Electrical Safety Authority
For Your Safety
FLASH
99-03

Supplementary Protectors

(Sometimes called Mini-Circuit Breakers)

In December 1998, a maintenance worker received second-degree burns while resetting a "Supplementary Protector" that was located within a Control panel. Investigation revealed that the Supplementary Protector was reset while the equipment was still energized and fault condition was on the equipment protected by the Supplementary Protector.

It is important to note that each piece of electrical equipment has it's own place and function within a circuit.
Circuit Breakers are Certified to Standard CSA 22.2 #5.1 and Supplementary Protectors are Certified to Standard CSA 22.2 #235.

By Definition:

Circuit breaker

A circuit breaker is a device designed to open and close a circuit by non-automatic means; and to open a circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its ratings. Circuit breakers are intended for the protection of services feeders, and branch circuits in accordance with the Canadian Electrical Code, Part I.

Supplementary protector

A supplementary protector is a device designed to open a circuit automatically on predetermined value(s) of time versus current or voltage within an appliance or other electrical equipment. Supplementary protectors are intended for use as a component within an appliance or other electrical equipment where branch circuit overcurrent protection is already provided (or is not required) in accordance with the Rules of the Canadian Electrical Code, Part I. Supplementary protectors shall not be used for branch circuit protection.

Since 1994 The Ontario Electrical Safety Code requires:

Under Section 14-012, Ratings of Protective and Control Equipment…
a) "Electrical equipment required to interrupt fault currents shall have ratings sufficient for the voltage employed and for the fault current that is available at the terminals."

The Difference?

Circuit Breakers and Fuses are "required" to be able to interrupt fault currents, *Supplementary Protectors are not.*

It is important to realize that, unlike Circuit Breakers, all Supplementary Protectors certified to C22.2 No. 235, have no code application for branch overcurrent circuit protection.

This means that the Supplementary Protectors may rely on the fuses or circuit breakers ahead of them in the circuit for overcurrent (Short Circuit) protection. Closing them into a fault is subjecting them to a situation for which they were not designed or certified to do. *The consequences of this misapplication can be devastating.*

The difficulty is in identifying whether the device is a "Circuit Breaker" or a "Supplementary Protector".

It is also difficult to check, since there is no marking to identify the difference between "real" circuit breakers and supplementary protectors. This makes it very difficult to identify a device built to the supplementary specification versus a device built to the circuit breaker specifications.

We have recently asked the certification organizations to look into marking the devices so they can be differentiated.

In some cases, the only way to tell is to look up the product code number in the manufacture's catalogue. To complicate the matter further, some literature refers to the Supplementary Protectors as circuit breakers, until you look closer.

Some clues to a Supplementary Protectors are that they tend to be located with-in equipment, DIN rail mounted, and usually are physically smaller than circuit breakers, but not always.

Note that Rule 2-304 (1) OESC states that …

"No repairs or alterations shall be carried out on any live equipment."

This means that, as with any equipment, internal components should not be reset or adjusted with the power on.

Electrical Inspection suggests the following:

- all such equipment should have warning signs indicating that the equipment's main disconnect be opened before any devices within are reset, and;
- any personnel likely to be working on such equipment be advised of this concern and the proper procedure for resetting these devices.

Disconnecting power, in accordance with the Code, ensures that workers can safely reset supplementary protectors without fear of failure

In Summary:

- ***Never* work within equipment that is energized. Turn off the Main disconnect feeding the equipment, *before* entering an equipment enclosure.**
- **Use Safe Lockout, Tag Procedures.**
- **Use Warning Signs**