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From: Dr. William K. Krebs, Aviation Maintenance Human Factors Program Manager  
To: Airworthiness TCRG

Subj: AVIATION MAINTENANCE HUMAN FACTORS FOURTH QUARTER '02  
REPORT

Ref: (a) Aviation maintenance human factors execution plans

1) Per reference (a), the fourth quarter report for each aviation maintenance human factors project is listed below.

- a) An Evaluation of Broadband Applications to Aircraft Maintenance Safety.  
Researcher received funds on 9/20/02 to begin addressing the first year milestones.

*All indications indicate that this project is on track to complete year 1 milestones as planned.*

- b) Vision Testing Requirements for Certain Persons Maintaining and Inspecting Aircraft and Aircraft Components. Phase I report is almost complete.  
Researchers will submit report to AAR-100 Aviation Maintenance Human Factors Program Manager on October 15<sup>th</sup>, 2002.

*All indications indicate that this project is on track to complete Phase I milestones as planned.*

- c) Language Barriers Result in Maintenance Deficiencies. Considerable literature on communication errors has been collected, from aviation and elsewhere. A comprehensive model is being developed to place maintenance communication errors in context, enabling the literature to be applied to those errors of primary interest. An analysis of language-related errors from the ASRS, National Transportation Safety Board (NTSB) and AIDS (UK) databases has been completed. About 700 records met the criteria. Preliminary error taxonomies have been located in the literature and will be revised to give a background for a maintenance/language error model and taxonomy. Contacts have been located for

possible site visits, but none have been scheduled at this time. Significant milestones include:

- The literature on communications errors has been summarized and about 700 reports from ASRS and other sources entered into a database.
- Error taxonomies have been located in the literature and will form the basis for our data collection efforts.

*All indications indicate that this project is on track to complete year 1 milestones as planned.*

d) Using Technology to Support Inspector Training. Researcher conducted a detailed literature review of the visual inspection and maintenance literature as it pertains to aviation. Developed contacts for conducting GA site visits and visited local sites. Planned preliminary site visits to GA repair facilities in Oklahoma City and St. Louis in September and October. Significant milestones include:

- Identified team of researchers who will participate in the effort. Established contacts with local GA Facilities
- Conducted a comprehensive literature review of visual inspection, maintenance literature
- Developed a database of literature. Database available for public use through the following web-link (screen shots included in a separate file):
  - [http://www.ces.clemson.edu/~agramop/cur\\_act.htm](http://www.ces.clemson.edu/~agramop/cur_act.htm)
- Conducted preliminary site visits to local GA facilities in Greenville, Greer and Oconee
- Develop task analysis data collection forms

*All indications indicate that this project is on track to complete year 1 milestones as planned.*

e) Review Amateur-Built Aircraft Accident/Incidents. Extended the general aviation (GA) database to 2001 for all maintenance-related accidents. Converted the GA database up to 2001 into SPSS. The researchers are compiling literature on aviation maintenance models of human error. Significant milestones met:

- A research protocol was completed and approved by the Institutional Review Board of the FAA, which is located at CAMI. Obtaining this approval shows compliance with federal government and FAA standards on conducting research with human participants or archival data.

- The Amateur-built database was extended through 2001 reports completed by the National Transportation Safety Board.
- The database was converted into SPSS so that (1) analyses could be completed and (2) AAM-520 could respond to future queries in a timely manner
- Analyses were completed comparing airframe time, time since last inspection, phase of operation for both kit and non-kit built amateur built aircraft.
- On September 30<sup>th</sup>, the researchers will brief the sponsor on the following results:
  - Taxonomy of M-R causes\* and frequency of causes,
  - Causes by fatalities and injuries,
  - Airframe time\*\*\* by fatalities and injuries,
  - Time since last inspection by fatalities and injuries,
  - Phase of operation by fatalities and injuries

*All indications indicate that this project is on track to complete year 1 milestones as planned.*