

Working Live on 347 Volt Lighting Equipment – T. Olechna, Provincial Code Engineer

Electrical workplace accidents have increased 30% over the past six years resulting in 17 workers being killed and another 327 being seriously injured working on live electrical equipment. The Ontario Electrical Safety Code, which defines the standards for safe electrical installations, states that “No repairs or alterations shall be carried out on any live equipment” - Rule 2-304(1)”; and where it is not practical to disconnect an electrical system that “No one shall work on any live equipment unless protected by approved insulated or insulating devices such as tongs, rubber gloves, boots, mats, etc, which shall always be maintained in proper condition for use.” - Rule 2-306. **These rules are broadly known among the electrical trades – the risk of working on live electrical systems is acknowledged – but incidents continue to occur and have been increasing.**

Working on live 347-volt systems has become an area of growing concern. In the last four years this has resulted in 3 fatalities and 8 severe injuries incidents involving electricians, apprentices, and maintenance personnel.

The popular 347-volt system can accommodate more light fixtures than 120-volt systems, and can be directly wired with no need for a transformer. **However, connections associated with these systems require special care when servicing to keep contractors safe from electrical shock hazards.** Typically, industrial and commercial lighting installations that operate at 347-volts do not have individual area switching. The lack of switching makes it difficult to de-energize the circuit when performing maintenance such as ballast changes. In addition, electricians regularly respond to customer pressure to avoid work disruptions by not de-energizing circuits.

These are some of the pressures that result in a reported 71% of electricians working live on 347-volt systems. A recent survey of 5,000 electricians/apprentices has told us that 80% of electricians place an above-average or high-risk association with working on live 347-volt systems; however, 44% told us they believe that they can do so without sustaining injury.

The conscious decision to take this risk is not the only concern associated with 347-volt. Given that 347-volt systems are multi-wire branch circuits there are other hazards to be considered - even if steps have been taken to de-energize. If the continuity of the shared neutral conductor is interrupted while other branch circuits are energized accidental contact with the neutral conductor will effectively connect the worker to ground thus completing the circuit and electrocuting the worker.

Before attempting any work on 347-volt systems make sure that the circuit is de-energized by verifying that the circuit and its associated neutral have been de-energized by using an approved tester – **don't take the risk associated with working on live electrical systems.**