ABSTRACT
As electrical safety continues to be a focal point across the industry, there is a growing need to provide further protection from arc flash incidents. New technologies have emerged to meet this need, creating an opportunity for industry standards and guides to be revised to account for these technologies. The IEEE C37.20.7 Accessibility Type 2 and Suffix B rating combination has, for many years, been considered the cornerstone for safety in metal-enclosed switchgear. However, recent testing has shown that it’s possible to exceed Type 2B requirements and increase the level of personnel protection that arc quenching technology can offer. This new level of protection has been demonstrated through arcing fault testing in equipment utilizing arc quenching technology that controls and contains the arcing energy inside of the switchgear even when circuit breakers are racked out or removed completely from their cells.

INTRODUCTION
Arc quenching technologies have emerged as one means for satisfying the arc flash reduction requirements of section 240.87 of the National Electric Code, 2011 [1][2]. Incident energy reduction is large benefit of these technologies. Likewise, the question has arisen as whether new thresholds for incident energy reduction should be established for those technologies allowing for new levels of accessibility to arc-resistant switchgear - thresholds that are not only compliant with the current standards but can exceed them. In the following section, this paper will cover the results of arc testing that was completed with the circuit breaker compartment doors open and the circuit breakers removed from the switchgear.

TESTING PER UL 2986
UL 2986 - 2015 Recommended Practice for Measuring Incident Energy Exposure [3] provides an industry-accepted method for measuring the value of incident energy exposure from an arcing fault occurring in low-voltage power distribution equipment, and this method was followed for the test described in this section. The purpose of the test was to measure the arc incident energy exposure in front of a low-voltage power circuit breaker compartment with the breaker and door removed, while utilizing arc quenching technology. The unit under test (UUT) was low-voltage switchgear with the arc quenching technology installed. Calorimeters were placed per the requirements of UL 2986 in front of an open circuit breaker compartment. Black cretonne cloth burn indicators were placed everywhere else around the UUT per the requirements of IEEE C37.20.7[4].

UUT with calorimeters and burn indicators placed

突破 IEEE C37.20.7

The testing demonstrates that it is possible to maintain the arc-resistant rating and protect personnel near switchgear even if a breaker is removed. The testing also shows that the technology already exists to allow for additional test categories. Creating additional accessibility suffixes within the standard will allow for new scenarios where low-voltage switchgear can address arc flash, even outside of normal operations defined by IEEE C37.20.7-2017.

REFERENCES
3. UL 2986-2015. Recommended Practice for Measuring Incident Energy Exposure, Northbrook, IL: UL, LLC.