Occupational electrical injuries are low-frequency/high-consequence events. For an industrial facility’s electrical safety resource, this means that the facility’s emergency response team (ERT) may never have responded to an electrical injury case. If an electrical incident did occur, however, an electrical injury is more likely to be fatal than most other types of occupational injuries. This highlights the need for facilities to have a specific electrical emergency response plan in place to ensure that timely and appropriate actions are taken if an incident occurs. Conducting periodic electrical injury drills will test a facility’s emergency readiness and identify learning and growth opportunities. When planning an electrical injury drill, the scenario and type of drills will vary depending on the type and frequency of electrical activities performed at the site, ERT training, and facility resources. Using data and observations from emergency drills conducted at different industrial sites, this article examines a variety of approaches to electrical injury drills and the information and best practices that resulted.

**Electrical Emergency Drills as a Practicality**

Emergency preparedness drills are an opportunity for hours of training and planning to be tested. For industrial manufacturing facilities, there are a
plethora of scenarios that can occur, from fires and hostile intruders to hazardous material releases and industrial accidents. The types and severities of the emergencies most likely to occur may vary, depending on the industry and the size of the facility. There is one hazard, though, that is almost inescapable for any industrial worker today: electricity. From electricians and laborers of other disciplines to operators utilizing energized equipment and office workers using power strips and computers, essentially everyone in an industrial facility is exposed to electrical hazards.

Because of the ubiquitous nature of electricity and the hazards that it introduces, it is important for ERTs to know how to respond to an electrical incident. In the following sections, real-life examples of three different electrical injury drill approaches [1] will be assessed, and the best practices drawn from these experiences will be shared.

The Need for Electrical Emergency Drills

For industrial safety programs and ERTs, electrical incidents have a unique nature as low-frequency/high-consequence events [2]. Cavley and Brenner put this into concrete terms in their article on occupational electrical injuries [3]: for every 13 electrical injuries from 2003 to 2009, one worker died; on the other hand, there was one death for every 325 fall injuries in the same time period. These data are summarized in Table 1. There are, of course, fewer total electrical injuries per year than fall injuries; however, a person who is injured by electricity is more likely to die from his or her injuries than someone who has fallen.

Because electrical injuries occur less often than many other types of occupational injuries, this can lead to several complications. As pointed out in [2], “The fact that electrical incidents are low in frequency can do two things: 1) create the false perception that the management of the hazard is under control and 2) create a challenge for workers to stay vigilant in the face of a low-probability occurrence.”

Another consequence of the relative rarity of electrical incidents is that even experienced emergency responders might not have responded to an electrical incident. Because electrical injuries are more likely to result in death, however, it is crucial for an ERT to be able to promptly provide the correct response to an industrial electrical accident. The National Fire Protection Association’s standard NFPA 70E recommends in Article 110.2(C), “Emergency Response Training,” that employees who are exposed to electrical hazards or responsible for emergen-

Working near an invisible, unrecognized hazard such as electricity will almost inevitably lead to injury at some point.

Responding to an Electrical Injury

Each type of medical emergency has its own appropriate response steps, and electrical injuries are no exception. The immediate actions taken in the aftermath of an electrical injury should include the following:

1) **Call for help:** Activate the site’s ERT so that help is on the way.

2) **Remove the hazard:** De-energize the source of electricity that caused the injury or move the injured person away from the hazardous area so that first aid can be administered without endangering others.

3) **Initiate first aid:** Depending on the type of electrical injury and whether the injured worker is conscious, appropriate first aid can vary and may include cardiopulmonary resuscitation (CPR) or helping the injured worker extinguish burning clothing [7].

Once the ERT arrives, part of its response should include recording any known details about the injured worker and the incident, such as the type of electrical exposure (e.g., shock, arc flash, or both) and the voltage that the injured person may have contacted [7].

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Accidents and Fatalities</th>
<th>Fatal Injuries</th>
<th>Percentage of Injuries Resulting in Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical</td>
<td>20,033</td>
<td>1,573</td>
<td>7.85%</td>
</tr>
<tr>
<td>Falls</td>
<td>1,718,219</td>
<td>5,279</td>
<td>0.31%</td>
</tr>
</tbody>
</table>
See “Post-Electrical Injury Questionnaire,” which is based on [8], for a sample questionnaire. Once the details are gathered, they should be sent to the hospital with the injured worker. Because electrical injuries, particularly shocks, do not always have immediate visible effects, it is important for those providing medical care to be made aware of the types of injuries that the patient may have sustained [7].

After the injured worker has been transported to a medical facility for treatment, some additional follow-up work can prove useful in preventing future incidents. Documentation that can be obtained about the incident in the immediate aftermath may provide valuable clues to the group conducting the failure analysis. Detailed notes and photographs of the scene, as well as other information about the events that led up to the incident, can help investigators identify the root causes and, hopefully, prevent future incidents. These findings can also provide the site’s electrical safety and ERT programs with information to improve training and emergency response plans [7].

Case Studies
The case studies in this article outline the sequence of events for three types of electrical injury drills: tabletop, mock, and full scale. Each drill was completed at different industrial manufacturing sites, and each was the site’s first electrical injury drill to be completed. While all three facilities were part of the same company, each site was at a different stage of implementing its electrical safety program. In every case, the drills provided valuable experience that will ideally lead to safer workplaces and better-prepared ERTs.

Tabletop Drill
Tabletop drills are an excellent tool for introducing a new response scenario to an ERT. The group is presented with an emergency scenario, and the appropriate response steps are discussed. This provides a low-pressure environment for a diverse group of people (i.e., emergency responders from maintenance and operations, safety professionals, engineers, and knowledgeable electrical personnel) to brainstorm about what could go wrong and how the situation could be handled.

A tabletop drill was planned at a site where a regular emergency drill program was in place but an electrical injury drill had not been performed. In 25 years of operation, the site never experienced a serious electrical injury. While overall this is very good, it meant that the site’s ERT had yet to respond to such an event. This amplified the need for an electrical injury drill to adequately prepare the ERT to respond appropriately and without hesitation. Participating in this drill were a site safety specialist, two site electrical safety and power distribution representatives, the site contract administrator, six members of the ERT, and 11 maintenance technicians.

### Post-Electrical Injury Questionnaire

A list with questions similar to the ones presented here should be a part of a site’s emergency response plan for electrical injuries. If at all possible, a completed copy should accompany the victim to the hospital or treatment center. The information will help ensure the best possible evaluation and treatment by initial medical caregivers.

**Name of injured person:**

1. When and where did the accident occur?
2. What was the victim doing at the time of the accident?
3. Did the victim come in direct contact with electricity? Was an arc the source of electrical current exposure? Explain.
4. Could the victim have inhaled metal vapors or extremely hot air caused by arc flash?
5. What was the duration of exposure to electricity?
6. Please identify the following as related to the incident:
   - Voltage:
   - Current capacity:
   - Source of electrical hazard:
7. Did the victim fall? If yes, explain.
8. Was the victim wearing protective or insulated clothing, safety boots, or gloves? If yes, what protective equipment?
9. Were others involved in the accident? If yes, explain.
10. Had the hazard been identified before the accident?
11. Did the victim seem dazed, confused, or lose consciousness at any point following the accident? If yes, please elaborate.
12. Did the victim require CPR?
13. Did the victim require the use of an automated external defibrillator?
14. Was the victim treated as if bones might be broken, especially in the neck?
15. Did the accident involve an explosion?
16. Did the accident occur in a closed space? If yes, please elaborate.
17. Did other hazards, e.g., combustibles, heavy loads, moving or fixed machines, vehicles and equipment, or extreme ambient temperatures, exist at the time of the accident? If yes, please explain.
18. Name and telephone number of person who can provide further information about the accident events.
The group gathered in a conference room and began by reviewing general electrical safety and the site's electrical safety program and its impact on ERT response. Then a scenario involving an electrical injury was described. A 480-V power circuit breaker was being replaced in an electrical control room (ECR) by two maintenance technicians. During the job, Technician One received a shock and was rendered unconscious. As discussed by the group, the response included the unharmed technician, Technician Two, first making sure that Technician One was clear of any energized parts and then pulling the fire alarm to simultaneously alert the site ERT and signal for an ambulance. After ensuring that help was coming, Technician Two would move Technician One outside of the work area to a clear part of the room and begin CPR. The ERT would send one or two responders to investigate the alarm and enter the ECR to help. The group also discussed that the ERT would direct the ambulance to the correct location on the site, keep curious observers out of the area, and access any available medical information on the injured worker before sending him in the ambulance.

After the tabletop discussion, the group moved to an ECR to act out the sequence discussed in the first part of the drill. After the ERT had taken command of the situation, Technician Two returned to the work area to de-energize the equipment that caused the injury. The ERT practiced CPR on a dummy for 8 min, which is about the length of time it takes for an ambulance to reach the site.

What Was Learned
This relaxed, discussion-based approach to the electrical drill was beneficial in bringing improvement opportunities to light for the site's electrical safety program. As a result of the drill, the following actions were taken to facilitate safe work habits and help the ERT respond in case of an emergency.

1) An emergency equipment list was added to the standard energized electrical work permit. Items on the list included a rescue hook and a communication radio (radios were not commonly carried by maintenance personnel at this site, but they are the ERT's main method of communication in case of emergency).

2) At the time of the drill, the site only had two rescue hooks. According to the site's electrical safety program, a rescue hook must be present at the job site when required by the job-hazard analysis. However, there was no designated storage location for the two hooks; they were moved from room to room as needed. Workers sometimes had to look in multiple locations across the site to locate one. Additional rescue hooks were purchased to provide one hook for each of the site's 15 electrical rooms, and a clearly marked storage location was established in each room to provide point-of-use access to this important emergency tool. The hooks are now more accessible for planned energized work and in case of an emergency.

3) The ERT's resource binders were updated to include a sheet with the name and location of each electrical room (e.g., E-Room 2: old utility building); because multiple names were sometimes used to refer to the same area, this provided an easy reference so the team could quickly identify the location of an emergency.

Functional Drill
In a functional drill, one or more functions of an emergency response are tested but may not involve outside resources, e.g., the local fire department. This provides a more realistic experience than a tabletop drill by setting up a scenario and allowing the ERT to practice its response. Reactions may be timed to see if there are opportunities for system or training improvements to facilitate faster responses. Observers may be stationed in a few locations (e.g., the control room and the location of the emergency) to record the flow of actions.

A functional drill was planned at a new industrial facility that was under construction and beginning the commissioning process. This was the first official drill for the newly formed ERT and participating were a site electrical safety resource; a corporate electrical safety resource; a shift incident commander (IC); four ERT members; a safety technician; a safety resource; a contract safety resource; the site operations manager; the readiness-to-operate manager; the plant manager; and the safety, health, and environmental manager, who also served as the drill critique leader.

The following scenario was set up. A work order was given for an electrician to reterminate wires in a 480-V compartment in a motor control center between two energized compartments. The electrician locked out the compartment that would be worked on, but, by site procedures, he was not required to lock out the compartments above or below, which were energized with 480 V. The electrician performed absence-of-voltage (AOV) tests in the compartment and verified that no voltage was present before beginning work. For the electrician to access a terminal strip, it was necessary for the vertical raceway next to the de-energized compartment to be open during work, as shown in
Figure 1. During the course of his work, the electrician accidentally dropped a screwdriver into the energized compartment below. He went to retrieve it but accidentally contacted the 480-V terminal strip of the energized compartment below, receiving a shock and causing an arc flash event. The injuries were communicated by a note placed on the victim (a live volunteer for the drill) at the scene of the incident for the ERT to review upon arrival. The electrician’s injuries were burns and lacerations (from the arc flash) around his head, neck, and upper body. The note indicated that the victim was initially unresponsive.

It was decided in advance that interaction with off-site emergency responders would be simulated rather than bringing them on-site. A site safety technician played the role of an off-site responder, receiving a call and driving to the entrance gate, simulating the arrival of an ambulance crew.

The drill planning team elected not to require employees to report to their regularly designated rally points to conduct a head count, partly because the plant alarm system was not functioning properly in a few locations, including some of the designated rally points. In addition, the resulting confusion during the drill would not benefit the site’s learning process. The site had not yet conducted any broad training on how to properly conduct or manage the head-count process. On-site contractors were notified of the drill immediately before it began and were instructed to continue working rather than to stop for a head count, which should be the standard response.

The event chronology was recorded by the designated observers.

1) The drill alarm was activated by the IC at 1:26 p.m.
2) The designated observer in the ECR, where the incident occurred, used a key to activate the local fire alarm pull station in the room at 1:27 p.m.
3) An audible alarm sounded, and a visual alarm was indicated on the fire alarm control panel in the central control room. The IC left the central control room and moved to the ECR.
4) The IC activated the ERT from the ECR via a radio at approximately 1:29 p.m.
5) Three ERT members arrived on the scene at 1:30 p.m. and began the scene-evaluation process.
6) The ERT members used the victim’s arms to pull him away from the open 480-V equipment before beginning direct treatment at 1:31 p.m.
7) Simulated chest compressions were started on the victim at 1:32 p.m.
8) An automated external defibrillator was retrieved, and its use was simulated at 1:33 p.m.
9) The IC returned to the central control room to silence the plant alarm at 1:35 p.m.
10) The ERT treated the victim’s burn injuries on his neck, face, and upper body by wrapping the neck area at 1:37 p.m.
11) The IC simulated the call to off-site emergency responders to communicate the emergency medical need at 1:38 p.m.
12) The ERT prepared the victim for extraction from the ECR at 1:39 p.m. in preparation for transfer to an ambulance. The victim was loaded into a basket and moved to the south door of the ECR at 1:42 p.m.
13) The simulated ambulance arrived at the plant entrance and received instructions from the designated ERT member at 1:44 p.m.
14) The ambulance proceeded to the south side of the ECR. The victim handoff was completed, and the victim was loaded into the ambulance at 1:46 p.m.
15) The electrical and instrumentation department was contacted at 1:48 p.m. to secure the motor control center where the arc flash occurred.
16) Barricading and scene control were completed at 1:51 p.m.
17) The all clear was given, and the drill was terminated at 1:53 p.m.

There was some delay in contacting the simulated off-site emergency responder, which was caused by a misunderstanding between the IC and one of the drill observers.
The IC stated the need to contact an ambulance earlier without recognizing that it was intended to be a simulated call during this drill. The IC conducted a visual assessment of the scene upon his arrival. No check for energized electrical conductors was performed by the ERT; however, the hazard was functionally recognized in the decision to move the victim before beginning treatment. The IC did not assign a note-taker in the incident command center and conducted most activities from the incident scene. During the victim's treatment, it was not clear how well the team considered and managed potential internal injuries.

What Was Learned
In the drill critique, several items were identified as having gone well.
- The ERT and IC demonstrated a good initial understanding of the arc flash event.
- The ERT showed good effort in team communication.
- The team worked actively to stay clear of the open 480-V motor control center hazard.
- The ERT understood the appropriate response to the victim's injuries.
- All activities were performed with an appropriate sense of urgency.
- The information handoff between the ERT and the ambulance crew was effective.

Based on the team's discussion of the drill and the site's overall performance during the event, the evaluation team identified items that they felt deserved additional attention, which included a discussion on communication, emergency equipment, emergency response procedures, ETR performance and training, and off-site responders.

Communication
There was extraneous radio activity during the event. Participants did not understand that radio activity not related to an ongoing event should stop during drills or emergencies. Site procedures were updated to prohibit extraneous radio traffic during drills and emergencies. Moreover, during the drill, it was not well understood how or when to silence site alarms. Continuing alarm activity hindered on-scene communication. It was also not clear how communication using the public announcement system would interact with an active alarm tone. Site procedures to address these scenarios are being developed.

Emergency Equipment
The ERT's equipment management made it difficult to quickly identify and deliver the necessary tools to the scene. Improvements are being made to simplify the ERT's equipment storage and movement system. There was no noncontact voltage tester for the ERT to use in performing an AOV test while securing the scene, and a tester was acquired after the drill. The ERT must be trained on the proper use of this tester, and an exception must be added to the site's electrical safety procedure to allow AOV testing with a noncontact tester in emergency situations. There were no nonconductive rescue hooks for emergency use. Rescue hooks were ordered, and they will be placed strategically around the site for ERT use.

Emergency Response Procedures
At the time of the drill, the central control room had been designated as a head-count rally point. It was recognized that this would create logistical issues for the IC and ERT members during an emergency, as the central control room was also designated as the incident command center. After the drill, a storm shelter in a different location was identified as the head-count rally point. Current procedures call for the IC to remain in the central control room to manage and direct an incident. During the drill, the IC chose to direct the incident from scene.

Site procedures and training are being evaluated to ensure that incident command is handled in the best way and in a standardized fashion with all crews. The ERT note-taker role was not activated during the drill; ERT training was updated to guarantee that every shift has all roles identified consistently with corporate emergency response standards.

ERT Performance and Training
The IC and ERT members did not check for AOV upon entry to the ECR where the incident occurred. More details about when, why, and how to do this were reinforced in the post-drill discussion and also incorporated into regular electrical safety and emergency response training. While the ERT understood concepts and concerns relative to arc flash, more training, especially on approach boundaries, was needed.

During the training, it became apparent that one member of the responding ERT had not received CPR training and certification. It was also recognized that additional training on the proper method of loading an injured person onto a backboard or into a basket for transportation to a medical facility would be beneficial. This training is being developed and will be provided to the team.

It was unclear during the drill whether the ERT or the IC understood the importance of securing an incident
scene once the immediate injuries and hazards were managed. This fact was communicated to the team during the post-drill debrief discussion and will be incorporated into future ERT training.

Off-Site Responders
The designated ERT member met the simulated ambulance at the site entrance and gave adequate directions to the scene of the incident. However, the ERT member did not ride with the ambulance. The post-drill discussion mentioned the need to ensure that this person accompanies the arriving off-site responders unless responders report directly to the control room. This procedure will be incorporated into future ERT training.

Full-Scale Drill
A full-scale drill calls for a multifaceted response, allowing many players (e.g., site emergency responders as well as those from the community, such as fire and police) to react in real time to a complex scenario. It may include disrupting a process, simulating a power outage, or calling for a full evacuation of the site. While a full-scale drill is a large undertaking, it is a very valuable emergency planning tool because it can help reveal details that may be overlooked in less rigorous drills.

A full-scale drill was planned at a mid-sized industrial facility. Although it was the site’s first electrical injury drill, the site had conducted many other types of emergency drills in the past. The site had its own emergency response vehicle that was used in the drill, so no off-site emergency responders from the community were used. Site personnel were aware that a drill would be held, but the details were known only to those who were directly involved in the drill preparation. The electrical injury scenario is detailed in the following steps.

1) A mock incident occurred when Electrician One was installing a 15-kV power circuit breaker into a switchgear located in the site powerhouse.
2) Electrician One, wearing full electric arc flash personal protective equipment and appropriate voltage-rated gloves, was found unconscious on the floor of the electrical room.
3) Electrician Two, who was acting as a standby for Electrician One, was unhurt and was able to assist the site’s ERT at the scene.
4) The incident caused the loss of power to several areas and affected the lighting in the electrical room where the incident occurred and in the facility’s fire station that served as the primary incident command center. Immediately before the drill, the power to the lighting circuits for the electrical room and the fire station were turned off and locked out.
5) The site ERT delivered mock emergency response assistance to Electrician One. Electrician One had a sign that indicated his basic medical condition to the ERT (Figure 2).
6) A mannequin replaced Electrician One to allow ERT members to perform CPR. The mannequin was transported by the ERT in the site ambulance to the helicopter-landing area at the facility.

Some of the key, mentionable occurrences that arose during the drill include the following.
- The power and the lights to the electrical room and the site fire station were turned off and locked out.
- Electrician One and Electrician Two were staged at the scene.
- The personnel assigned to observe and evaluate the drill were in place.
- The site emergency system was activated to indicate an emergency in the electrical room where the electricians were located.
- Electrician Two contacted the ERT personnel as they approached and effectively portrayed the event and the status of Electrician One.
- The ERT personnel took 20 min to enter the electrical equipment room.
- The ERT personnel were unsure who to ask for permission to enter the electrical room even though Electrician Two was immediately available.
- The lack of lighting in the electrical room created problems for the ERT members as they were not prepared to work without normal lighting.
- The ERT members responded well once they were inside the electrical room, and their training seemed adequate once they reached the victim and provided rescue assistance by transporting the mannequin to the designated location (Figure 3).

![Figure 2](image-url) Electrician One at the incident location. (Photo courtesy of Paul Sullivan.)
Other ERT personnel reported to the incident command center.

The loss of power at the primary incident command center (i.e., the fire station) caused many incident command problems (e.g., the ERT could not electrically open the fire station doors and had to open them manually), and issues with emergency lighting created many dark areas (e.g., the lighting did not last the required 90 min, did not function at all, or was not installed in all of the needed locations).

The incident command personnel moved to a secondary incident command center (i.e., a specific conference room). Some personnel were not aware of its location. Personnel also could not operate the relatively elaborate communication control system in that room because they had had no training or practice.

What Was Learned
Below is a list of some of the key things that were learned from this drill.

1) The 20-min response time for ERT members to get to Electrician One meant that the ERT members would have been performing a recovery activity instead of a rescue activity if this had been an actual emergency. Methods to improve response time needed to be identified and implemented.

2) The lack of lighting at the incident scene must be considered during emergency planning. An incident can cause a site's lighting system to fail, or an incident may occur at night when lighting may not be ideal.

3) The incident command centers need to be properly managed, and appropriate training needs to be in place for all personnel who may need to operate these facilities.

Best Practices
In evaluating these case studies, some best practices can be extracted that may be helpful for others seeking to conduct an electrical injury drill. The involvement of a knowledgeable electrical resource familiar with the site's electrical system is invaluable in both emergency drills and actual incidents. As a part of emergency response planning, an electrical resource can help the ERT determine how lights, emergency systems, and other parts of the electrical system may be affected by different incidents. A knowledgeable electrical resource can also help devise realistic drill scenarios that are likely to occur based on the type of work done at the site. During an emergency, the ERT may need an electrical resource to help shut off and lock out sources of electrical energy [9].

Planning
Effective planning is the key to the success of any drill. However, there are several factors specific to an electrical injury emergency that should be considered by those conducting the drill.

- Form an electrical injury drill-planning team that includes, at minimum, the following personnel:
  - a site electrical safety resource
  - an electrical power distribution resource
  - an ERT representative
  - a site safety resource.

- Utilize any existing site emergency drill-planning processes.

- Decide what type of drill will be conducted (i.e., tabletop, functional, or full scale).

- Select a scenario for the drill and consider the following:
  - make the scenario realistic and likely
  - decide whether the scenario will involve an electric shock, electric arc flash, or both
  - consider having two individuals participate as actors (i.e., one who sustains the injury and another who is a standby and summons the emergency responders).

- Review key information and results from the last electrical injury drill, and identify if any items warrant specific focus in the drill.

- Determine what key measures of success will be used to evaluate the drill. These could include the response time of the emergency responders as well as their actions (e.g., did they ensure that the scene was safe before entering?).

An electrical injury drill should be incorporated into the site's emergency drill schedule to ensure the drill will be completed at a set frequency. Regularly advocating the appropriate emergency response will keep the procedures at the forefront and help personnel remain cognizant of electrical hazards in everyday work.
• Evaluate whether any production-related problems could arise if the planned drill scenario actually occurred. Communicate this information to production personnel to determine their response to the production outage and to the injured person.

• Advertise the date that the drill will be held, but do not include the actual scenario’s details. Out of respect for uninvolved personnel and to avoid unnecessary panic, it is important to make sure that plant personnel are aware that there is not an actual emergency but that a drill is in progress.

Performing
When the time comes to hold the drill, it can be helpful to designate one observer in the control room (or another appropriate incident command center) and another observer at the location of the incident. This allows elements such as the response time of the emergency responders, the participants’ actions and responses to drill events, and the production personnel’s reaction to production-related problems during the scenario to be effectively and accurately recorded for later review. If using off-site emergency resources, it should be determined whether it is necessary for them to respond as if it were an actual emergency; they may not want to respond with their lights and sirens activated, as it may create traffic problems and possibly generate unwanted publicity or concern from the community.

Evaluating
The final piece to conducting a successful emergency drill is to analyze what went well and what could be improved. A post-drill debriefing discussion with all of the participants is a valuable part of evaluating the drill; involving all layers of the response team can help paint a thorough picture of the event as well as generate a feeling of ownership of the resulting action items. Items to discuss with the team can include the following questions.

• Was the response time acceptable? What if the drill had been performed on a weekend, a holiday, or during an evening shift? Would the response time change?

• What if power was lost to the site’s main entrance gate? Can the gate be opened manually? Do emergency responders know how to open the gate?

• How did emergency responders determine whether it was safe to enter the location where the electrical injury occurred?

• Did emergency responders secure the scene to prevent others from entering the area?

• Did emergency responders follow the appropriate protocol for treating a shock victim (if applicable)?

• Were there any key learning outcomes to focus on for the next electrical injury drill?

After the drill has been evaluated and action items identified and assigned, it is extremely important that any follow-up actions be completed promptly. An automated system that sends reminder e-mails can be effective for logging action items, assigning due dates, and tracking completion. A drill is a very useful tool for identifying gaps or improvement opportunities in electrical safety and emergency response programs. Promptly resolving these items is important to ensure site readiness in case of an actual electrical injury emergency.

Conclusions
Since occupational electrical injuries are characteristically low-frequency/high-consequence events, electrical safety professionals must find ways to help workers remain vigilant to electrical hazards while on the job. Regularly performing electrical injury drills is a good way to combat complacency and reinforce proper emergency response to electrical injuries. Careful planning, execution, documentation, and follow-up to these drills will help establish a fruitful learning experience for all involved.

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