

Purpose of This Checklist

This checklist captures the engineering data needed to perform Insulation Coordination Studies, ensuring accurate fault analysis, reliable protection design, and full system security.

- Estimates are acceptable note them as 'approx.'
- Attach existing SLD, relay setting files, or test reports.
- Partial data is useful our engineers will follow up on gaps.

Project / Contact Details

Company / Organization: _____

Project Name : _____

Site / Facility Name: _____

Contact Name & Role : _____

Email Address : _____

Phone Number: _____

Date Submitted: _____

A. SYSTEM OVERVIEW & NETWORK CONFIGURATION

System Type	<i>Industrial / Utility / Renewable / Hybrid</i>	Applicable Standards	<i>IEC / IEEE / Utility-specific / All</i>
Voltage Levels in Network	<i>e.g. 132 kV / 33 kV / 11 kV / 415 V</i>	Earthing / Grounding Philosophy	<i>Solid / Resistance / Unearthed / Petersen coil</i>
Network Configuration	<i>Radial / Ring / Meshed / Mixed</i>	Is Latest SLD Available?	<i>Yes, attach / Partial / No</i>
Known System Issues / Constraints	<i>e.g. Known protection gaps, recurring faults, planned expansion, grid interface restrictions...</i>		

B. GRID / UTILITY FAULT DATA (Point of Common Coupling, PCC)

Maximum Fault Level at PCC	<i>e.g. 25 kA / 500 MVA (all sources connected)</i>	Minimum Fault Level at PCC	<i>e.g. 10 kA (weak grid / reduced generation)</i>
X/R Ratio at PCC	<i>e.g. 10 (from utility, affects DC offset)</i>	Grid Grounding at PCC	<i>Solid / Resistance / Unearthed</i>
Utility Protection Interface Requirements	<i>e.g. Anti-islanding, DTT, ROCOF, Vector shift</i>	Fault Level Contribution (kA)	<i>Positive / zero sequence if available</i>

C. EQUIPMENT ELECTRICAL PARAMETERS

Transformers

Tag / ID	Rating (MVA/kVA)	Voltage Ratio	% Impedance	Vector Group	Z0 / Grounding
<i>e.g. TR-01</i>	<i>10 MVA</i>	<i>33/11 kV</i>	<i>10%</i>	<i>Dyn11</i>	<i>Solid earth</i>

Generators / DG Sets / Inverter-Based Sources (IBR)

Tag / ID	Rating (MVA/kW)	Type	X"d / X'd	Neutral Grounding	Fault Contribution
<i>e.g. GEN-01</i>	<i>5 MVA</i>	<i>Sync / Async / IBR</i>	<i>0.15 / 0.25 pu</i>	<i>Resistance earthed</i>	<i>Confirmed / Estimated</i>

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Motors

Motor ratings & locations	Sub-transient reactance X"d (if known)	Starting method	Neutral grounding
e.g. 630 kW MV motor, Compressor A	e.g. 0.17 pu from datasheet	DOL / Soft starter / VFD	e.g. Resistance / Solid / Unearthed

D. CABLE & NETWORK IMPEDANCE DATA

Positive, negative, and zero-sequence impedances are all required for accurate earth fault and SLG fault calculations. Zero-sequence data is frequently overlooked.

Cable / Feeder ID	From → To	Type & Size	Length (m)	R1 / X1 (Ω/km)	R0 / X0 (Ω/km)
e.g. CB-01	Bus-A → TR-01 LV	XLPE 3x185mm ²	350 m	0.099 / 0.08	0.31 / 0.25

E. BUSBAR & SWITCHGEAR RATINGS

Bus / Panel ID	Voltage Level	Bus Rating (A)	SC Withstand (kA)	CB Breaking (kA)	CB Making (kA pk)
e.g. MV-BUS-01	11 kV	1250 A	25 kA / 1 s	25 kA	63 kA

Fuse details (if applicable)	Rating, type, manufacturer, time-current curve ref	Existing fault level utilization (%)	e.g. 18 kA of 25 kA capacity = 72%
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F. PROTECTION SYSTEM DETAILS

Protection Relays

Relay Tag	Make & Model	Protection Functions	Location / Panel	Existing Settings?	Comms / Protocol
e.g. R-01	SEL-751 / GE P14D	OCR, EFR, O/V, U/V	Feeder CB-01	Yes attach file	IEC 61850 / Modbus

Current & Voltage Transformers (CT / VT)

CT/VT Tag	Location	Ratio	Class	Burden (VA)	Knee Point / ALF
e.g. CT-01	Feeder CB-01	200/1 A	5P20	15 VA	e.g. Vk = 180 V / ALF 20

Auto-reclosing schemes in use?	Yes describe / No	Interlocking / busbar protection?	Yes describe / No
Load shedding scheme?	Yes describe / No	Backup protection philosophy	e.g. Time-graded IDMT / Definite time
Special protection requirements or constraints	e.g. Selectivity requirements, utility interface relay, arc flash limitation, protection for renewable source...		

G. FAULT SCENARIOS, INSULATION & THERMAL DATA

Fault Study Scenarios Required tick all applicable

- | | |
|---|---|
| <input type="checkbox"/> 3-Phase symmetrical fault (all busbars) | <input type="checkbox"/> Single Line-to-Ground (SLG) fault |
| <input type="checkbox"/> Line-to-Line (LL) fault | <input type="checkbox"/> Double Line-to-Ground (DLG) fault |
| <input type="checkbox"/> Near-end feeder faults | <input type="checkbox"/> Far-end feeder faults |
| <input type="checkbox"/> Transformer terminal faults (HV & LV) | <input type="checkbox"/> Maximum fault condition (all sources ON) |
| <input type="checkbox"/> Minimum fault condition (weak grid / DG OFF) | <input type="checkbox"/> N-1 contingency (transformer / feeder outage) |
| <input type="checkbox"/> Islanded operation fault scenarios | <input type="checkbox"/> Motor starting voltage drop / fault contribution |

Insulation Coordination

Equipment BIL (Basic Insulation Level)	e.g. 95 kV BIL for 11 kV equipment	Lightning Impulse Withstand (kVp)	e.g. 95 kV from equipment test cert
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Switching Impulse Withstand (kVp)	<i>e.g. 250 kV (for HV systems)</i>	System Maximum Overvoltage (pu)	<i>e.g. 1.4 pu temporary / 1.7 pu transient</i>
Surge Arrester Ratings & Locations	<i>e.g. 10 kV MCOV at HV transformer terminals</i>	Arrester Manufacturer / Model	<i>e.g. ABB PEXLIM / Siemens 3EP</i>

Thermal & RMS Withstand

Cable short circuit withstand (I²t)	<i>e.g. from cable datasheet, 185mm² XLPE</i>	Maximum fault clearing time allowed	<i>e.g. 0.5 s (protection must clear within this)</i>
Transformer damage curves available?	<i>Yes, attach ANSI / IEC curve / No</i>	Motor thermal damage curves available?	<i>Yes, attach / No / Not applicable</i>

H. EXISTING DATA, SITE HISTORY & STUDY OBJECTIVES

Documents & Data Available:

- Single Line Diagram (SLD) with protection devices
- Previous short circuit / protection study report
- CT / VT test records or excitation curves
- Generator / DG datasheets (reactance values)
- Arc flash study (if previously performed)
- Equipment nameplate photographs
- Relay setting files (*.rcp, *.iid, *.cfg, etc.)
- Transformer test certificates (impedance confirmed)
- Cable schedule with impedance data
- Fault / tripping history or event logs
- Utility interconnection agreement / requirements
- SCADA / DCS fault record exports

Known system issues / fault history	<i>e.g. Repeated nuisance tripping on feeder 3, upstream CB failing to clear, discrimination issue on LV board...</i>
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Study Objectives

- Short circuit fault level calculation at all buses
- Selectivity / discrimination verification
- Earth fault protection design (SLG/DLG)
- Insulation coordination & surge arrester selection
- Grid code / utility compliance verification
- Arc flash assessment (IEEE 1584 / IEC 62271)
- Protection relay setting calculation & coordination
- Equipment protection adequacy check (SC rating vs fault level)
- Differential / distance protection setting
- RMS / transient overvoltage study
- Protection for renewable / inverter-based generation
- Other, describe below

Specific compliance or utility requirement	<i>e.g. DNO requires protection study before grid connection, utility has issued notice, permit/approval needed...</i>
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Project completion timeline	<i>e.g. Grid connection approval needed by June / No fixed deadline</i>
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<p>COMPANY NAME</p> <p>Full Name: _____</p> <p>Designation: _____</p> <p>Signature: _____</p> <p>Date: _____</p>	<p>What Happens Next</p> <p>Our engineer will review your form shortly and contact you.</p>
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