



OptaSense Delivers Cable Fault Detection for Major U.S. City

Utility Provider Uses Fiber-Optic Sensing to Protect Critical Infrastructure

The Challenge

Indianapolis Power & Light Company (IPL) provides retail electric service to more than 470,000 residential, commercial and industrial customers in Indianapolis, Indiana. IPL maintains a vast network of underground infrastructure and power cables throughout downtown Indianapolis which are subject to faults from both naturally-occurring and man-made damage.

Current methods of detecting primary faults uses a “thumping” method. This involves repeatedly applying a 10kV pulse to the faulty cable. Technician are then deployed in the field and listed at each manhole along the route to try and determine the location of the fault.

Sustained or frequent testing can be detrimental to the integrity of the cable and sometimes the pulsing can go on for days.

Solution Deployment

To access a better solution, IPL’s engineering team recently implemented a pilot program using OptaSense’s fiber-optic-based Distributed Acoustic Sensing (DAS) technology to monitor for threats to the underground network. The technology allows IPL to monitor for infrastructure damage, third party intrusion in the removal of manhole covers, as well as locating cable faults.

Following the successful evaluation of the OptaSense intrusion detection system in

Problem:

- Underground cable faults from both naturally-occurring and man-made damage
- Inefficient existing fault detection solution

Solution:

- OptaSense Fiber-Optic Monitoring Solution, including:
 - OLA 2.1-5000 Interrogator Unit
 - Rack Mount Control Unit with Graphic User Interface

Value Delivered:

- Early detection and precise location of faults
- Reduced man hours
- Critical intrusion alerts
- Minimized damage to infrastructure and cables



Overlay of the 1.6-mile monitored fiber-optic cable route in downtown Indianapolis. Image courtesy of Google Earth™.

December 2017 on a fiber cable in downtown Chicago, IPL worked with OptaSense to provide a similar setup as the pilot project for a 1.6-mile route in downtown Indianapolis.

Delivered Value

The implementation of DAS has allowed IPL to become the first electric utility to use fiber-optic sensing technology to monitor threats to an underground secondary network. More importantly, the system allows IPL to be proactive in ensuring the downtown secondary network remains a safe, reliable system.

Monitoring of the power cable with DAS allows the client to rapidly detect and locate faults, reducing the amount of manhours typically required. Additionally, by reducing the amount of “thumping” required along the cable, the chances of further damage to cable is subsequently reduced.

Other benefits to the client are:

- Advanced warning of digging activity
- Detection of entry to vaults (manhole cover removal)
- SCADA networking
- Primary circuits fault detection after tripping
- Secondary circuits fault detection as they happen
- Email notification with Google Maps™ location of an event or incident
- Improved overall public safety

For more information, please contact your OptaSense representative or visit www.optasense.com/security.

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