

Many business aircraft operators are unknowingly using performance software that is miscalculating climb performance as described within the aircraft flight manual.

I am an ex-simulator instructor and hold a PhD in applied aeronautics. I have lectured on this subject extensively for over eight years and which is increasingly becoming known as an issue within the US.

The two software programs go by the name UltraNav and Abacus. Both of these software programs use methodologies that are not supported by any AFM or any manufacturer. Because the procedures miss or extrapolate major components of the net takeoff flight path, the results are misleading and potentially dangerous.

The most important issue the Australian government can commit to is this one underlying principle:

The operating regs, the aircraft certification regs, the manufacturers and the FAA all explicitly require an adherence to the NET TAKEOFF FLIGHT PATH profile as described within the AFM.

With that commitment, aircrews can now have the foundation to support the tougher enacting phase within their departments.

1) Review every rule of thumb, whether its taught at sim school or passed down from one member to another. Verify that it meets the requirements of the NTFP within the AFM. They're usually pretty obvious. Just looking at the takeoff profile graphic in the AFM' you'll be able to dismiss practices like "I'll never lower the nose if I lose an engine", or "maintain V2 to 12000"

2) Insist that the training center require a 4 segment approach (NTFP) to engine inop training. That means strict adherence to level-off altitude callouts and briefings.

3) Determine what procedure you are going to use to support your NTFP calculation. Whatever it is, establish training and SOPs to use the tool regularly. As I've discussed in previous submissions, the FMS is essentially worthless to you in this area (except for very low DPs). That leaves the AFM spaghetti charts, calculators and runway analysis. I think if you do this calculation in the AFM manually, you pretty quickly discard it as a viable solution. In my opinion, EFB-Pro is the only calculator that effectively answers the NTFP problem. The calculator solution and the runway analysis solution are viable solutions but they give you entirely different results with entirely different risk levels. Runway analysis is a "heavy as you get, lowest vertical and lateral clearance" solution that is still legal. It requires a dual mindset, i.e. how and who navigates with all engines operating and with one-engine inop. This requires proficiency training and familiarity with the procedure for that airport (what is the window of opportunity for taking the modified route) and your aircraft. Appropriate training on alternate requirements and selections (remember it does not guarantee placing you into the enroute structure, only barebone 35ft on a net path clearance). It may or may not be appropriate for the weather and other environmental circumstances of the flight. Again, you will be heavy (higher deck angle) and low compared to other solutions. Valid under some conditions and not for others.

The calculator gives you your weight restrictions based on following the published DP. In other words, you fly the DP whether you lose an engine or not. In my opinion this is the safest solution, easiest to follow and train for because you have the vertical and lateral safety margins that are associated with the SID which is considerably greater than that required by runway analysis and you end up in the enroute structure. Its also the easiest to go back into the books and justify your solution using the spaghetti charts and does not constantly need updating.

You will have to decide under what circumstances to use one over the other. That too can be part of your SOPs.

James Deuvall

[www.CAVUcompanies.com](http://www.CAVUcompanies.com)