

### HOW TO MAKE A HEALTH, SAFETY, AND ENVIRONMENTAL PLAN

Making an HSE plan is more than a creating set of rules for manufacturing health, safety, and environmental activities. Here's what you need to know about HSE. See table: Effects of current on the body.

## Effects of Current on the Body

| Current Value   | Effects                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| < 1 ma          | Barely Perceptible                                                                                                   |
| 1-5 ma          | Perceptible shock, reflex actions                                                                                    |
| 5 ma GFCI trips | Accepted as maximum harmless current                                                                                 |
| 6-10 ma         | Painful shock, victim can "let-go"                                                                                   |
| 10-20 ma        | Painful shock, victim can not let go                                                                                 |
| 50-100 ma       | Ventricular Fibrillation possible                                                                                    |
| 100-200 ma      | Ventricular Fibrillation likely                                                                                      |
| 200 ma          | Severe burns, severe muscular contractions, chest muscles clamp the heart and stop it for the duration of the shock. |
| 833 ma          | Current used by 100 watt light bulb                                                                                  |

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We encounter risks on every job we do; it comes with the territory. How we manage those risks is what sets us apart from the competition. And managing risks means you need to think about the hazards you encounter before arriving on-site to start work. You need a plan. The difference between having a plan and not having a plan can be lost time, lost revenue, or worse—injury or even death.

A health, safety, and environmental (HSE) plan is a crucial step towards mitigating project risks, yet many companies don't use them on every project. They may require more time and planning up front, but the payoff can be huge.

#### Setting up an HSE plan

An HSE plan is a living document, developed before the project work begins using the scope of work as a starting point. As the project evolves, the plan is revised as the scope changes.

Project managers:

- Get a detailed scope of work from the client
- Get appropriate HSE information from the client contact
- Distribute the plan with any drawing packages to the project team
- Review the plan during the initial kick-off meeting
- Post and maintain the signed plan on the job site
- Enforce all elements of the plan while on the project
- Inspect the job site, document and report all safety conditions
- Revise the plan if the scope of work changes
- Verify appropriate training for special job tasks for employees and contract labor.

Within each plan is a check list of information you need to consider—eye bath locations, whether asbestos or lead is present on-site, chemicals in the work area, and so on. It considers various hazards depending on the type of work performed, such as electrical and confined space hazards. The goal in initiating the plan this way is to allow the project manager or person in charge the opportunity to think about all of the different aspects of the job throughout the life of the whole project.

**Get it done right, the first time, without incident.**

Safety, a regular subject of coverage for *Control Engineering*, is a hot topic for readers. In a safety survey last year, most respondents indicated that they regularly violate NFPA 70e rules when working on control panels “always” or “most of the time”—72%, to be exact. So why promote using an HSE plan? In some cases, using an HSE plan can actually prevent the need for the same personal protective equipment (PPE) that many choose not to put on before working.

The HSE plan helps the engineer think about the voltage coming into the panel he’s working with on-site. Under NFPA 70e, any energized panels operating at 50 V or above require PPE. As a result of using the plan before the project begins, engineers are designing panels differently. They’re designing a 480 V circuit outside of the control engineer’s panel. The control engineer gets the power where he needs it; and it’s at a lower voltage that doesn’t require PPE. This is one example of how the front end loading of the HSE plan for this kind of activity eliminates all kinds of extra work. When you don’t think about the plan before designing the panel, you don’t have the right people who are qualified under NFPA 70e to perform the install using proper PPE. This usually means having to leave the job site and delaying the project work until you can find a qualified person with PPE. When you use the plan to assess the risks before they begin design, you eliminate these risks and any controls engineer can do the work.

This leads to the mantra “Get it done right, the first time, without incident.” Using an HSE plan allows you to assess the work hazards so that you can complete the work properly, without having project delays due to unqualified persons or missing required PPE, and without incidents or accidents, because you already understand the risks you will encounter and have a plan for how to mitigate them.

Some respondents in the earlier *Control Engineering* article also indicated that with a system operating on 480 V, the risk for electrocution really isn’t there. Consider this: at 200 milliamps, a victim will experience severe burns, severe muscular contractions, and possible heart failure. A 100 W light bulb uses 833 mA. The HSE plan also provides an opportunity to consider hazards other than electrocution. A controls engineer visiting a paper mill, for example, discovered during his walk-through that the mill floor had not been cleaned in some time. Opening a charged panel with paper dust floating in the environment is welcoming a fire or even an arc-blast hazard. Many system installs involve working in tight spaces, around hazardous substances such as chemicals and/or hazardous environments such as pressurized systems.

### Getting client buy-in for HSE

Among the excuses for not having an HSE plan is that the client contact won’t know what the HSE requirements are and won’t want to spend time defining them. While your specific contact may not have the answers to HSE questions, most mid-size to large companies appreciate and expect that you will have a plan in place.

Still unsure about how to get client buy-in? Start by asking for the HSE requirements for wherever the work will be performed. Optimization broaches the subject in the proposal. We list providing HSE requirements as a part of the client responsibility on the project. Under the NFPA 70e standard, the client has the responsibility to provide this information to the contractor. But that doesn’t mean that you’re off the hook. Occupational Safety and Health Administration (OSHA) also requires that if the client does not provide this information, the contractor then has the responsibility to learn these risks and become familiar with the hazards before beginning the work.

If your client doesn’t give you the information up front, ask for it. If he doesn’t have the information available, ask him if he’s familiar with the NFPA 70e standard. If he isn’t aware of his responsibilities, send the standard and work with him as much as possible to define the hazards. If you get pushback, it doesn’t remove your liability and it may mean you need to adjust and learn about the risks on your own.

In our experience, even companies who aren’t aware of the information and the role they need to play in defining HSE requirements have come around and expressed gratitude for learning about the standard and how to properly mitigate risk.

### HSE plan advantage

Our safety track records continue to follow us and affect the bids we win. Clients ask for our OSHA safety rates, safety policies, an HSE plan, or a “site-specific safety plan” in most pre-qualification packages. Some clients may even tell you not to bother with filling out the rest of the paperwork if you don’t have an HSE plan in place.

An HSE plan can also help you stand out from the crowd during the bid process. It can demonstrate preparedness, organization, and professionalism. Details like these are often the deciding factor with multiple bidders on a project.

Take, for example, a recent experience Optimization had with a large client who went out for bid to multiple contractors. When our project managers went to the original bid meeting with a client, they had talked with the client about scope of work. The project managers then used the scope of work to develop an initial HSE plan, which Optimization used in the bid package for the client. During the bid presentations, the client was blown away that our team had prepared an HSE plan ahead of time. While the plan wasn’t perfect, it was a lot closer because our project managers thought through what we would encounter. Since the other contractors hadn’t thought about creating an HSE plan, Optimization presented itself as the only bidder prepared to manage the risks associated with the project. The client awarded the bid to Optimization, because it was the only contractor that was prepared. We’ve continued to get calls from the client on a regular basis for project work.

HSE plans can also help you bid the project accurately, knowing what you would need to do to perform the work and how much time it would take to do it right the first time, without incidents. An HSE plan and a more accurate bid up front may take more effort, but it is certainly preferred to repeated project change notices and additional charges, as far as the client is concerned.

Not having a safety plan in place simply puts you at a higher risk for incidents on the project, whether it’s having to leave the job site because you aren’t wearing the required PPE or because of an injury. But a safety plan can also play a crucial role in client management, by working with your contacts to identify risks and manage them together and performing project work smoothly and within schedule.

