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Shedding a Light on Streetlight Meter Testing

TESCO's Meter School

TESCOOL

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2:00 PM – 2:45 PM

John Williams

INTRODUCTION

This presentation will discuss the current usages and challenges for streetlight metering and the latest in testing/qualification of streetlight meters.

Photos: Acuity Brands Lighting

Streetlight Metering—Why change?

LED's

LED's have swept through one industry after another over the past twenty five years. Once LED's are developed for a particular application they take over that industry in just a few years

A Better Solution

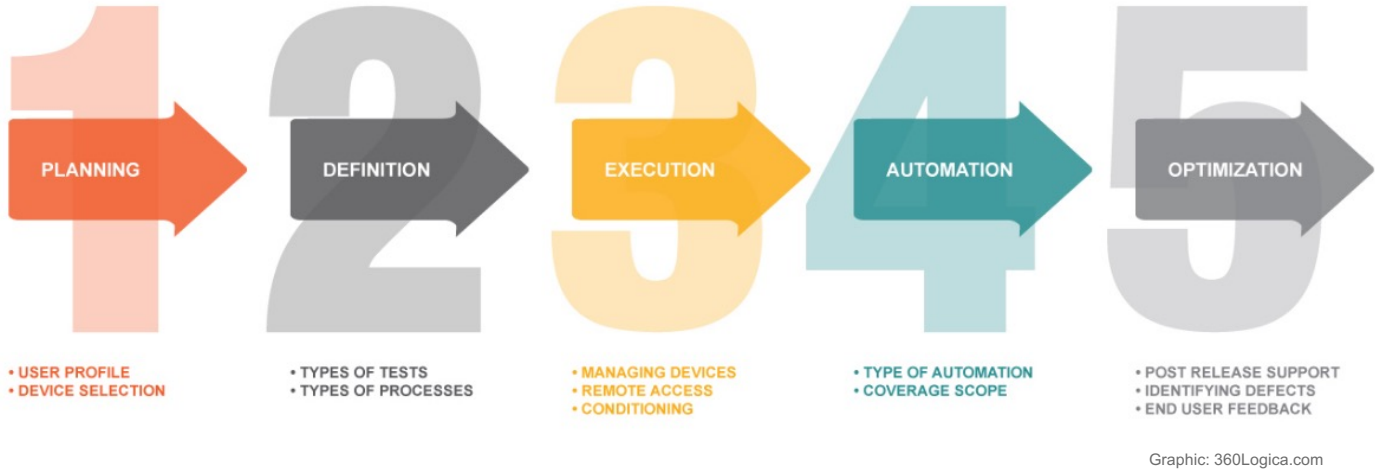
- Better lighting of the pavement surface
- Light is better directed so there is less light pollution
- Less maintenance
- Longer Life
- Less energy consumed
- Ability to control the lighting load by individual light or bank for
  - more suitable use given the location and time of day
  - emergency situations

Streetlight controls:

- Standard photocell operation
- Advanced controls for holiday lighting, billboards, etc.
- Remote mesh network communications
- Scheduling and dimming (LED Lighting)

Graphic: GE lighting

Integration of metrology into streetlighting…



Graphic: 360Logica.com

Integration of metrology into streetlighting

- Metrology (metering function) integration into “nodes”
- Combining metrology with remote access gives utilities access to information that they may never have had before.
  - Read voltage, current and power factor from each node.
  - Determine changes in lighting element faults and poor operation.
  - This information can be used to determine lighting outages (and dispatch a service truck automatically).
  - Can be used to monitor general outages like residential meters are now.

Streetlight Metering—Intelligent Lighting

Energy metering today:

- .5%, 1%, and 2% metering capabilities are now being quoted
- Qualification and validation documentation very sparse.
- No complete ANSI regulation to guide qualification testing, though a committee has formed and a spec is being developed (C136.50)

Energy metering today:

- Without the type of qualification testing that metering groups are used to doing prior to rollout of new vendor equipment or technology, billing usage for these nodes has been rare.

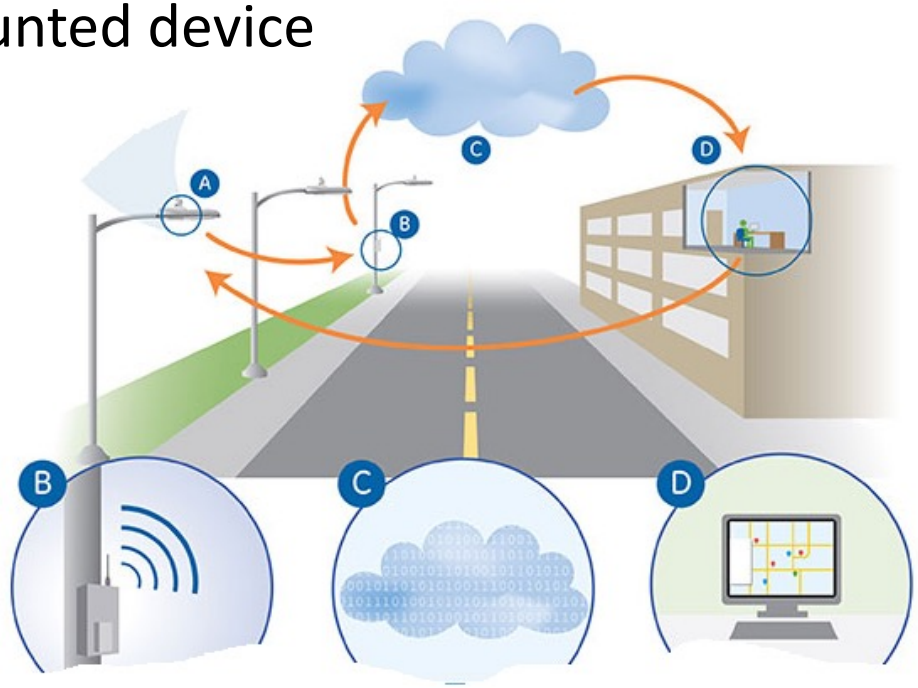
Using metrology to do energy metering

- A utility may want to test the accuracy of the nodes and work with local municipalities to determine whether the variance in billing due to metering accuracy could still provide better consistency and more accurate billing than current fixed billing algorithms can provide.

Streetlight Metering—Applications

Applications

- Single streetlight meter
- Group of single streetlight meters
- Meter for a group of streetlights
- Meter for any pole mounted device



STREETLIGHT METERING—CHALLENGES

Testing Challenges

- Meter test pulse

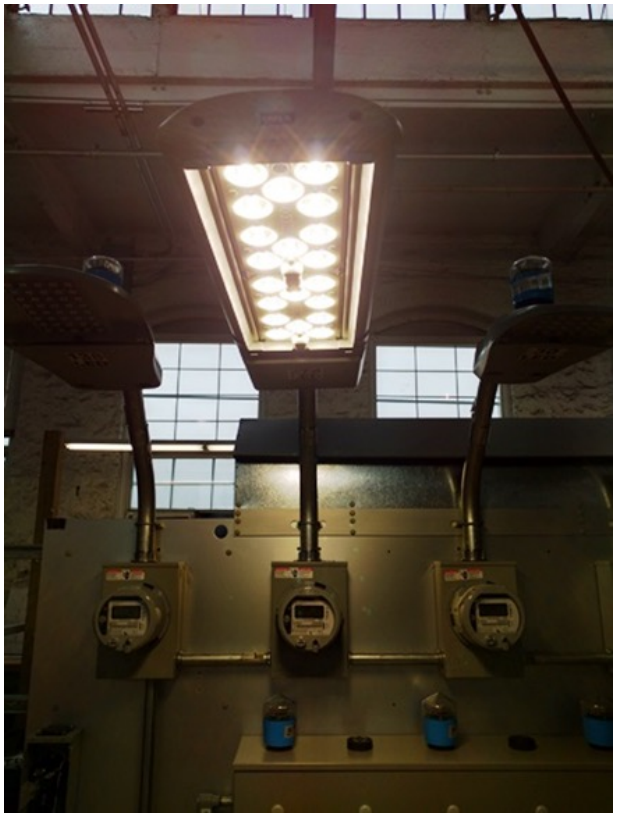
  Without this pulse, most nodes only report whole watthours through their communications radios. Testing requires 10,000 Wh (in order to get 5 significant digits – 100.00%). 10,000 Wh at 120V and .25A (typical Light Load value) would take 320 hours

– C136.50 is now requiring a pulse for every street light “meter”. Testing can now be done in “conventional” time periods.

Streetlight Metering—Challenges

Testing Challenges

- Meter setups
- The setup on each node must be checked to make sure that it is not setup to do any scheduled dimming, or scheduled on/off control, so that the output relay remains on during the testing.
- After testing is complete, the setups should be returned to the factory settings before releasing the node.
- Working to introduce to C136.50 the concept of test modes for street light meters.



Streetlight Metering—Challenges

Testing Challenges

- Functional / Communication testing
  - This testing is going to be quite similar to standard revenue meters, as the communications networks used are either the same, or similar to what you are used to.
  - One difference would be that if the utility is using scheduled on/off/dimming, that program will have to be setup or downloaded to the node before releasing for installation.

Testing Challenges

- Conclusions
  - A Test Mode will make testing of streetlight meters easier and more consistent to perform in a meter shop environment.
  - The testing will all be more equitable for all manufacturers and users once the ANSI specification is released.
  - Relevant testing both for accuracy and functionality can still be done in light of the above; it will just take longer and could be somewhat subjective

Streetlight Metering—Tests Required

Tests:

- Manufacturer product evaluation testing
- Accuracy testing
- Functional testing
- Qualification testing

Streetlight Metering in the Meter Shop

Equipment Needed:

- Test Boards
- Mounting sockets
- Transformer Rated applications
- Field Test Equipment
- Meter Farms
- Meter Socket Adapters

Negative Business Case or Business Opportunity?

A large investment by Electric Utilities for less revenue

- When the market place wants something there is no wisdom in trying to hold back the flood gates. Embrace and figure out how to not only survive but to thrive.
- Smart Poles
- Additional Lighting
- Controls for the Lighting
- Potential new products for Industrial Customers
- Potential new products for residential customers

…..but also an investment in future Business Opportunities

Transformer-Rated SmartPole Meter and SmartPole Disconnect Box

701 and 702

TESCO's **SmartPole Meter Boxes** use a 3-pin adapter and are approved for use with overhead services connected to powered pole attachments whether they be internally or externally mounted.

TESCO's **SmartPole Meter Box, Cat. 701,** is designed for smart meters and can be strapped to either a wood or metal pole with the included pole strap kit. The smart meter (not included) is secured to the box with a meter seal lockable strap and is rated for up to 5A self-contained operation.

TESCO's **SmartPole Meter Disconnect Box, Cat. 702**, combines the required fused disconnect switch along with the same socket and lockable security strap as the Cat. 701.

Cat. 701 (left) and Cat. 702 (right)

Pole Brackets

702-PB & 703-PB

How do you install an ANSI C136.41 socket based meter to your streetlight pole? TESCO's **Universal SmartPole Meter Boxes** are the approved method to install an ANSI C136.41 socket-based meter to your streetlight pole. These SmartPole Meter Boxes can mount streetlight meters, meter telecommunication devices, or meters for any other pole-mounted services using Cat. 702-PB and 703-PB Pole Mounting Brackets.

TESCO's new Pole Mounting Brackets make it easier to mount the Cat. 702 SmartPole Meter Disconnect Box and the Cat. 703 Transformer-Rated SmartPole Meter Disconnect Box to a streetlight pole.

The Cat. 702-PB pairs with the Cat. 702, and the Cat. 703-PB pairs with the Cat. 703.

Transformer-Rated SmartPole Meter Disconnect Box

703

With 5G deployment, communication providers are putting larger and larger new services on utility poles that need to be metered. TESCO's **Cat. 703 Transformer-Rated SmartPole Meter Disconnect Box** provides the mounting infrastructure to meter these services.

TESCO's **Transformer-Rated SmartPole Meter Disconnect Box** has been created to mount communications provider equipment and node meters on a utility pole.

This meter assembly contains a 100:5 CT and is designed for smart meters and can be strapped to either a wood or metal pole. The smart meter (not included) can be secured to the box with a standard meter box seal.

This assembly is for use with meters rated up to 5A.

Current up to 60A (fuses supplied by customer)

- Cat. 703-120 for 120V 2-Wire Single Phase Applications
- Cat. 703-240 for 240V 2-Wire Single Phase Applications

Cat. 703 with smart meter (not included)

Questions and Discussion

John Williams

Vice President of Engineering

TESCO Metering

Bristol, PA

215.228.0500

This presentation can also be found under Meter Conferences and Schools on the TESCO website: tescometering.com

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