EPC Best Practices for Solar PV Performance Testing

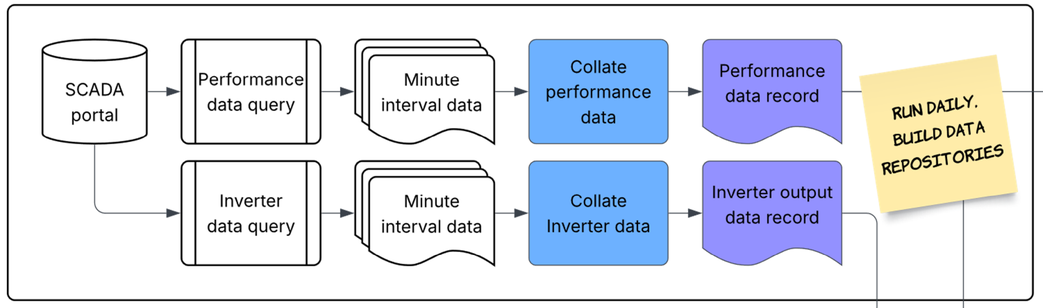
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Summary

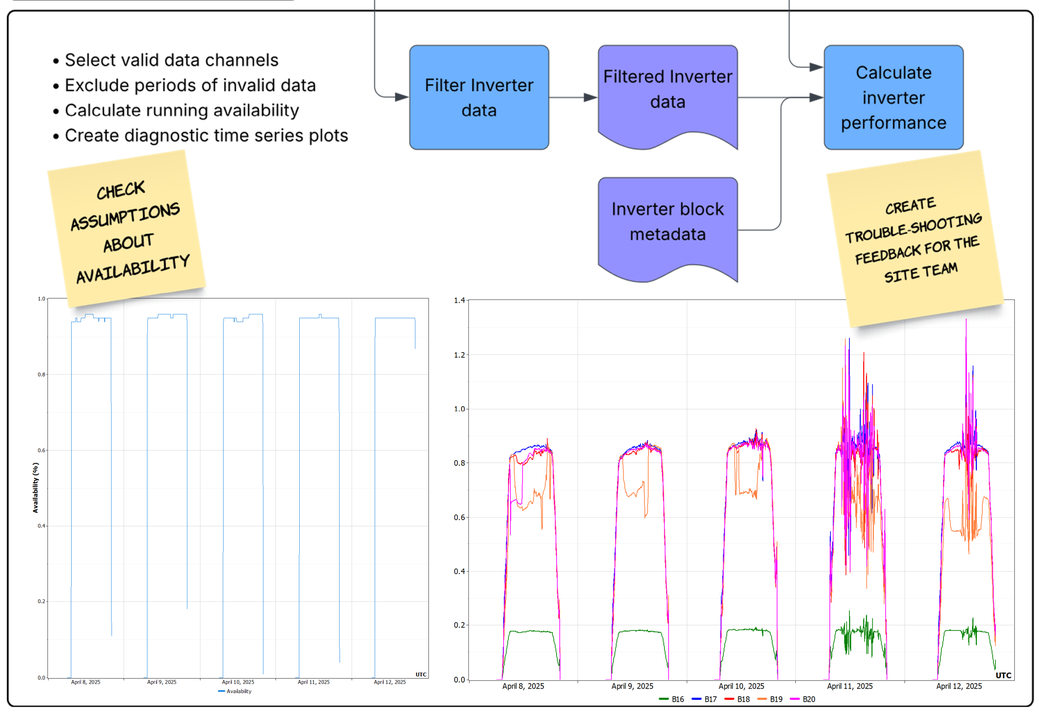
EPC (engineer/procure/construct) contracts for utility scale PV projects frequently obligate the EPC contractor to carry out a performance test of the completed project to prove that the project's performance meets or exceeds an agreed or guaranteed level of performance.

Requirements for the performance test are described by contract exhibits, which can reference standard methods e.g., ASTM E2848-2013; these exhibits are focused on drawing boundaries for the test and treatment of the data, and apart from this are generally not specific concerning the testing process, data handling, etc. Black & Veatch recognizes and applies a set of best practices in preparing for, carrying out, and closing out solar PV performance tests in the EPC context.

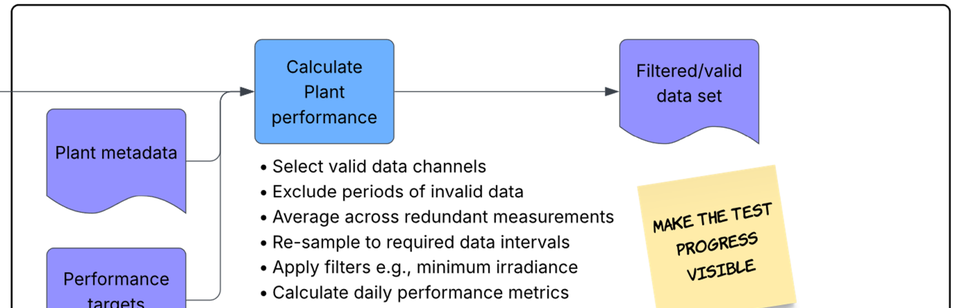
Collect performance data



Create diagnostic plots, filter data



Evaluate Plant performance against performance target





Take-aways

- ✓ Prioritize transparency and trust throughout the testing process.
- ✓ Prepare a complete and detailed Test Plan that clarifies which data will be collected and how the data will be managed.
- ✓ Plan data treatment carefully; use or create tools that will be appropriate to the tasks.
- ✓ Ensure that the plant performance model matches the plant configuration and condition as closely as practical, maintaining an agreed total margin.
- ✓ Minimize plant disturbances during testing.
- ✓ Provide daily communications of progress during the test.
- ✓ Provide prompt and frequent performance troubleshooting feedback.
- ✓ Build and maintain a complete record of plant performance data.
- ✓ Catalog all data exclusions and causes.
- ✓ Be prepared to adapt to changing conditions in the plant.