

1 Purpose

The purpose of this document is to provide guidance and suggest an approach for conducting a task analysis as part of the design and development of new control rooms/systems for power plants and for supporting major control room upgrade programs. The basic premise is that task analysis data, when collected early, is beneficial throughout the design process and serves to identify instrumentation needs, assist in evaluating design options, and assist in validating completed designs for human-machine interface concerns.

This particular document is one of three parts. The reader is encouraged to consult the remaining two documents for additional information in performing integrated control room design. These documents are:

ISA-RP77.60.02-2000 (R2010), Fossil Fuel Power Plant Human-Machine Interface – Alarms

ISA-TR77.60.04-1996 (R2008), Fossil Fuel Power Plant Human-Machine Interface – Electronic Screen Displays

2 Scope

Approaches are provided in this recommended practice for the application of task analysis during the conceptual design, preliminary design, and detailed design phases, as well as the test and evaluation of new control rooms/systems and control room upgrade/development programs. Although the relationship between task analysis and other system development techniques is briefly considered, the emphasis is clearly on the methods and benefits to be derived from a detailed analysis of operator functions and activities in the control room.

Methods used to support the task analysis are also presented. These include the use of surveys and questionnaires, tabletop analysis approaches, and the use of mockups and walkthroughs.

Applications of the data are considered for addressing a number of design-related issues. The discussion in this section will focus on the analysis of operator tasks, but could be extended to include maintainer tasks.

3 Definitions

3.1 anthropometrics:

the application of data concerning the measurement of physical features and functions of the body in the design process.

3.2 function:

a broadly defined operation or activity that contributes to a system's goal.

3.3 function allocation:

the process of deciding the relative emphasis to place on the human vs. the machine in selecting components to fit particular task requirements.