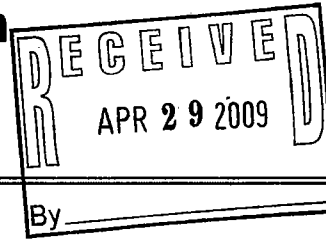




Federal Aviation Administration



Memorandum

Date: APR 29 2009

To: Environmental Protection Specialist
Seattle Airports District Office, SEA-632

From: Jason E. Pitts 
Manager, Western Flight Procedures Office

Subject: INROMATION: Friedman Memorial Airport (SUN) Feasibility of
technological improvement to approaches at the existing airport

We have conducted an evaluation of the approaches at Friedman Memorial Airport (SUN) per your April 9, 2009 memorandum request. Your questions and our answers follow.

1. Could the high minimum descent altitudes at SUN be reduced by using Automatic Dependence Surveillance – Broadcast (ADS-B) technology along with Wide Area Augmentation System (WAAS) or Local Area Augmentation System (LAAS)?

Answer: No. Instrument approach minimums are predicated on Required Obstacle Clearance (ROC). Neither WAAS nor LAAS will change the terrain features surrounding SUN that currently drive the existing minimums. ADS-B could possibly enhance arrivals and departures in terms of reduced delays and/or reduced separation between successive aircraft but it does not affect minimums.

2. Could the existing RNP approach from the south be improved to achieve lower minimum descent altitudes at SUN?

Answer: No. The lowest RNP value possible was used in determining those minimums. Any lower minimums would degrade safety and put aircraft in an unsafe proximity to terrain in the event of missed approach. While lengthy, the ground track of the existing missed approach is the only way to guide aircraft from the terminal environment back to the enroute environment in the event of missed approach. It was designed and established with criteria-driven regard to terrain, ROC, and climb gradients.

3. Could an RNP approach from the North be developed at SUN?

Answer: No. All possibilities were explored. Excessive precipitous terrain in the final approach segment makes an RNP approach from the North impossible. (See additional discussion on number 4 below.)

4. Are there any technologies that would provide a system that could facilitate operations when cloud ceilings are no lower than 200-feet above the airfield elevation and visibility is not less than one-half mile?

Answer: No. All procedures must begin in the enroute segment and tie back to the enroute segment in the event of missed approach. We evaluated all possible approaches from both the North and the South. As stated above, there are no better minimums that can be achieved from the South.

From the North, we evaluated RNAV (GPS) approaches with LNAV, LNAV/VNAV, LPV, as well as RNP minima. The only way to attempt successful development of a final approach segment was to raise the glide slope angle/final segment descent gradient to the maximum possible. A LPV approach was attempted with a 3.6 degree angle—the highest angle allowed for CAT C. The LPV was not feasible. The resulting DA/HAT of 8301/2983 made the DA higher than the 8000' MSL glide slope intercept altitude which is contrary to criteria. The LNAV/VNAV is not feasible for the same reason.

We attempted an LNAV only. Final segment angle was set at a 3.77 degree angle with the FAF at 7800 and 6.1 NM from the threshold. The MDA/HAT was 7620/2310. To achieve lower minima, a step down fix was attempted. Optimum placement resulted in a final step down to MDA angle of 4.24 degrees exceeding the final segment descent angle of 3.77 degrees. Since this is contrary to criteria, the final step down fix was removed. The intermediate segment was developed but was unable to get down to the 7800 FAF altitude due to terrain. A step down fix in the intermediate did not help due to high terrain. The final approach was extended but higher terrain in the longer final segment set the MDA higher than the FAF altitude. The LNAV was then offset 14 degrees to the east and though the MDA was lowered to 7000, the intermediate again could not get down to the 7800 FAF altitude. Also, the intermediate segment needed to be adjusted by 167 ft for precipitous terrain.

In short, there is simply no option or combination of options that will allow the approach.

Finally, the request to develop procedures at SUN from the North was submitted to the Regional Airspace Procedures Team (RAPT). The RAPT is the governing body that approves and/or disapproves all such actions. After discussion on the feasibility of the proposal and discussion on the safe and efficient use of airspace, the RAPT disapproved any further action on approaches to SUN from the North.