Distribution constraint-to-duty worksheet

Blank planning record | Non-wires alternative scoping

1 / Utility-defined need

Use utility planning inputs first. This worksheet scopes an engineering discussion; it is not engineering approval or an operating procedure. Leave unknowns blank and record them on page 4.

Utility, record date and planning owner

Utility / project reference; planner and team; worksheet date / revision.

Constrained asset and electrical location

Asset ID / type, substation / feeder / segment, voltage and phase; constraint type; candidate connection point and topology / one-line revision.

Utility planning criterion and system condition

Applicable rating / limit and units; normal or contingency configuration; limiting condition, affected customers and study reference.

Dated overload window and need-by date

Study years; season / dates, start-end times and time zone; interval length, hours per event, events per year and consecutive-day exposure; in-service deadline.

Load forecast basis and uncertainty

Dated interval dataset / forecast revision; measured vs forecast status; growth, weather, existing DER and electrification assumptions; sensitivity cases.

Required net contribution at the constrained location

Time-varying relief and units (kW / kVA / A as applicable); required duration / energy; reserve or margin; utility study mapping connection-point output to asset relief.

2 / Proposed resource duty

Describe a candidate resource or portfolio separately from the need. Nameplate capacity alone does not establish net relief at the constrained asset. Proposed duties require configuration-specific evidence.

Candidate configuration and measurement boundary
Technology / portfolio, configuration revision, location and owner; gross output, auxiliaries / site load and proposed net export or load reduction boundary.

Dispatch duty over the overload window
Proposed net output profile, startup / notification time, ramp and minimum output; sustained duration, repeat calls and recovery / replenishment between events.

Availability and limiting conditions
Availability during every required interval; weather / ambient limits, planned maintenance, forced outages, derating, resource life and degradation assumptions.

Supply and infrastructure dependencies
Fuel / feedstock or stored-energy inventory and replenishment; water, auxiliaries, access and supply continuity during the required duty; permits and operating-hour limits.

Control, dispatch authority and performance verification
Who calls and confirms delivery; communications / telemetry and metering boundaries; dispatch priority against other services; verification records and responsible party.

Duty-to-need match still to demonstrate
Requested tests / models and conditions for output, duration and repeat duty; mark each assertion measured, estimated, projected or planned; cite source and revision.

3 / Failure, fallback and delivery constraints

Record arrangements and questions for utility review, not switching steps or settings. A candidate must be studied against the actual network and underperformance scenarios.

Failure and underperformance scenarios

Loss of unit / portfolio member, fuel or stored energy, communications or dispatch; correlated outages; unmet relief and resulting asset exposure for each case.

Fallback arrangement and responsible owner

Proposed alternate capacity / utility mitigation, activation lead time, duration and limits; who confirms sufficiency; contingency-study reference and unresolved gaps.

Interconnection and electrical constraints

Connection / export limits, protection, voltage, thermal / fault-duty impacts, power quality, metering and controls; required studies, mitigations and approval dependencies.

Site, infrastructure and schedule constraints

Land / rights, civil works, access, fuel / water / electric service, environmental permits and network works; procurement, construction and commissioning lead times vs need-by date.

Commercial responsibility and review gates

Ownership / dispatch contracts, availability and performance obligations, monitoring and remedies; utility engineering / procurement owners; evidence required before the next decision.

4 / Comparison inputs and evidence to obtain

Compare alternatives against the same utility need, reliability criteria and dated analysis basis. No savings, upgrade deferral or feasibility finding is established by completing this worksheet.

Conventional baseline and other alternatives

Named upgrade / other options; scope, estimate source / date, in-service timing, useful life and residual value; any candidate deferral period to study, not assume.

Project-specific costs and economic basis

Capital / connection / site works, fuel / energy, O&M, controls, contracts, backup, replacement / removal; study period, discount rate, price basis and sensitivities; source / confidence.

Benefits, risks and comparable analysis still needed

Potential avoided costs and timing; permitted additional services without double counting or dispatch conflicts; reliability / delivery risks; shared cost-benefit method and evidence gaps.

Evidence still to obtain: item / owner / due date

List missing interval studies, forecast cases, location-to-relief model, duty / failure evidence, interconnection scope and dated quotes; source / revision / status for each item.

Next engineering discussion

Open decision / question, participants and next review date. Summarize what must be obtained before deciding whether further NWA study is warranted.

Source references

EPRI, Integrating Non-Wires Alternatives into Utility Planning, 2023 Research Guide (3002027412), Aug. 2023; especially pp. 6-7.
Open source

Berkeley Lab, Value of Distributed Energy Resources Largely Depends on Three Things: Location, Location, Location, Feb. 12, 2021 (primary explainer).
Open source