



FEDERAL AVIATION ADMINISTRATION
AAR-100 (Room 907)
800 Independence Avenue, S.W.
Washington, D.C. 20591

Tel: 202-267-8758
Fax: 202-267-5797
william.krebs@faa.gov

September 4th, 2002

From: Dr. William K. Krebs, (AAR-100), General Aviation Human Factors Program
Manager

To: Ms. Anne Graham (AFS-820)

Subj: Low Visibility and Visual Detection

Ref: (a) General Aviation TCRG February 21, 2002 meeting minutes
(b) Communication between Ms. Graham and Dr. Krebs, 07/23/02
(c) General Aviation requirement entitled "Low Visibility and Visual Detection"

1) Per references (a) and (b), the General Aviation TCRG considered the "Low Visibility and Visual Detection" (ref: c) an important requirement for Flight Standards. The requirement's objective is to "develop research and educational materials that will help reduce accidents caused by 4 related problems: 1) continued flight into reduced visibility, 2) failure to detect targets, 3) failure to utilize resources, 4) need for improved education and training for problems 1-3."

2) The project will be executed as follows:

Phase I tasks:

- i. Perform a comprehensive literature review to determine whether there is sufficient research and educational materials to create a visibility and detection training aid. The literature search will include but not limited to military technical reports and other Department of Defense technical reports.
- ii. Image collection, database search and analysis of scenes. Assemble simulator apparatus and program visual scenes.
- iii. Begin experiments:
 - Experiment 2: Thresholds for terrain detection
 - Experiment 3: CFIT under variable contrast and blur
 - Experiment 4: Target detection and contrast masking
 - Experiment 5: Strobe lighting and contrast masking

- iv. Quarterly (December, March, July, and September) research progress status reports
 - Informal e-mail reports from the AAR-100 general aviation human factors program manager to Anne Graham (AFS-820)
- iii. FY03 annual report summarizing year's activities by grantee. This annual report including other human factors general aviation projects sponsored by general aviation TCRG will be electronically submitted to the committee.
 - Grantee will submit an annual report using AAR-100's Productivity Report website (<http://www.hf.faa.gov/report/>) to the AAR-100 general aviation human factors program manager.

Phase II tasks:

- i. Complete experiments 2 thru 5.
- ii. Begin data analysis.
- iii. Defined milestones (if possible, milestones will be determined)
 - Note: a grantee is not responsible to adhere to defined milestones.
- v. Quarterly (December, March, July, and September) research progress status reports
 - Informal e-mail reports from the AAR-100 general aviation human factors program manager to Anne Graham (AFS-820)
- iv. FY04 annual report summarizing year's activities by grantee. This annual report including other human factors general aviation projects sponsored by general aviation TCRG will be electronically submitted to the committee.
 - Grantee will submit an annual report using AAR-100's Productivity Report website (<http://www.hf.faa.gov/report/>) to the AAR-100 general aviation human factors program manager.

Phase III tasks:

- i. Complete analysis and write-up of experimental data.
- ii. Produce educational materials including informational presentation and interactive training software.
- iii. Defined milestones (if possible, milestones will be determined)
 - Note: a grantee is not responsible to adhere to defined milestones.
- vi. Quarterly (December, March, July, and September) research progress status reports

- Informal e-mail reports from the AAR-100 general aviation human factors program manager to Anne Graham (AFS-820)
- v. FY05 annual report summarizing year's activities by grantee. This annual report including other human factors general aviation projects sponsored by general aviation TCRG will be electronically submitted to the committee.
 - Grantee will submit an annual report using AAR-100's Productivity Report website (<http://www.hf.faa.gov/report/>) to the AAR-100 general aviation human factors program manager.

Deliverables:

- i. Final report containing
 - Deliver educational materials that will help reduce accidents caused by problems of visibility in the aviation environment in the air and on the ground.
 - Educational software will include:
 - lessons on the underlying causes of poor visibility and target detection.
 - Microsoft Flight Simulator software will be augmented to allow a pilot train in more realistic flying circumstances, complete with distractions from unforecast weather, equipment failures, and navigation demands.
- ii. Final Report formatted to permit development of appropriate guidance material by AFS-800
 - AFS-800 is responsible in submitting defined format to the program manager for aviation maintenance human factors by January 2005.

Schedule:

Phase I Tasks: FY03
Phase II Tasks: FY04
Phase III Tasks: FY05
Final Report: FY05 (September 2006)