

**User-Generated Engine Failure Procedural List, for ETOPs-Regulated Multi-Engine Aircraft**  
(for flight in the NAT HLA and other oceanic airspace — See Chapter 8)

**1. Secure** the failing/failed engine, turn on all exterior lights, turn toward alternate (at least 30 degrees Atlantic to offset of 5 NM, 45 degrees Pacific to 15 NM offset) while establishing proper minimum sink speed.

This assumes you have the most current METAR and have chosen that alternate airport. Set transponder at 7700. We suggest use of LNAV so as to not blow through the offset while you're very busy. Ensure that one pilot is flying the airplane!

**2. Log** the time and location of failure.

**3. Communicate:**

- Notify ATC center and request a new clearance;
- Broadcast a Mayday on 121.5;
- Declare your intentions on 123.45, so other aircraft in the area know what's happening.

*Now... Pause, and consider the alternates —*

During preflight planning you have considered all aspects of the conditions when, if, and how you will go to one of the alternates you have chosen for emergencies. If your bird is multi-engine (especially twin engine), you have planned out the ETOPS issue and decided:

- If and where, with an engine failure, you are using what primary and secondary alternate, and
- Whether you will be fuel-rich or fuel-poor when you get there, and whether you are going to fly the offset to below the tracks doing the descent at the MACH speed (that was assigned and being used before the engine failure), then go direct to the alternate at minimum sink speed, or
- If you need to cross the tracks direct to the alternate at minimum sink speed because you will be fuel-poor.

That part of planning is easy-peasey (look again at Figure 8-5A in the book):

Captain Van Wormer has drawn the three large arcs showing maximum legal ETOPS distance to each alternate. See how easy it is to take a glance at that chart/master document and see the relationship, and how far it is to each alternate? The turn toward the alternate probably crosses other parallel tracks during descent. The new PBCS tracks (reduced lateral separation) are only ½-degree apart (30 NM). Use your TCAS to look for conflicts! That is where the greatest hazard is.

Since 90% of the NAT traffic is in NAT HLA airspace, strong consideration should be given to descending more quickly (at the previously assigned MACH speed) below the HLA tracks while on the offset and then cross under the traffic, and be on your way to the rim alternate — but at single-engine minimum drag speed. If the PIC

decides having more fuel in the tanks when reaching the rim alternate area is prudent, then tracks must be crossed until the aircraft is below the HLA. That requires a more immediate turn toward the rim alternate at single-engine minimum drag speed.

**IMPORTANT!**

**Study and discuss the new ETOPS regulations carefully. Realize you can always go to a different airport if needed. The ETOPS airport is for planning/dispatch purposes and another airport may be closer and/or have more appropriate weather for the emergency.**

*Therefore:*

**4. Options for alternates...** Plan on a “pocket” alternate. (A pocket alternate is a second-level alternate, planned for in case the alternate becomes unsuitable.)

— Another item to keep in mind is how the legal ETOPS distance was determined...

Note that the operators use the highest speed possible to create the greatest distance for the rim alternate. That would put the aircraft in what’s considered the heavy icing stratum of the atmosphere (15,000 ft. would be typical). But the pilot and crew would be happier spending less time at that altitude — less risk of icing up higher. With an actual engine failure, I would use single-engine max range speed. Being on the ground within the ETOPS time (usually, 120 to 180 minutes) is not a requirement. On a 767 with an engine failure, I would use 240 KT and FL 240 for a diversion. That gives a better operational altitude for only a small increase in time. For all machines, knowing the minimum drag speed is a must. There is no requirement to divert and meet any time limit.

**Again, ETOPS is the set of rules you are dispatched with. It is for planning purposes and some aspects of it (in this case, speed) may not be your best option once an engine has failed.**

**5. Coordinate** the crew for arrival, and brief the cabin crew and passengers.