SGIP Equipment Reviews Standard Operating Procedure

(New Equipment and Factory/Field Discharge Data Reviews)

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Who is this document for?

- For SGIP applicants or Energy Storage System (ESS) manufacturers who want to get their new ESS equipment approved for SGIP **OR** for an applicant or manufacturer who want to submit either a Factory test or field test data for an already approved ESS equipment.

What is the purpose of Equipment or Factory test reviews?

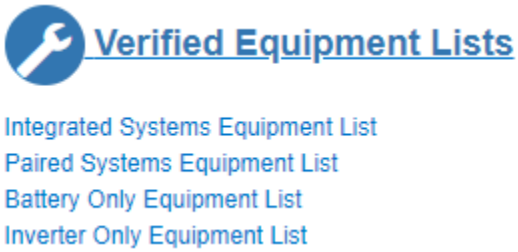
- Equipment review helps the SGIP Program Administrators (PAs) to verify the safety standards of an ESS equipment and also calculate the SGIP incentivized capacities for each system. For any particular ESS, these values are,
  - Energy storage capacity of the system in *kWh-AC*
  - System power output in *kW-AC*
  - and discharge duration in hrs. (Note: *kWh-AC = kW*hrs.*)
- Whereas a factory or field discharge test review helps the PAs verify the approved capacity of the ESS.

Who conducts these reviews?

- Alternative Energy Systems Consulting, Inc. (AESC), has been contracted by the SGIP PAs as a third-party technical consultant to complete these reviews. After completing a review by coordinating with the applicant and/or manufacturer, AESC submits its final determination to the PAs who take the final decision of approving or disapproving an equipment for SGIP.

How do you first verify if an ESS (either battery, inverter or a battery-inverter paired or integrated system) has already been approved?

- Equipment manufacturers can opt into having equipment that has been vetted statewide added to a public list posted on the SGIP application portal. This list can be downloaded at https://www.selfgenca.com/home/resources/ -> *Verified Equipment Lists.*



- The Integrated Systems list includes those ESS equipment which are being sold as a single integrated AC battery-inverter system by a manufacturer or by an Energy Equipment solutions company which simply assembles a particular battery and inverter model and sells them as a single unit.
- The Paired Systems list includes certain battery and inverter pairings, where the battery and inverter are mostly manufactured by different companies but are being sold as “preferred” configurations.

- Battery Only list includes batteries being sold as single units which can be paired with any other inverter in the market.
- Inverter Only list includes inverters being sold as single units which can be paired with any other battery in the market.[1]
- *Important Note*: though all equipment listed in the above lists have already been approved for SGIP, not all ESS equipment approved by the PAs appears on these lists because the PAs sometimes do not receive approvals from certain manufacturers to make their equipment information public. In those cases, please contact the PA for the territory in which you are applying to check if their system has already been approved to participate in the program. The PA can provide you with the approved values for the system.

How do you initiate a New Equipment or Factory Test Review?

- You can reach out to one of the PAs - PG&E, SCE, SCG or CSE - based on the territory your projects are located in. The emails for the respective PAs are listed below:
    - selfgen@pge.com (PGE)
    - SGIPGroup@sce.com (SCE)
    - selfgeneration@socalgas.com (SCG)
    - sgip@energycenter.org (CSE)
- After receiving a request, the respective PA will initiate the review process with AESC. An engineer from AESC will send you an email to initiate the equipment review process. The details of the process are given in the next section.

Communication pipeline for New Equipment and Factory Test Reviews[2]

1. After receiving an Equipment review request from PAs, an engineer from AESC (called "reviewer" moving forward) will reach out to the applicant within 5 business days with a request for information (RFI) email if supporting documents and/or equipment specifications were not already submitted. The applicant[3] will be given 2-weeks to get back with all the requested information. The applicant should inform the reviewer if more time is needed and the review can be put on hold temporarily. If no response is received within the 2-week period, a notice will be sent to the applicant of pending cancellation of the review. If there is no response within the following week AESC will request approval from the PAs to cancel the review.
2. After completing an initial review, the reviewer will,
    - either respond to the applicant with any follow up questions within 10 calendar days of receiving the documents, or;
    - forward the review for a Quality Control (QC) check within AESC if it is determined that all the information submitted meets the eligibility requirements to participate in the SGIP.

[1] Note: An applicant can choose an inverter from the inverter only list and pair it with a battery from the battery only list and vice-versa, and this system will be eligible for SGIP because both the equipment have already been vetted and approved by the PAs individually. The only part that remains is the calculation of SGIP incentivized capacity values for these systems which can be done by using the Energy Storage Working Sizing Worksheet found here https://www.selfgenca.com/home/resources/ -> *Calculators and Examples.*

[2] Note that the same communication process is followed for both New Equipment Reviews and Factory test reviews.

[3] Refers to SGIP applicant or manufacturer whoever is submitting the request for the equipment approval.

3. Note that the reviewer will move forward with the review only when all the documents have been received. The deadlines mentioned above in step one above will be followed until then. During this time the applicant can setup meeting/s with AESC when deemed necessary in order to explain nuances of the equipment or to respond to or get clarification on reviewer questions.
4. If the QCer has more questions for the applicant, steps 1 to 3 will be followed again until the QCer reaches a determination on the review.
5. If approved by the QCer, the final calculated incentivized capacity values will be sent to the applicant for confirmation. The applicant has 1-week to reply back with confirmation or with any suggestions requiring changes to the values (note: *appropriate justification will be required in the latter case; further time of 1-week will be given to the applicant for the same*).
6. Final determination of the review (Approval, Rejection or Partial Approval) along with the calculated SGIP incentivized capacity values will be sent to the PAs for review.
7. The PAs will respond back with their approval or questions within one week. If PAs have any questions or concerns, the reviewer will contact the applicant.
8. The reviewer will inform the applicant of the approval and provide the final SGIP incentivized values to be used in all SGIP applications using that system configuration.
9. At this stage, the reviewer will also send a request to the applicant[4] seeking their approval to upload the equipment information on the public lists on selfgenca.com. *Note: This is not a requirement to participate in SGIP but is recommended for granting easier access to SGIP applicants to the approved systems information.*

New Equipment Review

- Receivables from the applicant:
  - Component specification sheets (battery, inverter and/or integrated system)
  - UL certificates (Battery: UL1973, 1642, 1989; Inverter: UL1741; Integrator: UL9540)
  - Factory discharge test data if available[5]
- Please refer to *Appendix A* for specific requirements.
- Categories of Approvals:
  - *Approval:* If AESC and the PAs determine, based on the submitted specification sheets and UL certificates, that the equipment meets SGIP requirements, a Final Approval is granted to the ESS equipment and it can be used in SGIP applications across all stages – RRF, PPM, ICF – and may also be listed on the public Verified Equipment Lists.
  - *Partial Approval:* If any of the UL certificates for the battery, inverter and/or the integrated systems are not available at the time of the Equipment review, then provided the other things check out, the PAs can grant a Partial Approval to the ESS equipment if certification with a NRTL is underway. This means that RRF and PPM applications can be submitted using this particular equipment, but UL certificates must be submitted by the ICF application stage. The project will not receive the final incentive until the system receives a

[4] If the applicant is not the manufacturer of the system, the applicant needs to forward the request to the actual manufacturer and forward AESC an approval email or letter from them.
[5] Requirements for the factory test data are discussed in the Factory test data section.

Final Approval from the PAs. Only equipment which has received a Final Approval can be listed on the public Verified Equipment lists.

- **SCRTE Requirement:** As per section 6.2.4 of the SGIP 2023 Handbook, *all new residential systems, regardless of system size, must have a single cycle round trip efficiency (SCRTE) of 85% or greater.*
- The SCRTE is calculated as **CEC-EFFICIENCY-INVERTER^2 * BATTERY-DC-DC-RTE**. If the applicant can prove that the battery is DC coupled with the inverter and the system is designed to charge solely from solar PV, then the applicant can submit the charge controller efficiency. Subsequently, the SCRTE will be calculated as **CEC-EFFICIENCY-INVERTER * BATTERY-DC-DC-RTE * CHARGE-CONTROLLER-EFFICIENCY**.

Factory Test Data

Why is a Factory test required?

- This allows the PAs to verify that the ESS equipment is capable of operating within +-5% of the approved SGIP incentivized capacity (the total discharged AC energy in kWh should be within +-5% of the approved kWh value when discharging at the approved system kW-AC capacity for the approved discharge duration hours).
- Factory tests submitted for a certain configuration of an integrated ESS or a battery plus inverter pairing can be used across all the SGIP projects using the same system and configuration. This saves a lot of time for the applicant as well as the PAs.

When can you submit a Factory test data?

- (Highly recommended) This can be submitted immediately after the New Equipment Review process. If a factory test is not available at the time the equipment is verified, the test can be submitted any time before or when the projects utilizing the ESS reach the ICF stage.

What is the alternative to a Factory test?

- If you are not able to obtain the factory test data from the manufacturer, you can also submit a Field Continuous Discharge test.
- The Field continuous discharge test involves discharging the equipment at a specific project site to verify its capacity. Please see the protocol below for more details.
- Unlike the factory test data, the Field test data can **ONLY** be used for the specific project site at where it was tested.

SGIP Test data protocol

- Please refer to the *Pre-Inspection Discharge Data/Continuous Discharge Test* section in the Inspection protocol for more details on both the Factory and Field test requirements. The protocol can be found here -> https://www.selfgenca.com/home/resources/ -> *Field Inspection Protocols -> Energy Storage Inspection Protocol.pdf.*

Appendix A

The following documents are required to initiate a New Equipment review process.

1. A copy of the UL 1973 and UL 1642 (if available) certification for the battery module.
2. The corresponding battery specification sheet (*the model name on the spec sheet and the UL certificate should match*) which includes at minimum the C rating, Amp-hrs, DC voltage, depth of discharge (DOD) and DC-DC RTE. If you are submitting the UL1642 certification for the individual battery cells instead of the UL1973 for the battery module, then we will also need to review the corresponding cell specification sheet.
3. We will also need information about the general configuration of the ESS as a whole. For example, X cells in series and Y cells in parallel make 1 module of the ESS, Z modules make 1 rack and so on. We are hoping that this information at the component level will extrapolate up to the information provided at the system level. If UL1973 is submitted then only the module level information is required, the cell make and model or configuration are not mandatory.
4. A copy of the ESS spec sheet to verify the integrated specs at system level.
5. A copy of the UL9540 and UL9540A (if available) at the system level for the corresponding ESS model.
6. If you're pairing the battery with an inverter then inverter spec sheet and a copy of its UL1741 certification will also need to be provided. The inverter spec sheet should clearly list the continuous power output of the inverter and also the CEC weighted efficiency value. The CEC efficiency value should be verifiable from the Grid_Support_Inverter_List_Full_Data_ADA.xlsm list. If not, then the inverter manufacturer needs to conduct the CEC efficiency test and send AESC the test results in this form -> https://www.energy.ca.gov/media/3900 (Download Power_and_Efficiency_of_Inverter_Form.xlsm)
7. (Optional but recommended) A copy of a 10-year performance guarantee for the ESS which clarifies 1) the cycle life or energy throughput and 2) the depth of discharge or usable energy storage capacity the battery can safely operate at to avoid voiding the warranty.
8. Please refer to sections 5 and 8.1.3 of the SGIP 2023 Handbook for more information about the specification sheet requirements. You can find the Handbook here.
9. (Optional but recommended) Near the end of the equipment review, please also submit a factory lab test data showing the Battery discharging from 100% SOC to 0% SOC (or the minimum possible) through the inverter. Please check the "Continuous Discharge Test" section in the SGIP ESS Field Inspection protocol available here.

Once AESC receives the above documents, an engineer from AESC will review them and get back to you if they have any questions. After AESC finalizes the review, it will be sent to the PAs for a final approval.