

Single-line diagram *checklist*.

49 checks to run on a single-line diagram before it is issued: document control, supply, transformers, switchboards, protection, cables, loads, alternate supplies, earthing and cross-checks.

PROJECT	DRAWING NO. / REV
CHECKED BY	DATE

1. Title block and document control

- ☐ Title block matches the client or project template: project, drawing title, drawing number, sheet number and total sheets
- ☐ Revision letter or number, date, description and the prepared / checked / approved initials are complete
- ☐ Revision clouds and triangles mark every change since the last issue
- ☐ Issue status is stated (for example preliminary, for review, for construction, as-built)
- ☐ Drawing references list the related drawings: layouts, schematics, panel and cable schedules, protection study
- ☐ Legend or symbol key is included, or the drawing references the project symbol standard (for example IEC 60617 or IEEE 315 symbols)
- ☐ Text is legible at the issued sheet size and nothing overlaps the title block

2. Supply and point of connection

- ☐ Each incoming supply is shown with its source: utility, network operator or DNSP connection, or on-site generation
- ☐ Nominal voltage, number of phases and frequency are stated for every voltage level
- ☐ Prospective fault level (or available fault current) at the point of connection is stated, with its source and date
- ☐ Metering point and metering CTs/VTs are shown where they form part of the scope
- ☐ Point of supply and ownership boundary between the network and the installation are clear
- ☐ Earthing system is identified (for example TN-C-S / MEN, TN-S, TT or IT) and the main earthing or grounding connection is shown

3. Transformers

- ☐ Rating (kVA or MVA), primary and secondary voltages and vector group are shown
- ☐ Impedance (%Z) is shown, because it drives the fault levels downstream
- ☐ Tap range and tap position, cooling class and neutral earthing arrangement are shown where relevant
- ☐ Transformer protection (fuses, relays, Buchholz or temperature devices) is shown or referenced

4. Switchboards, switchgear and MCCs

- ☐ Each board has a unique tag that matches the layout drawings and the panel schedule
- ☐ Busbar current rating and short-circuit withstand rating are stated and are at least the calculated fault level at that board
- ☐ Main switch or incoming breaker type and rating are shown
- ☐ Bus sections, bus couplers and interlocks are shown, including the normal open/closed state

- ☐ Assembly details required by the project are noted (for example form of separation and IP rating for AS/NZS 61439 assemblies, or the short-circuit current rating for NEC panelboards and switchboards)
- ☐ Spare and space positions are shown where the client wants them recorded

5. Protective devices

- ☐ Every circuit shows its device type (circuit breaker, fuse, MCCB, ACB, relay-operated breaker) and rating
- ☐ Breaking capacity of every device is at least the prospective fault current at its point of installation
- ☐ Relay functions and CT ratios are shown for relay-protected circuits, with a reference to the protection settings or study
- ☐ Earth-fault and residual-current protection (RCD/GFCI) is shown where required
- ☐ Discrimination / selectivity is referenced to the protection coordination study rather than assumed

6. Cables and conductors

- ☐ Every cable has an ID that matches the cable schedule
- ☐ Size, number of cores, conductor material and insulation are shown for each feeder, plus the earth or equipment grounding conductor
- ☐ Feeder sizes are consistent with the cable schedule after derating (current-carrying capacity and voltage drop checked to the applicable standard, such as AS/NZS 3008.1.1 or the NEC)
- ☐ Parallel conductors are shown as such, with the number of runs

7. Loads, motors and drives

- ☐ Each load is tagged and rated (kW, kVA or A) and matches the load list or equipment schedule
- ☐ Motor starters are identified (DOL, star-delta, soft starter, VSD/VFD) with their ratings
- ☐ Power factor correction and harmonic filtering equipment is shown where installed
- ☐ Essential, emergency or life-safety loads are identified and fed as the design intends

8. Alternate supplies: generators, UPS, PV and batteries

- ☐ Generators, UPS, solar PV inverters and battery systems are shown with their ratings
- ☐ Transfer switches or changeover arrangements are shown with their interlocking
- ☐ Paralleling, anti-islanding or export-limiting arrangements are shown or referenced where applicable (for example to AS/NZS 4777 for inverter connections in Australia, or the utility interconnection requirements in the US)
- ☐ Neutral switching and earthing of alternate supplies is consistent with the earthing system

9. Earthing, bonding and arc flash

- ☐ Main earthing conductor / grounding electrode conductor and main earth bar are shown
- ☐ Equipotential bonding and earthing of transformers, generators and switchboards are shown or referenced
- ☐ Arc flash study and labelling are referenced where the project requires them (for example IEEE 1584 calculations and NFPA 70E labelling in the US)

10. Final cross-checks before issue

- ☐ SLD agrees with the panel schedules: circuit numbers, device ratings and descriptions
- ☐ SLD agrees with the cable schedule: cable IDs, sizes and from/to
- ☐ SLD agrees with the protection study and the fault level calculations

- ☐ SLD agrees with the general arrangement and layout drawings: equipment tags and locations
 - ☐ All open queries are closed or listed as holds on the drawing
 - ☐ A second person has checked the drawing and initialled the check box in the title block
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This checklist is a review aid, not engineering advice. It does not replace the applicable standards, the network operator's or utility's requirements, or review by a competent engineer.

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