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Comment Letter on Staff Assessment Section 41 and 42

See Attached Comment Letter

Additional submitted attachment is included below.

California Energy Commission
Corby Battery Energy Storage System Project
Docket No. 24-OPT-05

Comments on Staff Assessment Sections 4.1 and 4.2
Facility Design and Facility Reliability

Commissioners:

I submit these comments regarding Sections 4.1, Facility Design, and 4.2, Facility Reliability, of the Staff Assessment.

These sections present a somewhat different issue from many of the environmental-resource sections of the Staff Assessment. I do not question that modern engineering codes and standards exist for the design and construction of battery energy storage facilities, nor do I question the value of the California Energy Commission's Delegate Chief Building Official (DCBO) review and inspection process.

My concern is more fundamental.

The Commission is being asked to make findings now concerning the design and reliability of a 300-MW/1,200-MWh battery storage facility, while important elements of the project-specific engineering will be developed, submitted, reviewed, and approved after certification.

That makes it important to distinguish between two propositions:

The final project will be required to comply with applicable engineering codes.

and

The present record contains sufficient project-specific evidence to support Staff's conclusions concerning the design and reliability of the particular facility the Commission is being asked to approve.

Those are not necessarily the same thing.

1. Much of the Project-Specific Engineering Review Will Occur After Project Approval

Staff concludes that there are “no unique site constraints that require special design features.” It further concludes that the preliminary design, standard engineering practices, DCBO review, inspections, and Conditions of Certification provide reasonable assurance that the project can comply with applicable engineering requirements.

At the same time, the proposed Conditions of Certification make clear that substantial engineering work remains to be performed.

GEN-2, for example, requires the project owner to provide a schedule for future facility-design submittals before submitting the initial engineering designs for DCBO review. Those subsequent submittals include engineering drawings, calculations, specifications, and other information for major structures, systems, and equipment.

There is nothing inherently unusual about completing detailed engineering after a large infrastructure project receives approval.

But that does not eliminate the Commission's obligation to have an adequate engineering basis for the findings it makes at the time of certification.

The question therefore is not whether the DCBO process is useful.

What project-specific engineering information presently demonstrates that this particular BESS, at this particular site, can achieve the design and reliability conclusions Staff reaches, rather than merely demonstrating that the final design will later be required to comply with applicable codes?

The final Staff Assessment should distinguish clearly between matters that have already been demonstrated and matters that remain subject to future engineering verification.

2. Staff Acknowledges That Corby Has Not Provided a Specific Availability Factor

The Facility Reliability analysis identifies three principal benchmarks: equipment availability, facility maintainability and maintenance, and reliability in relation to natural hazards.

Availability is a straightforward concept. In practical terms, it asks how often the facility will actually be ready and capable of operating when called upon.

Yet Staff expressly states: “The applicant has not provided a specific availability factor.”

Staff nevertheless concludes that the use of a SCADA system for real-time monitoring “suggests a high availability” for the facility.

That conclusion requires further explanation.

A SCADA system can monitor equipment, report operating conditions, identify alarms, and assist operators in controlling a facility. But the existence of a monitoring system does not itself establish how frequently the underlying battery modules, inverters, cooling equipment, transformers, controls, and other systems will actually be available for service.

A system can monitor an equipment failure very effectively. That does not mean the equipment did not fail.

If Corby has not provided an availability factor, what project-specific evidence supports Staff's conclusion that the project will have high availability?

3. Staff's Comparison With Other Generating Facilities Does Not Supply the Missing Corby Availability Factor

Staff compares Corby's anticipated availability with the approximately 82-percent average availability factor reported for North American electric generating facilities.

But Staff itself recognizes that a BESS is fundamentally different from a generating facility. Corby will not generate electricity. It will store electricity supplied to it and subsequently return a portion of that electricity to the grid.

Staff also discusses capacity factor and notes that NREL estimates an approximately 17-percent capacity factor for utility-scale four-hour battery energy storage systems assuming one full charge-discharge cycle per day.

Availability factor and capacity factor measure different things, and they should not be confused.

But neither a generic generating-facility availability factor nor an industry-average BESS capacity factor establishes the expected availability of this particular Corby facility.

If Staff believes Corby will achieve a high availability factor, the Staff Assessment should identify the project-specific basis for that conclusion.

4. The Change in Battery Technology Makes Project-Specific Reliability Evidence Particularly Important

During the certification proceeding, the proposed battery technology changed.

The CEC identified the change from CATL EnerC+ equipment to LG Energy Solution JF2 DC LINK equipment as a substantial change to the project requiring updated project-description and environmental-review materials.

That change matters to Facility Reliability.

Reliability is not simply a characteristic of “batteries” as a generic category. It depends upon the particular battery system, thermal-management equipment, controls, inverters and associated components ultimately installed.

Accordingly, Staff should identify what reliability information concerning the actual LG Energy Solution system now proposed for Corby supports its conclusion that the facility is expected to demonstrate high availability.

If project-specific information concerning the selected system exists in confidential technical filings, Staff need not disclose legitimate proprietary information. But the public Staff Assessment should nevertheless explain, at a meaningful level, the evidence upon which Staff relied in reaching its reliability conclusion.

Otherwise, the public is left with a conclusion of “high availability” without the information necessary to understand how Staff reached it.

5. Staff Should Distinguish Monitoring Capability From Reliability

Staff places substantial emphasis on SCADA monitoring.

SCADA is unquestionably important to operation of the project. Staff explains that it will provide real-time monitoring, supervisory control, communications, and indications of system availability.

But monitoring and reliability are different concepts.

Monitoring tells an operator what the equipment is doing.

Reliability concerns whether the equipment continues to perform its intended function over time.

The Staff Assessment should therefore identify the underlying factors Staff used to evaluate reliability, including reasonably available information concerning equipment failure, maintenance requirements, component replacement, thermal-management reliability, auxiliary power requirements, and system redundancy.

The Commission need not require an exhaustive engineering failure analysis in the Staff Assessment.

But there should be an identifiable analytical bridge between the existence of a monitoring system and the conclusion that the facility itself will be highly available.

6. The Natural-Hazard Analysis Relies Heavily on Future Engineering Controls

Staff recognizes seismic shaking as a credible threat to project reliability.

It nevertheless concludes that applicable seismic codes, geotechnical requirements, engineering review, inspections, and Conditions of Certification will reduce the potential reliability effect to an acceptable level. Staff similarly addresses landslides, flooding and subsidence primarily through design requirements and cross-references to the Geology, Facility Design and Water Resources analyses.

Again, the issue is not whether those engineering controls are appropriate. The issue is the timing and evidentiary basis of Staff's conclusion.

Section 4.1 states that: "There are no unique site constraints that require special design features."

Yet Section 4.2 recognizes seismic shaking as a credible reliability threat and relies upon later geotechnical, structural and civil engineering requirements to address natural hazards.

Those statements may ultimately be reconcilable.

But Staff should explain the project-specific engineering basis for concluding, before final design and engineering review are complete, that there are no site constraints requiring special design treatment.

7. Staff's "No Unique Site Constraints" Finding Is Difficult to Reconcile With the Geology and Water Record

Our review of the Geology and Water Resources sections makes Staff's statement that there are "no unique site constraints that require special design features" more difficult to accept without further explanation. The preliminary geotechnical information identifies shallow groundwater on the order of approximately 7.5 to 15 feet below ground surface, and Staff elsewhere discusses questionable or expansive soils, perched or seasonal groundwater, drainage limitations, and the possibility that dewatering may be necessary during construction.

Those conditions do not necessarily make the project unbuildable. But they are precisely the kinds of site-specific conditions that can affect foundation design, grading, corrosion protection, underground electrical work, drainage, settlement, and long-term maintenance. CIVIL-1 and related Conditions of Certification defer final soils, geotechnical, foundation, drainage, and grading investigations and designs to the post-certification DCBO process.

The Commission should therefore either explain why those identified conditions nevertheless do not constitute site constraints requiring special design treatment, or revise the finding. A more supportable conclusion may be that no presently identified condition has been shown to make compliant design infeasible, while acknowledging that final project-specific design features remain dependent upon geotechnical, groundwater, drainage, corrosion, and foundation information that has not yet been completed.

This distinction matters because compliance with a future engineering review is not the same as demonstrating today that the site presents no special design constraints.

8. The Reliability Finding Should Be Consistent With the Commission's Other Findings Concerning Project Performance

Facility Reliability should not be viewed in isolation.

The Commission is evaluating Corby in part on the basis of the energy and grid benefits the project is expected to provide. Those benefits depend not merely upon installed nameplate capacity, but upon actual project performance.

A 300-MW/1,200-MWh rating describes the facility's nominal capability. It does not by itself establish how often that capability will be available.

That distinction becomes particularly important where Staff expressly acknowledges that the applicant has not supplied a project-specific availability factor.

The Commission should therefore ensure that its findings concerning project reliability, efficiency, energy benefits, and any ultimate Statement of Overriding Considerations are based upon mutually consistent assumptions about what the facility can actually deliver. That should include any operating limitations that materially affect usable output or availability, including thermal-management requirements, auxiliary loads,

maintenance outages, battery augmentation, state-of-charge restrictions imposed for safety, and performance during high ambient temperatures.

The Commission should not rely upon optimistic project-performance assumptions in one section while acknowledging that the corresponding project-specific performance information is unavailable in another.

9. Staff Recommends No Additional Reliability Conditions Despite the Missing Availability Factor

After acknowledging that Corby has not supplied a specific availability factor, Staff concludes that the project would nevertheless be expected to demonstrate high availability.

Staff then recommends no additional Conditions of Certification for Facility Reliability and no reliability mitigation measures.

That sequence deserves attention.

If Staff had a demonstrated project-specific availability factor and supporting reliability data, the absence of additional conditions might be readily understandable.

But Staff acknowledges that the availability factor has not been provided.

At minimum, the Commission should consider whether certification should include a requirement for the project owner to establish, monitor, and report actual operational availability after commercial operation begins.

That would provide an objective means of determining whether the “high availability” Staff predicts is actually achieved.

10. Requested Action

I respectfully request that the Commission require Staff to supplement or clarify Sections 4.1 and 4.2 before adopting final findings.

Specifically, Staff should:

1. Identify which project-specific engineering determinations have been completed before certification and which remain subject to future DCBO review;
2. Explain the project-specific evidentiary basis for concluding that the Corby facility will demonstrate a high availability factor when Staff acknowledges that the applicant has not provided one;
3. Distinguish clearly between SCADA monitoring capability and evidence of equipment or facility reliability;
4. Identify the reliability information relied upon for the LG Energy Solution battery system actually proposed for Corby;
5. Explain the basis for comparing Corby's anticipated reliability with generic generating-facility availability data and industry capacity-factor data;
6. Explain the project-specific basis for concluding that there are no unique site constraints requiring special design features, in light of the shallow groundwater, expansive/questionable soils, drainage conditions, possible dewatering, corrosion concerns, and other site-specific issues identified elsewhere in the Staff Assessment;
7. Ensure that the assumptions used in Facility Reliability are consistent with the assumptions used elsewhere in the Staff Assessment concerning project efficiency, energy performance, grid benefits, and overriding considerations; and
8. Identify any thermal, state-of-charge, auxiliary-load, maintenance, or other operating limitations that materially affect the usable 300-MW/1,200-MWh capability or expected availability relied upon in the Commission's public-benefit and reliability findings;

9. Consider requiring post-operation monitoring and reporting of actual facility availability so that the predicted high availability can be objectively verified.

The issue is not whether Corby will eventually be required to comply with engineering codes.

Of course it will.

The issue is whether the evidence presently before the Commission supports the project-specific findings Staff is making today.

Staff's statement that the applicant has not provided a specific availability factor is particularly important. The Commission should not replace a missing project-performance metric with the observation that the facility will have a sophisticated monitoring system.

SCADA can tell an operator when Corby is working and when it is not.

It does not, by itself, tell the Commission how often Corby will work.

Before making a finding that this project will be highly available and reliable—and before relying upon those expected benefits elsewhere in its decision—the Commission should require the evidentiary basis for that conclusion to be stated clearly in the record.

For these reasons, I do not believe the Commission should approve the proposed Kilkenny Road project on the present Facility Design and Facility Reliability record. The unresolved questions are not about whether engineering codes exist; they are about whether the project-specific evidence is sufficient to support the findings Staff proposes to make before the final engineering work is complete.

In addition to these comments, I formally incorporate by reference and fully support the technical comment letter submitted by Keep Vacaville Safe.

Respectfully submitted,

Michael Geller