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Recommended Practice for Lighting Maintenance



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

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has been approved by IES.
Suggestions for revisions

Prepared by:
The IES Maintenance Committee

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Contents

1.0	Introduction	1
2.0	Failure Modes	2
2.1	Lamp Mortality	2
2.2	Lumen Depreciation	3
2.3	Color Shift	4
2.4	Visual Instability	5
3.0	Light Loss Factors	6
3.1	Lamp Lumen Depreciation (LLD)	6
3.2	Luminaire Dirt Depreciation (LDD)	6
3.2.1	LDD Factor Calculation Procedure for Indoor Environments	6
3.2.2	LDD Factor Calculation Procedure for Roadway Luminaires	7
3.3	Lamp Failure	8
3.3.1	Lamp Burnouts (LBO)	9
3.4	Room Surface Dirt Depreciation (RSDD)	9
3.5	Foliage	9
3.6	Non-Recoverable Light Loss Factors	10
4.0	Maintenance Methods	10
4.1	Spot Relamping	10
4.2	Group Relamping	11
4.3	Periodic Luminaire and Room Cleaning	13
4.4	Visual Inspection and Troubleshooting	13
5.0	Planning And Economics	14
5.1	Economic Group Relamping Interval	14
5.2	Group Relamping Optimization	14
5.3	Luminaire Cleaning Interval	15
5.4	Luminaire Cleaning Economics	15
5.5	Program Performance Example	15
6.0	Maintenance And Design	16
6.1	Programming	16
6.2	Conceptual Design	16
6.3	Commissioning	16
6.4	Design Development	16
6.4.1	Design Planning	16
6.4.2	Lamps	17
6.4.3	Ballasts	17
6.4.4	Luminaires	18
6.4.5	Lighting Controls	18
6.5	Documentation	19

7.0	Planning And Executing Maintenance Operations	20
7.1	Safety Considerations	20
7.1.1	General Precautions	20
7.1.2	OSHA Lockout/Tagout Regulations	20
7.1.3	Disconnecting Means During Re-Ballasting	21
7.1.4	NEC Requirements for Luminaire Support	21
7.1.5	Hazardous Materials Communication	21
7.2	Operational Planning	22
7.3	Cleaning/Relamping Basics	22
7.4	Manufacturer Instructions	22
7.5	Lamp Technologies	23
7.5.1	Incandescent Lamps	23
7.5.2	Linear Fluorescent Lamps	23
7.5.3	Compact Fluorescent Lamps (CFLs)	23
7.5.4	HID Lamps	24
7.5.5	Metal Halide Lamps	24
7.5.6	High-Pressure Sodium Lamps	24
7.5.7	Mercury Vapor Lamps	25
7.5.8	LED Lighting	25
7.6	Cleaning Compounds and Luminaire Surfaces	25
7.6.1	Aluminum	25
7.6.2	Silver Film	25
7.6.3	Porcelain Enamel	25
7.6.4	Synthetic Enamel	25
7.6.5	Glass	25
7.6.6	Plastics	26
7.7	Maintenance Equipment	26
7.7.1	Ladders and Stilts	26
7.7.2	Scaffolding	26
7.7.3	Telescoping Scaffolding	26
7.7.4	Personnel Lift	26
7.7.5	Disconnecting Hangers	26
7.7.6	Lamp Changers	27
7.7.7	Catwalks, Cranes and Cages	27
7.7.8	Vacuum Cleaners and Blowers	27
8.0	Disposition Of Failed Lighting Components (USA)	27
8.1	Lamp Disposal	27
8.2	Low-Pressure Sodium Lamps	28
8.3	PCB Ballast Disposal	28
9.0	System Troubleshooting	28
9.1	Safety First	28
9.2	Isolating the Cause of Operating Problems	28

- 9.3 Troubleshooting Gaseous Discharge Lighting 29**
 - 9.3.1 Troubleshooting Fluorescent Lighting 30
 - 9.3.2 Troubleshooting HID Lighting 30
 - 9.3.3 Troubleshooting LED Lighting 31
- 9.4 Maintenance and Troubleshooting of LEDs 31**
 - 9.4.1 Failure Modes 32
 - 9.4.2 Replacing LED Fixtures 33
 - 9.4.3 Replacing LED Drivers 33
 - 9.4.4 Surge Protection in LED Drivers 34
 - 9.4.5 Ambient Temperature Issues 35
 - 9.4.6 Troubleshooting Light Output Degradation 35
 - 9.4.7 Color Shift and Color Control in LEDs 36
 - 9.4.8 LED Startup 36
 - 9.4.9 End-of-life Signalling 36
 - 9.4.10 LED Dimming 36
 - 9.4.11 LED Dimming Issues with Commercial 0-10V Dimmers 37
 - 9.4.12 LED Dimming Issues with Residential Dimmers 38
 - 9.4.13 Testing Dimmer Compatibility 39
 - 9.4.14 Track Lighting and 12V LED MR16 Replacements 39
 - 9.4.15 Specific Issues Relating to “LED Tubes” 40
 - 9.4.16 Cleaning and Routine Maintenance of LED Fixtures 41
 - 9.4.17 Summary 41

- Annex A – Lighting Terms 42**

- Key Sources of Codes and Guidelines 61**

- Additional Resources 61**

- Bibliography 61**

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;