Open the Door to Opportunity through Arc Flash Data Collection

By Bryan Rupert

An arc flash analysis (AFA) spans a number of tasks, most of them performed by electricians and professional electrical engineers. Data collection—the first phase of an AFA—must be performed by a qualified worker, most appropriately a licensed electrician. Most companies and organizations look to outside contractors to provide AFA services in general, including the data collection. As an electrical contractor, you may be considering branching out into this growing and lucrative field. Here you can read about how to propose a project scope, how to price the project, and how to discover other opportunities that result from data collection. For an overview on the different roles involved in an AFA, from beginning to end, refer to "Arc Flash Analysis: A Basic Project Overview for Electrical Contractors" in the May 2015 edition of *Electrical Products & Solutions*™.

Preparing the Project Scope

It's important to do an accurate job defining the scope of a data collection project before you attempt to quote the work. When defining the scope, you have the opportunity to approach the data collection portion of a client's AFA request in phases, which can help you manage your work schedule and help your clients feel more in control of their budgets. In addition, your approach can differentiate you from other contractors who only consider quoting a complete site. You can define the scope of the project based on different criteria. Here are a few logical criteria to use as a basis for defining scope:

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Voltage class: Depending on the number of voltage levels in a facility, you may want to define the project parameters based on voltage class. For example, Phase I might span from 15 kV down to 600 V class equipment,

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Phase 2 from 600 V to 300 V, and Phase 3 for everything under 300 V.

Equipment type: Sometimes it makes sense to define your scope based on equipment type. An example of this might be defining a phase that starts at the utility transformer and goes up to the busway or 800 amp distribution panels. The next phase might be from the busway to the floor equipment it feeds, or from the 800 amp panel to the lighting panel or other loads the panel feeds.

Number of points: If your pricing is point-based, a client may simply choose to scope the project based on the number of points that will work with his/her budget at the time.

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Pricing the project

The two most common pricing models for arc flash projects are based on *time and materials* or *cost-per-point*. There's a tendency, especially if you're new to this type of project, to want to price it the "safe" way—based on time and materials. While time and materials presents the least risk to you as a contractor, it will be a hard sell to your client. Clients need cost parameters; they seldom will approve any job carte blanche. In addition, contractors familiar with arc flash analysis know from experience that the time-and-materials model can limit profitability. Consider this example (using basic figures for simplicity):

	HOURLY RATE	PER-POINT RATE
Rate	$100 per hour	$25 per point
Avg points collected	6 per hour	6 per hour
Total for 8-hour day	$800	$1200

The rule of thumb is that an experienced qualified worker can collect, on average, four to six points an hour—35 points a day at an average facility. Consider that the more familiar you become with performing data collection, the faster you'll get. Using a per-point model, you'll stand to come out ahead as you become faster at data collection.

As you set your rate for either type of pricing, remember to account for overhead costs. The most basic tools required for AFA data collection are pen and paper. Realistically though, you'll want to have a spreadsheet tool at a minimum. If you want to be more competitive, consider introducing into your process a data collection software tool, like FlashTrack™, which was designed to assist electricians in collecting the vital information needed for an arc flash analysis, short-circuit calculation, or coordination study.

In the case of setting per-point pricing, since you won't be billing an hourly rate, remember to account for the cost of having an electrician on-site, including travel time, set-up time, and the planning time that went into the project.

When estimating your time for the project, remember to set an expectation with your client that the project size can change. When you visit a site in preparation for quoting a job, you don't always get the complete picture. During a facility tour, you're typically not going to open enclosures to see what's inside. The fact is, points exist within points. For example, a power distribution panel or motor control center (MCC) may have a protective main, which would be two points. Or perhaps you're quoting based on an "as-built" one-line for the facility. (Always keep in mind that as-built one-lines never represent reality.) Either way, the number of points can often turn out to be higher than you originally thought. Therefore, it's always a good idea to make an allowance for providing a Project Change Notice later to account for additional points not contained in the original estimate.

Receipt of Order

When branching out into this growing, lucrative market, it's likely you'll need to spend considerable time planting seeds for new business before you get your first contract. You may be pleasantly surprised to find an occasional client who has budgeted funds "shovel ready." But it's more likely that, regardless of whether the project scope is 80 points or 800 points or more, you may have to wait months or even years to hear back that an order has been approved. When you do hear back, especially when a year or more has passed, be sure to review your original estimate with the client to account for any site changes. You'll also want to account for any price increases that may affect your original estimate.

Data Collection as a Bridge to New Opportunities

Don't forget about other opportunities tied to the arc flash study data gathering. As an electrician performing data collection, you have a unique perspective for identifying additional opportunities to assist your client with electrical needs.

Site Training: When it comes to electrical safety, qualified workers are required to be trained. OSHA and the NFPA 70E standard stipulate that businesses must have a written safety program and training shall be provided at least every three years. Even unqualified workers are required to be trained on electrical hazard awareness and symbol recognition. As an electrical contractor familiar with your client's electrical system, with the right training, you can help to train those workers. The best safety training programs are site-specific and focus on practical application for the qualified worker. If you intend to branch out into electrical safety site training, it is not enough to sit and read the training standards to your students. Design the training program to be useful and effective. Done correctly, the training should be able to be accomplished in four

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hours or less. Training of qualified workers should include, but not be limited to:

- Understanding how to interpret label data
- Inspecting and caring for personal protective equipment (PPE)
- Field inspecting and testing gloves—the correct processes and intervals—and dielectric glove testing requirements
- Evaluating risk associated with the tasks at hand

Code Violations: You're bound to come across code violations during data collection. It's extremely rare to complete data collection without identifying any electrical code violations. In fact, in October 2014, OSHA cited electrical-related violations in three of its TOP TEN Most Frequently Cited Violations.[1] Specifically, these included Lockout/tagout (#6), Electrical: wiring (#8), and Electrical: system design (#10). Not surprisingly, number two on the OSHA list was Hazard communication. All of these point to arc flash data collection as an opportunity to identify future repair work to ensure worker safety and the integrity of the electrical system.

Mitigation/Coordination: As an electrical contractor, mitigation and coordination can also open doors to new business. Early in the arc flash study, determine if your clients are more interested in equipment reliability (coordination) or life safety and equipment protection (mitigation). Examples of sites that focus on coordination are data centers, research and development labs, and defense contractors. Examples of sites more interested in mitigation are manufacturing facilities and office buildings. Ensuring your client sites conform to their needs—whether coordination or mitigation—can lead to additional income opportunities.

Managing Change: OSHA isn't going away. Considering that every facility is dynamic, updates will always be necessary. The NFPA 70E standard stipulates that an arc flash analysis requires periodic review and updating during a timeframe that is not to exceed five years, or more frequently if the system is modified. Use this as an opportunity to set up a regular schedule with your client to update their one-line diagrams and labeling. It's not cost effective to be called out every time the client reports a single change. Instead set a reasonable threshold for visiting after a recognized minimum number of changes. Based on the rule of thumb that a qualified worker can collect at least 35 points a day, consider re-visiting after 15 or 30 point changes, thus ensuring at least one-half to one full day's work. In a perfect world, your clients would contact you when they've added or subtracted components. But the reality is, you'll most likely need to contact them to remind them of the need to update their studies.

Maintenance: The NFPA 70E and the NFPA 70B standards stipulate that maintenance is required for equipment directly associated with employee safety. Performing arc flash studies also leads to maintenance opportunities, especially for infrared and ultrasonic testing. As a field electrician, you'll be close enough to identify some loose connections or see obvious signs of electrical tracking. Any anomalies should be recorded and documented during the data collection phase. These visual observations should also be reported in the final Arc Flash Analysis report. Later, you may have the opportunity to, at a minimum, return and do a thorough pass using infrared and/or ultrasonic testing.

Data collection is only one part of the arc flash analysis process—but it's a critical part. When it's done well, not only does it provide your client with the basis for completing a successful AFA, it also has the potential to protect your client from unnecessary risk. In addition, doing a good job with data collection can lead to additional revenue opportunities for electrical contractors. ❑

[1] "Top Ten Most Frequently Cited Standards," OSHA, October 28, 2014. https://www.osha.gov/Top_Ten_Standards.html

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