

---

# 1 Scope

---

The intent of this recommended practice is to present design concepts which are compatible with the physical and mental capabilities of the control center operator while recognizing any of the operator's limitations.

The control center can be designed for efficient functioning of the man-machine system after one first defines the information the operator needs to control the process, and the controls to be provided.

This recommended practice is limited to those aspects of human engineering that will affect the layout of and the equipment selection for the control center. It is recognized that some of the human factors discussed in this document are also used in the design and manufacture of instruments.

---

## 2 Physical aspects

---

### 2.1 Static anthropometric data

In the dimensional design of a control center, one should consider the physical characteristics of the plant operators. The possible range in these characteristics is rather wide, but can be narrowed for a specific design if knowledge of such factors as age, sex, and physical qualities of the expected group is applied. Useful data may be obtained from the references listed in the bibliography for this recommended practice. It is important to note that in application of these data, one should not design the control center for average human characteristics but rather for the normally expected extremes of the subject group. [Figures 1 and 2](#) and [Tables 1 and 2](#) provide static anthropometric data taken from Military Standard (MIL. STD) 1472.

### 2.2 Dynamic anthropometric data

**2.2.1** While the basic layout for a control center may be designed using static anthropometric data, it should be checked and refined using dynamic data. If this is done, the range to be covered by one operator can be described by physical reach and reasonable lateral movement. Included in the relevant dynamic information are the ranges of eye and head movement. If there is no head movement, the visual range is a cone whose angle is approximately 60°. However, discomfort results if the eye must be positioned off the standard line of sight. Therefore, head movement is used to accommodate or assist any scanning requirement. The result, then, is a control center whose dimensions and shape match the process and the operator. The standard profiles detailed in ISA-dRP60.7, "Control Center Construction," represent industry practice in the application of anthropometric data.

**2.2.2** Displays should be arranged and positioned so that they are perpendicular to the line of sight when the eyes and head are in a comfortable position, and in any case should not be less than 45° from the normal line of sight. This is particularly important for displays which require constant attention.