

Toolbox Talks 2

057: Unsafe Acts: Hazardous Locations

Discussion leader duties for this session:

Review Article 500 of the NEC.

What this Safety Talk covers:

Most injuries occur not due to unsafe conditions, but due to unsafe acts. This Safety Talk addresses unsafe acts related to Hazardous Locations.

Discussion notes:

Background

A location is considered “Hazardous” if certain ignition sources are present or are likely to be present. The three classes of Hazardous are:

- Class I: Flammable vapors or gases
- Class II: Combustible gases
- Class III: Ignitable fibers

Each location is also either a Division 1 (ignition source present during normal operation) or Division 2 (ignition source present during abnormal operation only). Article 500 of the NEC contains further details and definitions, including what “zones” are.

Unsafe acts with hazardous locations

- Treating an entire area as though it’s all the same Class or Division. Even within the same room, you can have multiple Classes and Divisions.
- Entering the location before reading and applying the MSDS for ignitable chemicals known to be in that location. The MSDS will tell you the requirements for ignition source control, ventilation, and hazardous material monitoring. It will also tell you the handling and disposal rules for those materials.
- Using tools not authorized for that location. If, for example, the location requires nonspark tools (typically brass), using your ordinary screwdriver (typically stainless steel) could set the whole place on fire. Also consider cell-phones, pocket computers, and other electronic devices.
- Installing equipment not listed for that location, and/or using methods that violate Hazardous Location installation rules. This is not only unsafe, it’s criminal.
- Not mapping out the alarms, exits, fire extinguishers, and emergency procedures before working in the area. What will you do, if, despite your precautions, an ignition event occurs?
- Forging ahead with the job, instead of coordinating with the operators. The operators may be able to manipulate process steps, ventilation means, and other factors to reduce your risk. On the other hand, the ignitibles concentration may be unusually high at certain times due to process reasons.
- Not logging in. Ensure there is a record of who is in the Hazardous Location. If you’re trapped there during a fire and nobody knows you’re there, you won’t be rescued.
- Leaving non-current-carrying metal parts unbonded (vs. “ungrounded”). Where you have locknuts or bushings, install bonding jumpers. Don’t use a locknut or bushing as part of the grounding path. Don’t use a ground rod or other earth connection as the bonding means.

Review and discussion

1. What Article of the NEC provides the basis for Hazardous Location work? *[Note to Presenter: It’s Article 500. That Article is the starting point. Anyone work-*

ing in a Hazardous Location should start with Article 500 and then become familiar with the related Articles (also in Chapter 5) that address that particular type of location. Article 500 will tell you what the other Articles are.]

2. What are the three Classes of Hazardous Location and what do they mean?

3. What are the two Divisions of Hazardous Location and what do they mean?

4. Can you have multiple Classes or Divisions in the same room?

5. What should you read and apply before entering a location that is Hazardous or that may be Hazardous? How can you find out which ignitibles are present or may be present in a given area? *[Note to Presenter: This information is easy to obtain from the owners or operators. You will also find process information on various drawings related to the work. The type of process should raise questions about what materials will be present. Ignorance is no excuse, and it can get you killed. The project manager should obtain this information, but make sure you have it before beginning work in a location that may be Hazardous.]*

6. How do you know what tools you can and can't bring into the Hazardous Location? If specific items, such as electronic devices, are not mentioned in the MSDS, does that mean they are safe? *[Note to Presenter: The idea isn't to see what you can get away with bringing into the Hazardous Location. The idea is to answer the question, "How can I make it safe for me to work in this location?"]*

7. What requirement must anything installed in a Hazardous Location meet? *[Note to Presenter: It must be listed for that location. It must also be installed per the NEC requirements for that location. Someone else's personal safety might depend on your following this requirement. For example, you install equipment not listed for the location and leave. Another group energizes it and three people die in the explosion. You can be held personally liable, if the cause can be traced back to violating this requirement.]*

8. Why should you coordinate with the operators, before working in a Hazardous Location? Can anyone give an example of how doing this made your job safer?

9. How does logging in and out of a Hazardous Location affect safety?

10. Suppose you install a piece of equipment in a Hazardous Location. The installation guide requires you to drive a ground rod and attach the equipment grounding connection to this rod while keeping the equipment "isolated" from the main grounding system. This is supposed to protect the electronics from surges and harmonics, and the warranty is void if you don't comply. What should you do? *[Note to Presenter: This egregious safety violation violates basic electrical theory and several electrical standards, including the NEC. Contact your foreman to get a warranty exception in writing and to make the owner aware of the problem.]*

Participant's Signature and Date
