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ENGINEERING SOCIETY

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Recommended Practice for Lighting Maintenance

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**IES/NALMCO Recommended Practice for
Lighting Maintenance**

Publication of this Recommended Practice
has been approved by IES.
Suggestions for revisions

Prepared by:
The IES Maintenance Committee

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1.0 INTRODUCTION

All electric lighting systems degrade in performance during their operating life. Lamps produce less and less light the longer they operate, while their spectral output may shift in color. Lamp output may be absorbed by dirt and dust accumulation on luminaire surfaces. Light distribution may be distorted by dirt and dust and/or degradation of luminaire surfaces. Components fail over time. If left unchecked, ongoing loss of illuminance and disruption to uniformity will continue until the lighting system ceases to function.

Although automatic lighting controls are specified increasingly in commercial buildings as a mandatory energy-saving measure, they should be properly designed, installed and calibrated to save energy. Over time, space layout, user needs or occupancy patterns may change, resulting in misalignment between control operation and how the space is used. If users are dissatisfied, they may seek to override the controls, potentially negating energy savings.

To ensure continuing operations, owners take actions to preserve the functionality of their lighting systems, which we call maintenance. Well-maintained lighting systems function in a predictable manner while offering the potential for capital and operating cost savings. Poorly maintained lighting systems may suffer from low illuminance and unaddressed outages, non-uniform light distribution, color shift, improperly aimed luminaires, mismatched components, cycling lamps, early component failure and other problems. This may translate to problems with user satisfaction, productivity, aesthetics, sales, safety and security, and the ability to capture intended energy savings on an ongoing basis.

How a lighting system will be maintained is important information for lighting designers, just as design information is important for maintenance personnel. Since the maintenance method influences the extent of expected light loss, it also relates to the amount of lumen output needed to maintain the required illuminance. In other words, if a well-maintained lighting system will result in a higher maintained illuminance, then fewer lumens are needed to produce the design level, which may translate to fewer lamps and/or luminaires. This will reduce capital and energy costs.

Designers, meanwhile, should design lighting systems that are easy to maintain, specify commissioning criteria or expectations when possible, and ensure maintenance personnel are properly trained and given a complete system manual upon turnover. Easy-to-maintain lighting systems feature readily accessible, long-life components within designs in

which the luminaires are similarly accessible without excessive difficulty or cost. Commissioning ensures that the initial installed system is verified as satisfying owner project requirements. Maintenance personnel should be trained on the proper operation and maintenance of the lighting system, and have all appropriate documentation on hand regarding the finished design and how to maintain it, including owner project requirements, design intent, final drawings, schedule of installed components and systems, device settings, lighting control sequence of operations and recommended maintenance plan.

Robust maintenance requires more attention and resources and therefore benefits from planning. Planned maintenance involves scheduling operations and maintaining the lighting system with the most time- and cost-efficient use of labor and resources, utilizing techniques such as periodic inspection, group relamping and luminaire cleaning. All components in the lighting system (controls, power supplies, sensors, for example) are documented so that they are properly maintained. The design itself is documented and understood by maintenance personnel so that operations are undertaken to maintain the original design intent, not just the equipment in the system.

As lighting systems become increasingly complex, properly maintaining them requires more resources, expertise and competence. Often, it is desirable for the owner to use a lighting management company and trained staff. Such companies are represented within the lighting industry by the interNational Association of Lighting Management Companies (NALMCO). Its members' professionalism, experience and lighting expertise are recognized by the Association's Certified Lighting Management Consultant (CLMC), Certified Senior Lighting Technician (CSLT) and Certified Apprentice Lighting Technician (CALT) certifications.

This Recommended Practice examines common lighting maintenance procedures and the central components of an effective planned maintenance program. Specifically, it describes:

- typical lighting system behavior, identifying those light loss factors that can be addressed by maintenance;
- maintenance approaches that can optimize lighting system performance;
- ways in which designers should address maintenance;
- typical maintenance techniques, equipment and operations;