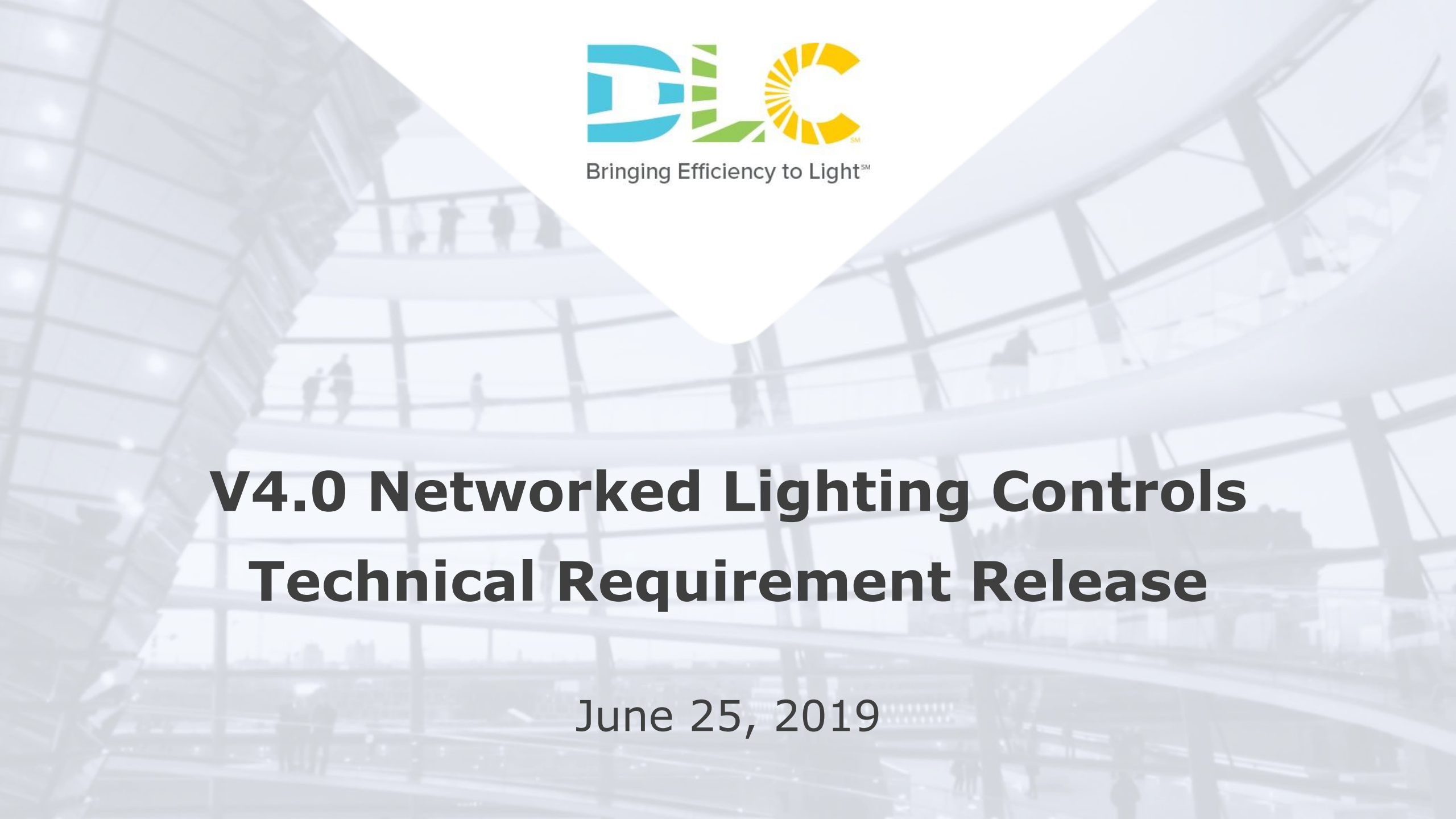


Bringing Efficiency to Light℠

V4.0 Networked Lighting Controls Technical Requirement Release

June 25, 2019

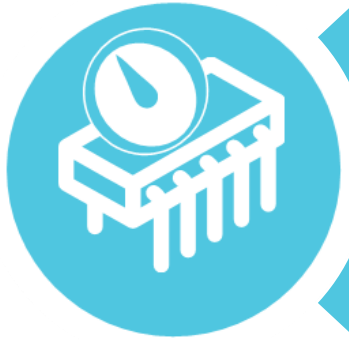
Webinar Logistics

- Slides and recorded webinar will be posted to www.designlights.org after presentation
- All attendees on mute; Please use GoToWebinar Interface (Question pane) to submit questions as we go
- DLC will answer simpler questions as we go; and follow-up directly with attendees with any unanswered questions
- If you experience any technical issues, use Chat feature to let us know

V4.0 Focus Areas

Expansion of Program Scope

- Networked Lamps
- Building Management System lighting capabilities



Energy Monitoring

- The capability of a system to measure and report the energy consumption
- Strengthens the value for utilities and customers

Cybersecurity

- The practice of defending networked systems and data from malicious attacks
- Critical for customer trust and adoption

Speakers

Gabe Arnold

DLC

Levin Nock

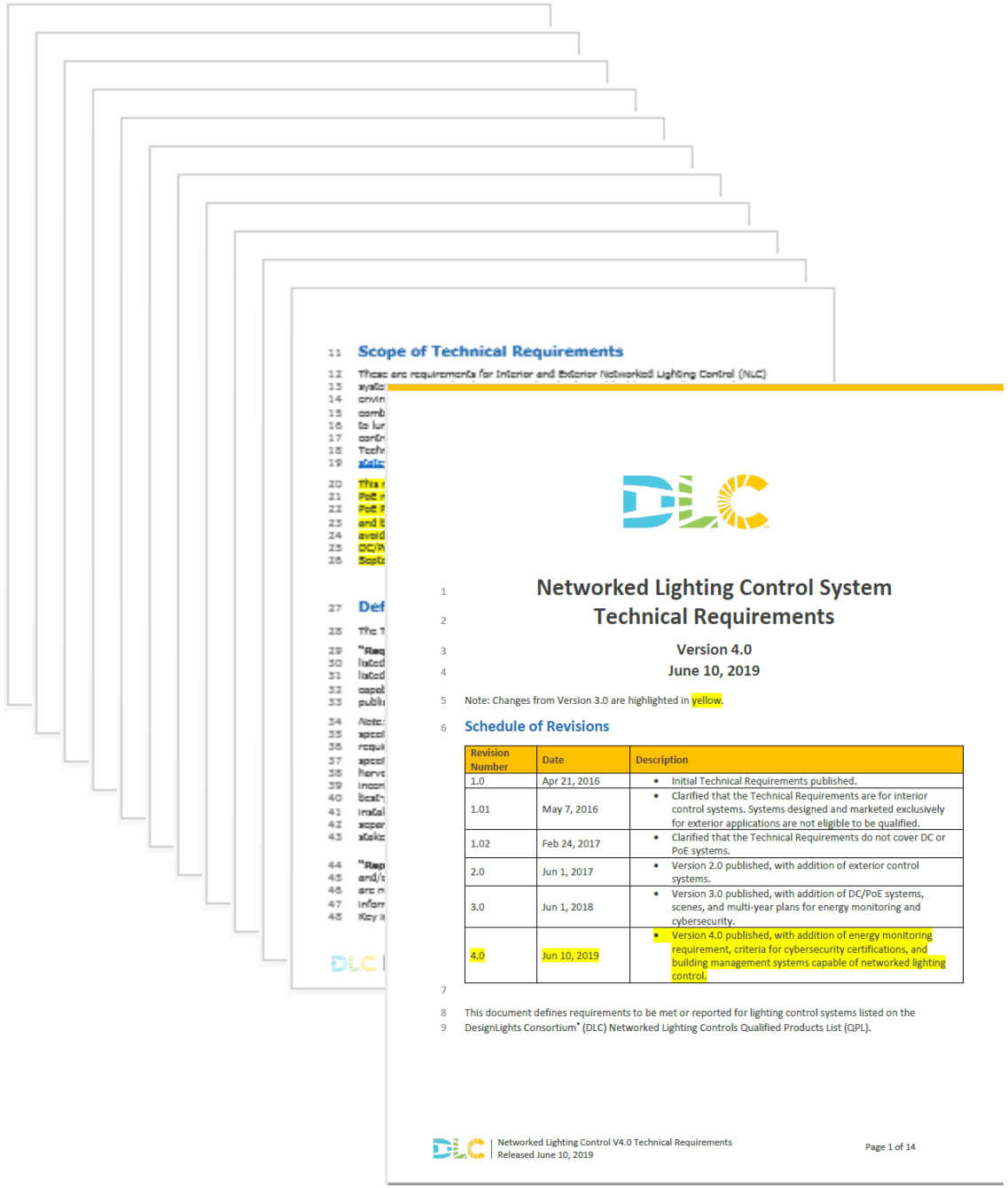
DLC

Bagwat Mohan

DLC

Agenda

- Introduction to the NLC Technical Requirement
- Program Expansion
  - Networked Lamps
  - Building Management System lighting control capabilities
- Energy Monitoring
- Cybersecurity



Networked Lighting Control System Technical Requirements

Version 4.0
June 10, 2019

Note: Changes from Version 3.0 are highlighted in yellow.

Schedule of Revisions

Revision Number	Date	Description
1.0	Apr 21, 2016	• Initial Technical Requirements published.
1.01	May 7, 2016	• Clarified that the Technical Requirements are for interior control systems. Systems designed and marketed exclusively for exterior applications are not eligible to be qualified.
1.02	Feb 24, 2017	• Clarified that the Technical Requirements do not cover DC or PoE systems.
2.0	Jun 1, 2017	• Version 2.0 published, with addition of exterior control systems.
3.0	Jun 1, 2018	• Version 3.0 published, with addition of DC/PoE systems, scenes, and multi-year plans for energy monitoring and cybersecurity.
4.0	Jun 10, 2019	• Version 4.0 published, with addition of energy monitoring requirement, criteria for cybersecurity certifications, and building management systems capable of networked lighting control.

This document defines requirements to be met or reported for lighting control systems listed on the DesignLights Consortium® (DLC) Networked Lighting Controls Qualified Products List (QPL).

Scope of Technical Requirements

These are requirements for Interior and Exterior Networked Lighting Control (NLC)

Table 1

Interior Lighting Systems

'Required' Interior System Capabilities	'Reported' Interior System Capabilities
• Networking of Luminaires and Devices	• Control Persistence
• Occupancy Sensing	• Scheduling
• Daylight Harvesting / Photocell Control	• Device Monitoring / Remote Diagnostics
• High-End Trim	• Type of User Interface
• Zoning	• Luminaire Level Lighting Control (LLLC, integrated)
• Individual Addressability	• Personal Control
• Continuous Dimming	• Load Shedding (DR)
• Energy Monitoring	• Plug Load Control
	• External Systems Integration
	• Emergency Lighting
	• Cybersecurity
	• Color Changing / Tuning
	• Ease of Implementation
	• Scene Control

Table 2

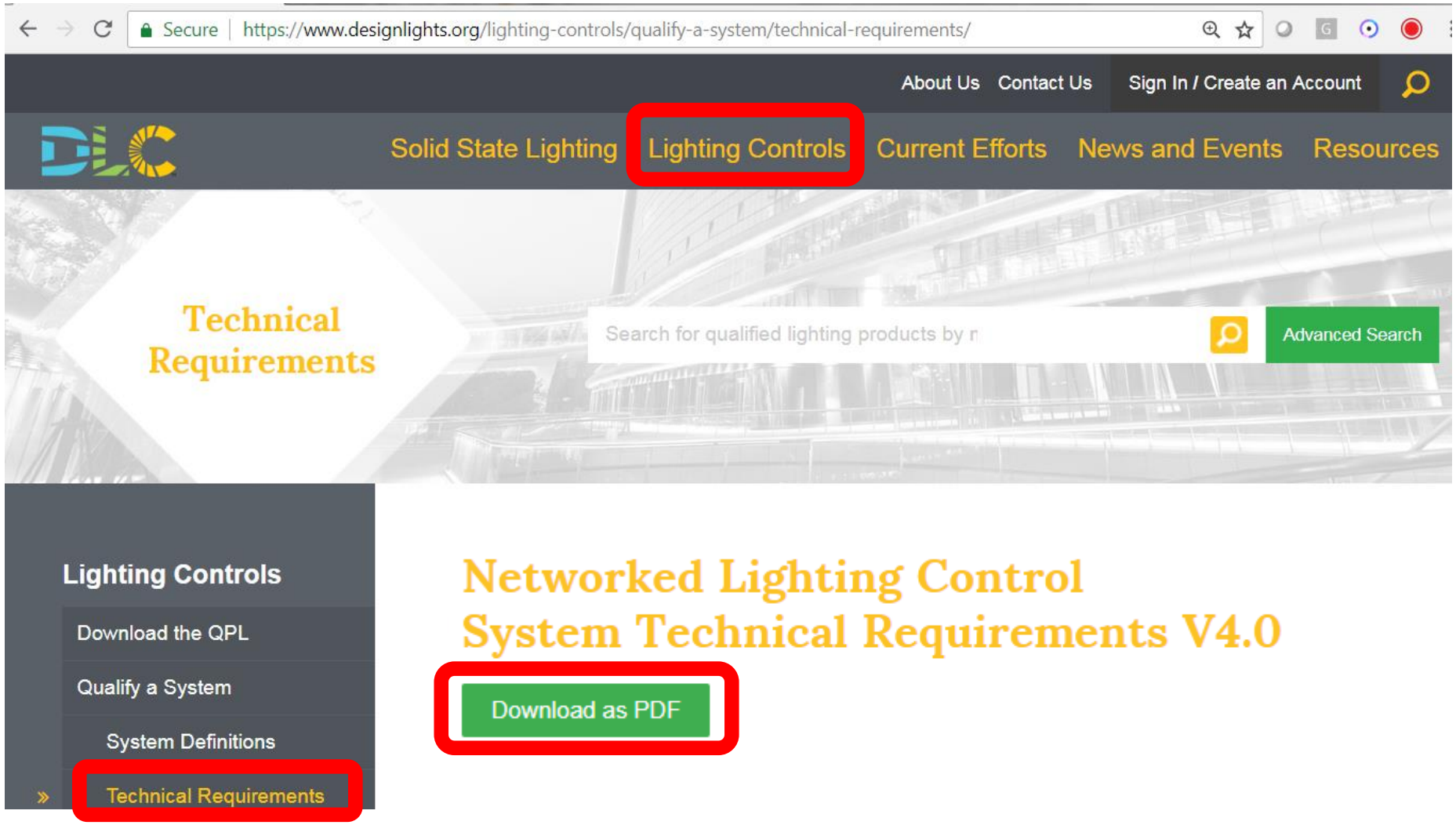
Exterior Lighting Systems

'Required' Exterior System Capabilities	'Reported' Exterior System Capabilities
• Networking of Luminaires and Devices	• Control Persistence
• Occupancy Sensing AND/OR Traffic Sensing	• Device Monitoring / Remote Diagnostics
• Daylight Harvesting / Photocell Control	• Type of User Interface
• High-End Trim	• Load Shedding (DR)
• Zoning	• External Systems Integration
• Individual Addressability	• Emergency Lighting
• Continuous Dimming	• Cybersecurity
• Scheduling	• Color Changing / Tuning
• Energy Monitoring	• Ease of Implementation
	• Scene Control

Table 3:
Capability and Requirement Definitions

Row	Capability	Definition
1	**Networking of Luminaires and Devices**	The capability of individual luminaires/lamps and control devices to exchange digital data with other luminaires/lamps and control devices on the system. This capability is required at the room, space, or area level, but not at the whole building level or beyond (e.g. non-lighting systems, or the internet).
2	**Occupancy Sensing**	The capability to affect the operation of lighting equipment based upon detecting the presence or absence of people in a space or exterior environment. Exterior systems must include either occupancy sensing or traffic sensing. They may include both, but that is not required.
...		
23	**Scenes**	The capability of a system to provide two or more pre-programmed light level settings for a group or multiple groups of luminaires to suit multiple activities in a space, and allow for recall of these settings via a switch, control device, or signal from a BMS or API.

V4.0 available on www.designlights.org



Networked Controls Revision Cycle

Technical Requirement
Revised Annually every June

Revision process began in January to allow time for stakeholder input

One Year Grace Period:

re-apply under last year's version.

NLC V4.0 – Networked Lighting Controls

Program Expansion: Networked Lamps

Networked Lamps

Table 3: Capability and Requirement Definitions

Note: Some NLC systems control luminaires and retrofit kits, and some NLC systems control lamps within luminaires. The latter systems use a wireless controller integrated inside each lamp. The "luminaires/lamps" phrase indicates that a requirement applies to luminaires and retrofit kits if an NLC system controls luminaires and retrofit kits; and the requirement applies to lamps if an NLC system controls lamps.

Row	Capability	Definition
1	Networking of Luminaires and Devices	The capability of individual luminaires/lamps and control devices to exchange digital data with other luminaires/lamps and control devices on the system. This capability is required at the room, space, or area level, but not at the whole building level or beyond (e.g. non-lighting systems, or the internet).

Changes to Luminaire/lamp

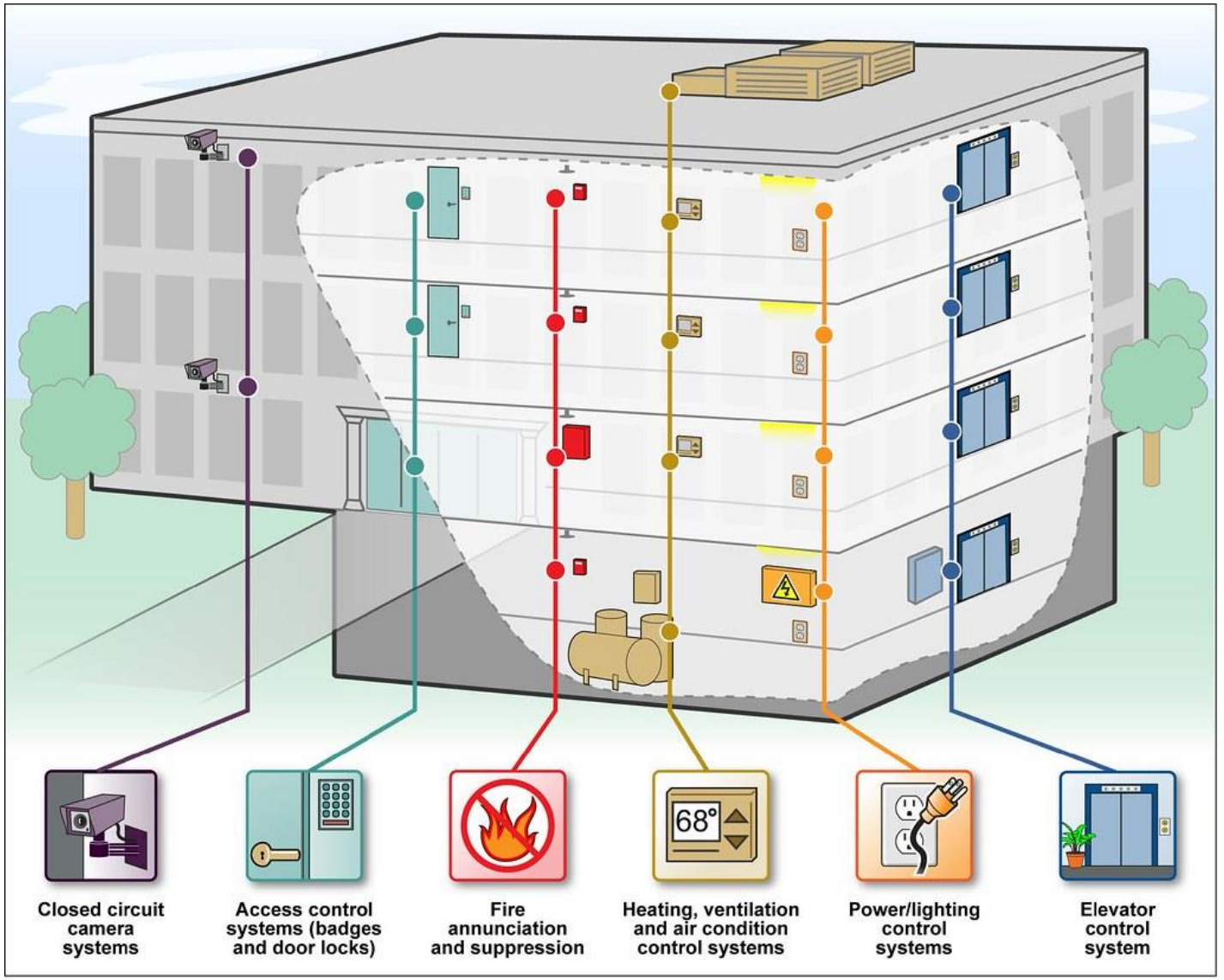
Row	Capability
1	Networking of Luminaires and Devices
5	High-End Trim*
6	Zoning
7	Individual Addressability
9	Control Persistence
11	Energy Monitoring

Program Expansion:

Building Management Systems (BMS)

BMS

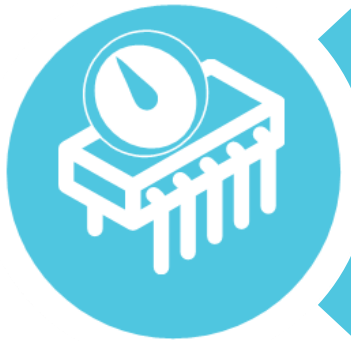
- Networked Lighting Control capabilities



Source: GAO. | GAO-15-6

Energy Monitoring

V4.0 Focus Area

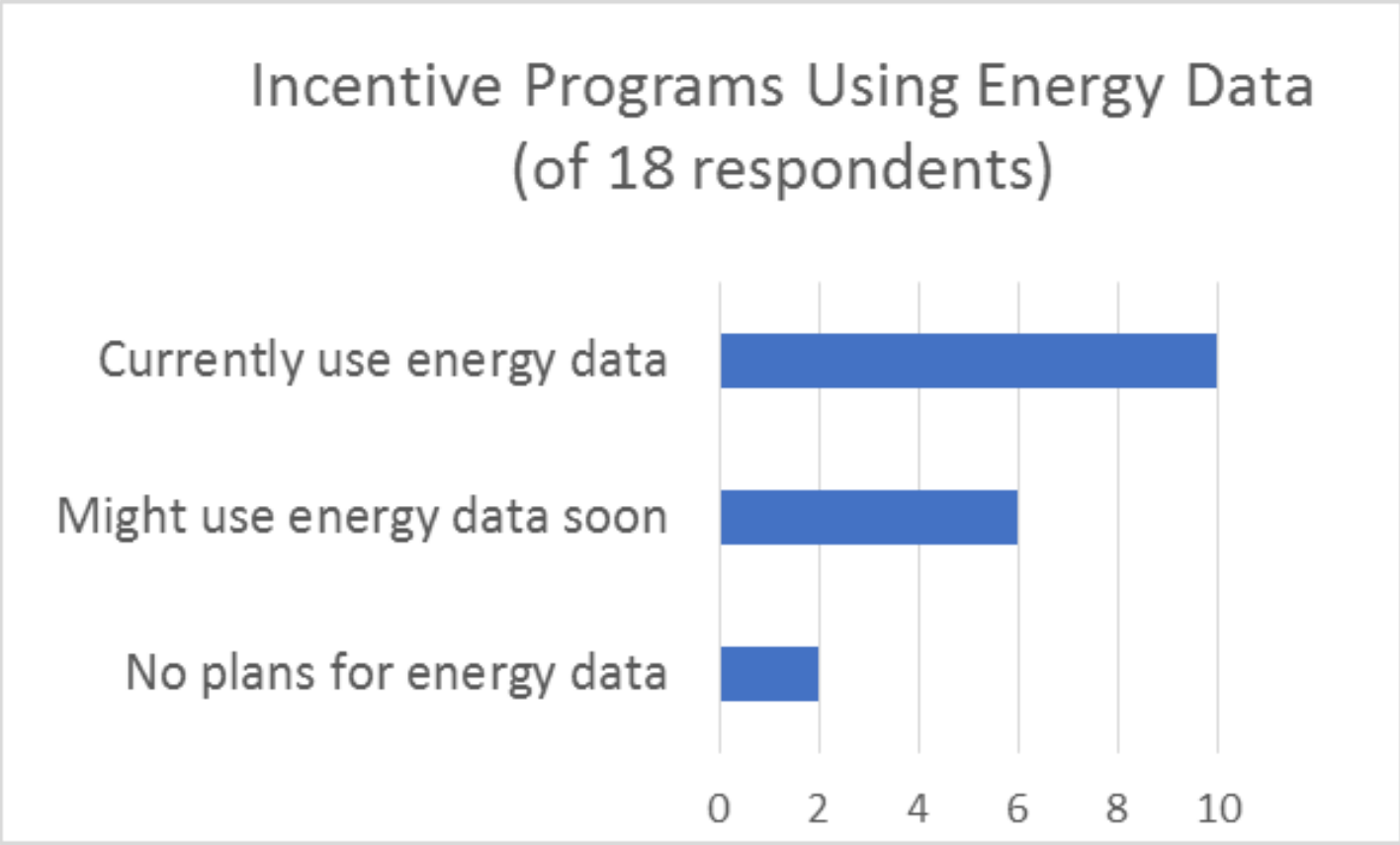


Energy Monitoring

- The capability of a system to measure and report the energy consumption
- Strengthens the value for utilities and customers

Desired Outcomes

Energy Data
Utility Program Poll 2/2019



Energy Monitoring Multi-Year Plan

June 2018 V3

- The Energy Monitoring type was **Reported**.

June 2019 V4

- Energy Monitoring Capability is **Required**
- Energy report .CSV and/or API
- Exception for room-based systems
- 1-year grace period

June 2020 V5

- Data requirements to be developed
  - 15-minute timestamped interval data
  - Record retention ≥ 1 year

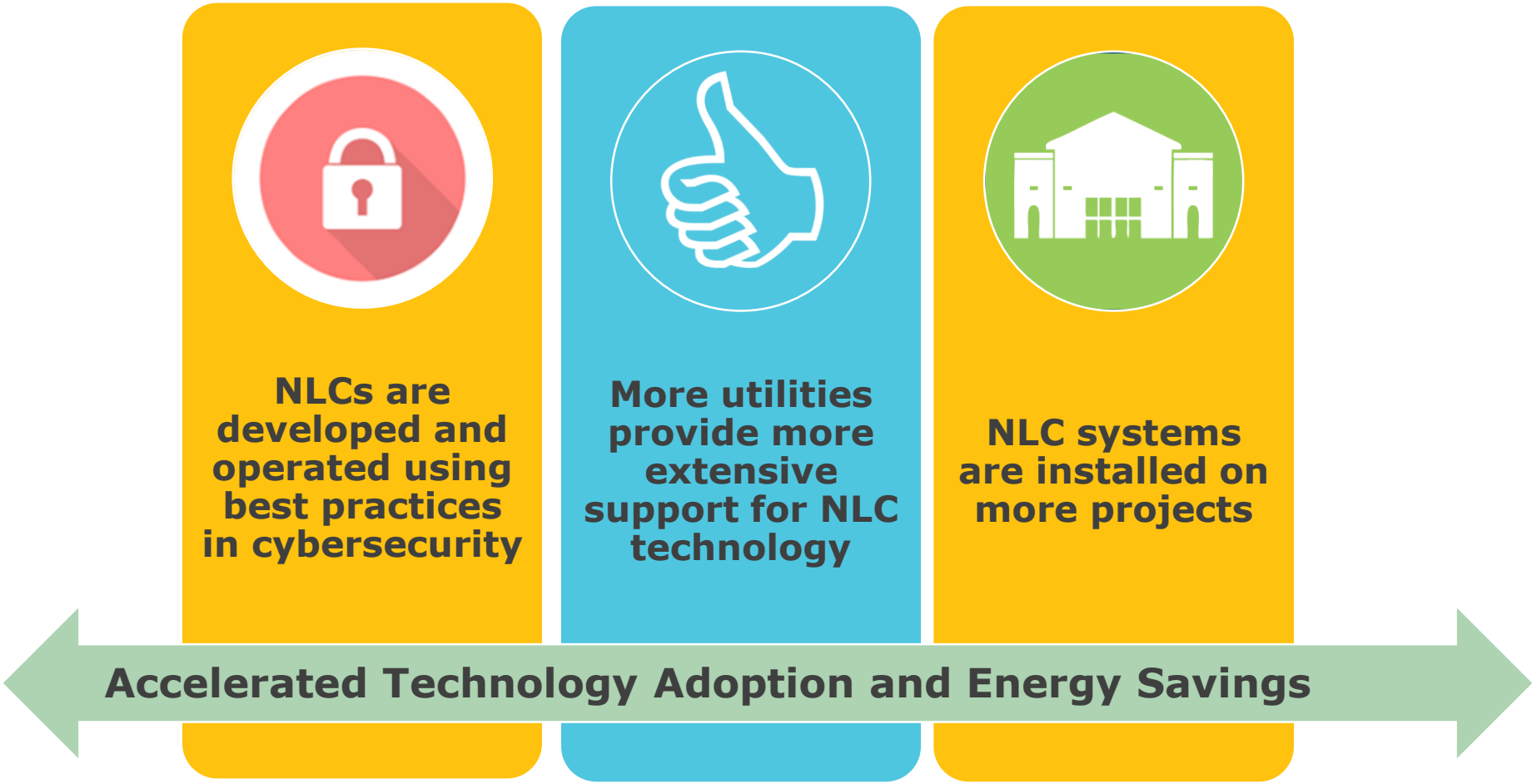
Cybersecurity

V4.0 Focus Area

Cybersecurity

- The practice of defending networked systems and data from malicious attacks
- Critical for customer trust and adoption

Desired Outcomes



Cybersecurity Plan

June 2018 V3

Cybersecurity activity is reported.

June 2019 V4

Establish criteria to qualify a set of cybersecurity standards.

Only products that comply with a qualified standard may declare the **optional** cybersecurity capability.

June 2020 V5

Cybersecurity is **Required**. Products must comply with at least one standard that meets the criteria defined in V4 (or reapply under V4 with the 1-year grace period).

June 2021 V6

Cybersecurity is **Required**.

Criteria for Acceptable Cybersecurity Standards

- The DLC recognizes cybersecurity standards that meet the following criteria:

1. Certifiable with a standardized methodology established through either:
   a. A voluntary consensus process such as ANSI, ISO, IEC, *et al*
   b. A federal agency of the USA or Canada
   c. A collaborative multi-stakeholder engagement process such as the Cloud Security Alliance
2. Applies to one or more of the following:
   a. Product development process lifecycle
   b. Components/Embedded Devices
   c. System
   d. Cloud Services
3. Includes at least 3 of the following technical content, for (2. b,c,d) above
   a. Penetration testing
   b. Communication robustness testing
   c. Vulnerability identification testing
   d. Multiple levels of security
4. Renewal is required at least every 3 years, in order for a certification to remain valid

Cybersecurity standards that meet the criteria

Standard	Process	Components/ Embedded Devices	System	Cloud Services
ANSI/UL 2900-1	y	y		
IEC 62443	-4-1	-4-2	-3-3	
SOC 2	y		y	y
ISO 27001	y			
ISO 27017 (with 27001)				y
FedRAMP				y
CSA STAR				y

- No removal of any of these standards with less than 2 years of notice
- Additional standards will be added after review

Future plans for V5.0

- Convene a Cybersecurity working committee in Fall 2019
- Certification in any one of the categories(Process, Component, System, Cloud) is sufficient
- Process for recertification will be described, incase a system's certification expires after qualification
- For room level systems that cannot be connected to the internet, an exception or delay in the requirement will be considered

Thank You