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Why you need an OPERATIONS ASSESSMENT [not an ergonomic study]

User-centric design is the foundation
of ISO 11064 — conformance can't be
rubber-stamped afterwards

by Brad Walker and Peggy Hewitt, BAW

LATELY we've seen many RFPs cross our desk for "ergonomic studies." Each one is uniquely different but with a disturbing trend. One of the most concerning requests is what we refer to as the "rubber stamp" request. This is when the client, often an engineering company with a project in hand, is looking for a company with human-factors expertise to evaluate a control room design that's already been approved. Why, you might ask, would they ask for an ergonomic study if they already have a control room design? The answer is often simple: the engineering company's client, an operations company, wants to make sure that their new control room will meet ISO 11064 standards for proper, safe control room design.

When designed properly, and applying ISO 11064 standards, a successful control room creates an environment for the operators of situational awareness within the event velocity timeline of the operating company. This equates to a safe, well-thought-out control room environment that should reduce incidents and make it easier to react to and address any incidents that arise.

So with these requests for ergonomic studies, consultants and architects with control room expertise are sought to review the design and provide a report that will ensure the design, once built, will provide all the benefits the operational company is looking for. Those benefits include an efficient and effective environment for control room operators with a high degree of situational awareness to minimize fatigue and operational errors. With a focus on cost savings, procurement managers from engineering companies are asking to have these studies completed remotely, without ever talking to an operator or understanding the operational requirements. Many consultants and console furniture suppliers with limited experience in designing control rooms are taking on these "ergonomic studies," and for a few thousand dollars are providing the rubber stamp that these control room designs will meet ISO 11064.

A process, not an end state

This is a problem on many levels. First, ISO 11064 defines a process, not an end state. If the process—a bottom-up definition of the requirements starting with the operator—was not implemented in the designing of the control room to begin with, a review after the design has been completed will not improve anything. ISO 11064 Part 1 is the most critical and important part of the standard; it explains the user-centered approach as a foundation for the design. It calls out the necessary process, and this is not merely a checklist to achieve its goals. It's a thorough methodology to design a safe, resilient control room where situational awareness is the priority, not the afterthought.

Does the control room design meet ISO 11064, yes or no? This is a *risk* issue. You may want to view it as a standards issue, but it's a risk issue. The standard defines the process: if the process wasn't used the answer can't be yes. The risk is designing and constructing a control room based on a design with no input from the operators and operations team that will be working in this mission-critical environment. The risk of *not* designing the control room according to a defined process results in a variety of issues, such as the following:

- Control rooms with so many reflective surfaces, so much glare and such poor lighting that it's simply turned off at all times.
- Control rooms in a corridor or hallway because the originally designed room was so completely ineffective that the operators had to move out.
- Control rooms so dense that noise continues to be a major impediment to safe operations.
- Control room lighting using the same fixtures found in the rest rooms, and control rooms with lighting specifically known to cause fatigue.
- Control rooms with workflows so poor that operators are constantly disrupted by unnecessary people walking around, and not enough room for effective shift handover activities.

Alone, each of these observations don't mean the operational company will have an incident or failure relating to their control room, but what each of these observations do tell us is that the risk of the operator losing situational awareness within the event velocity required is higher. It's higher because instead of an integrated process that verifies the operator requirements within the context of his or her job, workflow and interactions between people and automation, no human-factors related process was followed, and thus no input from the operator was considered in the design.

We understand the desire to save time and money at every stage of a project. But the actual cost of properly designing a control room at the beginning of the process is often a small fraction, akin to a rounding error in the cost of the entire project. If we then add in the potential higher risk by doing an ergonomic study after the design is done by organizations without the proper credentials, we're making a poor situation worse.

Take for example, the operational HAZOP process, a process every major operation company knows well. Now imagine outsourcing that HAZOP to a hardware vendor or a consultant. This would never happen. Yet, we routinely see ergonomic studies being done by console furniture suppliers and



The ISO 11064 standard describes a methodology for creating a control room that will provide operators with situational awareness appropriate to the event velocity timeline of the operating company. Ergonomics is only one small piece of the solution that will fit the bill.

by consultants who may have some human factors experience but have very little experience designing control rooms. The increased risk alone we believe is enough to consider making sure this is done properly.

Start with different terminology

So how do you do a proper ergonomic study? Our first suggestion is to stop calling it an ergonomic study, which literally makes us think we're evaluating fixtures and furniture and viewing angles. We may do this, but what we believe clients need is an operations assessment. This is a comprehensive evaluation of the control room starting with the operations requirements, and includes ergonomics, human factors, workflow, building and room design and layout, lighting, acoustics and finishes.

Changing the name alone won't solve the problems. We also encourage you to employ a control room design firm with a credentialed human factors specialist. This is essentially the beginning of the control room design process, but it can be applied to review an existing design. What is critical is that the work isn't just

an approval of a design that was done in a vacuum. To effectively evaluate what's needed in a control room or operations building is nothing short of a comprehensive understanding of the work to be done in that room by the people who will work there.

We think it's worth repeating: designing a control room is a complex undertaking. There are literally thousands of variables that should be considered with each design to ensure an optimum outcome, and there's no such thing as ISO 11064 compliance "rubber stamp." Designing a control room is a series of decisions, trade-offs and constraints—human, fiscal and risk-based. Whether you're designing a new control room or improving one you have, the key takeaway is to follow the process properly. Cutting corners will only increase your risk, and therefore increase costs in the long run. ∞

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