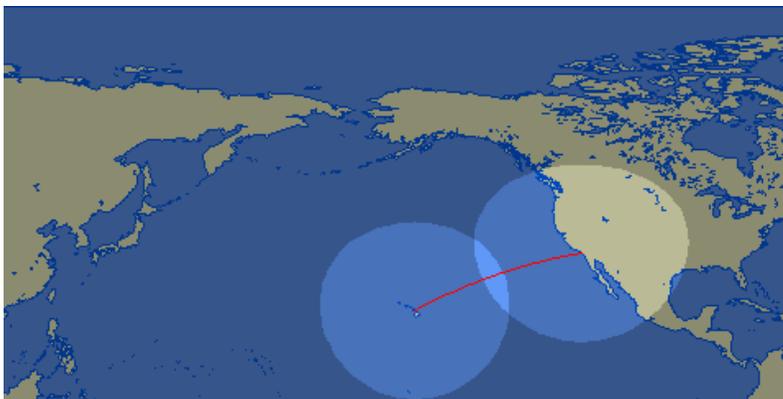
Figure 1. Individual Aircraft Area of ETOPS Applicability

Step 2: Determine if you require ETOPS authority based on your calculations in Step 1.

If your calculations in Step 1 indicate that any of your anticipated flights will be outside the “circles,” (in the area of ETOPS applicability), then you must first apply for, and receive, ETOPS authority in your operations specifications prior to that operation.

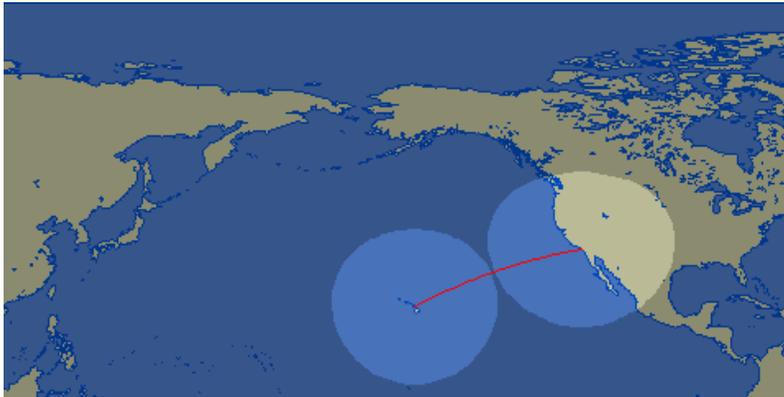
If your calculations indicate that you will remain within your non-ETOPS area at all times, then you do not need to apply for ETOPS authority. You may conduct any flight within your non-ETOPS area, provided you meet the applicable operating rules for which the flight is being conducted. In other words, once you determine that you are not ETOPS during a route-planning exercise (such as in step 1.), if during operational “pre-flight planning” you find that the airplane will be 190 minutes from an adequate airport due to winds (or other condition), you may still conduct the flight without ETOPS authorization. Since your planned flight is still within your previously calculated non-ETOPS area, you may continue to fly the flight as a non-ETOPS flight provided you meet all other applicable regulations for which the flight is being conducted.

For example, an airplane has a calculated non-ETOPS area of 1200 NM (180 minutes [3 hours] x 400 knots = 1200 NM). The certificate holder has previously made the ETOPS area calculation outlined in Step 1 and has determined the non-ETOPS area for that airplane. Based on that non-ETOPS area, it is determined that a hypothetical trip from Los Angeles, CA (KLAX) to Maui, HI (PHOG) would remain within the previously calculated non-ETOPS area.



KLAX-PHOG
Calculated Non-ETOPS Area

However, during operational “pre-flight planning” for a specific flight from KLAX to PHOG, it is determined that at the fuel load and altitude required for the flight that the airplane will be 198 minutes from an adequate airport during part of the flight, you may still conduct the flight without ETOPS authority since it geographically falls within your non-ETOPS area as originally calculated.



KLAX-PHOG

Based on operational pre-flight planning. Flight may still occur since it is still within the originally calculated Non-ETOPS Area

Another technique that can be employed is to “curve” the planned routing to remain in the non-ETOPS area of operation. While this technique may add time to a flight leg, it may also allow the flight to occur without ETOPS authorization.



KLAX-NTAA

Direct route results in operations in the ETOPS Area of Applicability and would require ETOPS authorization. By curving the route to the northwest, the route remains within the Non-ETOPS Area and can be performed without ETOPS authorization.

Note: *Regardless of how a non-ETOPS flight is planned and executed, it is important to ensure safety and compliance when conducting non-ETOPS long-range operations.*

Non-ETOPS Long-Range Operations

There are some things to consider when conducting long-range operations, even if ETOPS authority is not required:

Just because ETOPS authority is not required, that does not mean that a particular long-range flight can be conducted safely. The applicability determination related to the ETOPS rule is an academic exercise and is not a replacement for sound operational pre-flight planning. All of the usual pre-flight considerations must be addressed before any long-range flight. These include, but are not limited to:

1. Weather
2. Routing
3. Equal-Time-Point (ETP) calculations for all contingencies (engine failure/depressurization/medical emergency/etc.).
4. Aircraft maintenance status
5. Crewmember status
6. Unplanned contingencies