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From: General Aviation Human Factors Program Manager, ATO-P R&D HF  
To: General Aviation Human Factors TCRG, (POC: Susan Parson, AFS-800)

Subj: How Pilots Use Weather Information Execution Plan

Ref: (a) General Aviation TCRG February 2<sup>nd</sup>, 2005 meeting minutes  
(b) General Aviation requirement entitled "How Pilots Use Weather Information"

1. Requirement Background: The Federal Aviation Administration (FAA) Flight Standards Service (AFS) General Aviation and Commercial Division's mission is to enhance aviation safety, provide the general aviation community and FAA field workforce with responsive, customer-driven services, and support technological advancement of general aviation. There are currently numerous general aviation (GA) safety programs underway in the FAA and the GA industry, and the FAA-industry General Aviation Joint Steering Committee (GA-JSC) has focused heavily on ways to mitigate accidents involving weather and pilot decision-making.

AFS-800 needs research materials guidance to help mitigate GA fatal accidents related to weather, with special emphasis on weather-related decision-making by GA pilots. Specifically, the FAA seeks to respond to GA-JSC recommendations in these areas by developing a *Pilot's Preflight Guide to Preflight Planning, Weather Self-Briefings, and Weather Decision-Making*. The purpose of this product is to give GA pilots a practical weather evaluation and decision-making tool for use in their flight operations. Although there are numerous FAA and industry products that address the subject of preflight planning, weather, and decision making, they are not integrated into a single product that addresses and integrates the various components of pilot decision-making on weather (e.g., sources of information, evaluation techniques, single pilot resource management (SRM), situational awareness, risk management techniques).

2. Project Objectives: Provide a thorough and comprehensive discussion of available weather and weather-decision-making resources, to include Internet sources, flight planning software, weather computer terminals at fixed base operators (FBOs), direct user access terminals (DUATS), weather datalink technology (portable and installed), flight service station (FSS) briefings (telephone and walk-in), inflight weather

updates, and any other sources that pilots use for weather information and decision-making.

3. Research Questions to be Addressed: specific research questions to be addressed include, but are not limited to:

To the extent that it is feasible to do so, the researcher should distinguish between the “ideal” and the “actual” (i.e., what pilots actually do) in each area.

- a. A review of research literature on this topic.
  - b. A comprehensive list of available weather data sources, plus the top five sources that GA pilots claim to consult most frequently when making preflight and en route weather decisions. This list can include both “packaged” sources (e.g., standard telephone weather briefing by Flight Service) and specific products (e.g., pilot uses Internet to review selected METARs and TAFs).
  - c. A narrative summary of how GA pilots evaluate (analyze) the information they obtain from these sources. For example, how much time do they generally spend looking at the weather when planning a GA flight? Do they give more weight to certain elements of a briefing, and/or to certain specific products (e.g., convective SIGMET)? Do pilots have a specific analytical and evaluative process (e.g., start with “big picture” and drill down, or start with departure forecast and work toward the big picture)? How many alternate destinations do they evaluate for weather? How much time do they spend considering these alternatives, relative to weather at the planned destination? Is the evaluative process specific to individuals, or are there common features in how GA pilots evaluate information?
  - d. A narrative summary of how pilots use both the raw data and analysis (including FSS analysis as well as self-briefing analysis) to make decisions about the flight. For example, what, if any, elements of weather information (e.g., PIREP on icing) lead to an automatic “no go” decision? What kind of weather information might lead to a decision to divert or, alternatively, to continue the flight? This summary should explicitly include an analysis of pilots’ decision-making behavior and the extent to which “mission” goals influence weather analysis and decision-making.
4. Tasks and Schedule:
    - a. Complete literature search (May 2005)
    - b. Complete comprehensive list of available weather data sources (May 2005)
    - c. Complete top five sources that GA pilots claim to consult most frequently when making preflight and en route weather decisions (May 2005).
    - d. Complete narrative summary of how GA pilots evaluate (analyze) the information they obtain from these sources (August 2005).
    - e. Complete narrative summary of how pilots use both the raw data and analysis (including FSS analysis as well as self-briefing analysis) to make decisions about the flight (August 2005).

- f. Final report summarizing all analyses of how pilots use weather information (November 2005)
5. Deliverables:
- a. Provide annual and interim reports as well as briefings addressing how pilots use weather information to the AFS-800 and contract monitor.
  - b. A final report containing a summary of all analyses of how pilots use weather information during the duration of the project. The Final Report will be formatted to permit development of appropriate guidance material by AFS-800.
  - c. Text (tasks a-e) will be included in AFS-800's *Pilot's Preflight Guide to Preflight Planning, Weather Self-Briefings, and Weather Decision-Making* handbook.
  - d. Quarterly (December, March, June, September) research progress status reports: Informal e-mail reports from the program manager general aviation human factors to General Aviation Human Factors TCRG.
  - e. Annual five page report
  - f. Program Review: investigator will participate in the annual program review.
6. AFS-800 Responsibilities
- Make available personnel and resources to investigator
  - Implement project deliverable into the *Pilot's Preflight Guide to Preflight Planning, Weather Self-Briefings, and Weather Decision-Making* handbook.
7. Communication:
- Monthly telephone meetings will be conducted between the investigator, ATO-P R&D HF representative, and AFS-800 representatives. The purpose of the telephone meetings will be to monitor the project's progress and to obtain sponsor feedback.
  - The researcher will meet sponsor representatives three times FY05Q3, FY05Q4, and FY06Q1. Unless directed by ATO-P R&D HF, primary location of meeting location will be FAA headquarters.

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