



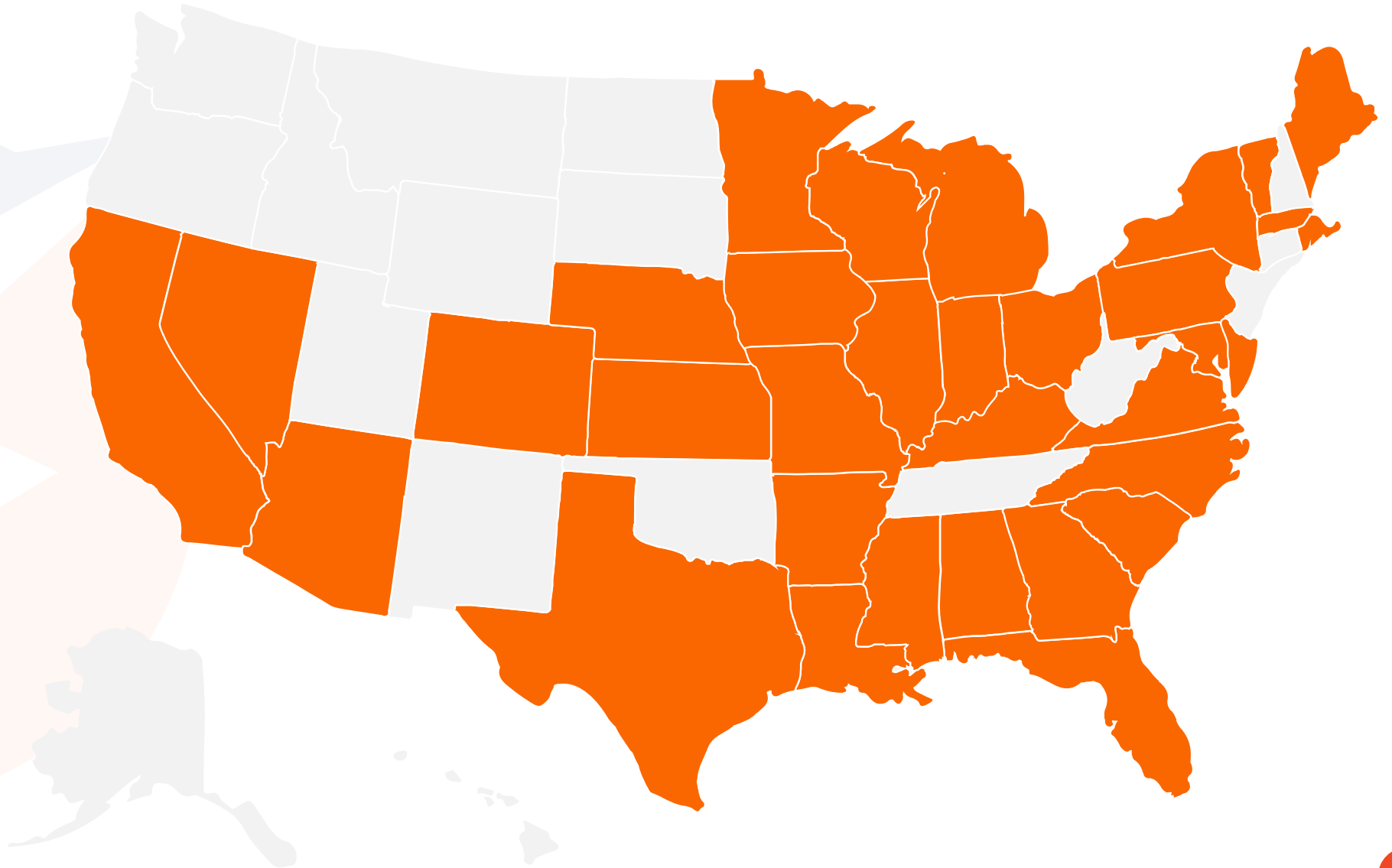
Some people want it to happen, some wish it would happen, others make it happen.

”

Michael Jordan

Let's make it happen together!

Growing
Strategically,
Not Chasing
Dollars...



Overview

This program will explore the different components of a short circuit, coordination, and arc flash study, explaining why each section is important and how each section relates to the others. We will touch on relevant section of the NEC and NFPA 70E. It will also look at the 2018 changes in the NFPA 70E.



Why Perform Studies?



Information Needed

- Submittals for gear, transformers
- Utility information
- Cable length and sizes



FAQ



Why Use Pioneer Power Group



Our Services

01



Short Circuit,
Coordination &
Arc Flash Studies

02



Load Flow/Voltage
Drop Analysis

03



Motor Starting
Studies

04



Arc Flash
Label Printing

05



Arc Flash
Training

What is a Power Study?



Short Circuit

Will the gear withstand or interrupt the available fault current?



Coordination

Which breaker will trip first?



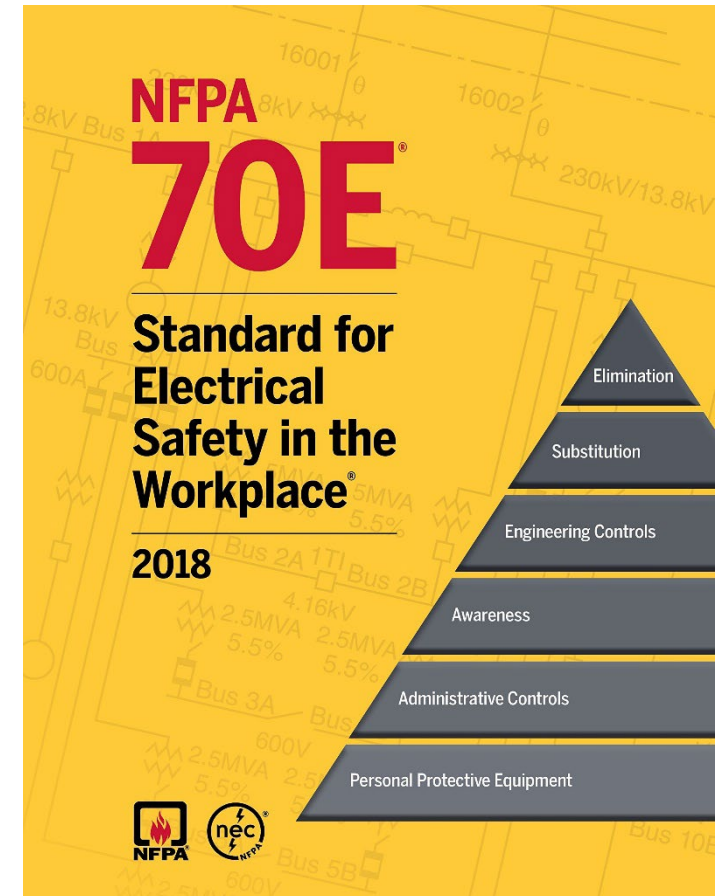
Arc Flash

How much PPE should a worker wear while working on the equipment? Can the equipment be worked on live at all?

2018 Changes to NPFA 70E

 Service entrance label for all equipment > 1200A if there is not an Arc Flash Label. Label must include the following:


- DATE APPLIED
- Available Fault Current
- Nominal System Voltage
- The Clearing Time



Arc Flash Reduction

NEC 240.87 Arc Energy Reduction



 For all systems 1200A and above, there needs to be a documented method of reducing arc flash incident energy



Zone Selective Interlocking



Differential Relaying



Energy-Reducing maintenance switching with local status indicator



Energy-reducing arc active arc flash system



An approved equivalent means

 Note: With Maintenance Switches, there is a temporary miscoordination while the switch is engaged.

Study Process

Distributors submit a RFQ to studies@pioneerpwr.com
Include One-Line and Spec if available



We send the proposal to the distributor within 1 business day.



After a PO is issued, we create a point-to-point detailed data request with all of the information needed for a study



Once all of the information is returned, the study is typically provided within two weeks



Once we receive an approved study, the labels are printed and shipped within 5 to 7 business days.

F.A.Q #1



Why is my gear Extreme Danger? How can I fix it?

Arc Flash incident energy rating is based on the magnitude of the fault and the time it takes for the upstream protective device to trip. If the utility does not provide its protective device, the first Switchboard or Panelboard in a system will almost always be Extreme Danger. In other words, the rating doesn't have to do with the equipment itself, but rather the upstream equipment.

F.A.Q #2



Can't we just lower the breaker settings to reduce the Arc Flash Incident Energy?

There is a tradeoff between coordination and Arc Flash. Lowering the settings of the upstream device will likely lower the incident energy, but might also cause a miscoordination to occur. It is up to the customer to decide which objective takes precedence.

F.A.Q #3



Why can't we run Arc Flash based on an infinite bus?

Arc Flash Incident Energy calculations are based on the magnitude of the fault and the time it takes the upstream device to trip. An infinite bus gives the worst-case fault currents. Higher fault current will generally lead to faster tripping times, that could make the incident energy seem lower than it is. The reason that we don't perform Arc Flash with an assumed fault current value is safety; we want all personnel to be properly protected against the actual incident energy at a location.

Additionally, running short circuit calculations with an infinite bus in some applications may yield results that are overly conservative. This could result in appropriately rated equipment failing the short-circuit analysis, potentially resulting in increased equipment costs and project delays that are unnecessary.

F.A.Q #3



Why can't we run Arc Flash based on an infinite bus?

Arc Flash Incident Energy calculations are based on the magnitude of the fault and the time it takes the upstream device to trip. An infinite bus gives the worst-case fault currents. Higher fault current will generally lead to faster tripping times, that could make the incident energy seem lower than it is. The reason that we don't perform Arc Flash with an assumed fault current value is safety; we want all personnel to be properly protected against the actual incident energy at a location.

Additionally, running short circuit calculations with an infinite bus in some applications may yield results that are overly conservative. This could result in appropriately rated equipment failing the short-circuit analysis, potentially resulting in increased equipment costs and project delays that are unnecessary.

F.A.Q #4



Thermal-magnetic versus Static Trip breakers

Thermal magnetic breakers have no adjustability, or only an adjustable instantaneous setting. They are unlikely to coordinate if the trip ratings are close together. Static Trip breakers have adjustable long time, short time, and instantaneous settings. They provide the best possible coordination. They are also out of the budget range on some projects.

F.A.Q #5



Miscoordinations are noted on the cover letter attached to my report. Is this OK?

Pioneer Power objectively comments on the system coordination based on the power system design and provided bill of material.

It is common to encounter instances where protective devices will not selectively coordinate (or perfectly isolate overloads and faults) during abnormal circuit conditions. In many cases, miscoordinations do not imply that there are protection issues, or the system isn't compliant to code however this may not be true for life-safety, legally required, or critical equipment branches.

F.A.Q #5 Continued



Miscoordinations are noted on the cover letter attached to my report. Is this OK?

The coordination in the distribution system is one factor that should be weighted by the engineer of record and end customer along with the expected frequency of abnormal conditions, the consequences of a non-selective trip, the project cost, and equipment size.

The engineer of record should have the final responsibility of approving the overall system coordination. In the event that they are not tied into the project Pioneer can offer practical opinions to the customer, but ultimately, they will own the distribution system.

F.A.Q #6



Can Pioneer Power help the project team improve system coordination?

Yes, however, to streamline the process this needs to be a collaborative effort between all project stakeholders. As a first step, coordination results will be provided to the engineer of record and end customer in a report format. The engineer of record and customer should review all comments and identify (to Pioneer Power) any miscoordinations in the report they find unacceptable.

In most cases, coordination for new construction projects can be improved by installing circuit breakers with electronic “LSI” trip units. A consequence is that these breakers may lead to increased equipment sizes and project costs. Pioneer can identify breakers in the original bill of material that, if changed to an electronic trip, could improve coordination. The PM would then need to work with the equipment manufacturer to identify specific equipment that can be installed and develop new bills of material.

F.A.Q #6 Continued



Can Pioneer Power help the project team improve system coordination?

In some rare cases (i.e. if a main breaker and feeder breaker at a panel have the same trip rating) the engineer of record may need to redesign some portions of the distribution system.

Once revised bills of material are prepared and any changes to the distribution system have been identified, Pioneer can review all changes – comment further if necessary – and incorporate the final design into a revised report.

F.A.Q #7



The proposal is for \$1900 even though there are only three panels. Why is that?

We have a minimum bid for small projects, as the bulk of the work is not in the modeling or data input for these projects, but putting the report together and includes the cost of the AF labels

Why Use Pioneer Power Group?



Our Technical Expertise

- ⚡ Half of our engineering team came from Eaton. You can have confidence in the fact that the work being done on your studies is of the highest quality.
- ⚡ Feedback from Customer on 4/4: “Your team is so great to work with! They often suggest technical solutions that I didn’t think of to help solve issues. Also, they are so great at communicating with me throughout the project!”



Cost Effective Solutions

- ⚡ We are always willing to take a last look at projects to make sure we are helping you price your study jobs as competitively as possible.
- ⚡ Feedback from Customer on 3/23: A customer recently told us that we priced a study 40% less than the manufacturer and because of that he was able to secure the order for the gear on the project.





Why Use Pioneer Power Group?



Turnaround Times that Can't be Beat

- ⚡ Turn around time for quotes = 1 business day; Turn around time for data request forms (after receipt of PO) = 1 business day; Turn around time for typical size study = 2 weeks or less from receipt of all data
- ⚡ Feedback from Customer on 3/7: A customer reached out and asked if we could complete a study for them within a couple of days because of the upcoming holidays. We immediately took action! Engineering was able to get the study completed in 2 days!!!



In House Label Printing

- ⚡ Labels are printed and shipped 5-7 business days after final approval of the study.
- ⚡ We have taken measures, all while following the guidelines for social distancing, to ensure that labels are still able to be printed weekly during the pandemic.
- ⚡ Customer Situation on 3/16: We printed labels on Monday, 3/14 but on Wednesday the customer called requesting a reprint because the contractor messed up the installation. We immediately jumped into action, went into the office, reprinted the labels & shipped them out. All in the same day!

Why Use Pioneer Power Group?



Customer Service is Everything

- ⚡ You, our customer, are the most important thing to us! Our team believes in going above and beyond at any and every point during the process..... from quote to label printing.
- ⚡ We not only want to meet your expectations, but we want to exceed them!
- ⚡ Feedback from a Customer on 4/8: “Based on how you handled this situation, I will make sure we send more orders your way. I really appreciate the way you stepped up & took care of the issue. GREAT SERVICE!”



What people are saying...

★★★★★

“I have been working with Pioneer Power Group for over three years now. They have the best team I have worked with for Power System Studies. Their turnaround time from Quote to Final Report is unmatched. Everyone we work with at PPG has been a tremendous help. They take time to help in any way they can. Explaining what needs done and the best approach to solving the problems or issues. They make gathering info, doing the studies and working out any power quality issues much easier than anyone we worked with in the past. We use PPG for all our Studies opportunities.”

★★★★★

“Pioneer Power Group provided a better-quality product at the best possible value. Their team coordinated closely with us, and completed the study in our tight windows, as we sprung it on them at the last minute.”

★★★★★

“Our experience with Pioneer Power Group has been excellent. Response to questions has been prompt and studies have been competitively priced and turned around quickly.”

How to reach us

Contact your local Schaedler Yesco representative and request that Pioneer Power Group perform the short circuit, coordination, arc flash study for your project!

Contact your local Cusick Electrical Sales representative!



Discussion
