Data-Driven Electrical Systems: Automated fault detection, diagnostics, and prediction for lighting systems

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Research Questions

- What are the common faults that occur in lighting systems?
- What are appropriate maintenance actions for lighting systems?
- How well do AFDD techniques for lighting systems apply to other electrical systems?

Progress

- Began laboratory exploration of the potential for lighting systems to identify faults, and explore approaches for automated detection, diagnostics, and prediction.
- Defined key terms (fault, fault detection, fault diagnosis, and maintenance action), and potential examples of each for lighting systems.
- Developed a first-draft set of faults and associated maintenance actions for luminaires and the equipment that comprise (e.g., controller, LED driver, enclosure, LED module, sensor, electrical distribution) and connect to them (e.g., communication network, electrical distribution system).

Laboratory testing showing an example of how a fault in one system (ELECTRICAL DISTRIBUTION: UNDERVOLTAGE fault) can cause a fault in another system (LUMINAIRE: WRONG OUTPUT fault)

Future Work

- Additional laboratory investigations to identify faults and demonstrate detection schemes
- Develop fault diagnostics techniques and associated maintenance action decision tree(s) appropriate for various maintenance maturity levels
- Laboratory and field demonstrations
- Explore standards development opportunities

Project Outputs


Want to learn more?
Wednesday April 27, 12:15 PM
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