Ohmics

AI ELECTRICAL REVIEW

AUTOMATED PRELIMINARY SCREENING

Coordination & Selectivity Review

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Prepared for	[REDACTED]
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Job ID	SAMPLE-CO-01
Order ID	SAMPLE: anonymized production test run
Review type	Automated release

AT A GLANCE: 16 FINDINGS

4	12	0	0
CRITICAL	SIGNIFICANT	OBSERVATION	INFORMATION

EXECUTIVE SUMMARY

Findings and Recommendations Summary

This review found 16 findings: 4 critical and 12 significant. The critical findings concern overlap, code requirement and configuration. The recommendations below cover every critical and significant finding. Full detail begins on the following page.

SEVERITY DISTRIBUTION



Critical 4 Significant 12

RECOMMENDATIONS

Finding 1 · Critical
1. Verify this pair first against the manufacturer curves.

Finding 2 · Critical
2. Verify against the manufacturer curves. Remedies are limited because the upstream instantaneous is fixed.

Finding 3 · Critical
3. Determine whether the adopted edition requires a method on these devices and whether one can be added.

Finding 4 · Critical
4. Evaluate coordination on generator and with the tie closed, or state which configurations are excluded.

Finding 5 · Significant
5. Publish a settings table covering every device in Appendix C.

Finding 6 · Significant
6. Verify this pair against the manufacturer curves at the available fault current (29,108.37 A three-phase).

Finding 7 · Significant
7. Verify this pair against the manufacturer curves at the available fault current.

Finding 8 · Significant
8. Verify. With finding 4, this pair has no declared margin in any region.

Finding 9 · Significant
9. Report ground fault pickup and delay for every level.

Finding 10 · Significant
10. State the coordination claim with its current and time range, and address the phase-side items.

Finding 11 · Significant
11. Document the basis with a load inventory of what the generators feed and how each load is classified.

Finding 12 · Significant
12. If any device has a reduced mode, document both settings and the coordination effect of the reduced one.

Finding 13 · Significant
13. Check the pairs in findings 2 and 3 at minimum fault current.

Finding 14 · Significant
14. Mark each device's settings basis and record who applied the settings and when.

Finding 15 · Significant
15. Confirm the plots are current and cite the one-line by number and revision.

Finding 16 · Significant

16. Address all three, particularly conductor protection if the delays are extended.

BY CATEGORY

Completeness	2	Overlap	7
Code requirement	4	Configuration	2
Documentation	1		

Coordination & Selectivity Review

Job SAMPLE-CO-01 · Order SAMPLE: anonymized production test run · Automated release

Anonymized sample. Client, site, people, dates, document numbers, equipment tags, part numbers and manufacturer names are removed or generalized, and identifying values are slightly modified. Findings are shortened; the engineering point of each is unchanged.

Read before relying on anything below.

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Submission details

Report	Coordination & Selectivity Review — Report CO-01
Submittal reviewed	[coordination and arc flash study].pdf (52 pages)
Client identity	Anonymized for public release

CRITICAL (4)

CO-OVL-03-4 · Overlap · issue

Critical

1. Panel B: instantaneous on both devices at the same 8000 A pickup

Both breakers have instantaneous enabled at 8000 A. The available fault current is 29,087.51 A, roughly 3.6 times that pickup, so a load-side fault can exceed both pickups. The study narrative does not mention it.

RECOMMENDATION

Verify this pair first against the manufacturer curves.

Source: page 28, Appendix B, Panel B TCC settings blocks, p. 28; one-line, Panel B bus

Code ref: none (general observation) · Confidence: medium

CO-OVL-03-5 · Overlap · issue

Critical

2. Panel A: upstream fixed instantaneous is within reach of the fault current

The upstream breaker has a fixed 17,500 A instantaneous and the downstream is set at 8000 A, with 29,108.37 A available. A load-side fault can reach the upstream instantaneous, and because it is fixed it cannot be adjusted.

RECOMMENDATION

Verify against the manufacturer curves. Remedies are limited because the upstream instantaneous is fixed.

Source: page 27, Appendix B, Panel A TCC settings blocks, p. 27; one-line, Panel A bus

Code ref: none (general observation) · Confidence: medium

CO-CODE-03-10 · Code requirement · issue

Critical

3. No arc energy reduction on any 2000 A device

No arc energy reduction method appears for the four 2000 A breakers or the generator breakers. The four buses above 40 cal/cm² in the companion arc flash report (99.6, 72.4, 71.3 and 60.8 cal/cm²) all come from 2-second capped clearing times. No code threshold is stated because no code text was supplied.

RECOMMENDATION

Determine whether the adopted edition requires a method on these devices and whether one can be added.

Source: page 27, Appendix B, pp. 27–48; §3, p. 6; §1.3 · Code ref: none (general observation) · Confidence: medium

CO-CFG-01-12 · Configuration · issue

Critical

4. Coordination checked in one configuration only

The arc flash section evaluates utility and generator sources, and the generator case governs at two buses. The coordination plots carry no scenario, and the one-line shows a tie and several normally open breakers.

RECOMMENDATION

Evaluate coordination on generator and with the tie closed, or state which configurations are excluded.

Source: page 6, §3, p. 6; Appendix B; one-line, p. 7; Appendix C scenario legend, p. 51

Code ref: none (general observation) · Confidence: high

SIGNIFICANT (12)

CO-SET-01-1 · Completeness · issue

Significant

5. Settings exist only on TCC plots; no settings table

Settings appear only as blocks beside each time-current curve (TCC) plot. Appendix C names about 38 devices, Appendix B has settings for a smaller subset, and a device with no plot has no recorded settings.

RECOMMENDATION

Publish a settings table covering every device in Appendix C.

Source: page 26, Appendix B, pp. 26–48; table of contents, p. 2 | Code ref: none (general observation) | Confidence: high

CO-OVL-01-2 · Overlap · issue

Significant

6. Panel A: both long-time pickups are 2000 A

The upstream and downstream breakers both have a 2000 A long-time pickup. The upstream delay is fixed and the downstream is band 7, so the declared settings give no pickup margin.

RECOMMENDATION

Verify this pair against the manufacturer curves at the available fault current (29,108.37 A three-phase).

Source: page 27, Appendix B, Panel A series-breaker TCC and settings blocks, p. 27 | Code ref: none (general observation) | Confidence: medium

CO-OVL-01-3 · Overlap · issue

Significant

7. Panel B: identical long-time settings

The upstream and downstream breakers have the same long-time pickup (2000 A) and the same delay band (7). The trip units are different families, so the curves may still separate, but the settings declare no margin.

RECOMMENDATION

Verify this pair against the manufacturer curves at the available fault current.

Source: page 28, Appendix B, Panel B series-breaker TCC and settings blocks, p. 28 | Code ref: none (general observation) | Confidence: medium

CO-OVL-02-6 · Overlap · issue

Significant

8. Panel B: upstream short-time delay set to minimum

The upstream short-time delay is at its minimum (flat, instantaneous position) at an 8000 A pickup. The downstream is 0.1 s with I^2t on. The upstream band is at or below the downstream band in the short-time region.

RECOMMENDATION

Verify. With finding 4, this pair has no declared margin in any region.

Source: page 28, Appendix B, Panel B TCC settings blocks, p. 28 | Code ref: none (general observation) | Confidence: medium

CO-OVL-04-7 · Overlap · issue

Significant

9. Ground fault protection at several levels, settings at none

The study states one ground fault trip unit cannot coordinate with downstream breakers. The settings blocks carry phase settings only, and Appendix C shows ground fault protection on nearly every row with no settings.

RECOMMENDATION

Report ground fault pickup and delay for every level.

Source: page 4, §1.3.2, p. 4; Appendix B settings blocks; Appendix C, Ground column, pp. 49–51

Code ref: none (general observation)

Confidence: high

CO-CODE-02-8 · Code requirement · issue

Significant

10. Coordination conclusion cannot be checked

The narrative reports "a few concerns" and describes only the ground fault item. It states no current or time range for any coordination claim and does not mention the phase-side items in findings 2 through 6.

RECOMMENDATION

State the coordination claim with its current and time range, and address the phase-side items.

Source: page 4, §1.3.2, p. 4; Appendix B, pp. 27–28

Code ref: none (general observation)

Confidence: high

CO-CODE-01-9 · Code requirement · issue

Significant

11. No basis for the system classification

The study states no part of the system is an emergency system, so none requires selective coordination. The system has generators and automatic transfer switches, and no load inventory supports the statement.

RECOMMENDATION

Document the basis with a load inventory of what the generators feed and how each load is classified.

Source: page 4, §1.3.2, p. 4; one-line, p. 7

Code ref: none (general observation)

Confidence: medium

CO-CODE-04-11 · Code requirement · issue

Significant

12. No reduced-setting mode documented

No maintenance mode or zone interlocking appears in any settings block, and the coordination effect of a reduced mode is not discussed.

RECOMMENDATION

If any device has a reduced mode, document both settings and the coordination effect of the reduced one.

Source: page not applicable, Appendix B, all settings blocks

Code ref: none (general observation)

Confidence: high

CO-CFG-03-13 · Configuration · issue

Significant

13. Coordination checked at maximum fault current only

The short circuit analysis calculates maximum fault current only. Selectivity in the long-time region, where findings 2 and 3 sit, can be lost at low fault current.

RECOMMENDATION

Check the pairs in findings 2 and 3 at minimum fault current.

Source: page 4, §2.1, p. 4; §2.2.2, p. 5; §3, p. 6

Code ref: none (general observation)

Confidence: high

CO-SET-05-14 · Completeness · issue

Significant

14. Settings basis and implementation not recorded

The settings blocks are not marked as found, as designed or as recommended, and nothing records that the settings were applied in the field.

RECOMMENDATION

Mark each device's settings basis and record who applied the settings and when.

Source: page 6, §3.1, p. 6; Appendix B; cover disclaimer | Code ref: none (general observation) | Confidence: high

CO-DOC-01-15 · Documentation · issue

Significant

15. TCC plots older than the report; one-line not identified

The TCC title blocks are dated ten months before the report, and nothing confirms they reflect the system at the report date. No one-line drawing number, revision or date is cited.

RECOMMENDATION

Confirm the plots are current and cite the one-line by number and revision.

Source: page 3, Appendix B title blocks; cover; §1.1, p. 3; §5, p. 7 | Code ref: none (general observation) | Confidence: high

CO-OVL-05-16 · Overlap · issue

Significant

16. Transformer, conductor and motor protection not addressed

The study does not address transformer damage curves or inrush, conductor damage protection, or motor starting for the mechanical loads. Conductor protection matters here because extending delays is the usual remedy for findings 2, 3 and 6.

RECOMMENDATION

Address all three, particularly conductor protection if the delays are extended.

Source: page 6, §3, p. 6; Appendix B plot titles | Code ref: none (general observation) | Confidence: high