Measurement and Verification Report

Fill in this template to provide a complete account of the M&V methods used in your project. In addition to completing the indicated fields, please also provide a process and instrumentation diagram of the technology's installation, or a simplified block diagram.

Project Title: Moss Project Plan Wireless Controls Demonstration

Investigators: Francis Rubinstein

Investigator Organization: Lawrence Berkeley National Lab

Technology Name: Wireless Lighting Controls

Brief Description of Technology:

Advanced lighting controls also remain a significant and largely untapped energy savings strategy. Despite the availability of advanced lighting controls, only 2% of commercial buildings in the U.S. employ photosensors for daylighting control and only 1% have installed energy management and lighting control systems [5]. Controls currently available include continuous dimming, institutional tuning, fine-tuned occupancy sensing, daylight harvesting, and personal control. Continuous dimming in overhead fixtures allows for transition between light levels with minimal disturbance to the occupant. Institutional tuning and scheduling allows building managers and tenants to decrease energy consumption by programming default light levels within the lighting management system that reflect areal and/or building policies. Occupancy sensors reduce electrical demand by adjusting light levels or turning lights on or off in an area in response to the presence or absence of an occupant. Daylight harvesting similarly employs photosensors to reduce electrical demand in response to daylight levels. Finally, personal control allows occupants to adjust their individual light levels to suit their personal preferences.

Building Name: John E. Moss Federal Building
Address and City: Sacramento, CA
Description of Building:

The John E. Moss Federal Building was completed in 1961 and is an eight-story high-rise located in Sacramento, CA. The concrete building has a long rectangular footprint with the long axis oriented east-west. Horizontal swaths of windows dominate the north and south walls while the east and west walls contain no windows. Based on reflected ceiling plans (RCPs) sent by GSA in November, 2012, the windows appear to be 4' wide and located continuously along the perimeter. The wireless controls will be installed throughout the 4th and 6th floor. However, due to the size of the demonstration site, a representative portion of the entire site will be studied. The three study areas selected are located along the south wall of the 4th floor, in the northwest portion of the 4th floor, and along the south wall of the 6th floor. These sites are described below.

Building size: 13,700 square feet
Climate zone: Click here to enter text.
Building owner: General Services Administration
Building operation hours: Click here to enter text.
Documentation of the building's base year condition: Click here to enter text.
Any significant equipment problems: Click here to enter text.

Technology Objectives, Metrics and Potential Issues

Objective	Metrics	Equipment	Potential issues
Energy Savings	The open office area, the private offices, and additional miscellaneous end use rooms including the break room, training rooms, conference rooms, and supply rooms will be metered. The reception area and soffit lights will not be metered.	(4) HOBO U30 Wireless Data Loggers (U30-GSM-000-10-S100-802) (4) Advanced Pulse WattNodes (WNB-3Y-480-P, Opt P3, Hz=50/50/50) (4) Pulse Input Adapters (S-UCC-M006) (4) AC Power Adapters (AC-U30) (11) CTs (CTM-0360-020)	Energy savings may be impacted if occupancy patterns change during study period
Photometric Performance	Desktop illuminance measurements will be taken at the assumed primary work area, characterized as the front edge of the main desk's center section.	Spectrometer (Konica Minolta)	None specified
Occupant Satisfaction	Surveys will be administered online unless paper surveys are requested. Occupant responses will be recorded anonymously.	Online survey from Survey Monkey	None specified
Other	Photos of relevant surfaces (desktop, cabinets, carpet, ceiling), fixtures, and switches will be taken for documentation purposes.	Digital camera	None specified

M&V Instrument List

4) HOBO U30 Wireless Data Loggers (U30-GSM-000-10-S100-802)
(4) Advanced Pulse WattNodes (WNB-3Y-480-P, Opt P3, Hz=50/50/50)
(4) Pulse Input Adapters (S-UCC-M006)
(4) AC Power Adapters (AC-U30)
(11) CTs (CTM-0360-020)

Spectrometer (Konica Minolta)

Online survey from Survey Monkey

Digital camera

Total cost of instruments and ancillary equipment: Click here to enter text.

Total cost of labor: Click here to enter text.

Labor skill sets used (Electrician, HVAC technician, etc.):

- Click here to enter text.
- Click here to enter text.
- Click here to enter text.

Name and contact information of contractors used for installation:

Click here to enter text.

Data Transmission and Analysis

Method used to transmit data from demonstration site to the lab (select all that apply):

☐ Data files manually downloaded from loggers and emailed to lab

Period of data file download and transmission (Weekly, monthly, etc.): Click here to enter text.

☒ Automated transmission of data

Transmitted via: ☒ Cellular modem ☐ Other: Click here to enter text.

☐ Other: Click here to enter text.

Special issues with transmission:

None specified

Format in which data was transmitted to lab (.csv, .xlsx, etc.): Not specified

Software used to analyze data: Not specified

Methods used to analyze data:

Not specified

Methods used to present data:

Not specified

Other Comments

Not specified