5 Best Practices for Corporate Control Rooms

Corporate control rooms for mission critical or network operations centers serve many purposes, such as monitoring networks, communications, transportation, and trading activities.

From monitoring, responding, and reporting, control rooms enable oversight of sensitive resources, accelerate the delivery of informed decisions, and reduce skill-development time.

Designing a control room is no small task. This paper describes five best practices for control-room design based on AVI-SPL's 12 years of designing control rooms. The paper presents lessons learned from operators, systems analysts, and IT managers, including those regarding room design, display selection, human factors, standardized design, and plans for ongoing support and future expansions.

Best Practice 1: Understand the use of the room

Control room design needs to be operator focused. This means considering the user's perspective and the tools required to perform their tasks before any requirements documents or design plans are drawn up. Ideally, every project team includes user representatives.

This practice lets users provide important insights and increases the likelihood of user satisfaction when the project is finished.

For users to be effective in their job, they need a control room environment that makes it easy to comprehend and respond to the information presented. By understanding the user's workflow, and how and what type of information they need to access, the project team can guarantee the room environment increases productivity, improves work quality, heightens worker satisfaction, and reduces or eliminates human error. As a bonus, a properly designed work environment is usually a major factor in employee satisfaction and retention.

Information Checklist

- ☐ Define the use of the room
- ☐ Learn what operators need to accomplish
- ☐ Identify what information operators need to view
- ☐ Identify what tools operators need to perform their tasks
- ☐ Understand the workflow of the room
- ☐ Know the budget
- ☐ Determine staffing and scheduling requirements
- ☐ Find out about any building restrictions that could impact room layouts

Operator Perspectives

"I've been an operator for just shy of 3 years now, and I can tell you the environment you work in plays a huge role in how comfortably you handle the workflow. It's nice to focus on the more technical bits such as equipment and infrastructure, monitors, etc., but do not forget that people have to comfortably be there for hours at a time. We do 12 hour shifts here, and the most important consideration for me would be the temperature and air quality."

"Get the best and most comfortable chairs you can find and then get the ones that are even better. People will be sitting in these 24/7, you need the best you can get or they'll get worn down in mere months, both chairs and people. Full range of adjustability is essential, as is full back and lumbar support."

Best Practice 2: Select displays that support the content

It's not easy to replicate the image quality delivered by a desktop HD display. Yet adequate resolution and color conformance is critical to the operator's ability to easily understand and interpret the information. It's imperative to use two critical considerations when defining display requirements: usage level (24/7 or other) and type of content (text or image).

For example, high usage or 24/7 facilities should avoid LCD- or LED-lit LCD type screens because they ultimately decay and display burn-in. This means the popular LCD screen will need to be replaced in 2 to 3 years.

Also, factor in the type of content transmitted. Typically, images handle the resolution process better than text. However, text and vector graphics require more precision to avoid user eyestrain and ensure easy comprehension. To provide the optimal experience, make sure the displays support pixel mapping.

When evaluating display options, consider the types of displays available:

Multiscreen Windowing allows 1:1 pixel mapping and creates edge-to-edge displays and maps images across screens. This solution can be complicated and expensive, so it is important to understand users' needs.

LCD Screens have bezels so they are not optimal for tiled displays that need perfect alignment. As mentioned, LCD screens are not designed for 24/7 use.

Rear-Projection Cube Technology comprises multiple cubes that can be arranged to create any size video wall. If the room is used 24/7 and users view these types of images, this is the technology to consider.

Information Checklist

- ☐ Determine what type of information will be displayed, such as text, images, or continuous lines
- ☐ Select the right device for the use level: 24/7, light, or medium
- ☐ Select displays that allow 1:1 pixel mapping
- ☐ Avoid displays with bezels if building a continuous screen
- ☐ Consider what the content will look like on the screen from different angles and distances

Best Practice 3: Consider human factors

A focus on human factors and the work environment has a positive impact on how operators perform. As a project team designing the room, focus on room flow, equipment placement, lighting, climate control, and noise control with the intended use in mind. This results in fewer human errors and accidents. At the same time, it increases operator productivity and overall work satisfaction.

To optimize the space for users, be sure to consider the acoustics, spatial design, climate control, as well as lighting and color temperature for displays.

Information Checklist

- ☐ Physical factors: working height, viewing angle, leg room, sitting comfort
- ☐ Ambient factors: lighting, noise level, temperature, humidity, air quality
- ☐ Lighting and colors depending on process state (smart textiles and daylight control)
- ☐ Sound systems for public and personal information
- ☐ Traffic control (field operators, visitors, and others not working as active operators)
- ☐ Access to other functions or rooms (for example, printer room, rest room, kitchen, toilet, meeting room, offices, computer room, library, exercise room, emergency room)
- ☐ Console proximity (communication and collaboration)

Operator Perspectives

Control Room "Must-Haves"

What goes on the "big screen" has to be useful. It must be workable in a very short period of time. If you can't look at it for 2 seconds and get a good idea of what's going on, it's too complicated.

Multiple displays per operations person

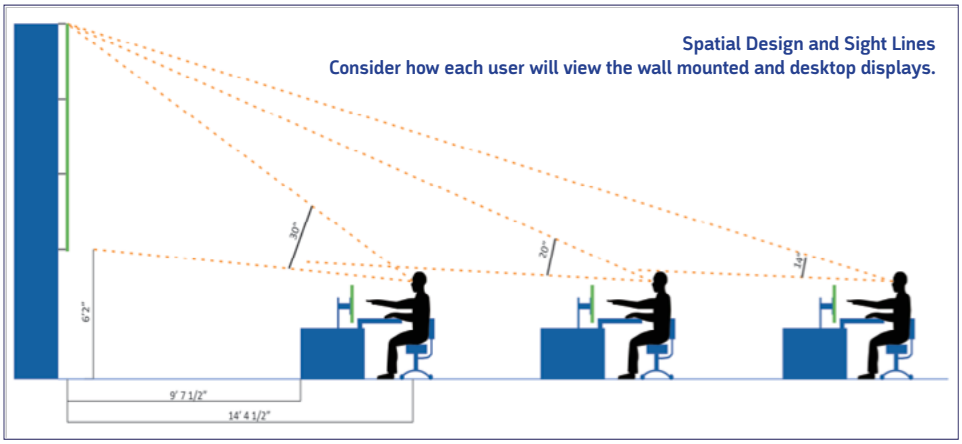
Good task lighting. Good lighting period is everything. ~~Pay~~ a real designer to do this.

Good seating. We have let operations people pick chairs that fit their needs. Expect to spend $800-1k/person on seating.

Sound deadening/management. NOCs get loud, and managing the acoustics is important to make sure that people can "think" and they can interact with one another.

Virtualized desktops (think RDP, X11, etc.) so that people can move and maintain their setup

Color-shifting lighting to compensate for normal rhythms of people on weird shifts. Turns out green is effective after lunch at helping people maintain focus. This isn't cheap, but it sure does have a big impact.



Spatial Design and Sight Lines
Consider how each user will view the wall mounted and desktop displays.

Best Practice 4: Standardize design across locations

The ideal approach is to create rooms easily replicated across an organization. Every piece of equipment should work the same regardless of which office or control room someone is in. Most control and visualization rooms have a master control panel including a graphical user interface (GUI) on the color touch panel. Design these control panels with the same look, feel, and flow for ease of use regardless of location.

Information Checklist

- ☐ Consider current and future rooms for standardization
- ☐ Ensure every piece of equipment functions the same, regardless of location

Best Practice 5: Plan for ongoing support

The reality of control rooms is that they require ongoing maintenance and support. They represent a significant financial investment. For companies to realize all the potential benefits, these rooms need to be online at all times. Many companies let the existing IT help desk and network teams absorb these support functions. However, dedicated support and a clear preventative maintenance plan ensure that control rooms are ready and deliver the desired value.

Information Checklist

- ☐ Plan for upgrades and ongoing maintenance
- ☐ Consider a managed service provider with specific control room expertise
- ☐ Where possible, assign dedicated support staff
- ☐ Remember preventative maintenance is critical to ensure maximum uptime

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As the world's leading video communications partner, AVI-SPL designs, builds, and supports the systems and environments that enable communication and collaboration. AVI-SPL has highly-trained and certified system engineers throughout 40 offices across the United States, Mexico, Canada, the United Kingdom, and Dubai.

The Control Room Group (CRG) at AVI-SPL is North America's leading provider of mission-critical control center facilities. This specialized group is solely dedicated to the design and build of 24 x7 mission critical control room facilities.

For more information about control room design, please contact AVI-SPL at 866.708.5034.

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