Meeting Objectives

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The Federal Aviation Administration is sponsoring today's meeting as part of a broad effort to enhance communications between the FAA and industry as well as among different groups concerned with human factors and personnel issues in aircraft maintenance and inspection. Our Human Factors R&D Program within the FAA requires a continuing flow of information from the outside world if the program is to be effective. The FAA has held a number of meetings concerning maintenance and inspection, including one last year which specifically addressed human factors issues - a meeting attended by many of you here today. These meetings are a key part of our communications process and we plan to continue them into the future.

An important part of the communications process is the identification of human factors R&D requirements. We want you to tell us what you think we should be doing in FAA. What kinds of problems should we address in our R&D program? For our program to be successful, we must target the R&D activity toward industry needs. That is where the payoff will be. To this end, all of the presenters in the program, with one exception, are from outside the FAA.

The catalyst for the FAA's current program dealing with aircraft maintenance and inspection was the Aloha Airlines accident in April 1988. Shortly after this accident, the FAA convened an international conference at which human factors were identified as a crucial issue underlying effective maintenance and inspection. The more we looked at problems in maintenance operations, and particularly those of aging aircraft, the more we saw human factors as some part of the problem. At this international conference, the FAA Office of Aviation Medicine was assigned responsibility for the development and management of a research program concerning human factors in aircraft maintenance and inspection.

As one of our first activities, in October 1988 we held our first human factors conference with a wide spectrum of industry, Government, and academic interests in attendance. The purpose of the meeting was to develop a listing of human factors issues and to establish priorities whereby these issues might be addressed by our R&D program.

In developing the Human Factors Research Program, we believed that a major accomplishment would be to provide compendiums of information that would be useful to various aspects of the aviation maintenance industry. We hope to provide information of value to those involved in maintenance training, people responsible for establishing and monitoring workplace conditions, and those who prepare written documents to support maintenance work.

As another goal, we want to identify experts who can help industry and the FAA incorporate proper human factors concepts in their activities. Target groups for our R&D activity include aircraft designers, individuals working in the manufacturing environment; manufacturers themselves; air carriers and their maintenance operations; repair stations; and of course our own people within the FAA.

A number of research topics for our R&D effort have been identified, many developed through our first conference held last year. At that meeting, information transfer/communication was identified as the most important issue facing the aviation maintenance community. Training also is a crucial issue and is one which requires careful review if we are to develop a training strategy which best supports present maintenance needs. As a start toward optimum working environments for maintenance personnel, we are sending people to various air carrier maintenance sites and looking at environmental parameters such as lighting, noise level, and other factors which might be either helpful or detrimental to the process. Other topics of concern for our program include the kinds of equipment and job performance aids required for maintenance and inspection as well as studies of vigilance and variables which might lead to boredom and complacency on the job.

A number of initiatives already are underway as we build our research program. As part of the FAA's aging fleet evaluation program, we send a human factors specialist on each site visit and use that as an opportunity to collect information concerning work environments and working conditions. We also are sending research teams to conduct task analyses of maintenance activities at different air carriers. To date the teams have visited Pan Am facilities at Kennedy and Miami airports. A number of other visits are planned both for air carriers and for repair stations.

Another activity just starting is a study of the application of intelligent tutoring systems and computer-based instruction in maintenance training. These interactive technologies have developed considerably in recent years and now may be of real value as systems to improve the effectiveness of maintenance training.

We plan to use the findings of our various research activities to develop an information source, a handbook available to industry and others concerned with maintenance. At this time we do not know exactly the contents of this handbook or the form which it might take. Ultimately it might be a printed handbook supported by such things as video tutorials and other types of machine oriented media. But, again, I want to emphasize that our product is going to be information.

While we do not have a firm set of chapters for the Human Factors Handbook at this time, some chapters that we anticipate might be included will cover:

Information transfer/communications

Work environment

Selection/training

Equipment/job performance aids

Inspection methods

Human limits

Problems of vigilance/boredom/complacency

Reliability of NDI activities

Just as the present meeting focuses on matters of "information exchange and communications," we plan another meeting for June 1990 which will focus on "training issues." At that time we will discuss some of the initiatives I have just described, such as intelligent tutoring systems, computer-based instruction, and other new training techniques. The June conference will be held under auspices of the FAA Technical Center in Atlantic City, New Jersey. Detailed information concerning this meeting will be available in the near future.

The Human Factors Research Program I have just described is organized as shown in Figure 1. The top of this figure indicates that we are seeking input from industry, the Federal Government, and any others who can contribute. Within the Government, we plan to deal not just with FAA facilities but to include the Department of Defense (DoD), the National Aeronautics and Space Administration (NASA), and others such as the Nuclear Regulatory Commission (NRC), with expertise and information of value. Private sector groups, such as professional and technical societies as well as academic institutions, also will be invited to contribute. We also will use our own in-house activity at the Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. Behavioral scientists from CAMI will be responsible for the aging fleet evaluation visits. We also expect to have the NASA Ames Research Center as well as others connected with the Space Shuttle program as contributors. Finally, there are of course the industry people who are most conversant with the issues of aviation maintenance and its problems.

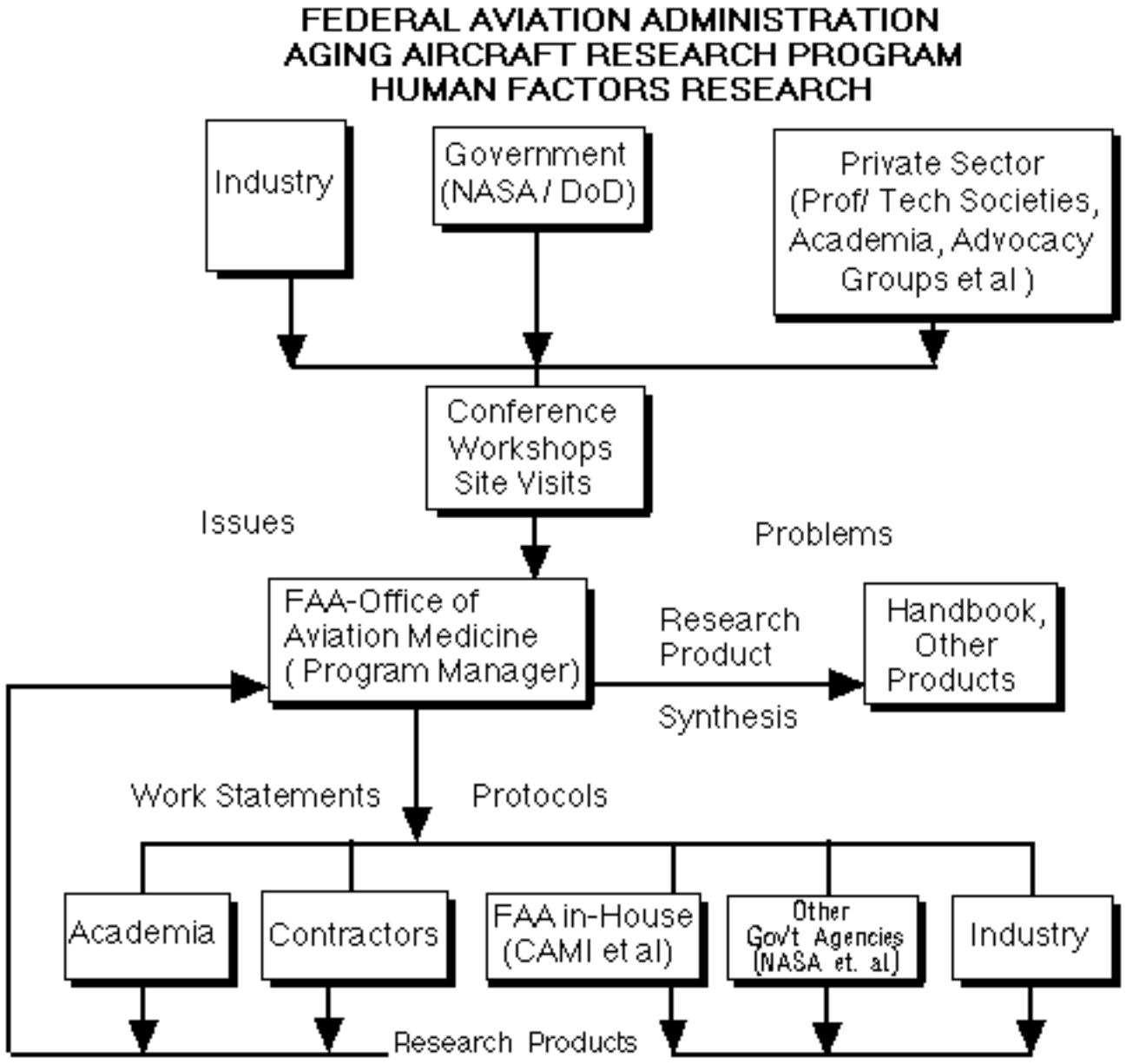

Figure 1

The Human Factors Research Program will draw on all of the above sources as we prepare our handbook and other information products. Within the next year, I hope that we can begin to make some of these products available to industry and thereby contribute to aviation safety through improvements in the efficiency and effectiveness of aircraft maintenance and inspection.