



Seattle City Light

**Street Light Engineering
Customer Service and Energy Delivery Division**

Contact Voltage Testing

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Introduction

Seattle City Light completed its annual contact voltage testing on November 13, 2014. Utilizing a mobile detection system for the fifth year in a row, City Light tested all conductive assets in the right-of-way, regardless of ownership. If 30 volts or more was detected, the structure was immediately repaired or de-energized for public safety.

City Light is committed to maintaining a safe streetlight system. The department has jurisdictional responsibility for approximately 85,000 streetlights in its 131 square mile service territory providing lighting on residential and arterial streets. There are several types of streetlight poles and luminaires. Approximately 35,000 are conductive structures including poles, handholes, and access covers.

A number of factors can contribute to contact voltage including aging infrastructure, weather, improper installation, rodent activity, copper wire theft, and corrosion. Annual testing for contact voltage is being conducted because streetlights are a vital public service.

History

In the fall of 2010, a dog was electrocuted after stepping on an energized handhole cover. A combination of factors contributed to the touch potential voltage that caused the structure to be electrified. Shortly after the discovery, City Light was notified of six other incidents of dogs receiving non-lethal shocks from conductive structures in the public right-of-way. These incidences, along with further investigations into the streetlight system, identified potential issues with contact voltage. City Light responded by instituting an annual detection program along with a number of maintenance improvements and internal business process improvements.

Annual Contact Voltage Testing Methodology

City Light hired Power Survey Company (PSC), a national expert on contact voltage detection programs, to perform testing of the Seattle City Light service area. PSC has developed an efficient and accurate technology program that uses a mobile detection system, sensitive enough to detect objects electrified at less than one volt.

Survey Results

The survey was performed between September 8, 2014, and November 11, 2014 covering approximately 2451 miles. The testing equipment does not distinguish between City Light infrastructure and other touch potential assets in the right-of-way.

City Light crews inspected each of the voltage events and determined the cause; pinched wires, faulty equipment, and aging infrastructure. For structures transmitting at least 30 volts, action was taken immediately either to repair or take the structure out of service until the necessary repairs could be made. City Light assets with less than 30 volts but greater than 3 volts also have been either repaired or de-energized by City Light crews.

In comparing the results of City Light assets surveyed in 2014, there was an increase in the number of contact voltage events at 30 volts or greater on SCL owned equipment from the previous year. Four of the events were determined to be the result of pinched wires in the door of the luminaire during LED conversion. Retraining on proper luminaire installation was conducted with the Contractor crews. The past five years testing results are as follows:

2014

Total of ALL Events	71
Events detected <30V	57
Events detected =>30V	14
SCL owned equipment	14
Non-SCL equipment	0

2013

Total of ALL Events	102
Events detected <30V	89
Events detected =>30V	13
SCL owned equipment	5
Non-SCL equipment	8

2012

Total of ALL Events	52
Events detected <30V	45
Events detected =>30V	7
SCL owned equipment	5
Non-SCL equipment	2

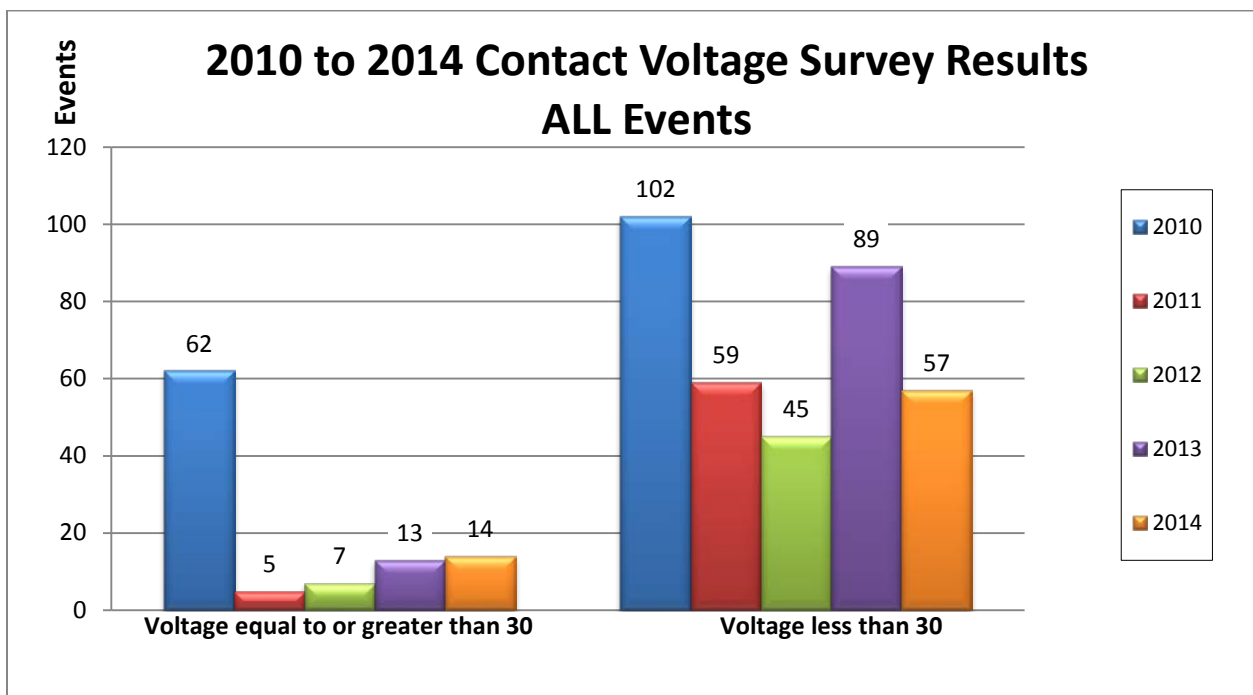
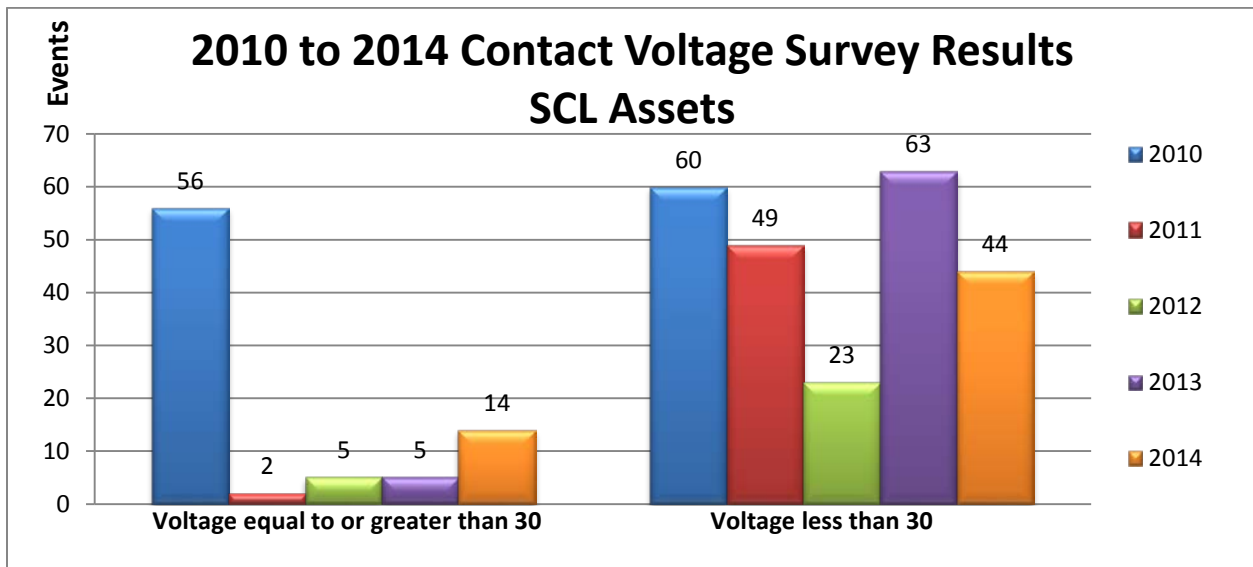
2011

Total of ALL Events	64
Events detected <30V	59
Events detected =>30V	5
SCL owned equipment	2
Non-SCL equipment	3

2010

Total of ALL Events	164
Events detected <30V	102
Events detected =>30V	62
SCL owned equipment	56
Non-SCL equipment	6

The following chart of contact voltage findings compares survey results from years 2010 to 2014.



City Light's Response to the Findings

Based on the success of the detection program and further recommendations:

- City Light has touch potential testing in place for both its crews and contractors performing streetlight work
- City Light will continue to test its streetlight system annually and report the findings to the public (Note: corrected data from previous years)
- Finally, City Light has taken responsibility for testing and inspecting all streetlight equipment before it is energized

The public is reminded to notify the Streetlight Hotline at (206) 684-7056 or street.light@seattle.gov with any concerns about a streetlight or if an energized structure is suspected.