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

To: Les Vipond (AFS-300)

Subj: Language Barriers Result in Maintenance Deficiencies Execution Plan

Ref: (a) Airworthiness TCRG March 5-6, 2002 meeting minutes

(b) Aviation maintenance requirement entitled “Determine Whether Language Barriers Result in Maintenance Deficiencies” – submitted by the Department of Transportation Secretary (1/29/02).

1) Per reference (a), the Airworthiness TCRG ranked the “English Language” (ref: b) as the number two FY02 aviation maintenance human factors priority. The requirement’s objective is to determine whether the growing number of maintenance and inspection personnel who possess a wide range of non-native English reading, writing, and speaking abilities are more inclined to commit an error than personnel whose native language is English.

2) The project will be executed as follows:

Phase I tasks:

- i. Comprehensive literature bibliography
- ii. Determine frequency and types of errors attributable to language for maintenance and inspection personnel who work in maintenance facilities and third party repair stations.
 - Maintenance facilities may be included in the analysis. The grantee will determine whether there is sufficient documentation from previous studies (refer to Drury) to warrant further investigation of maintenance facility error rates. The program manager for aviation maintenance human factors recommended that maintenance facilities be included in the analysis to serve as the baseline to compare types of errors between maintenance facilities and third party repair stations to determine whether non-native English personnel have a higher propensity to commit errors or are these errors committed at the same rate between non-native and native English personnel.

- iii. Develop a comprehensive list of potential language error types and patterns as well as provide a better estimate of the different type of errors and rates.
- iv. 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 program manager aviation maintenance human factors to Les Vipond
- vi. Phase I report (to be published in the AAR-100 aviation maintenance human factors FY03 program review).
 - Grantee will submit an annual report using AAR-100's Productivity Report website (<http://www.hf.faa.gov/report/>)

Phase II tasks:

- i. If maintenance deficiencies are attributed to language (results of phase I), phase II will develop strategies to mitigate these errors. For example, changing the maintenance worker (e.g. language education, coaching, job restrictions) or changing the task (e.g. by using Simplified English, by translation of all documents, by bilingual supervisors explaining and monitoring, or by job aids such as glossaries).
- ii. Defined milestones (if possible, milestones will be determined)
 - Note: a grantee is not responsible to adhere to defined milestones.
- iii. Quarterly (December, March, July, and September) research progress status reports
 - informal e-mail reports from the program manager aviation maintenance human factors to Les Vipond
- iv. Phase II report (to be published in the AAR-100 aviation maintenance human factors FY04 program review).
 - Grantee will submit an annual report using AAR-100's Productivity Report website (<http://www.hf.faa.gov/report/>)

Deliverables:

- i. Final report containing
 - a. Quantitative data identifying patterns of language related errors and magnitude estimates for current and future problems associated with third-party repair station maintenance deficiencies resulting from language barriers.

- b. Recommendations in reducing third-party repair station maintenance deficiencies by changing maintenance personnel qualifications or changing maintenance tasks and/or procedures.
 - c. Recommendations will address maintenance documentation issues, and personnel issues (e.g. selection and training)
- ii. Final Report formatted to permit development of appropriate guidance material by AFS-300
 - a. AFS-300 is responsible in submitting defined format to the program manager for aviation maintenance human factors by January 2004.

Schedule:

Phase I Tasks: FY02/FY03

Phase II Tasks: FY04

Final Report: FY04 (September 2004)