



EPC · STEP 01 · ENGINEER FOR CONSTRUCTABILITY · MODEL

Equipment Sizing & Interconnection Model

Engineering calculation set validating PCS, transformer and cable sizing against site ambient conditions and auxiliary loads, replacing generic vendor assumptions.

Worked example (anonymised): Standalone BESS constructability review · 400 MW / 800 MWh · Western India. A DISCOM-awarded standalone BESS project moved from vendor reference layout to a site-adapted design after review flagged drainage, crane-access and fire-clearance issues ahead of procurement.

Sample excerpt · BESS Sizing & Auxiliary Load Summary

Parameter	Design value	Basis	Margin applied
Nameplate capacity	800 MWh (DC)	Tender requirement plus degradation curve	10% oversize for 20-yr EOL
PCS AC output	400 MW	1C discharge design point	—
Auxiliary load (HVAC + BMS)	6.2 MW peak	Thermal model at 45°C ambient	15% contingency
33 kV feeder cable	630 mm ² Al XLPE	IEC 60502, derated for trench grouping	1.2x thermal margin
Transformer capacity	2 x 63 MVA	N-1 redundancy at full output	—

Notes

- Model rerun against three ambient temperature scenarios before freezing sizing
- Used directly by procurement to write vendor technical specifications

What happens in this step

1. Cross-check vendor reference layouts against site topo survey, geotechnical data and drainage patterns
2. Validate equipment sizing (PCS, transformers, cabling) against actual ambient conditions and site-specific auxiliary loads
3. Review access roads, crane paths and lay-down areas against real construction logistics, not idealised plot plans
4. Verify clearances, bay spacing and fire safety against applicable IS/CEA codes and state electrical inspectorate requirements
5. Design O&M; walkways, module-swap aisles and maintenance zones for 20-year operability, not just installation-day access
6. Flag constructability risks in a formal register with mitigation options, costed where material
7. Issue a sign-off package that procurement and construction teams work from — not a marketing-grade GA drawing

Outcomes

- Site-specific design issues identified before procurement, avoiding costly rework during construction
- O&M; access and safety clearances built into the layout from day one, reducing lifecycle operating costs
- Equipment sizing validated against actual site conditions, not vendor default assumptions
- Constructability sign-off typically reduces change orders during EPC execution by 15-20%

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