



AUTOMATED PRELIMINARY SCREENING

AI Arc Flash Study Review

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Prepared for	[REDACTED]
Job ID	SAMPLE-AF-01
Order ID	SAMPLE — redacted production test run
Review type	Automated release

AT A GLANCE — 26 FINDINGS

5

CRITICAL

16

SIGNIFICANT

4

OBSERVATION

1

INFORMATION

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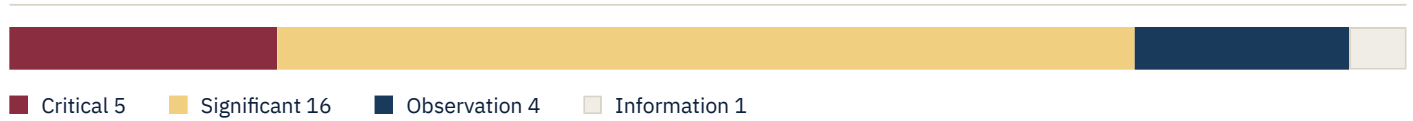


EXECUTIVE SUMMARY

What to look at first

26 findings across 4 severity levels — full detail begins on the following page.

SEVERITY DISTRIBUTION



PRIORITY SHORTLIST

- AF-ELEC-03-1 · electrode configuration
Single electrode configuration applied to every bus in the facility
- AF-GEOM-01-2 · geometry
One enclosure dimension set applied to every bus
- AF-TIME-03-5 · clearing time
2,000-second clearing time applied to ~35 buses with no stated justification
- AF-SRC-03-7 · source data
Only an infinite-bus (maximum) source was modeled

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AI Arc Flash Study Review

Job SAMPLE-AF-01 · Order SAMPLE — redacted production test run · Automated release

SAMPLE — redacted. Client name, address, personnel and contact details removed; equipment tags, manufacturer and model names pseudonymised. Engineering findings unchanged.

Read before relying on anything below.

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Submission details

Report	AI Arc Flash Study Review — Report AF-01
Submittal reviewed	[arc flash study].pdf (50 pages)
Client identity	Redacted for public release

CRITICAL (5)



AF-ELEC-03-1 · electrode configuration · issue

Critical

Single electrode configuration applied to every bus in the facility

Every one of the ~90 rows in the Appendix F Incident Energy Report carries Electrode Config = VCB. The same facility contains 480 V service switchboards, automatic transfer switches, generator skid breakers, UPS modules, static transfer switches, PDUs, 208 V branch panelboards and dry-type transformer secondaries. Those are not one electrode arrangement. The uniformity is the signature of a global software default that was never revisited per bus.

Driving input: Electrode Config column, Appendix F

RECOMMENDED ACTION

Assign electrode configuration per bus from actual equipment construction and re-run. This input changes incident energy directly.

Source: page 42 — pp. 42–44, Appendix F Incident Energy Report

Code ref: none — general observation

Confidence: high

AF-GEOM-01-2 · geometry · issue

Critical

One enclosure dimension set applied to every bus

Box Width 12 / Box Height 14 / Box Depth 10 (inches) appears on every row, including ATS-02-UTILITY-BREAKER (19.89 kA bolted, 71.61 cal/cm²), ATS-01-UTILITY-BREAKER (69.83 cal/cm²), the 480 V service disconnects, and the UPS and STS equipment. A 12 × 14 × 10 in enclosure does not describe service-entrance switchgear or a UPS lineup. Under the stated 2018 model, enclosure size is a calculation input.

Driving input: Box Width / Box Height / Box Depth columns, Appendix F

RECOMMENDED ACTION

Collect actual enclosure dimensions for at least the switchgear, ATS, UPS, STS and PDU classes and re-run those buses.

Source: page 42 — pp. 42–44, Appendix F

Code ref: none — general observation

Confidence: high

AF-TIME-03-5 · clearing time · issue

Critical

2.000-second clearing time applied to ~35 buses with no stated justification

Approximately 35 rows carry Trip/Delay Time = 2.000 s with note (*N9) — Max Arcing Duration Reached. These include the two highest-energy buses (71.61 and 69.83 cal/cm²) and the entire PDU/RPP chain. A maximum arcing-duration cap is an assumption about how quickly a worker can move out of the arc, not a device characteristic. The report body contains no discussion of the cap, no per-location egress evaluation, and no statement that 2 seconds was checked against any specific work position.

Driving input: Trip/Delay Time column and note (*N9), Appendix F

RECOMMENDED ACTION

Document the egress basis for every capped bus, or report the uncapped clearing time. Where a worker cannot clear the boundary in 2 seconds, the capped result understates exposure.

Source: page 42 — pp. 42–44, Appendix F; note legend p. 44

Code ref: none — general observation

Confidence: high



AF-SRC-03-7 · source data · issue

Critical

Only an infinite-bus (maximum) source was modeled

Method section: "The short circuit calculations assume a utility fault availability of infinite bus amperes at the 480 volt, 1000 kVA transformer." The one-line confirms UTILITY SC Contribution 3P 999999.9 MVA. An infinite source is the maximum-fault-current condition. Minimum utility source conditions — which lengthen clearing time and frequently produce the higher incident energy — were not evaluated for the utility case.

Driving input: Method p. 2; one-line Appendix A utility block

RECOMMENDED ACTION

Obtain an actual utility available-fault-current letter with a date, and evaluate a minimum-source case.

Source: page 2 — p. 2 (METHOD); p. 6, Appendix A

Code ref: none — general observation

Confidence: high

AF-RANGE-04-9 · applicability · issue

Critical

UPS DC systems present with no indication of method

UPS-01 and UPS-02 appear as buses with AC results (PD-UPS-01-INPUT, PD-UPS-02-INPUT, PD-UPS-01 BYPASS, PD-UPS-02 BYPASS, SWBD-02, PNL-UA). No DC bus — battery string, DC link — appears in the results table, and no statement excludes DC systems from the study or identifies a different method for them. A reader cannot tell whether the DC side was evaluated, deliberately excluded, or overlooked.

RECOMMENDED ACTION

State explicitly whether battery/DC equipment is in scope, and if excluded, why.

Source: page 42 — pp. 42–44, Appendix F; p. 5 (Arc Flash Study Summary)

Code ref: none — general observation

Confidence: medium

SIGNIFICANT (15)

AF-GEOM-02-3 · geometry · issue

Significant

One conductor gap (25 mm) across 480 V and 208 V equipment

Gap (mm) = 25 on every row. The table spans 0.208 kV, 0.21 kV and 0.48 kV buses and spans panelboards, switchboards, ATSS and transformer secondaries. A single gap value across mixed voltage classes and equipment types is a default artifact rather than a modeled value.

Driving input: Gap (mm) column, Appendix F

RECOMMENDED ACTION

Confirm gap per equipment class against the stated edition and re-run affected buses.

Source: page 42 — pp. 42–44, Appendix F

Code ref: none — general observation

Confidence: high



AF-GEOM-04-4 · geometry · issue

Significant

18-inch working distance applied to all equipment classes

Working Distance = 18 in on every row, including the 480 V service-entrance equipment reporting 71.61 and 69.83 cal/cm². Working distance should reflect how a worker actually stands at that equipment; low-voltage switchgear and a 208 V branch panel are not worked from the same distance. Applying the shorter distance uniformly moves the result in a known direction at the switchgear.

Driving input: Working Distance column, Appendix F

RECOMMENDED ACTION

Assign working distance per equipment class per the stated edition and re-run.

Source: page 42 — pp. 42–44, Appendix F

Code ref: none — general observation

Confidence: high

AF-TIME-06-6 · clearing time · issue

Significant

Breaker opening time recorded as zero for every device

Breaker Opening Time/Tol = 0.0000 s on every row, including rows served by electronic-trip circuit breakers (Vendor A L-frame electronic-trip MCCB, Vendor A P-frame electronic-trip MCCB, Vendor B 1200 A low-voltage power circuit breakers). Total clearing time for a breaker is trip-unit time plus mechanism opening time. A uniform zero means mechanism time was not added anywhere in the study.

Driving input: Breaker Opening Time/Tol column, Appendix F; Appendix D device list

RECOMMENDED ACTION

Confirm whether the the study software device library already embeds mechanism time for these breakers. If not, add it — this input is additive to every clearing time in the study.

Source: page 42 — pp. 42–44, Appendix F; pp. 27–29, Appendix D

Code ref: none — general observation

Confidence: high

AF-SRC-01-8 · source data · issue

Significant

Utility fault current source and date not stated

No utility contribution value, no issuing utility, and no date of utility data appear anywhere in the study. The infinite-bus assumption substitutes for utility data rather than documenting it.

RECOMMENDED ACTION

Record the utility contribution, its source, and the date obtained.

Source: page 2 — p. 2 (METHOD); p. 4 (ASSUMPTIONS AND CLARIFICATIONS)

Code ref: none — general observation

Confidence: high



AF-IARC-02-10 · arcing current · issue

Significant

Governing arcing-current case not identified per bus

The reduced arcing-current case was run — rows carrying (*N3) Arcing Current Low Tolerances Used indicate where the reduced tolerance governed. However the table reports one incident energy per bus, and the note legend appears only as a footer fragment on p. 44 with no explanation in the report body. A reader cannot see both cases' results or confirm which was carried forward.

RECOMMENDED ACTION

Report both cases' incident energies per bus, or state in the body that the higher of the two is tabulated, and explain the note codes.

Source: page 42 — pp. 42-44, Appendix F, PPE Level / Notes (*N) column and note legend

Code ref: none — general observation

Confidence: high

AF-RES-04-11 · results · issue

Significant

Two buses above 40 cal/cm² handled as a labeling outcome, not a hazard-elimination item

The study identifies ATS-01-UTILITY-BREAKER (69.83 cal/cm²) and ATS-02-UTILITY-BREAKER (71.61 cal/cm²), states "no safe PPE exists," and assigns red DANGER labels. It then characterises the condition as "common for equipment fed from the service when the main overcurrent protective device is in the same switchboard or switchgear lineup." No engineering control is identified or evaluated — no arc energy reduction method, no remote operation, no relocation of the main device. The result is presented as an accepted condition rather than a hazard to be engineered down.

RECOMMENDED ACTION

Add a hazard-elimination discussion for these two buses identifying candidate engineering controls and why each was or was not pursued.

Source: page 1 — p. 1 (EXECUTIVE SUMMARY); p. 5 (Equipment Exceeding 40 cal/cm²)

Code ref: none — general observation

Confidence: high

AF-TIME-05-12 · clearing time · issue

Significant

No arc energy reduction evaluated on the devices whose clearing time governs

The two 71/70 cal/cm² results are driven entirely by the 2.000 s capped clearing time at the upstream devices (PD-UPS-01-INPUT, PD-GEN-01 SKID). The study neither credits nor evaluates any energy-reducing maintenance setting, zone interlock, or equivalent. Its own recommendation section states "All existing settings were reviewed, and no modifications are recommended," closing the only lever it examined.

RECOMMENDED ACTION

Evaluate whether an energy-reducing method is available on the Vendor A mid- and large-frame MCCBs at the affected locations.

Source: page 4 — p. 4 (TCC Curve Review Recommendations); pp. 27-29, Appendix D; p. 42, Appendix F

Code ref: none — general observation

Confidence: high



AF-MODEL-02-14 · model and edition · issue

Significant

Stated basis mixes two standards in a way the document does not reconcile

The method section states the study "utilized the IEEE 1584 - 2018 Edition Based on NFPA 70E 2018 Annex D.4." The 2018 model inputs are present (electrode configuration, enclosure dimensions), which supports the 2018 claim, but the study does not explain the "based on NFPA 70E 2018 Annex D.4" qualifier or reconcile the two references. Because no edition text was supplied as grounding, this review cannot confirm which document governs.

RECOMMENDED ACTION

State one governing calculation basis unambiguously.

Source: page 2 — p. 2 (METHOD)

Code ref: none — general observation

Confidence: medium

AF-MODEL-04-15 · model and edition · issue

Significant

Revision number absent

Date (17 Nov 2025), preparer ([STUDY PREPARER]) and responsible engineer ([ENGINEER OF RECORD], PE, TN [LICENSE NO.]) are all present. No revision identifier appears anywhere. The study supersedes a 9 May 2023 [STUDY PREPARER] study, which makes revision control material.

RECOMMENDED ACTION

Add a revision block identifying this as the revision superseding the 5/9/2023 study.

Source: page not applicable — cover page; p. ii certification page

Code ref: none — general observation

Confidence: high

AF-DOC-02-16 · documentation · issue

Significant

One-line reference is a date only, with no drawing number or revision

"This study was based on information illustrated on existing construction documents and arc flash study documents dated May 9, 2023. and record one-line documents dated July 7, 2025." No drawing number, sheet, or revision identifies which one-line the model was built from.

RECOMMENDED ACTION

Cite the one-line by number and revision.

Source: page 2 — p. 2 (METHOD)

Code ref: none — general observation

Confidence: high



AF-DOC-03-17 · documentation · issue

Significant

No review interval stated

The study states no review interval and no re-evaluation trigger. It supersedes a 2023 study and explicitly warns that settings changes affect the results, but never says when the study itself must be revisited.

RECOMMENDED ACTION

State the review interval applicable under the adopted edition and the date the next review is due.

Source: page 2 — searched METHOD (p. 2), ASSUMPTIONS AND CLARIFICATIONS (p. 4), SIMULATION RESULTS (pp. 4–5) — the sections where such a statement would appear

Code ref: none — general observation

Confidence: high

AF-RANGE-02-18 · applicability · issue

Significant

Buses at very low bolted fault current carried without a range statement in the body

Rows exist at 1.80 kA and 2.00 kA bolted fault at 0.21 kV, and at 3.13 kA and 3.47 kA at 0.208 kV. These carry note (*N15c) — Sustainable arc in 240V or less and bolted fault current < 2000 A is less likely to occur (IEEE 1584-2018 Section 4.3). The note appears only in the table footer; the report body does not identify which buses are affected or state how a "less likely" sustainable arc was treated for labeling purposes.

RECOMMENDED ACTION

Call out the affected buses in the body and state how they were treated.

Source: page 43 — pp. 43–44, Appendix F rows carrying (*N15c); note legend p. 44

Code ref: none — general observation

Confidence: medium

AF-SRC-04-21 · source data · issue

Significant

Alternate configurations limited to one generator scenario

Two scenarios are defined: "Base Project: Normal Operating Conditions" and "Scenario 1: Connected to Generator Open Transition." The facility contains two utility service disconnects, two generators, ATS-01, ATS-02, ATS-03 and ATS-04, two UPS systems with bypasses, and two static transfer switches. Configurations such as single-generator operation, maintenance bypass, and STS alternate source are neither evaluated nor listed as excluded.

RECOMMENDED ACTION

Add the configurations each bus can actually be worked in, or list the excluded configurations and the basis for excluding them.

Source: page 4 — p. 4 (SIMULATION RESULTS — equipment state for each scenario); Appendix A one-lines

Code ref: none — general observation

Confidence: high



AF-RES-05-22 · results · issue

Significant

Equipment-rating conclusion rests partly on assumed ratings

The executive summary states "The electrical equipment and associated breakers reviewed in this study are properly rated for the calculated available fault current." The assumptions section states that panels without breaker information were assigned "industry minimums of 10 kAIC for 208 v panels and 14 kAIC for 480 v panels," that unfused disconnects were assumed 10 kA, and that fused disconnects that "could not be safely reviewed for the manufacturer ratings" were assumed to contain Class R fuses at 100 kA. The adequacy conclusion therefore covers assumed ratings as well as observed ones, without distinguishing which is which.

RECOMMENDED ACTION

Tag every device whose rating was assumed rather than observed, and bound the adequacy conclusion to verified devices.

Source: page 1 — p. 1 (EXECUTIVE SUMMARY); p. 4 (ASSUMPTIONS AND CLARIFICATIONS); Appendix C, pp. 16–26

Code ref: none — general observation

Confidence: high

AF-DOC-01-23 · documentation · issue

Significant

Generator characteristics taken from software defaults

"Generator sizes were taken from the study performed by [STUDY PREPARER]. The characteristics of the generators are based on the default values in the study software, which were determined by the voltage and kVA ratings found in the original study." Generator subtransient reactance drives the arcing current in Scenario 1 and therefore the clearing times behind the generator-source results (GEN 01, GEN 02, GEN-01/02 DISC., GEN-01/02 CC — 16.70 to 17.14 cal/cm²).

RECOMMENDED ACTION

Obtain nameplate reactance data for the two CAT units and confirm against the defaults.

Source: page 4 — p. 4 (ASSUMPTIONS AND CLARIFICATIONS)

Code ref: none — general observation

Confidence: high

OBSERVATION (4)

AF-RES-01-19 · results · issue

Observation

Nominal voltage entered inconsistently for the same system

The Bus kV column records the same 208 V nominal system as 0.208 on some rows and 0.21 on others, within adjacent rows of the same table. Rows entered at 0.21 also carry four-decimal trip times (2.0000) while rows at 0.208 carry three (2.000), which suggests two data-entry passes or two model sources merged into one output.

RECOMMENDED ACTION

Normalize the nominal voltage entries and confirm both groups came from the same model revision.

Source: page 42 — pp. 42–43, Appendix F, Bus kV and Trip/Delay Time columns

Code ref: none — general observation

Confidence: high



AF-SRC-05-20 · source data · issue

Observation

Transformer impedance tolerance not considered

"Installed feeder length values and transformer impedances were provided by [FINANCIAL CLIENT]." No statement addresses whether the values are nameplate or tested, and manufacturing tolerance is not mentioned. The one-line shows Z% 5.7499 % to four decimals, which reads as a single deterministic value.

RECOMMENDED ACTION

State the impedance source and whether tolerance was applied.

Source: page 4 — p. 4 (ASSUMPTIONS AND CLARIFICATIONS); p. 6, Appendix A

Code ref: none — general observation

Confidence: high

AF-RES-03-24 · results · issue

Observation

Label set could not be compared to the results table

Appendix G — Arc Flash Labels is listed in the table of contents (p. 45) and appears as a section divider, but the submitted file carries no extractable label content in that appendix. This review could not confirm that every bus in Appendix F received a label, or that label values match the table.

RECOMMENDED ACTION

Confirm the label appendix is complete in the issued copy. A Label & PPE Boundary Review can perform the study-to-label cross-check if the labels are submitted.

Source: page 45 — p. 45, Appendix G section divider

Code ref: none — general observation

Confidence: high

AF-DOC-04-26 · documentation · issue

Observation

Field data basis stated, and it is a limitation

"Site surveys were not in the scope and not performed as part of this study. Confirmation of existing equipment was accomplished by [ELECTRICAL CONTRACTOR] Electrical Services electricians and facilities personnel." The study is candid about this. The limitation propagates into findings 1–4: uniform electrode configuration, enclosure dimensions, gap and working distance are consistent with a study for which no equipment geometry was collected in the field.

RECOMMENDED ACTION

None beyond findings 1–4.

Source: page 2 — p. 2 (METHOD)

Code ref: none — general observation

Confidence: high

INFORMATION (1)



AF-MODEL-03-25 · model and edition · issue

Information

Software and version identified

"Calculations were accomplished using the study software, vendor and version withheld" Recorded for completeness; no deficiency.

RECOMMENDED ACTION

None.

Source: page 2 — p. 2 (METHOD)

Code ref: none — general observation

Confidence: high

ITEMS TO VERIFY (1)

These findings depend on information not present in the submittal. They are not high-confidence conclusions — verify against field conditions or additional documentation.

AF-TIME-04-13 · clearing time · issue

Significant

Clearing times not traceable to settings for a large share of devices

Appendix D lists many devices whose trip settings are recorded only as "Fixed", "Thermal Curve =", or blank — among them PD-01, PD-02, PD-03, PD-04, PD-05, PD-06, PD-07, PD-08 MAIN, PD-09 MAIN, PD-10 MAIN, PD-11 MAIN, PD-12 MAIN, PNL-02 MAIN, PD-13. For those devices a reader cannot connect the clearing time in Appendix F to a setting at the arcing current used. Reported as a traceability gap, not as an error in the times themselves.

RECOMMENDED ACTION

Record the full trip characteristic (or the manufacturer curve reference) for every device carrying a result.

Source: page 27 — pp. 27-29, Appendix D — Overcurrent Protective Device Settings

Code ref: none — general observation

Confidence: low