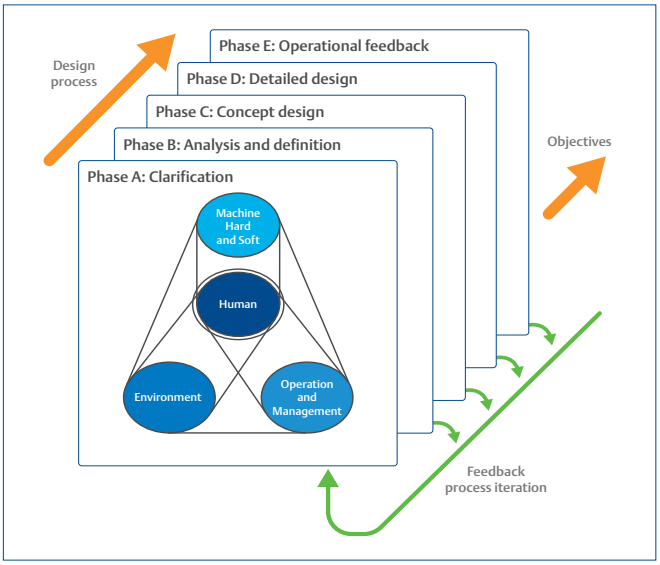
Ergonomic Control Room Design

- Increase operator efficiency
- Reduce fatigue
- Address ergonomic concerns
- Comply with regulatory and industry standards



Ergonomic approach to system designs

The Value of an Ergonomic Control Room

A properly designed control room ensures that the control room users are provided with an environment that allows them to work at a high level of efficiency, in comfort.

Best practice design follows the International standard ISO 11064 process ensuring all aspects of the human factor requirements are considered and addressed.

The process is a fully consultative one, engaging stakeholders throughout the design, starting with a formal task analysis and progressing through conceptual and detailed design to project execution and operational feedback.

This standard is recognized by many regulatory organizations around the world, including the Occupational Safety and Health Administration (OSHA).

The standard not only addresses control room design, but also control center and console design, and fully integrates human machine interface design.

Benefits of an Ergonomic Control Room

Increase operator efficiency – Without distractions from traffic or a noisy environment the operator can concentrate on the job of keeping the plant operating in a safe and efficient manner. A well laid out control room with multiple consoles will improve communications and collaboration under normal and abnormal operating conditions. A good design will allow for the full integration of the HMI, including elements such as large screen displays, further improving the operator's situation awareness and collaboration.

Reduce fatigue – Proper design will address all elements of environmental design such as lighting, temperature, humidity and noise that, if not addressed, can lead to operator fatigue, with significant risk of occupational or process safety incidents. The design of a properly integrated control suite, including rest rooms, break room and exercise room can provide opportunity to take breaks while staying in touch with the process. Emerson can also help with the development of a fatigue risk management plan, as required, for example, under PHMSA regulations for the pipeline industry.

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Address ergonomic concerns – Poorly designed consoles with too many screens, scattered keyboards and mice, or a layout that does not properly integrate equipment can lead to musculoskeletal and nervous system injuries such as repetitive strain injury.

Comply with regulatory and industry standards – The foundational control room operating philosophy, in conjunction with follow-up remediation, administered by Emerson's Operator Performance experts, will address shortcomings in your control room design and improve your alignment to regulatory and industry standards.

Control Room Gap Analysis

Emerson will perform an audit of your current control room(s) and identify any gaps compared to industry best practice and recommendations for addressing them. The deliverable from this service is a detailed gap analysis report.

Control Room Workshop

It is essential that all stakeholders understand the principles of control room design and the design process before a control room project starts. The workshop will also illustrate how control room design is an integral part of a comprehensive operator performance program that includes Operator Workload, Alarm Management and HMI design.

The workshop ensure that everyone is on the same page and that the project proceeds smoothly.

Philisophy Development

Emerson will develop a comprehensive, site-specific Control Room Operating Philosophy document which incorporates industry best practices.

The philosophy document contains information that establishes operational rules and procedures for the control room. Examples of content include:

- Roles and Responsibilities
- Security
- Breaks
- Maintenance access
- Smoking
- Housekeeping
- Music
- Phone usage

Conceptual Design

Conceptual design is an essential element in control room design, minimizing the risk of significant scope changes as the project moves into detailed design and construction, at which point changes become very expensive.

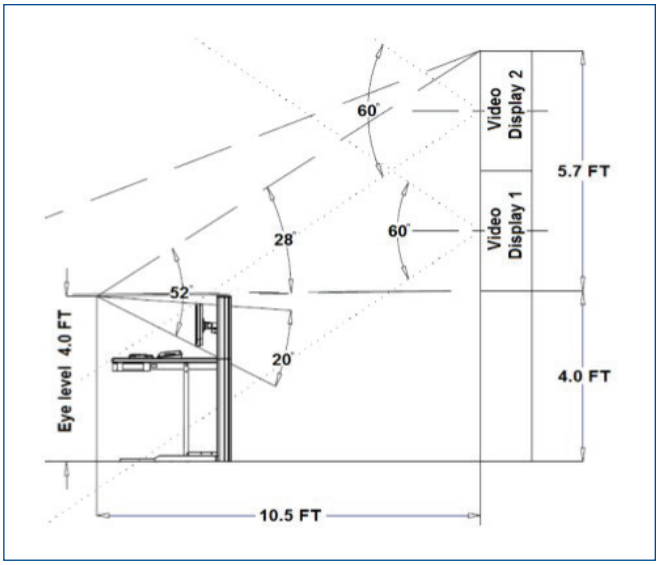
The first step of conceptual design is to work with you to capture the operational requirements of the control room, under normal, abnormal and emergency conditions. This focuses not just on the control room operator but all stakeholders, including field operators, maintenance, supervision, building maintenance and even vendors, to ensure that all tasks can be performed, safely and efficiently with the appropriate control room facilities.

We will then work with you to develop the conceptual design of the control room, suite or center. The deliverable from this activity is a conceptual design report that can be used by an architect as the basis for detailed design. The report will capture design decisions and their basis.

Equipment Specifications

In the conceptual design provisions will be made for equipment to be used on the console or in the control room itself. Emerson's experts can help you with an ergonomic console furniture design based on the ISO standard.

Special attention is paid to the specification and placement of on-console and large screen displays.

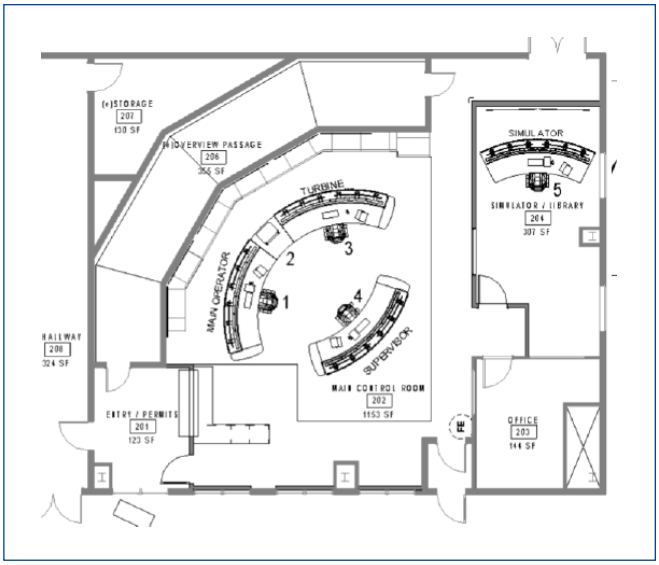


We also will work with you to detail the requirements and specifications of other equipment, including:

- Input devices
- KVMs
- Thin clients
- Storage
- Phone
- Intercom/radio
- Chairs
- CCTV
- Printers

Detailed Design

Once the conceptual design is agreed upon, the next step is to engage an Emerson architect, or architectural partner, to transform the conceptual design to a set of construction documents.



Certfication and Training

- Control Room Design Workshop

Related Services

Ergonomic Control Room Design is part of a full set of Operator Performance services that include:

- Alarm Management
- Advanced Operator Graphics
- Operator Workload

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