

**Nelson Lawrence**

Account Executive  
1-866-639-8727

**Jim Simpson**

Mining Admin Coordinator  
1-866-MINE CSS  
1-866-646-3277

[www.esamining.com](http://www.esamining.com)

# ESA Electrical Safety Mining Services Group Tech Brief

## Installation requirements when utilizing Portable Power Cable as conductor taps.

**NOTE:** This brief discusses the code requirements of tap conductors and recognizes the past and current practice of using Portable Power Cable (PPC) as a tap conductor to energize mini power racks. To ensure a safe installation, the minimum requirements of this brief must be met.

Mini power racks are typically cord connected to afford some flexibility and mobility. The cable that interconnects the rack to a source of power is generally a portable power cable that is sized to the rating of the main fused disconnect on the rack and is connected by a pin and sleeve type attachment plug. Due to the limited availability of power outlets in remote areas, the supply end of the PPC is often fitted with a male pin type attachment plug that has an ampacity exceeding that of the cable. The connection of a conductor to a circuit of higher ampacity is referred to as a tap conductor and shall be installed to conform to Rule 14-100 of the CEC.

14-100 states that proper over-

current protection shall be provided for each ungrounded conductor where it receives its supply of current especially where there is a reduction in the size of the conductor; exceptions to this rule would be where the smaller conductor:

- Has an ampacity not less than the ampere rating of the switchboard it supplies, nor does it extend beyond the switchboard; and
- Is not over 3 m long and is enclosed in non-ventilated raceways, armoured cable, or metal-sheathed cable when not part of the wiring in the switchboard.

Where the connecting PPC has a rating of less than 1/3 the rating of the upstream overcurrent device it would be in violation of 14-100(b) because the PPC is not an armoured or metal-sheathed cable nor is it a non-ventilated raceway. An example would be a 60 amp rated PPC connected to a 225 amp rated and protected receptacle. This has become accepted industry practice within the mining community.

**Rationale:**

This practice has been accepted due to the robust nature of PPC,

coupled with the ground fault protection and bond conductor monitoring that shall be provided to comply with CSA M-421. This practice is deemed to meet the intent of 14-100(b).

Proper overcurrent protection is important to protect the conductor and equipment against overheating and fire which could result from overloading or a short circuit. Tap conductors are permitted because the upstream overcurrent device will protect the tap conductors in the event of a short circuit or low impedance fault. The overcurrent device connected on the load side of the tap will provide overload protection if the ampacity of the equipment and the conductors is exceeded for an extended period of time.



Photo courtesy of  
Metalec Sudbury Inc