General Aviation

Requirements

Requirement ID: 613 Status Category: Completed
Requirement

Sponsor Organization: ACE Sponsor POC: Jeff Holland

Keywords: Accident Investigation, Errors, General Aviation Pilots (GA)

Title: CFIT/Terrain displays

Research Statement:
purpose of this research is to address CIT issues which were identified by the JSIT team. Research will focus on various countermeasures to include training, technology, and science-based regulations to significant reduce the occurrence of general aviation CFIT accidents.

Background:
Project Entails: Controlled flight into terrain (CFIT) accidents have been cited as one of the leading causes of fatalities for general aviation (GA) flyers. A CFIT accident occurs when an airworthy aircraft, under control of a pilot, is flown into terrain, including water or obstacles, with inadequate awareness on the part of the pilot of the impending accident. In response to the high rate of occurrence and fatalities, the FAA formed a Joint Safety Analysis Team to investigate the causes of GA CFIT accidents. The team analyzed over two hundred reported CFIT accidents for a two-year period (1996-1997). The team identified numerous casual factors that contributed to the occurrence of the accidents. Considering these casual factors, the team developed 55 intervention strategies that had some potential to mitigate the casual factors. One of the most effective strategies identified by the team was the installation and use of horizontal and vertical situation awareness displays. Manufacturers have been developing and marketing horizontal and vertical situation awareness displays for quite some time. The quality of the displays varies significantly. However, with the more recent advent of less expensive and higher quality color displays, there has been a significant increase in the quantity and sophistication of these systems. Unfortunately, the designs seem to be more driven by intuition, supposition and marketability than by data. The effectiveness of some of these systems to prevent CFIT accidents is at best questionable.Research needs to be conducted to determine the minimal amount and type of information that should be presented to develop adequate situation

awareness to avert CFIT related accidents. There are a number of key issues that need to be addressed: „h Horizontal Situation Displays versus Vertical Situation Displays versus Both „h Benefits/Detriments for 2-D & 3_D Displays „h Minimum Display Size „h Minimum Level of Detail and Quality of Terrain Depiction, „h Type and Form of Displayed Position-Terrain Information „h Color Application Philosophy (darker colors for lower elevations), „h Desired Visual/Audio Alerts. „h Most Appropriate and Effective Cues to Alerting Pilot of an Impending Situation „h Methods of Operation „h Appropriate Use of Such SystemsThe information from this research could be used by the CFIT JSIT to weigh and prioritize implementation strategies. It could also serve as "best practices" guidance to manufacturers of position-terrain awareness systems, it could provide a measure to compare new systems against in terms of best practices and undesirable features.

Output:

Regulatory Link:
a. AOA (FAA) Strategic Plan (1998-2003) - Mission Goal: Safety. By 2007, reduce U.S. aviation fatal accident rates by 80 percent from 1996 levels (pg. 13). Focus areas: Accident Prevention, General Aviation Initiative addresses CFIT, weather, runway incursions, loss of control, and decision-making (pg. 14).b. FAA FY2000 Performance Plan - Reduce the General Aviation Fatal Accident Rate (pg.16).c. AVR Performance Plan - Goal B-1, reduce fatal aviation accident rate attributed to human error.