Chapter 3. Scope and Placement of Aviation Maintenance Human Factors Programs

Aviation Maintenance Human Factors Programs are developed to effect changes within a system. Whether the program is undertaken to reduce human error, decrease cumulative trauma, increase awareness, or improve efficiency, it should be broad in focus. Systems are dynamic by nature. When a change, even a small change, is made, it has an effect on the entire system. For example, one way to lessen the likelihood of human error in a given task is to train the people involved in a certain way. Other ways to lessen the likelihood or error might be to change the following:

- The task elements
- The motivation to do the task
- The number of people used to do the task
- The postures people take while doing the task
- The amount of time to do the task
- Where the task is accomplished

If a program were to focus on just training, workstation design, industrial engineering, or biomechanics, it would miss out on the opportunity for improving the entire maintenance system. An effective program should take into account the various subspecialties within the discipline of human factors. A good reference document is the FAA Human Factors Guide for Aviation Maintenance[FAA98a]. This document breaks down many elements of a program and provides information and guidance on each subject.

3-1. Corporate Commitment and Support

3-1-1. Description and Purposes of an Aviation Maintenance Human Factors Program

The concept and purpose of an Aviation Maintenance Human Factors program is to identify, educate, and apply modern accident prevention fundamentals through systematic processes in an effort to protect people, equipment, property and the environment. A thorough Aviation Maintenance Human Factors program provides an active, on-going prevention education program that continually reviews the interfaces of man, machine, mission, and management. The continual learning process include the recognition and study of multiple causal relationships surrounding potential and past workplace accidents, incidents, injuries and deaths for the purpose of providing a prevention strategy rather than an after the fact review program.

3-1-2. Benefits of an Aviation Maintenance Human Factors Program

A forward-looking Aviation Maintenance Human Factors Program will provide an organization the framework to preclude or reduce the possibility of loss associated with workplace accidents, incidents, injuries and deaths. It will also provide management the feedback necessary to position the workforce for future growth and improved performance. By identifying the elements affecting human performance and the obstacles to improvement, management will be better armed for strategic planning. Also, when the workforce recognizes the organization's effort to remove hazards, educate and value safety, a natural increase in professionalism, performance and morale should occur. In addition, the general public will value the contribution to the industry and the recognition of safety initiatives.

3-1-3. Support Required

Management support is key to an effective Aviation Maintenance Human Factors Program. Human factors principles need to be identified, understood, educated, applied and written into management policies. In short, it must become part of the company culture starting with senior management commitment. Management must have a thorough indoctrination into Aviation Maintenance Human Factors and an understanding that management is a key to the success of the program.

3-2. Workforce Commitment and Support

3-2-1. Description and Purpose

A vital element of any Aviation Maintenance Human Factors Program is management/workforce cooperation. If the quality of maintenance performed on an airplane enhances flight safety, and quality results from positive cooperative efforts, then it behooves all parties to exert this effort. Positive attitudes produce positive results.

A collaborative approach toward the design and development of an Aviation Maintenance Human Factors Program will result in numerous benefits.

3-2-2. Employee Benefits of an Aviation Maintenance Human Factors Program

Commitment of the workforce toward the success of an effective Aviation Maintenance Human Factors Program will produce numerous benefits, including but not limited to:

- Increased safety
- Error reduction
- Teamwork enhancements
- Development of positive and assertive communication between all parties.
- Maintenance effectiveness

3-2-3. Employee Support Required

Just as all levels of management should provide total commitment and support toward the program, the workforce must also provide their complete support. Numerous cooperative programs currently in place within the aviation industry have demonstrated that there is an un-tapped wealth of information and knowledge within the workforce. The support of this group is a key and vital factor toward the program's success.

Joint management/workforce task groups should be formed to develop and maintain an Aviation Maintenance Human Factors Program to address methods for reducing human error in the workplace.

3-2-4. Education of Program Elements

A common mistake encountered during the design, development, and implementation of change programs is the failure to communicate these changes to the workforce.

The communication process must commence during the early design and development of the program. All information releases must clearly indicate that representatives of both management and the workforce at all levels are fully supportive of this effort. The communications should solicit input from the workforce to their task force representatives.

3-3. Placement of Aviation Maintenance Human Factors Programs

Human Factors practitioners carry out their work by interfacing between the many departments within the organization. They work with the safety department regarding occupational injuries, with the training department on **Maintenance Resource Management (MRM)**, ergonomics and other course development projects, with Line and Base maintenance, Shops and Ground Operations to work on projects to reduce human error. The very nature of Aviation Maintenance Human Factors Programs makes fitting them into one department difficult.

The purpose of this chapter is to give examples of locations where Aviation Maintenance Human Factors Programs are placed in different aviation maintenance organizations; it is not to dictate the one best way.

A recent Boeing survey of customer data relating to human factors found that the Human Factors function resided within a maintenance organization as follows:

Quality Assurance/Quality Control	58%
Maintenance Control	30%
Other Departments	12%

Both Maintenance Control and Quality Assurance/Quality Control are typically support organizations. The benefit of a human factors program that resides in a support organization is that it can serve as an internal consultant to many departments within the company without being influenced by the specific organizational culture of those departments.

Placement of Aviation Maintenance Human Factors Program initiatives within any maintenance organization should be considered, even debated, at length by the organization. Before a program is initiated, a clear goal for the program should be defined and designed to meet that goal. It is much easier to understand the goal of the program if it is specifically stated, e.g., to reduce maintenance error, to improve line maintenance communication processes, etc. To focus only on "awareness" is to under-specify any program from the outset.

A suggested general model for Aviation Maintenance Human Factors program implementation should address the following:

- Program goal statement
- Scope of the effort i.e., what departments will be affected by the program, and for how-long
- What the "tools" of the program will be e.g., error reduction processes, awareness training courses, ergonomics audits, etc.
- What department, function, or focal-point person will have administrative oversight of the program
- Timelines for implementation
- Methods of program evaluation, e.g., surveys, operational audits, division performance metrics, etc.
- Systematic feedback to the affected workgroups to illustrate positive effects
- A recurrent exposure or training function