



## SUBJECT

Electrical Load Capacity Verification Guideline

**PIN:** 38

**Effective:** 10/6/1993

**Revised:** 9/19/2011



## PURPOSE

In the course of design and review of projects involving additions to existing facilities or remodels, the question of load capacity of existing electrical service always arises. It is the responsibility of the electrical engineer of record to provide verification that adequate load capacity exists at points in the existing electrical distribution system where additional loads are to be connected. This Policy Intent Notice (PIN) provides a guideline to uniform load calculations.

## POLICY

The intent of this guideline is to produce uniform load calculations in accordance with the requirements of the California Electrical Code (CEC). The word "panel" as used herein is defined as any panelboard, switchboard, motor control center, distribution panelboard, etc. Transfer switches and transformers are not defined as panels. Refer to CEC Article 100 - Definitions and Article 408 - Switchboards and Panelboards.

For new panels, a schedule with a tabulation of connected loads shall be submitted for review. For existing panels where load is to be added, a load summary shall be provided that details the existing load, loads removed, loads added, net load addition/reduction, and the new load. For new panels and existing panels with a net load increase, a partial single line diagram shall be provided that shows the ratings of the panel, its feeder, and feeder overcurrent protective device. Whenever the connected load exceeds 80% of the rating of the panel feeder overcurrent protective device, a backup load calculation in accordance with CEC Article 220 - Branch-Circuit, Feeder, and Service Calculations shall be provided to demonstrate that an overloading condition does not exist. Alternatively, the consultant must demonstrate that the apparatus is 100% rated.

OSHPD will require two levels of load capacity verification. Level one is the panel to which load is being added, its feeder, and its feeder overcurrent protective device. Level two is the next panel which is electrically upstream towards the source from the panel where load is to be added, the next panel's feeder and feeder overcurrent protective device.

**Note:** When load is being added to an essential electrical system panel electrically downstream from the transfer switch, and if the level two panel is electrically upstream from a transfer switch, level two load capacity verification must be provided for both the normal panel and the essential electrical system panel feeding the transfer switch.

For level one panels, the following are acceptable means of determining demand load:

- A. A minimum three-day (72 hour) recording ammeter shall be connected to all phases of the service/feeder. The maximum value recorded over this period shall be multiplied by 125% to establish the maximum demand. It is the electrical engineer's responsibility to ensure that this reading reflects the true maximum demand of the service/feeder.

This option shall not be used for verifying load capacity of equipment having loads consisting primarily of x-ray equipment (such as x-ray distribution boards) or motors (such as motor control centers). Load capacity verification for these systems shall be performed in strict accordance with CEC Article 220 – Branch-Circuit, Feeder, and Service Calculations and Article 517- Health Care Facilities. If demand data for a one-year period does not exist, one is afforded the option of performing a 30-day ammeter reading for a basis to determine maximum demand per CEC Article 220.87- Determining Existing Loads.

- B. A load calculation in accordance with CEC Article 220.

For level two panels, the following are acceptable means of verifying load capacity:

- A. Any of the means afforded for level one panels, described above.
- B. A letter or note on the drawings signed by the electrical engineer of record stating that the level two panel, its feeder and feeder overcurrent protective device have been checked and that sufficient load capacity exists at this point in the electrical distribution system.

It is not the intent of this PIN to relieve the electrical engineer of the responsibility to perform load capacity verification on all panels, their feeders, and their feeder overcurrent protection devices, upstream from the affected panels, back to the main service entrance, and to the terminals of all separately derived systems, as required by CEC Article 220.

<u>Original signed</u>	<u>9/19/11</u>
Paul Coleman	Date