

## **February 20, 2003 WG4 Telecon**

### ***Participants:***

**Jonathan Hammer (MITRE CAASD)**

**Steve Koczo (Rockwell Collins)**

**Joel Wichgers (Rockwell Collins)**

**Sheila Mariano and Paul Lipsky (FAA, Seattle)**

**Stu Searight (FAA)**

**Tom Foster (TRIOS)**

**Michael Petri (FAA)**

**Bob Manning (DoD)**

**Ann Drumm (MIT LL)**

**Bob Passman (FAA)**

**Lee Etnyre (UPS-AT)**

**Robert Duffer (FAA AIR-130)**

**Dara Gibson (FAA AIR-130)**

**Jim Duke (ALPA)**

**Connie Kleissas (ALPA)**

**Steve George (FAA AIR-130)**

**Larry Bauchman (Johns Hopkins)**

**Gene Wong (FAA)**

**Jerry Anderson (FAA)**

### **Agenda:**

1) Review of Conflict Detection Fault Trees – Lee Etnyre

#### ***Lee Etnyre – Conflict Detection Fault Tree Review***

We started with Page 13 – analysis of current GA visual acquisition.

Considered action (more than 60 sec before CPA)

Evasive action (less than or equal to 60 sec before CPA)

Notion of Collision pairs.

Lee determined that the average of  $1.5e-7$  collisions per flight hour represents the historical number of actual collisions over a 12 year history (for GA).

ICAO model actually allows greater percentage of collisions.

Jonathan noted that the source of the ICAO model is the Manual of Airspace Methodology for the Determination of Airspace Separation Minima.

Steve noted that “luck factor” seems to get a lot of credit, with aircraft taking action not getting much credit.

Sheila asked about why “considered” action is shown at same level as “evasive” action - due the sequential timing of the two. It was noted that the fault tree does not factor in time.

Lee – the probabilities are taken directly from the ICAO model.

Lee then described the fault tree when CDTI and alerting (i.e., CD application) is an available application (page 2 fault tree, and subsequent sub-trees).

Concerning the top-level probabilities of 1) visual acquisition (page 13), 2) enhanced visual acquisition, i.e., with CDTI but no alert (page 1), and 3) visual acquisition with CDTI and alerts, i.e., with CD application – Lee made the comparison by using very conservative numbers for continuity, integrity, etc. to show the minimum performance that can be tolerated and still provide equivalent performance. Lee also has more realistic numbers for continuity, integrity, etc., that he analyzed and will publish to determine the top-of tree performance.

Sheila would like FAA concurrence on the fault tree method being used. This will be discussed at a separate telecon.

It would be helpful for AIR to review the CD fault trees to ensure they are being addressed adequately. **Bob Passman took the action to assign someone to assist with this.**

Tom F. – One of the big challenges on TCAS was the issue of induced hazards. This should be considered for CD. It was noted that there are differences between TCAS and maneuvering based on OTW view of traffic.