

## Characterization of Glowing Contacts using Optical Emission Spectroscopy

Xin Zhou, Senior IEEE Member  
Innovation Center  
Eaton Corporation  
170 Industry Drive  
Pittsburgh, PA 15275  
[xinzhou@eaton.com](mailto:xinzhou@eaton.com)

John Shea, Senior IEEE Member  
Eaton Electrical  
Eaton Corporation  
170 Industry Drive  
Pittsburgh, PA 15275  
[johnjshea@eaton.com](mailto:johnjshea@eaton.com)

Glowing contacts are an interesting and complex phenomenon. They may be associated with residential arc faults and fire hazards. Previous investigation has shown that formation needs certain environmental and current conditions. The aim of this paper is to provide further understanding of their formation mechanism.

Optical emission spectroscopy is employed to investigate the state of gases along the glowing contact surface. A high-speed video camera is used to observe glowing contact behavior at frame rate up to 150fps. Based on emission spectroscopy and high-speed video images, analysis is carried out on how glowing contacts carry current through the interface. These results are correlated to glowing contact behavior at different current levels.

Key words: glowing contact, arc fault, contact material, optical emission spectroscopy