THE PEAR MODEL

Online Training

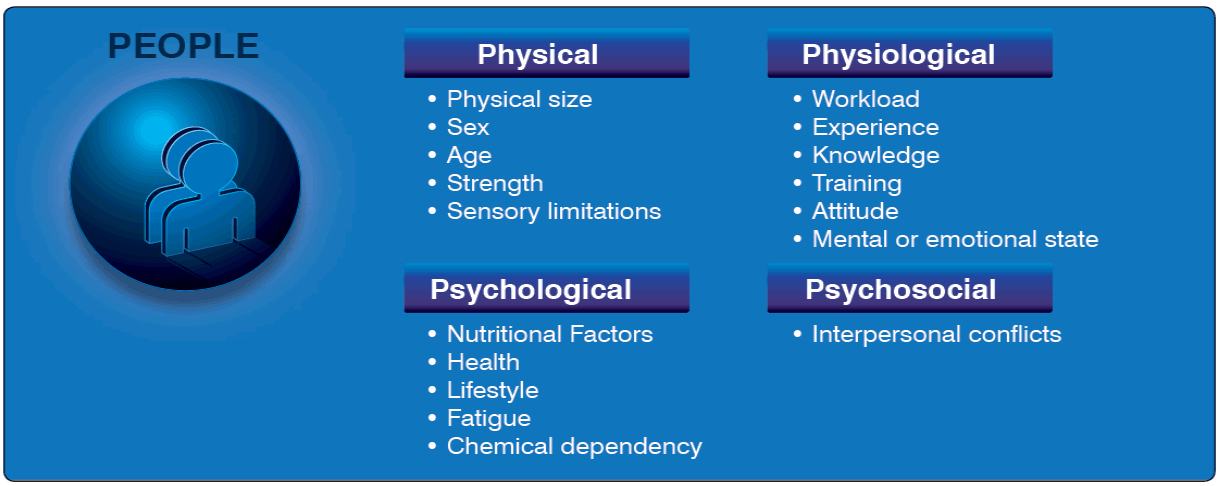
Introduction

There are many concepts related to the science and practice of human factors. However, from a practical standpoint, it is most helpful to have a unified view of the things we should be concerned about when considering aviation maintenance human factors. A good way to gain this understanding is by using a model. For more than a decade, the term "PEAR" has been used as a memory jogger, or mnemonic, to characterize human factors in aviation maintenance. PEAR prompts recall of the four important considerations for human factors programs, which are listed below.

- People who do the job.
- Environment in which they work.
- Actions they perform.
- Resources necessary to complete the job.

PEOPLE

Aviation maintenance human factors programs focus on the people who perform the work and address physical, physiological, psychological, and psychosocial factors. It must focus on individuals, their physical capabilities, and the factors that affect them. It also should consider their mental state, cognitive capacity, and conditions that may affect their interaction with others. In most cases, human factors programs are designed around the people in the company's existing workforce. You cannot apply identical strength, size, endurance, experience, motivation, and certification standards equally to all employees. The company must match the physical characteristics of each person to the tasks each performs. The company must consider factors like each person's size, strength, age, eyesight, and more to ensure each person is physically capable of performing all the tasks making up the job. A good human factors program considers the limitations of humans and designs the job accordingly. An important element when incorporating human factors into job design is planned rest breaks. People can suffer physical and mental fatigue under many work conditions. Adequate breaks and rest periods ensure the strain of the task does not overload their capabilities.



Another "People" consideration, which also is related to "E" for "Environment," is ensuring there is proper lighting for the task, especially for older workers. Annual vision testing and hearing exams are excellent proactive interventions to ensure optimal human physical performance.

Attention to the individual does not stop at physical abilities. A good human factors program must address physiological and psychological factors that affect performance. Companies should do their best to foster good physical and mental health. Offering educational programs on health and fitness is one way to encourage good health. Many companies have reduced sick leave and increased productivity by making healthy meals, snacks, and drinks available to their employees. Companies also should have programs to address issues associated with chemical dependence, including tobacco and alcohol. Another "People" issue involves teamwork and communication. Safe and efficient companies find ways to foster communication and cooperation among workers, managers, and owners. For example, workers should be rewarded for finding ways to improve the system, eliminate waste, and help ensure continuing safety.

ENVIRONMENT

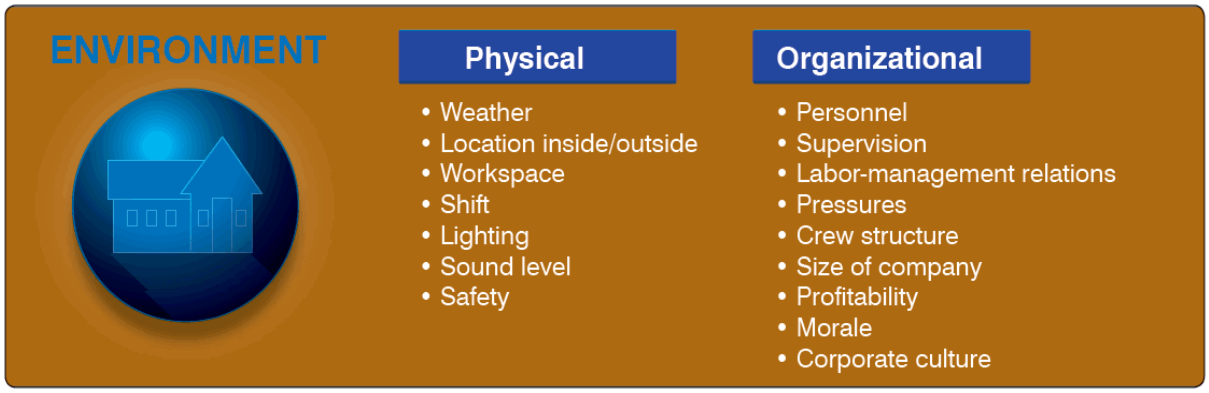
There are at least two environments in aviation maintenance. There is the physical workplace on the ramp, in the hangar, or in the shop. In addition, there is the organizational environment that exists within the company. A human factors program must pay attention to both environments.

- ***Physical***

  The physical environment is obvious. It includes ranges of temperature, humidity, lighting, noise control, cleanliness, and workplace design. Companies must acknowledge these conditions and cooperate with the workforce to either accommodate or change the physical environment. It takes a corporate commitment to address the physical environment. This topic overlaps with the "Resources" component of PEAR when it comes to providing portable heaters, coolers, lighting, clothing, and workplace and task design.

- ***Organizational***

  The second, less tangible, environment is the organizational one. The important factors in an organizational environment are typically related to cooperation, communication, shared values, mutual respect, and the culture of the company. An excellent organizational environment is promoted with leadership, communication, and shared goals associated with safety, profitability, and other key factors. The best companies guide and support their people and foster a culture of safety. A safe culture is one where there is a shared value and attitude toward safety. In a safe culture, each person understands their individual role is contributing to overall mission safety.



ACTIONS

Successful human factors programs carefully analyse all the actions people must perform to complete a job efficiently and safely. Job task analysis (JTA) is the standard human factors approach to identify the knowledge, skills, and attitudes necessary to perform each task in each job. The JTA helps identify what instructions, tools, and other resources are necessary. Adherence to the JTA helps ensure each worker is properly trained and each workplace has the necessary equipment and other resources to perform the job. Many regulatory authorities require the JTA serve as the basis for the company's general maintenance manual and training plan. Many human factors challenges associated with use of job cards and technical documentation fall under "Actions." A crystal-clear understanding and documentation of actions ensures instructions and checklists are correct and useable.

RESOURCES

The final PEAR letter is "R" for "Resources." Again, it is sometimes difficult to separate resources from the other elements of PEAR. In general, the characteristics of the people, environment, and actions dictate the resources. Many resources are tangible, such as lifts, tools, test equipment, computers, technical manuals, and so forth. Other resources are less tangible. Examples include the number and qualifications of staff to complete a job, the amount of time allocated, and the level of communication among the crew, supervisors, vendors, and others. Resources should be viewed (and defined) from a broad perspective. A resource is anything a technician (or anyone else) needs to get the job done. For example, protective clothing is a resource. A mobile phone can be a resource. Rivets can be resources. What is important to the "Resource" element in PEAR is focusing on identifying the need for additional resources.