TRANSMISSION ENGINEERING · STEP 03 · DETAILED DESIGN · DRAWING

SCADA & Communication Architecture Package

RTU/SCADA architecture, communication topology, and interface specification for data exchange with the utility load dispatch centre.

Worked example (anonymised): Standalone BESS Interconnection Package · 400 MW / 800 MWh BESS with 220 kV pooling substation · Western India. Detailed design of a 220 kV pooling substation, associated P&C; schemes and a 12 km double-circuit line package connecting the BESS to the state transmission utility's grid substation.

Sample excerpt · SCADA Interface Point List

Signal Group	Interface Type	Protocol	Data Point Count	Destination
Analog Measurements	RTU	IEC 60870-5-104	148	State Load Dispatch Centre
Digital Status	RTU	IEC 60870-5-104	96	State Load Dispatch Centre
Control Commands	RTU	IEC 60870-5-104	32	State Load Dispatch Centre
BESS SOC/Power Setpoints	Local SCADA	Modbus TCP	24	Plant Control Room
Event/SOE Logs	Historian	OPC-UA	N/A	Plant Control Room

Notes

• Redundant fibre communication path proposed via OPGW on the transmission line
• Cyber-security segregation per CEA guidelines included in the architecture

What happens in this step

1. Finalise single line diagrams (SLDs), bus arrangements and bay layouts based on approved load flow, short circuit and stability study outputs
2. Prepare substation general arrangement (GA), sectional and equipment layout drawings including clearances as per CEA/CBIP guidelines
3. Develop protection & control philosophy, relay coordination studies, and P&C; schematics for line, transformer and bus protection
4. Design SCADA/RTU architecture, communication network topology (OPGW/fibre), and interface points with the utility's control centre
5. Prepare transmission line design package: tower spotting, sag-tension calculations, foundation type selection and conductor/OPGW schedules
6. Cross-discipline clash check and constructability review across civil, electrical and protection drawings
7. Issue design packages for internal design review, statutory vetting, and procurement-ready issuance

Outcomes

• Construction-ready substation and line drawings accepted by the utility with minimal revision cycles
• Protection coordination validated against the utility's existing relay settings, avoiding nuisance tripping
• SCADA architecture pre-aligned with the load dispatch centre's interface standards, reducing commissioning delays
• Single integrated design package enabling faster, cleaner EPC tendering and vendor bid comparison

Want this for your project? Write to info@growthifye.com or use the Contact page — we will scope the real deliverable set for your capacity, state and lender requirements.