

Arc flash mitigation checklist



Arc flash is real and poses a potentially life-threatening hazard. Fortunately, there are ways to mitigate the risk posed by arc flash incidents. Follow the steps in this checklist to determine the right course of action to protect your personnel and property.

Reset Safety
Arc Flash Mitigation



Document the incident energy analysis

The initial step in addressing arc flash hazards is to have an arc flash study performed by an experienced power systems engineer. A comprehensive arc flash study should document the available fault current, clearing time and working distance used to calculate the incident energy at each equipment location. A chart like the one below will be generated as part of your arc flash study detailing these values and the calculated incident energy.

Bus name	Protective device name	Bus voltage (kV)	Bus bolted fault (kA)	Prot dev bolted fault (kA)	Prot dev arcing fault (kA)	Trip/delay time (sec)	Breaker opening time (sec)	Gnd	Equip type	Gap (mm)	Arc flash boundary (ft & in)	Working distance (ft & in)	Incident energy (cal/cm ²)
SWGR1 BUS 1	SWGR3 BUS 1 MAIN	0.48	38.43	38.43	19.33	0.35	0	Yes	SWG	32	11'1"	2'	14.9
SWGR1 BUS 1 (line side)	RLY-508A	0.48	38.43	38.43	19.33	1.917	0.083	Yes	SWG	32	36'2"	2'	85
SWGR1 BUS 2	SWGR3 BUS 2 MAIN	0.48	38.41	38.41	19.32	0.35	0	Yes	SWG	32	11'1"	2'	14.9
SWGR1 BUS 2 (line side)	RLY-708A	0.48	38.41	38.41	19.32	1.917	0.083	Yes	SWG	32	36'2"	2'	85
SWGR2 BUS 1	SWGR4 BUS 1 MAIN	0.48	38.42	38.42	19.32	0.35	0	Yes	SWG	32	11'1"	2'	14.9
SWGR2 BUS 1 (line side)	RLY-503A	0.48	38.42	38.42	19.32	1.917	0.083	Yes	SWG	32	36'2"	2'	85
SWGR2 BUS 2	SWGR4 BUS 2 MAIN	0.48	38.41	38.41	19.32	0.35	0	Yes	SWG	32	11'1"	2'	14.9
SWGR2 BUS 2 (line side)	RLY-703A	0.48	38.41	38.41	19.32	1.917	0.083	Yes	SWG	32	36'2"	2'	85
SWGR-GARAGE	NE-GARAGE MAIN	0.48	10.13	10.13	6.37	0.14	0	Yes	SWG	32	2'8"	2'	1.8
SWGR-GARAGE (line side)	FU-XFMR-NE-GARAGE	0.48	10.15	10.15	6.37	2	0	Yes	SWG	32	16'1"	2'	25.9
US-1 BUS 1	RLY-303A	0.48	25.19	25.19	13.59	1.917	0.083	Yes	SWG	32	28'2"	2'	58.7
US-1 BUS 1 (line side)	RLY-303A	0.48	47.33	47.33	22.99	1.917	0.083	Yes	SWG	32	41'1"	2'	102.7
US-1 BUS 2	US-1 BUS 2 MAIN	0.48	25.19	25.19	13.59	2	0	Yes	SWG	32	28'2"	2'	58.7
US-1 BUS 2 (line side)	RLY-403A	0.48	47.33	47.33	22.99	1.917	0.083	Yes	SWG	32	41'1"	2'	102.7
BLDG-1-A	B1-A TIE	0.48	19.1	19.1	9.18	1.57	0	Yes	SWG	32	17'11"	2'	30.1
BLDG-1-A (line side)	FU-XFMR-BLDG-1-A	0.48	29.85	29.85	15.66	2	0	Yes	SWG	32	31'1"	2'	68
BLDG-1-B	B1-B MAIN	0.48	19.14	19.14	9.19	2	0	Yes	SWG	32	21'1"	2'	38.5
BLDG-1-B (line side)	FU-XFMR-BLDG-1-B	0.48	29.65	29.65	15.57	2	0	Yes	SWG	32	31'	2'	67.6
BLDG-2N-A	BLDG-2N-A TIE	0.48	24.89	24.89	13.46	2	0	Yes	SWG	32	27'11"	2'	58.1
BLDG-2N-A (line side)	FU-XFMR-BLDG-2N-A	0.48	47.01	47.01	22.86	2	0	Yes	SWG	32	40'11"	2'	102.1
BLDG-2N-B	BLDG-2N-B MAIN	0.48	38.09	38.09	19.18	2	0	Yes	SWG	32	36'3"	2'	85.2
BLDG-2N-B (line side)	FU-XFMR-BLDG-2N-B	0.48	46.48	46.48	22.64	2	0	Yes	SWG	32	40'8"	2'	101

In addition, an arc flash study should include a discussion of the operating scenarios considered, including normal utility operation and alternative sources of power such as diesel standby generators. Incident energy numbers calculated in the arc flash study also determine what kind of personal protective equipment (PPE) is required.

For employee safety, OSHA requires that this information be based on the most current version of NFPA 70E®, documented and up to date.



Understand where you need to reduce incident energy

In the past, the industry focused on arc flash mitigation at areas that had “high” incident energy or in other words, where standard PPE would not be enough to protect a worker from an arc flash. Now, NFPA 70®, National Electrical Code® (NEC) has a prescriptive approach to reducing incident energy. The scope of the NEC Arc Energy Reduction requirements applies to all fusible (Section 240.67) and circuit breaker (Section 240.87) devices 1200 A and above.

Fusible devices

The fuse must have a clearing time of 0.07 seconds or less at the available arcing current, or one of the below approved methods for arc energy reduction must be implemented:

- Differential relaying
- Energy-reducing maintenance switching with a local-status indicator
- Energy-reducing active arc flash mitigation system
- Current-limiting electronically actuated fuses
- An approved equivalent means

Circuit breaker devices

There are seven approved methods for arc energy reduction that facilities may employ:

- Zone selective interlocking (ZSI)
- Differential relaying
- Energy-reducing maintenance switching with a local-status indicator
- Energy-reducing active arc flash mitigation system
- Instantaneous trip setting; temporary adjustment of the instantaneous trip setting to achieve arc energy reduction shall not be permitted
- Instantaneous override
- An approved equivalent means

In addition, both sections require:

- Documentation that identifies the location of the interrupting device(s) and the method chosen for the reduction must be available to demonstrate that clearing time is set to operate at a value below the available arcing current
- Performance testing of the arc energy reduction protection system by a qualified individual via primary current injection testing or another approved method when first installed on site



Research arc energy reduction solutions

While NEC provides a number of options, it is important to know that not all solutions are equally effective. Certain methods approved by the code might not be the right solution for every application. Exploring all options and understanding the advantages and limitations of each will help determine the best possible plan for a facility.

Eaton's arc flash experts are trained to assess every factor contributing to a facility's arc flash risks and recommend the right solution to maximize safety. Additionally, Eaton offers a wide array of products and services to help you achieve arc energy reduction and compliance with NEC 240.67 and NEC 240.87.


Before making a purchase plan, contact a power systems engineer to confirm the arc energy reduction solution selected will achieve the expected incident energy reduction level.

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 WARNING	
SHOCK & ARC FLASH HAZARD	
Location: 1117 SG-125	
Report #: TQS12345678.001 Rev. 0 Issued: MAR-2025	
28' 4"	ARC FLASH BOUNDARY
58.3 cal/cm²	CALCULATED INCIDENT ENERGY AT 3' 0" WORKING DISTANCE
15' 6"	ARC FLASH BOUNDARY
20.5 cal/cm²	CALCULATED INCIDENT ENERGY AT 3' 0" WORKING DISTANCE
2400 V Shock Hazard	
Min. Glove Class: 1	
Available Fault Current: 16.28 kA	
Limited Approach Boundary: 5' - 0"	
Restricted Approach Boundary: 2' - 2"	

Update all arc flash labels

Once your arc flash solution has been implemented, it is important to update the arc flash labels to reflect the reduced incident energy levels. Typically, per NFPA 70E, labels are required on equipment that is likely to need service or maintenance while energized such as:

- Industrial control panels
- Panelboards and switchboards
- Switchgear
- Meter socket enclosures
- Motor control centers

These labels require specific information be prominently displayed:

- Nominal system voltage
- Arc flash boundary
- At least one of the following:
 - Available incident energy and the corresponding working distance
 - Minimum arc rating of clothing
 - Required level of PPE
 - Highest Hazard/Risk Category (HRC) for the equipment

While not required, adding the date the available fault current was calculated on the label will be an indicator to update the calculation if changes are made to the system.

Contact the experts—Eaton's Power Systems Engineers
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Learn more at
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