ESC engineering

project brief

Attribute Inspection Enables Safe, Efficient, Successful Operations

Longmont Power and Communications (LPC) was in need of updated electric facilities attribute inspection and spatial location information. They requested the use of GPS technology as well as different measurement devices to ensure the continued operation of their utility system. The City of Longmont operates and manages 154 miles of overhead line and 38,000 active consumers over its 42.3 square miles of service area.

SUMMARY:
Electric Facilities Attribute Inspection and Spatial Locations Update

GOALS:

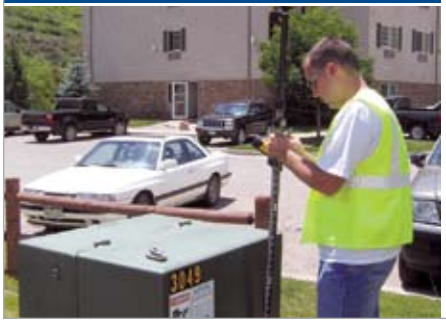
- Update electric facilities attribute inspection and spatial location information
- Replace obsolete safety data with new clearance measurements
- Identify NESC clearance violations in the field
- Test and deliver Microstation Data
- Improve future system collection and update

SYSTEM COMPONENTS:

- Electronic data collection devices and integrated GPS to collect and deliver data
- Microstation and Trimble Technology
- Linked Access database information to Microstation

HIGHLIGHTS:

- Complete field inventory within six months of award
- Covered a very dense electric network efficiently
- Integrated system database with Microstation GIS
- Used Trimble GPS, Sonic measurement devices, lasers and GPS enabled cameras



APPLICATION:

LPC's existing mapping data was outdated and did not meet current safety guidelines. There were many instances where data was either missing or incomplete.

Effective use of their current data was significantly limited because LPC employees had no easy way to capture data in the field and upload it to the office. This led to problems reporting safety violations and difficulty keeping their Bentley Microstation GIS current. Safety and clearance issues were prevalent and required field inspections to verify conditions present on each site in question.

The solution that ESC engineering recommended to LPC was an up-to-date electric facility attributes inspection and GPS spatial location information approach for their electrical system database. Once operational, the system would help LPC operate more efficiently, safely and successfully. To implement this plan, ESC engineering proposed to use handheld sonar and GPS technology, as well as a beta software process to update data to the Microstation GIS system. This combination approach is highly efficient and sets ESC engineering apart from other vendors in this field.

REQUIREMENTS:

- Enable ready field collection and data delivery of LPC's electrical network information
- Deliver data in a weekly format
- Allow LPC staff to easily update the existing mapping system

CHALLENGE:

ESC engineering encountered challenges in correctly navigating to collect everything via city grid in a service area that is 42.3 square miles—22.3 miles of which lie within the city limits with the remainder falling outside the city, including customers in Hygiene and Lyons, Colorado. The LPC service area represents a total of 395 miles of underground lines, 154 miles of overhead lines and a total of 38,000 customers. LPC required measurements of all road crossings, distance from phase to joint use connections on their poles, and a full field inventory to be conducted within a six-month timeframe. This timeframe also included testing and collecting data in a beta software product with weekly deliverables in Bentley Microstation format.

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SOLUTION:

The GPS inventory and mapping process was conducted on a city grid location basis with GPS, sonar, and a GPS-enabled camera. The attributes of each pole were verified and adjusted to ensure the right connections and equipment at each pole. ESC engineering measured at road crossings and identified NESC clearance violations in the field by using laser and ultrasonic cable height meter (sonar) technology. This specialized equipment notified field technicians of any code violations in the field by accurate measurements, specifically relaying recorded height-to-cable and recorded ambient air temperature for fluctuations in sag at different temperature ranges.

GIS development occurred simultaneously to the overhead pole inspection. As data came into ESC engineering's Fort Collins office, and as each grid area was completed, the GIS was populated, quality controlled and validated against all current Microstation data, existing facilities records and specifications and standards. Upon completion of QC field work, the circuit or specified area was updated to the existing GIS utilizing the Mircostation GIS Electric format and/or access database, per LPC's requested process. This updated the existing data and will help LPC manage its pole assets and NESC indicators for violation possibility moving forward.

RESULTS:

The execution went according to plan, despite encountering software issues at start-up. ESC engineering was able to work through these issues in a timely manner and deliver the solution in accordance with LPC's expectations.

ESC engineering conducts a nine-step quality control process to achieve a valid and dependable GIS and database. Much attention was given to the GPS inventory, however the Microstation data and the correct facilities information is what will help LPC operate more efficiently, safely and successfully for present and future electric utility operations.

FOLLOW-UP:

LPC received an effective end result within their six-month timeframe. Although GIS solutions like this one typically provide a return on investment within three to five years, LPC recognized the benefits immediately in keeping their customers and employees safe.

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