Synthetic Vision AC

Draft AC 23-26 Synthetic Vision and Pathway Depictions on the Primary Flight Display

Presentation to: FAA SV Workshop

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Brief Overview of the Topics Addressed in the AC

- ***Background*** – AC was developed using lessons learned on two synthetic display programs as well as experience from NASA, university, and CAMI research
- ***Intended Function*** – Applicants must clearly define the intended function of their display so that we can develop appropriate evaluation criteria

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Specific Guidance for Synthetic Vision

- ***Synthetic Terrain/Vision Imagery –*** Obstacles, runways, and landmarks should be integrated into display
- ***Terrain Alerting –*** The system should incorporate a TSO'd TAWS or the applicant should provide a terrain warning system similar to TAWS
- ***Airplane Reference Relative to Terrain –*** If the display shows that you will clear terrain, you have to clear the terrain
- ***Heading Integrity –*** Asks for consideration in the heading hazard assessment ; is the same sensor is driving both heading and terrain or are they different sources

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- ***Zero Pitch Line –*** Bold enough to see clearly but not so much that it hides other symbology
- ***Moving Map that Corresponds to and Compliments the SV PFD Display –*** Displays do not provide depth perception and tend to have limited fields of view
- ***Terrain Color and Depiction*** – Color and texture recommendations as well as the need to keep a good contrast with existing flight symbology

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- ***Minimums Audio Callout Capability*** – Applicants should provide a feature to allow pilots to select minimums and the system should then give them a “minimums” callout at that altitude
- ***Cultural Features –*** Need to connect the PFD picture to charts; runways, obstacles, and landmarks anchor the pilot’s position on a chart
- ***DEM Resolution –*** Discusses the desired approach to terrain resolution with some discussion on validation

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- ***Terrain Database Integrity –*** Should try to meet highest levels of DO-200A and DO-276
- ***Display Update Rates –*** Smooth movement, appropriate update rates for information if different, and remove synthetic display when errors are detected like frozen screen
- ***Aircraft Flight Manual Supplement*** – Should contain and explain the system's limitations
- ***Unusual Attitude Recovery*** – Should not remove the synthetic depiction and some indication of both sky and ground should always be visible on the PFD regardless of attitude

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Specific Guidance For Pathway Displays

- ***Pathway*** – Should be easy to acquire, re-acquire, and stay in; poorly implemented pathways can increase pilot workload; important characteristics include not leading the pilot below minimums; intended function; proper altimetry use
- ***Pathway Lateral and Vertical Limits*** – Important to define intended function
- ***Precision Approach Guidance*** – Consider using dual sensor or increasing the criticality of approach guidance failure
- ***Pathways and Terrain*** – Drawing order priorities; pathway should never be seen behind or continuing through terrain

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Test and Evaluation Methods and Criteria for Compliance

- ***Pilot Evaluation*** – There are 100s of features and implementations possible on synthetic displays so the only way to standardize on our criteria is to use pilot evaluations (using the same pilots)
- ***Evaluation Criteria*** – 1) meets intended function 2) cannot result in hazardously misleading information with tasks flown using the attitude indicator

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