

Standards Reference: NFPA 70B (Recommended Practice for Electrical Equipment Maintenance) & IEC 62271-200 (AC Metal-Enclosed Switchgear)

Facility / Substation: _____	Equipment ID: _____	Voltage Class: _____	Inspection Date: _____
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1 — TORQUE SCHEDULE (NFPA 70B §11.13 / IEC 62271-200 §4.6)

Joint Type / Hardware	Bolt Size	Material	Torque (N-m)	Torque (ft-lb)	Measured	Pass/Fail
Busbar-to-busbar splice	M10 / 3/8"	Cu-Cu	45-55	33-41	_____	■ P ■ F
Busbar-to-busbar splice	M12 / 1/2"	Cu-Cu	65-80	48-59	_____	■ P ■ F
Busbar-to-equipment lug	M10 / 3/8"	Cu-Al	40-50	30-37	_____	■ P ■ F
Busbar-to-equipment lug	M12 / 1/2"	Cu-Al	55-70	41-52	_____	■ P ■ F
Insulator mounting bolt	M8	Steel	20-28	15-21	_____	■ P ■ F
Cable terminal lug	M10 / 3/8"	Cu-Cu	42-52	31-38	_____	■ P ■ F

★ Apply calibrated torque wrench. Re-torque after initial 100-hr energised period. Use oxide inhibitor compound on Cu-Al joints.

2 — INFRARED (IR) THERMOGRAPHY INSPECTION INTERVALS (NFPA 70B §15 / IEC 62271-200 §7)

Equipment Category	Load Factor	Inspection Interval	Min. Load for Scan	Alert Threshold (ΔT)	Action Level (ΔT)	Last Scan Date	Next Due
Main busbar (MV)	≥ 70 %	Annual	≥ 40 % rated	5-10 °C vs ref.	≥ 15 °C	_____	_____
Main busbar (MV)	< 70 %	Every 18 months	≥ 40 % rated	5-10 °C vs ref.	≥ 15 °C	_____	_____
LV distribution bar	≥ 70 %	Annual	≥ 40 % rated	5-10 °C vs ref.	≥ 15 °C	_____	_____
Critical/life-safety	Any	Semi-annual	≥ 40 % rated	3-7 °C vs ref.	≥ 10 °C	_____	_____
Post new installation	N/A	Within 30 days	≥ 40 % rated	5 °C vs ref.	≥ 10 °C	_____	_____

★ NFPA 70B Table 11.1.3 severity criteria: ΔT 1-10 °C = Monitor; 11-20 °C = Investigate; > 20 °C = Immediate action. Scan under ≥ 40 % rated load for valid results.

3 — CONTACT RESISTANCE THRESHOLDS (NFPA 70B §11.14 / IEC 62271-200 §7.4)

Joint / Connection Point	Test Current	Baseline (μΩ)	Alert Level (μΩ)	Replace / Repair (μΩ)	Measured (μΩ)	Result
Bolted busbar splice (Cu)	100 A DC (DLRO)	≤ 10	11-50	≥ 50 (or > 2x baseline)	_____	■ P ■ F
Bolted busbar splice (Al)	100 A DC (DLRO)	≤ 20	21-80	≥ 80 (or > 2x baseline)	_____	■ P ■ F
Disconnect/switch contact	100 A DC (DLRO)	≤ 50	51-150	≥ 150	_____	■ P ■ F
CB main contacts	100 A DC (DLRO)	Per MFR	2x MFR	3x MFR spec.	_____	■ P ■ F
Cable lug-to-bar	100 A DC (DLRO)	≤ 15	16-60	≥ 60 (or > 2x baseline)	_____	■ P ■ F

★ Measure with calibrated DLRO (Digital Low-Resistance Ohmmeter). De-energise and lock out/tag out (LOTO) before testing. Compare to baseline and/or manufacturer spec.

4 — INSULATION RESISTANCE TEST VALUES (NFPA 70B §11.12 / IEC 62271-200 §6.2)

Voltage Class (kV)	Test Voltage (VDC)	Duration	Min. Accept. IR (MΩ)	Investigation (MΩ)	PI Ratio*	Measured (MΩ)	Pass/Fail
< 1 kV (LV)	500 VDC	1 min	≥ 1,000	< 5,000	≥ 1.5	_____	■ P ■ F
1 - 5 kV (MV)	2,500 VDC	1 min	≥ 5,000	< 25,000	≥ 2.0	_____	■ P ■ F
5 - 15 kV (MV)	5,000 VDC	1 min	≥ 25,000	< 100,000	≥ 2.0	_____	■ P ■ F
> 15 kV (HV)	10,000 VDC	1 min	≥ 100,000	< 500,000	≥ 2.0	_____	■ P ■ F

★ *PI (Polarization Index) = $IR_{10\text{ min}} \div IR_{1\text{ min}}$. PI ≥ 2.0 = Good; 1.0–1.9 = Questionable; < 1.0 = Dangerous. Correct all readings to 20 °C. Minimum 6-month trending interval per NFPA 70B.

Inspector Name: _____	Certification / Licence #: _____	Signature: _____	Date: _____
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References: NFPA 70B-2023 Recommended Practice for Electrical Equipment Maintenance | IEC 62271-200:2021 AC Metal-Enclosed Switchgear | IEEE Std 43-2013 (IR Testing)