



# RESEARCH FOUNDATION

## RESEARCH FOR THE NFPA MISSION

### STUDENT PROJECT PROSPECTUS

## Sizing of Equipment Grounding Conductors – Literature Review

3 May 2019

**Background:** The sizing of conductors intended to carry ground fault current, including supply side bonding jumpers, grounded circuit conductors (neutral) and equipment grounding conductors is inconsistent. The origin and technical substantiation for the existing criteria for sizing equipment grounding conductors (EGC) and the sizing of EGC's in parallel raceways (NEC Section and Table 250.122) is relatively unclear. Additionally, sizing for parallel supply-side bonding jumpers and the technical substantiation to allow sizing based on the size of the ungrounded conductors when no overcurrent protection is provided on the supply-side, also needs further evaluation.

**Research Goal:** The goal of this project is to evaluate the technical substantiation for the methods and factors that influence the sizing of equipment grounding conductors.

**Project Tasks:** This goal should be achieved through the following tasks:

Task 1: Historical Code Assessment. Review the existing and historical editions of section and Table 250.122 of the NEC, to identify the scientific basis of the existing requirements.

Task 2: Literature Review. In this review, also identify the following:

- How improvements in conductor insulation and overcurrent protection and increased fault current have affected the sizing of EGC's.
- Identify how an alternate sizing method could be supported (e.g. using phase conductor sizes instead of ICD amperage ratings).
- In a parallel grounding application, assess the ground fault current that exists in the EGC during a ground fault that (1) occurs between the source and the load, and (2) a ground fault current that exists in the supply-side bonding jumpers during a ground fault that occurs between the source and the OCPD.

Task 3: Knowledge Gaps. Present the knowledge gaps and identify any missing data for how to appropriately size equipment grounding conductors.

Task 4: Final Report. Develop a final report to document the above tasks.

**How this information will be used:** Project deliverables will be useful for the NEC® Code Making Panel 5 on the issue of sizing equipment grounding conductors, and identifying alternative sizing methods.