Guide to Arc Flash Mitigation Methods

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Learning Objectives

Guide to Arc Flash Mitigation Methods

1. Understand the categories of Arc Flash Mitigation Methods

2. Learn important questions to answer when developing an Arc Flash Mitigation Strategy

3. Learn the numerous methods available to mitigate Arc Flash hazards

4. Achieve a basic understanding of the pros & cons of various Arc Flash Mitigation Methods
Arc Flash Analysis and Mitigation

- By now, almost old news – the industry has made great strides in how we all deal with arc flash hazards – increased awareness, improved work processes, etc.
- The analysis is only part of the story – what do you do from there?
- NFPA 70E gives guidance on several mitigation methods, including Engineering Controls
- But…which one(s) should you choose?
  - Some may be task specific
  - Some may address risk or likelihood but not severity
  - Some may not be very effective or applicable in a given situation
  - All mitigation solutions are not created equal!
Types of Arc Flash Mitigation Methods

Guide to Arc Flash Mitigation Methods
First Step – Categorize the Solutions

Avoidance:
Help isolate personnel from the vicinity of the hazard but the arc flash hazard remains unaffected.

Prevention:
Reduces the likelihood of an arc event without necessarily altering the arc flash severity levels.

Containment:
Effectively contains and redirects the arc flash fault and its by-products away from personnel.

Reduction:
Lower the incident energy level by clearing the arc fault more quickly.

• Our contention – all arc-flash mitigation solutions fit into one (sometimes more than one) of four categories:
• Understanding what the solutions in these categories do…and what they don’t do…is the first key to understanding how to develop an arc-flash mitigation strategy
“Prevention” Solutions

- Solutions that make arcing faults less likely to occur – Prevent the Arcing Fault!
- Examples:
  - Additional barriers or compartmentalization in equipment
  - Insulated bus (including Solid Insulated Switchgear)
  - High-resistance Grounding
  - Proper equipment maintenance
- These solutions tend to primarily affect Likelihood
- Severity levels (and PPE requirements) may not change
- Can be difficult to quantify this effect
“Reduction” Solutions

• Solutions that clear the arc more quickly to reduce the available incident energy
• Incident Energy is directly proportional to time
• Examples:
  • Fast-acting fuses, breakers, and relays
  • Maintenance Switches
  • Arc Flash Relaying (optical, etc.)
  • Setting Optimization
  • System Topology
• These solutions do not affect the likelihood, but they do reduce the severity
“Avoidance” Solutions

• Solutions that remove the worker from the vicinity of the hazard
  • Incident Energy drops off as $\sim 1/d^2$
  • Ideally – allow for certain tasks to be done outside the Arc Flash Boundary

• Examples:
  • Remote Operation
  • Remote Racking
  • Infrared Windows
  • Safe work practices

• May reduce both likelihood and severity to the worker…but hazard level unaffected at the equipment itself

• Tend to be task-specific – for better or worse
“Containment” Solutions

- Solutions that contain / redirect the arcing fault and its by-products
- Example: Arc-Resistant Switchgear
  - Intent – protect the worker standing adjacent to the equipment
- Reduces severity by containment; likelihood is unaffected. No protection for equipment itself.
- No benefit for intentional exposure or equipment applied outside of product ratings…and product ratings are not always well understood
What’s Next?

- Technology is great – but developing an effective mitigation strategy requires more than just selecting the latest and greatest version of the Maintenance Switch.
- Based on years of experience of dealing with customers in various industries – we have developed a list of guiding questions and solution matrix that helps guide decision-making.
- First – look at the Questions, then get a sample of some of the Solutions.
Developing a Strategy for Arc Flash Mitigation

Guide to Arc Flash Mitigation Methods
Developing a Strategy – Question #1

What does “safety” mean to you?

- If you’re going to mitigate, what is the end goal?
  - Are you simply trying to meet NEC requirements? (e.g., NEC 240.87)
  - Do you want to make sure there are no energy levels above 40 cal/cm²? 8 cal/cm²?
  - Do you want all incident energy levels to be less than 1.2 cal/cm²?
- Goals drive solutions – the optimal solution for each criterion above may be different
- How can you solve a problem if you can’t define your goals?
- First step: define a set of safety-related Performance Requirements
Where / when is the exposure?

• How to prioritize mitigation actions? (Limitations on budget, available downtime, etc.)

• Common answer: start with highest IE level and work your way down

• May not be the best approach:
  • Example: MCCs have lower IE than service-entrance gear, but workers are exposed more frequently. Might lead you to address the MCCs first.
  • Example: Thermographic Scanning is most common task to expose workers. Might lead you to an Avoidance solution if Reduction of IE is too hard.

• Consider both Frequency of Exposure + Specific Work Tasks
Developing a Strategy – Question #3

How will you evaluate Likelihood vs. Severity?

- AF Calculations – evaluate severity (i.e., cal/cm² level), but this is only a part of Risk
- Severity and Likelihood are both important, but most solutions affect these unevenly
- When is it OK to forget about “bringing the numbers down” and look at other solutions (e.g., Prevention or Avoidance)?
- Worker training and safety policy become important:
  - Are workers capable of doing proper Risk Assessments?
  - Can they implement safe work practices? Is policy being effectively enforced?
- Can some solutions introduce or even increase some element of Risk?
What about equipment survivability?

• Obviously... 4 cal/cm² is easier to recover from than a 40 cal/cm² event

• The problem... how to quantify this?

• Even if it’s hard to quantify... the potential for damage reduction may provide additional motivation to mitigate at Critical Equipment locations
What are the Red Flags? (Limiting Factors)

- Budget?
- Available downtime for installation of retrofit solutions?
- Effect on Reliability? (Does your solution impact selective coordination?)
- Equipment footprint? (Can you fit arc-resistant switchgear into the electrical room?)
- Equipment maintainability?
- Is there something upstream to trip?
- Is there a reliable source of control power?
- Who is going to program, test, and **commission** that fancy relay system?
Know and Weigh Your Options:

Guide to Arc Flash Mitigation Methods

Introduction

Our arc flash experts have created this document to help assemble the information and knowledge you need to formulate an effective arc flash strategy. This makes the process of selecting the right strategy for your facility easier.

What are the goals for arc flash protection at each level of distribution equipment? The secret to success is establishing clear goals. We have defined four categories that break down the different types of technologies based on how they aid in reducing the incident energy.

Reducing Hazard Mitigation Types

1. **Prevention**: Help personnel avoid the hazard or add distance from it
2. **Reduction**: Reduce the incident energy
3. **Containment**: Effectively enclose the hazard
4. **Protection**: Protect personnel from the hazards

The categories prove effective regardless of the arc flash mitigation measure or the application (medium voltage vs. low voltage, industrial vs. commercial, etc.).

Guide to Arc Flash Mitigation Methods

Reduction

- **Arc Flash Mitigation Types**
  - **Protection During Operation**
  - **Protection During Maintenance / Abnormal Operation**
  - **Recovery Time**
  - **Impact on Footprint**
  - **Impact on Commissioning**
  - **Modifying Existing Equipment**
  - **CapEx**
  - **OpEx***

### Arc Flash Mitigation Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Operation</th>
<th>Maintenance</th>
<th>Recovery</th>
<th>Impact</th>
<th>Commissioning</th>
<th>Footprint</th>
<th>Equipment</th>
<th>CapEx</th>
<th>OpEx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Reducing Disconnect</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 9'12</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$5</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Arc Flash Mitigation</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 9'12</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$5</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Adaptive Settings</td>
<td>Limited</td>
<td>No</td>
<td>Less than 9'12</td>
<td>None</td>
<td>Medium</td>
<td>Limited</td>
<td>$5</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Current Limiting Devices</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 9'12</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$5</td>
<td>$</td>
<td></td>
</tr>
</tbody>
</table>
### AVOIDANCE
SOLUTIONS THAT HELP PERSONNEL AVOID THE HAZARD OR ADD DISTANCE

One way to reduce the likelihood of electrical incidents is to introduce measures that make it less necessary for personnel to be near locations with a high level of arc flash hazard. Avoidance measures can be effective in removing the worker from, or increasing the distance to, the exposed energized parts. Avoidance solutions reduce both the likelihood and severity to personnel but arc flash hazard levels remain unaffected.

<table>
<thead>
<tr>
<th>Arc Flash Mitigation Types</th>
<th>Protection During Operation</th>
<th>Protection During Maintenance / Abnormal Operation</th>
<th>Reduced Incident Energy (cal/cm²)</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modifying Existing Equipment</th>
<th>CapEx²</th>
<th>OpEx²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Operation</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>NA</td>
<td>Low</td>
<td>None</td>
<td>Easily</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Time Delay Switch (TDS) Operation</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>NA</td>
<td>None</td>
<td>None</td>
<td>Easily</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Absence of Voltage Tester</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>NA</td>
<td>None</td>
<td>None</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>InfraRed (IR) Windows</td>
<td>Limited</td>
<td>No</td>
<td>Yes</td>
<td>NA</td>
<td>None</td>
<td>None</td>
<td>Easily</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Close Door Racking</td>
<td>Limited</td>
<td>No</td>
<td>No</td>
<td>NA</td>
<td>None</td>
<td>None</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Remote Racking System</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>NA</td>
<td>None</td>
<td>None</td>
<td>Easily</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Partial De-Energization / Load Redundancy Multiple Sources (Main-Tie-Main)</td>
<td>Limited</td>
<td>Limited</td>
<td>Limited</td>
<td>Partial Operation Hours/Days</td>
<td>High</td>
<td>Medium</td>
<td>Difficult</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>
One of the best ways to prevent and control risk of hazard is to “design out”. Multiple technologies exist that help prevent or reduce the likelihood of an arc event. This is done by including prevention considerations in designs and are particularly important for critical applications.

<table>
<thead>
<tr>
<th>Prevention by Design Arc Flash Mitigation Types</th>
<th>Protection During Operation</th>
<th>Protection During Maintenance / Abnormal Operation</th>
<th>Reduced Incident Energy (cal/cm²)</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modifying Existing Equipment</th>
<th>CapEx</th>
<th>OpEx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers / ANSI Compartmentalization</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
<td>NA</td>
<td>None</td>
<td>Low</td>
<td>Application Dependent</td>
<td>$$</td>
<td>$$</td>
</tr>
<tr>
<td>High Resistance Grounding</td>
<td>Limited</td>
<td>Limited</td>
<td>No</td>
<td>NA</td>
<td>Low</td>
<td>High</td>
<td>Possible</td>
<td>$$$</td>
<td>$$</td>
</tr>
<tr>
<td>Gas Insulated Switchgear</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
<td>NA</td>
<td>Improves</td>
<td>Medium</td>
<td>No</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Shielded Solid Insulated Switchgear</td>
<td>Yes</td>
<td>Limited</td>
<td>No</td>
<td>NA</td>
<td>Improves</td>
<td>Medium</td>
<td>No</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>IR Thermographic Study</td>
<td>Increases exposure</td>
<td>Increases exposure</td>
<td>No</td>
<td>Predictive</td>
<td>None</td>
<td>None</td>
<td>NA</td>
<td>$</td>
<td>$$$</td>
</tr>
<tr>
<td>Continuous Thermal Monitoring</td>
<td>Alert Only</td>
<td>Alert Only</td>
<td>No</td>
<td>Predictive</td>
<td>Low</td>
<td>Low</td>
<td>Possible</td>
<td>$$$$</td>
<td>$</td>
</tr>
<tr>
<td>Continuous Humidity Monitoring</td>
<td>Alert Only</td>
<td>Alert Only</td>
<td>No</td>
<td>Predictive</td>
<td>None</td>
<td>Low</td>
<td>Easily</td>
<td>$$</td>
<td>$$</td>
</tr>
</tbody>
</table>
CONTAINMENT
SOLUTIONS THAT HELP ENCLOSE THE HAZARD

These solutions typically feature an enclosure that is reinforced enough to contain and redirect the high pressure and heat produced during an arc flash event.

<table>
<thead>
<tr>
<th>Containment Arc Flash Mitigation Types</th>
<th>Protection During Operation</th>
<th>Protection During Maintenance / Abnormal Operation</th>
<th>Reduced Incident Energy (cal/cm²)</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modifying Existing Equipment</th>
<th>CapEx $</th>
<th>OpEx $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc Resistant</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Weeks/Months</td>
<td>Medium</td>
<td>Low</td>
<td>No</td>
<td>$$$$$</td>
<td>$</td>
</tr>
</tbody>
</table>

Notes: 1. Based on clearing time and typical range of fault currents. 2. At the operator (18 inches). 3. Incident energy is reduced by adding distance between the operator and the hazard, the hazard level remains unchanged. 4. Costs are ranked for typical application but may vary based on actual application implemented. 5. Capital Expenditures, Operating Expenditures

### Arc Flash Mitigation Types

<table>
<thead>
<tr>
<th>Arc Flash Mitigation Types</th>
<th>Application Notes</th>
</tr>
</thead>
</table>
| Arc Resistant             | Enclosures designed to contain or safely vent an arc flash event. Tested per IEEE C37.20.7  
  - Available on a limited number of equipment types.  
  - Equipment must be installed within its ratings for maximum arcing current and arcing duration.  
  - Impact to footprint due to ducting and venting into "secure areas."  
  - Vent ducts obstruct space and need clearance. New hazardous regions introduced in venting areas. |
The most effective way to reduce incident-energy levels in an electrical system is to reduce the duration of the arc, by clearing the arcing fault from the system in the shortest amount of time possible.

<table>
<thead>
<tr>
<th>Reduction Arc Flash Mitigation Types</th>
<th>Protection During Operation</th>
<th>Protection During Maintenance / Abnormal Operation</th>
<th>Reduced Incident Energy (cal/cm²)</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modifying Existing Equipment</th>
<th>CapEx²</th>
<th>OpEx²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Reducing Maintenance Switch</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 0/12</td>
<td>Hours/Days* depending on EFRMS switch being turned on</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Circuit breaker with instantaneous or Override below arcing level</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 0/12</td>
<td>Hours/Days</td>
<td>None</td>
<td>Low</td>
<td>Limited</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Adaptive Settings</td>
<td>Limited</td>
<td>No</td>
<td>Less than 40</td>
<td>Weeks/Months</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Current-Limiting Circuit Breakers/Fuses</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 0/12</td>
<td>Hours/Days</td>
<td>Medium</td>
<td>Low</td>
<td>Limited</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Digital Multi-Function Relay</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 40</td>
<td>Weeks/Months</td>
<td>Low</td>
<td>High</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Zone Selective Interlocking</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 12</td>
<td>Hours/Days* depending on calorie availability</td>
<td>None</td>
<td>Medium</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Differential Protection</td>
<td>Limited</td>
<td>Limited</td>
<td>Less than 0/12</td>
<td>Hours/Days</td>
<td>Low</td>
<td>High</td>
<td>Possible</td>
<td>$$</td>
<td>$</td>
</tr>
<tr>
<td>Transfer Trip Scheme (Virtual Main)</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 0/12</td>
<td>Hours/Days</td>
<td>Low</td>
<td>Medium</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Arc Flash Detection Device (Optical Sensors)</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 0/12</td>
<td>Hours/Days</td>
<td>Medium</td>
<td>Medium</td>
<td>Application Dependent</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>High Speed Shorting Switch (Quenchers)</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 1.2</td>
<td>Hours/Days</td>
<td>High</td>
<td>High</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Line Side Isolation with Passive Reduction</td>
<td>Yes</td>
<td>Yes</td>
<td>Less than 1.2</td>
<td>Hours/Days</td>
<td>Low</td>
<td>Low</td>
<td>Possible</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>
Parameters Addressed in the Guide

- Protection During Normal Operation?
- Protection During Maintenance / Abnormal Operation?
- Reduced Incident Energy?
- Recovery Time (after an incident)

- Impact on Equipment Footprint
- Impact on Commissioning (complexity, time)
- Modifying Existing Equipment (i.e., is it available as a retrofit solution?)
- Impact on CapEx
- Impact on OpEx
Zone Selective Interlocking (ZSI)

<table>
<thead>
<tr>
<th>Protection During Operation</th>
<th>Protection During Maintenance</th>
<th>Reduced Incident Energy</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modify Existing Equipment</th>
<th>CAPEX</th>
<th>OPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Less than 12</td>
<td>Hours/Days* depending on calorie availability</td>
<td>None</td>
<td>Medium</td>
<td>Possible</td>
<td>$$</td>
<td>$</td>
</tr>
</tbody>
</table>

Upstream instantaneous trip without intentional delay when downstream feeder doesn’t communicate trip event to upstream, otherwise configured time delay on instantaneous trip

- Can reduce trip time depending on fault location
- Typical configuration where Main and Feeders are interlocked leave gaps in protection – particularly on load side of feeder breakers

![Diagram of Time-Based Protection](image)
Energy Reducing Maintenance Switch

<table>
<thead>
<tr>
<th>Protection During Operation</th>
<th>Protection During Maintenance</th>
<th>Reduced Incident Energy</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modify Existing Equipment</th>
<th>CAPEX</th>
<th>OPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited</td>
<td>Limited</td>
<td>Less than 8/12</td>
<td>Days* depending on ERMS switch turned on</td>
<td>None</td>
<td>Low</td>
<td>Possible</td>
<td>$$</td>
<td>$</td>
</tr>
</tbody>
</table>

Reduces trip time by changing protective device setting during maintenance operations

- Negatively impacts coordination when enabled for maintenance
- Typically manual operation but could be linked to presence monitoring to enable
- Arc Flash study required
Relays with Optical Sensing inputs – detect arc flash by virtue of the associated light (and often, current).

- Typically very fast operation – though you still have to wait for a circuit breaker to operate
- Light + Current allows for increased selectivity – don’t trip quickly based on conventional or downstream fault
- Potentially complex and costly
- May not provide much incremental benefit in some situations
Differential Protection

- Summation of current in and out of a zone of protective devices to trip all devices on current mismatch
  - Provides “short zone” protection when a fault occurs between the CT measuring current and an open circuit protector
  - Several types – bus differential, transformer differential, generator differential
  - Look closely at Zones of Protection – bus differential in particular leaves holes in the protection
  - Arc Flash study required
Compared to traditional single-function Electromechanical relays, modern Digital relays allow for increased setting flexibility. May be possible to tailor overcurrent protection curves to meet desired protection goals.

- Effectiveness depends on system topology – most effective on Radial MV Feeders
- Can be combined with AF Maintenance Switch for further reduction
- Cost effective (hey, you need a relay anyway) but may not reduce incident energy as much as some other means

<table>
<thead>
<tr>
<th>Protection During Operation</th>
<th>Protection During Maintenance</th>
<th>Reduced Incident Energy</th>
<th>Recovery Time</th>
<th>Impact on Footprint</th>
<th>Impact on Commissioning</th>
<th>Modify Existing Equipment</th>
<th>CAPEX</th>
<th>OPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Less than 40</td>
<td>Weeks/Months</td>
<td>Low</td>
<td>High</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>
Incident energy reduction from faster clearing of fault

- Relatively high fault current to actuate
- Coordination Study required to ensure coordination is possible
- Arc Flash study required

<table>
<thead>
<tr>
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<th>Impact on Commissioning</th>
<th>Modify Existing Equipment</th>
<th>CAPEX</th>
<th>OPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited</td>
<td>Limited</td>
<td>Less than 8/12</td>
<td>Hours/Days</td>
<td>Medium</td>
<td>Low</td>
<td>Limited</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>
Incident energy reduction from faster clearing of fault using protective device trip functions during maintenance operations

- Less costly but more complicated than ERMS switch.
- Arc Flash study required
- May negatively impact selective coordination when enabled
• One arc-flash solution rarely fits every situation
• Understanding the characteristics of the various solution types is critical
  • What do they do…and what will they not do?
• Asking the right questions can help guide you to optimal solutions
  • #1 Key – what are your performance requirements?
  • Answers to the questions help you sort through the various solutions that are out on the market
• New Schneider Electric Arc Flash Mitigation Guide to be published early Q1 2021
• Schneider Electric Seamless Portal for Engineers, Designers & Specifiers
  • https://www.se.com/us/e2e
  • Download location of *Arc Flash Mitigation Guide* once published
  • After portal login members may download copies of this presentation from our NEMA Electrical Engineers & Designers Forum accessible within the portal

• Connect with Jeff M. Miller on LinkedIn for news and updates
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Thank You!