

Background

Under sponsorship from the [FAA](#) Flight Standards Service, the FAA Office of Aviation Medicine has created a successful research program to investigate applied issues in human factors in aviation maintenance and inspection. This section reviews the formation of the research program and describes its basic structure for fulfilling its mission and goals, as listed in this strategic program plan. The section concludes with a discussion of program funding levels and the requirements for increased funding.

Formation of the Program

Responding to industry concerns, the Aircraft Maintenance Division of the Flight Standards Service, initiated human factors-related research beginning in 1987. A year later, the Aviation Safety Research Act of 1988 mandated research "...to develop a better understanding of the relationship between human factors and aviation accidents and between human factors and air safety..." The Aloha Airlines accident also occurred in 1988, prompting increased congressional and public concerns resulting with increased research funding. By 1989, the program was formalized with the formation of the [FAA](#) Scientific Task Planning Group (STPG). The STPG provided direct maintenance industry planning and involvement with the program. The *National Plan for Civil Aviation Human Factors* was developed in 1990 and formed a core foundation for the research program. The National Plan has been a major influence driving the maintenance human factors research and development program during the nineties.

Overview of the Research and Development Process

The research program interacts with many national and international groups to provide timely and needed research products. Figure 4 illustrates the overall process by which requirements are turned into products. Note that the research program is responsive to both government and industry requirements. Government requirements come from within the [FAA](#) (G-7 and Aviation Rule Making Advisory Committees [ARACs]) and from other governmental organizations, such as the National Transportation Safety Board (NTSB), the Department of Transportation (DOT/FAA Aviation Safety Action Plan - Zero Accidents...A Shared Responsibility), the White House (Commission on Aviation Safety and Security), the Joint Aviation Authority (JAA), and the International Civil Aviation Organization (ICAO). Industry requirements come from organizations such as the Air Transport Association (ATA) and its committees (e. g., Human Factors, Maintenance Training, Engineering and Maintenance, and Technical Information Communications Committee) as well as the Aviation Technician Education Council (ATEC), Professional Aviation Maintenance Association (PAMA), the International Air Transport Association (IATA) and the aviation groups of the Society of Automotive Engineers (SAE). In addition, the International Association of Machinists and Aerospace Workers (IAM & AW) has been a very active party in many of the research activities. After internal review and requirement prioritization, research is then executed via university grants, program contracts, and other vehicles.

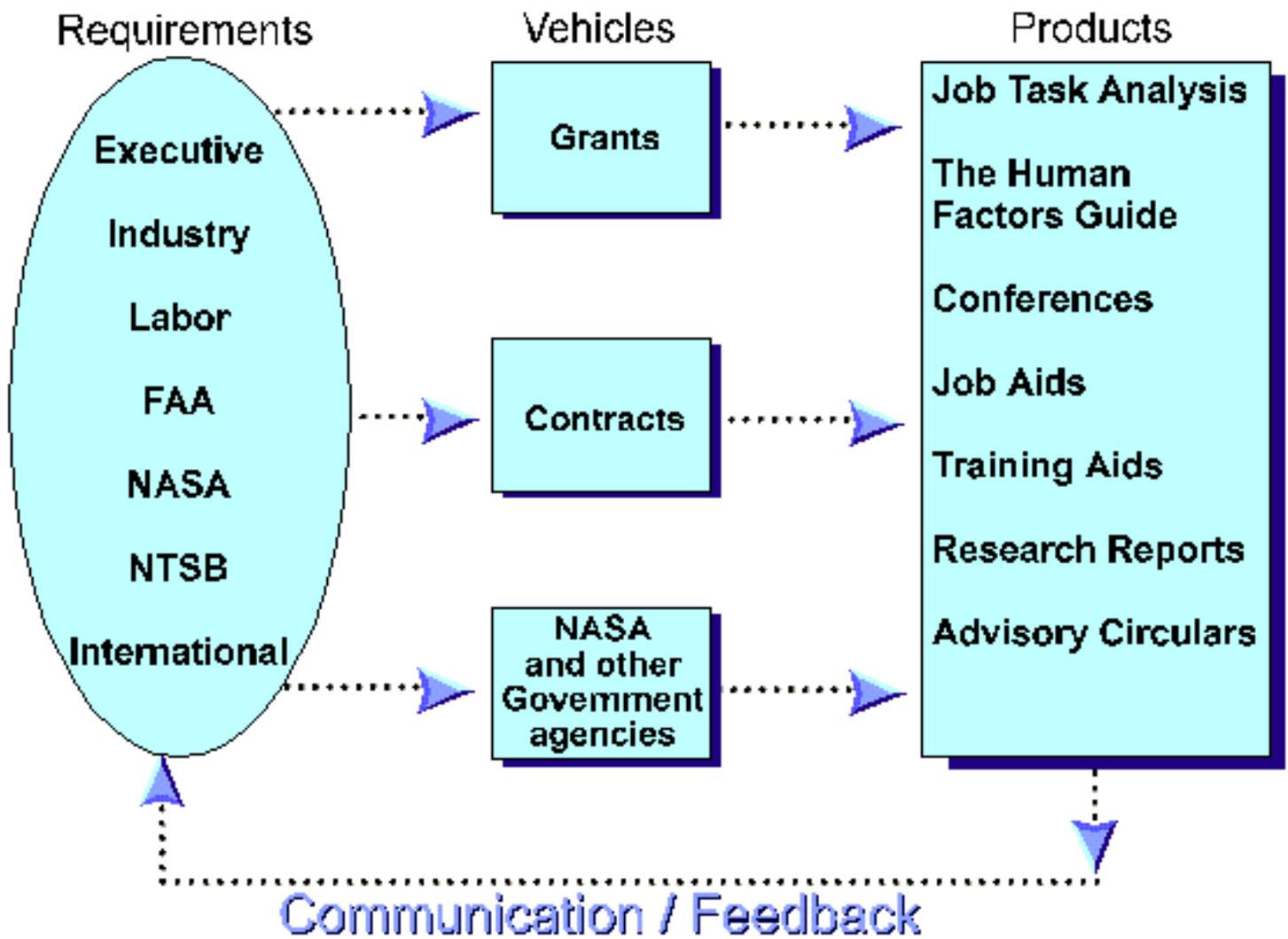


Figure 4. Research and Development Process

A field laboratory approach is used to complete research tasks, emphasizing on-site observation, measurement and testing at airline maintenance facilities. The products developed and evaluated by the research program include data to support regulatory efforts, Advisory Circulars and informal guidance material, prototype job aids and training systems. These products are communicated to industry, the military, and others via conferences and publications. The [FAA](#) human factors program distributes all of its research reports and software deliverables to industry via CD-ROMs and the internet. [Table 2](#) summarizes the widely distributed program products.

Table 2. Summary of Information Products

Communication Mechanism	Quantity
Conferences on Human Factors Issues in Aviation Maintenance and Inspection	Approximately one conference per year With an average of 145 attendees
CD-ROMs distributed to industry (annually for past five years) <ul style="list-style-type: none"> <li data-bbox="228 537 1089 642">Human Factors Issues in Aircraft Maintenance and Inspection (1993-1997) <li data-bbox="228 684 1089 737">Electronic Human Factors Guide <li data-bbox="228 789 1089 842">Aircraft Maintenance Team Trainer <li data-bbox="228 894 1089 947">Web site (hfskyway.com) 	<ul style="list-style-type: none"> <li data-bbox="1105 537 1500 590">> 10,000 copies <li data-bbox="1105 684 1500 737">> 6,000 copies <li data-bbox="1105 789 1500 842">> 3,000 copies <li data-bbox="1105 894 1500 1083">the web site has been accessed over 1 million times since January 1997
Research Reports/Presentation/Publications (1989-1997)	> 400 in multiple copy

Finally, the R, E&D process relies on a feedback loop, shown in [Figure 4](#). Field evaluations of products and techniques provide feedback that is used to guide future work as well as information on the usefulness of products. In addition, the program seeks feedback from industry on completed research. Such feedback provides additional or adjusted requirements for future research.

Program Funding

Funding for the Human Factors in Aviation Maintenance and Inspection research program has traditionally been at relatively low levels, when compared to flight deck human factors. The pie chart in [Figure 5](#) shows that in FY 1997, aircraft maintenance research received 12% of the funding at a total of \$1.265 M. In 1998 the \$1.3M funding is a reduction representing 10% of the budget.

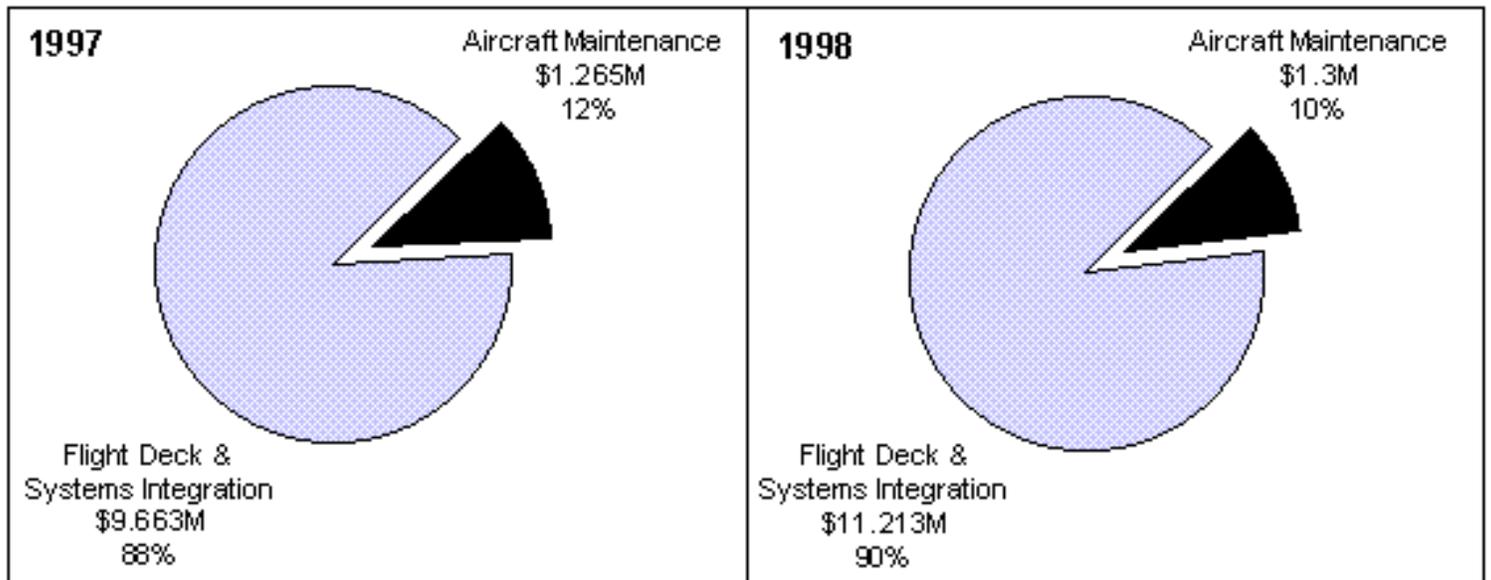


Figure 5. FY 97 & FY 98 Human Factors Funding for Flight Deck vs. Aircraft Maintenance

* FY 98 funding for the Human Factors in Aviation Maintenance and Inspection research program is \$1.3 M. This funding represents 4.6% of the total FAA budget of \$28M for all human factors research.

The White House, [NTSB](#), and [DOT](#) all agree that the time has come for maintenance human factors to receive additional funding to address important safety concerns. In 1995, the DOT/[FAA](#) Aviation Safety Action Plan (Zero Accidents...A Shared Responsibility) recommended that the Flight Standards Service devote additional research effort towards human factors for aircraft maintenance, focused on error detection and prevention. The 1997 White House Commission on Aviation Safety and Security Report identified numerous opportunities to improve airline safety, among them, extending the areas of FAA current human factors research. The research program needs appropriate funding to respond to the increasing requirements for aircraft maintenance human factors research.