Human Factors in Aviation Maintenance

As aircraft have evolved over time, the most frequent cause of accidents has also changed. In the early days of aviation, mechanical failure accounted for the majority of incidents; as aircraft became more reliable, human failure has soared to become the primary cause.

To combat pilot error, the industry adopted formal training programs to enhance crew coordination and communication. Crew resource management has become a standard requirement for operators. However, it has only been in the last few years that the maintenance community has begun to follow suit in an effort to minimize and ideally eliminate human error. As a result of this movement, several air carriers have implemented training classes to improve individuals' understanding of their impact on safety. Since accidents often occur as a result of a long chain of events, the breaking of the chain by any one person can preclude the accident from ever occurring.

FAR part 5*: Safety Management System (SMS) is the systematic management of the risks associated with Airline operations. Its ultimate goal is to facilitate the achievement of the highest level of safety performance throughout the industry by promoting programs that support operational excellence, preventing incidents, accidents, and managing risk. One of the four pillars of SMS is Safety Promotion. ICAO Flight Safety & Human Factors Digest Series defines safety culture as: "A set of beliefs, norms, attitudes, roles, and social and technical practices concerned with minimizing exposure of employees, managers, customers, and members of the general public to conditions considered dangerous or threatening."*

Whether called Maintenance Resource Management, Human Factors, or other names, the basic concepts are generally similar. These programs address management and mechanics working together to utilize all available resources to reduce human errors/promote safety. In order to reach these goals, the courses emphasize the importance of communications, the different types of errors, environmental factors and the importance of norms/culture.

Case studies are used to tie all other course material together. Accidents/Incidents and their "chain of events" are analyzed to identify what contributed to the accident/incident and what could have prevented it. These exercises help participants highlight potential situations that currently exist in their work areas.

Ultimately, the success of the training rests on the individuals. Both mechanics and managers can use the tools to identify and mitigate areas that can lead to potential aviation accidents. Often all it takes is a willingness to re-examine the work environment and job practices with a questioning eye.