

Interconnection of storage battery systems

Field Inspection Guidelines for interconnected residential battery storage systems

- Storage batteries for dwellings have the cells connected to operate at less than 50 volts. (NEC 690.71(B)(1))
- Live parts of battery systems for dwellings are guarded to prevent accidental contact by persons or objects. (NEC 690.71(B)(2))
- Flexible battery cables are listed RHW or THW, 2/0 minimum for battery cell connections. (NEC 690.74) NOTE: welding cables, marine, locomotive (DLO), and automotive cables do not meet the current Electrical Code requirements. (NEC 110.3(A) & (B))
- Flexible battery cables do not leave the battery enclosure. (NEC 690.74 & 400.8)
- Flexible, fine strand cables are only be used with terminals, lugs, devices, and connectors that are listed and marked for such use. (NEC 690.31(F), 690.74, 110.3(B) & 110.14)
- High interrupt, listed, DC rated fuses or circuit breakers are used in battery circuits. The AIC is at least 20,000 amps. (NEC 690.71(C) & 110.9)
- Cables to inverters, DC load centers, and/or charge controllers are in a conduit. (NEC 690.31(A) & 690.31(E))
- Conduits enter the battery enclosure below the tops of the batteries. NOTE: this is to avoid accidental ventilation of gases into electrical equipment where sparks may occur. Follow battery enclosure manufacturer's instructions for venting and conduit locations. (NEC 110.3(B), 480.9(A) & 480.10)
- A disconnect means is provided for all ungrounded conductors derived from a stationary battery system over 30 volts. (NEC 480.5 & 690.15) NOTE: see NEC 690.71(E) for additional service disconnecting means requirements for series connected battery circuits.

- Area is well ventilated and the batteries are not installed in living areas. (NEC 408.9(A) & 408.10)
- Charge control equipment shall be provided to control the charging process of the battery in accordance with NEC 690.72
- Photovoltaic power systems which use utility interactive inverters to control the state of charge by diverting power to the utility shall have a second independent means of controlling the battery charging process when the utility is not present. 690.72(B)(3).
- All interconnection of electrical power systems shall comply with NEC Article 705
- Utility interactive Inverters shall be listed to UL 1741
- Point of connection is at a dedicated breaker or disconnect. NEC 705.12(D)(1)
- Total rating of the overcurrent devices supplying equipment does not exceed 120% of the equipment rating. NEC 705.12(D)(2)
- Utility interactive power systems employing energy storage shall be marked with the maximum operating voltage, including any equalization voltage, and the polarity of the grounded circuit conductor. NEC 705.80
- A system maintenance plan shall be submitted to the building inspection office at time of permit application in order to ensure the homeowner is aware of the system maintenance requirements.
- Energy storage systems shall be listed to UL 1989 or 9540 as applicable.
- Applicant must provide a letter from the serving utility indicating they have been notified of the proposed battery/ energy storage system installation.
- All appropriate signage must be installed in accordance with NEC (see Santa Clara County interconnected power system signage guidelines).
- Any field modifications to the electrical service, or line side connections are subject to field inspector approval and may require accredited third party field evaluation.