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The Importance of Conducting Comprehensive Hazard Assessments for Safe Electrical Work

Safety doesn't happen by accident. Learn the key components of an effective job hazard analysis and why they sometimes fail in the field, along with how to improve those blind spots.

by Richard W. Neill

Key Highlights

- A job hazard analysis (JHA) is the blueprint for safe electrical work, which is why having a thorough, living documented plan is so crucial out in the field.
- An effective JHA starts with scoping the work; identifying energy sources and monitoring changing conditions; setting clear boundaries; and constantly reviewing and updating the plans to ensure electrical work is performed safely in open and ever-changing environments.
- JHAs are more than a plan; they're the foundation for creating—and sustaining—a workplace culture where employees know they are valued and safe work is prioritized above all else.

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Electrical work rarely happens in ideal conditions. Crews troubleshoot in busy plants, work from buckets along busy roads, restore service after storms and coordinate with other trades in congested areas. In those open, fast-moving environments, being careful isn't a strategy to control risk. But a proper hazard assessment can help make workplaces safer, even in less than perfect settings.



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A well-built job hazard analysis (JHA) is not a document that sits on a shelf or exists untouched in perpetuity. A JHA is a living document, a result of a team process that elevates compliance requirements into a shared plan.

The strongest JHAs are built with input from everyone who touches the job: crew leaders, qualified electrical workers, spotters, equipment operators and—when relevant—contractors or host site representatives. Everybody notices different exposures, and that shared planning helps the team catch hazards one person might miss on their own.

Safe electrical work should be defined before the first cover comes off. For a practical starting point, OSHA's Job Hazard Analysis booklet lays out a simple, repeatable framework that scales well to electrical work. At Centuri, the JHA is a crew owned conversation backed by real controls. The JHA forces us to stop and ask ourselves some fundamental questions before we start work: What are we doing? What could hurt us? What will keep us protected? What will we do when conditions change?

Why Hazard Assessments Fail

Despite how important JHAs are, many still fall short once the crew is in the field. It is impossible to anticipate every future condition, but in our experience the same breakdowns appear again and again in ineffective JHAs:

- They're completed after the work starts, so hazards aren't discovered until late.
- The job is described too broadly, meaning some step-specific risks are missed or combined.
- Personal protective equipment (PPE) is treated as the primary control rather than the last line of defense.
- Changing conditions (e.g., weather, traffic, public proximity and system status) are missed or ignored.
- Roles aren't assigned, so boundaries and verification aren't enforced.
- They are completed by an individual instead of as a team, so not everyone has the chance to provide input.

From our experience at Centuri, we've learned that it's vital to build reinforcement into your process from the start. Complete the JHA before work begins, describe the job in specific steps, then assign clear verification roles. And remember to pause whenever weather, traffic, system status or crew makeup changes.

Ultimately, the goal of a JHA is to create shared situational awareness, so everyone knows the plan and understands the controls. When everyone knows the hazards, crews can speak up the moment the work drifts outside safe boundaries. This gives crews a better chance to proactively intervene and mitigate or prevent risks altogether.

8 Key Components of an Electrical JHA

OSHA describes a JHA as a technique that focuses on job tasks to identify hazards before they occur, taking into account the worker, task, tools and environment. Electrical JHAs require extra rigor because the hazard(s) can be invisible and high consequence. Unlike many other jobsite risks, energized systems, stored energy, induced voltage and backfeed can remain present even when the work area appears stable. These lurking hazards mean you must place added emphasis on isolation, testing, boundaries and stop-work discipline.

With that in mind, the following components can help crews build a task-specific JHA that's flexible enough for the field.

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1. Job information and scope

Name the task in plain language and lock in the scope. Include equipment, the location(s), who's involved, known constraints and emergency response information. Stick to the scope and make sure information is up to date. If anything changes, bring everyone together to make sure everyone is in alignment on how to identify and eliminate any new job hazards.

2. Task breakdown

Develop a sequence of six to 12 steps that accurately reflects the actual workflow for electrical work. Ensure the process covers all critical steps, including staging, establishing access, cover removal, testing, grounding, lockout/tagout, torquing, restoration and demobilization. This detailed mapping is crucial for identifying potential hidden hazards.

3. Energy inventory and hazard identification

Although shock and arc flash are the headline hazards, field work adds the risks of backfeed, induced voltage, stored energy, traffic, and weather, among others. Our crews use an energy wheel *(below)* to ensure they identify risks beyond the obvious. This scan includes, but is not limited to:

- **Electrical:** shock, arc flash/arc blast, induced voltage, stored energy, backfeed from generators or distributed energy resources;
- **Motion, mechanical and gravity:** dropped objects, pinch points, moving equipment and suspended loads; and
- **Environmental:** wind, rain, poor footing, poor lighting, heat stress under PPE, public proximity and traffic.

4. Risk assessment

Evaluate the task by asking two questions: What is the potential severity if the event occurs? What is the likelihood of a potential event under current conditions?

These questions are crucial because electrical work leaves no room for assumptions, luck or overconfidence. A routine task can become a life-altering experience in seconds if one condition is missed, one exposure is underestimated or one control fails when it is needed most.

The next step of a risk assessment is to review the factors that elevate risk, including fatigue, heat stress, noise, unfamiliar equipment, recent abnormal behavior and time pressure. If a risk is deemed too high, the team should propose ways to reduce exposure through additional controls, a revised sequence, more resources, better site control or de-energization.

5. Hierarchy of controls

The hierarchy matters because it keeps teams from jumping straight to PPE. A core theme in NFPA 70E—the electrical safety standard that defines how workers must identify electrical hazards and use safe work practices and protective equipment to prevent shock, arc flash and arc blast injuries when working on or near energized equipment—is selecting controls in order of their effectiveness:

- **Elimination:** De-energize and remove exposure.
- **Engineering controls:** Guards, barriers, insulating covers and remote operation where feasible.
- **Administrative controls:** Procedures, permits, spotters and job rotation.
- **PPE:** Protective gear is the last line of defense.

A strong JHA also makes energized work an explicit decision, consistent with 29 CFR 1910.333.

6. Verified isolation

The JHA should state where isolation is applied and how the absence of voltage is verified at the point of work. It should also outline how stored energy is addressed and what prevents unexpected re-energization (i.e., switching orders, tagging and recloser considerations).

7. Boundaries

Approach boundaries, shock protection boundaries and arc flash boundaries are only effective when controlled. Define the boundary, how it's marked, who maintains it, and what happens when the site gets crowded or visibility drops. OSHA's guidance on arc flash approach boundaries is a useful refresher.

8. Briefing and stop-work triggers

A hazard assessment that lives only on paper is not a control. The JHA must be briefed so everyone shares the same picture of the job. Before work starts, a prepared facilitator should know the task, the environment, the dangers, the schedule and the situation/history. The briefing should also set clear stop-work triggers.

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The Power of JHAs: Safer Work and Stronger Compliance

A well-run JHA converts regulatory and consensus requirements into repeatable field behavior. Here's what that looks like in practice:

- It supports OSHA's hazard assessment expectations by forcing a hazard-based PPE decision (see 29 CFR 1910.132(d)).
- It aligns planning with OSHA's de-energizing and work-practice requirements in 29 CFR 1910.333.
- It operationalizes NFPA 70E's electrical risk assessment expectations by incorporating shock and arc flash hazards into the work plan.
- It creates an audit trail of what hazards were recognized, which controls were selected and who was briefed.
- It strengthens training because the same JHA becomes a teachable script for newly qualified workers.
- It improves learning loops by feeding near-misses and lessons learned back into future JHAs.

That is the real power of a strong JHA: It provides more than compliance because it sharpens workers' judgment and reinforces their roles. In addition, JHAs give crews a repeatable way to recognize when the job is no longer fully under control. To deliver that benefit consistently, the JHA has to be usable in the field, not just technically correct on paper.

How to Make JHAs Usable in the Field

If you want hazard assessments to change outcomes, design them for the way electrical work is actually performed. This is how you make a JHA a field tool rather than a formality.

The JHA itself should have a consistent structure to help crews quickly find critical information. It should use conversational language to make it easier for supervisors to brief the job, confirm understanding and raise questions before work begins. It should include clear subheadings and short prompts to give less experienced workers a better chance to follow the discussion and participate.

Most importantly, a JHA should be designed with change in mind. In electrical work, change is constant; switching conditions can change, crews might get pulled into adjacent work or access can tighten. Moreover, it's reasonable to expect external interference, such as a weather shift, or an incursion by a pedestrian, which adds more risk.

Throughout the document, the JHA should explicitly assign roles. By assigning roles up front and defining re-brief triggers, teams know who is watching the boundary and who verifies isolation. Lastly, the JHA should detail a clear communication chain, and the crews should understand when the entire plan must be revisited before work continues. A revised plan is a control; a stale plan is a risk.

Safe Electrical Work Starts Before Work Begins

Safe electrical work isn't defined by good intentions. Decisions characterize it: de-energize where possible, verify, control the boundary, and stop when conditions change or if high-energy hazards exist that were not already discussed.

The JHA process is where those decisions are made and where safety and compliance become practical. Proper hazard assessments put safety front and center.

In this way, safe work is a constant choice and prioritization. Systems must be in place to support assessments before the work begins. Whenever conditions change, the environment must be reevaluated and risk eliminated before work can resume. That is the only way to guarantee work is being done safely to protect workers.

In the end, the value of the JHA extends beyond preventing injuries. An effective JHA builds trust, improves execution and transforms safety from a slogan into a daily operating standard. When teams identify hazards correctly, communicate clearly, and re-evaluate conditions honestly, they strengthen performance and ensure the work is consistently completed correctly and safely for all.

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