

System Safety Assessment Issues

Synthetic Vision System Installations On Transport Category Airplanes

Presented to: SVS Workshop

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Issue Paper Summary

- **The following information is (or will be) available in an Issue Paper**

Regulations

- **25.601 (General design and construction)**
- **25.1301 (General function and installation)**
- **25.1309 (Equipment, System, and Installation)**
- **25.1529 (Instructions for Continued Airworthiness)**

25.1309

- **Current amendment 25-41**
 - AC 25.1309-1A
 - AC 25-11
- **Optional: Aviation Rulemaking Advisory Committee (ARAC) proposal (June 2002)**
 - http://www.faa.gov/regulations_policies/rulemaking/committees/arac/media/tae/TAE_SDA_T2.pdf
 - Requested by most recent new airplane TC programs, foreign and domestic.

Overarching Concern

- **“Misleading” information on PFD, or pilot misinterpretation of displayed information**
- **Safety is adversely impacted if information is followed**
- **“Misleading” means**
 - There is no succinct indication that the information or interpretation is incorrect
 - Could affect both pilots decision making simultaneously
 - The condition is not necessarily a result of a system malfunction or failure

Issues and Guidance

- **Clearly define SVS intended functions**
 - Analyze and validate (simulator or flight test) any foreseeable uses (explicit or not)
- **Assure integrity and reliability of “basic T” instrument indications as well as SV graphics**
 - AC 25-11 paragraph 4.a

Issues and Guidance

- **Egocentric terrain depiction on PFD is considered compelling**
 - Evaluate effects of misleading depiction in light of foreseeable impact on crew actions. This includes
 - Increased workload
 - Confusion
 - Correctness and timeliness of decision and action
 - Performance of pilot tasks
 - Assure integrity and availability
 - ARP4754 guidance

Issues and Guidance

- **Egocentric terrain depiction (cont)**
 - Assure terrain database to appropriate level of integrity and accuracy
 - Provide a method for maintaining the functionality and integrity of the SVS throughout the life of the installation.

Issues and Guidance

- **Validate (by analysis, simulator, flight test, etc.)**
 - SVS information is reliable and accurate
 - Assumptions of crew detection and manual intervention in case of malfunctions (pilot in the loop demonstrations)
 - Any misleading information display on one PFD would not significantly increase crew workload or impair crew efficiency
 - Loss of SV function is no worse than Major
 - Any foreseeable use (explicitly intended or not, minus deliberate misuse) of the SV depiction would not lead to a catastrophic condition