Discussion Session: Controllability
Objectives and Desired Outcomes

Session Objectives:

• Shared understanding of the Controllability policy draft
• Shared understanding of the main comment themes and outstanding items
• Discuss feedback and ways to address main comment themes and outstanding items

Desired Outcome:

• Actionable feedback to inform Draft 2
Agenda

• Welcome and Introduction

• Introduction: Problems and Proposed Solutions
  • What we’re trying to do
  • How we’re trying to do it
  • How we’re going to work together today

• Topic Reviews

• Wrap up, reflection, and review of next steps in the policy development process
Technical Team:

Damon Bosetti  
*DLC*

Dan Mellinger  
*EFG*

Facilitation Team:

Axel Pearson  
*DLC*

Liesel Whitney-Schulte  
*DLC*

Notes and Records Team:

Brady Nemeth  
*DLC*

Lani Malapan  
*DLC*
Audience

• Different stakeholder groups provided different feedback

• Who we have in this room?
  • Manufacturers
  • Researchers
  • Specifiers
  • Labs
  • Utilities
  • Distributors
  • Others
Ground Rules

• Speak up
• Let’s hear from everyone
• Be respectful
• Facilitators are the referees!
Why Are We Here?

• We want a policy that . . .

• Increases the ability to control lights . . .
  • By making more of them controllable, and . . .
  • By making it easier to understand how to control them.

• Is understandable.

• Does not add undue burden.

• Is simple to implement from . . .
  • The testing perspective.
  • The review perspective.
## Draft Testing and Reporting Requirements

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current V4.4 Requirements</th>
<th>Draft Requirement</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimming</td>
<td>Reporting of dimming capability required for all products</td>
<td>Dimming capability required for all products, with category exceptions. Continuous dimming required for indoor, continuous or stepped dimming for outdoor.</td>
<td>Product documentation</td>
</tr>
</tbody>
</table>

- Dimming section on QPL may show:
  - Continuous
  - Stepped
  - Exempt
### Draft Testing and Reporting Requirements

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current V4.4 Requirements</th>
<th>Draft Requirement</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral Controls</td>
<td>Reporting optional, with Yes/No answers of whether product has integral controls</td>
<td>Required to report, with additional information provided</td>
<td>Product documentation</td>
</tr>
<tr>
<td></td>
<td>(Reporting required for Premium).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Integral Controls section on QPL may show:
  - Daylight harvesting
  - Occupancy sensing
  - Energy metering
  - Temperature
  - ?
# Draft Testing and Reporting Requirements

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current V4.4 Requirements</th>
<th>Draft Requirement</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls Compatibility</td>
<td>None</td>
<td>Required to report method of inducing dimming in the product.</td>
<td>Product documentation</td>
</tr>
</tbody>
</table>

- Controls Compatibility section on QPL may show:
  - Dimming signal type
  - Dimming signal communication method
Comment Categories
Main Comment Trends

- Dimming requirement will present challenges
- Dimming requirements for lamps are unreasonable / unrealistic
- Dimming exemptions need further consideration
- Dimming and flicker will have interactive effects
- Integral controls reporting
- Miscellaneous concerns
Dimming requirement will present challenges

Comments
• Dimming should not be required
• Several comments that support continued reporting, potentially with enhanced reporting
• Most dimming fixtures sold are not actually dimmed in the field
• Too many products will be delisted
• Lack of a standard will create confusion

Icebreakers
• Where can we find stats on actual field usage of dimming?
• There are LOTS of dimming standards. If we require one or more of them, what does this do to test burden?
• If we do not require dimming, but ask for enhanced reporting about it, what might be useful reporting?
Dimming requirements for lamps are unreasonable / unrealistic

<table>
<thead>
<tr>
<th>Comments</th>
<th>Icebreakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The vast majority of lamps will be eliminated from the QPL</td>
<td>• How many reference ballasts would be required?</td>
</tr>
<tr>
<td>• Non-dimmable lamps will still sell absent DLC</td>
<td>• If there is a power threshold, are there special use cases that would penalize high-power lamps?</td>
</tr>
<tr>
<td>• The price for lamps would be forced artificially higher by requiring functionality that will not be used</td>
<td>• What <em>is</em> the actual dimming rate on the existing lamp-and-socket base?</td>
</tr>
<tr>
<td>• Would need a “reference ballast”</td>
<td></td>
</tr>
<tr>
<td>• The vast majority of the installed base, into which retrofit lamps and kits would go, is not dimmable</td>
<td></td>
</tr>
</tbody>
</table>
Dimming exemptions need further consideration

Comments
• Exempt low power products, potentially by PUD; see CA Title 24
• Exclude certain PUDs like bollards, decorative, and MogLEDs
• Exclude all outdoor; the selection of dimmable drivers is inadequate
• Step dimming should be allowed for indoor PUDs
• Exempt dimming by application, like retail sales floor or industrial
• Create a tier structure for dimming (no dimming, limited dimming, advanced dimming)

Icebreakers
• Let’s look at power and PUDs.
Dimming exemptions need further consideration
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Dimming exemptions need further consideration

<table>
<thead>
<tr>
<th>Dimmability by Product Type and Wattage Bin</th>
<th>Type</th>
<th>&lt;40</th>
<th>40-75</th>
<th>75+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor</td>
<td>Indoor</td>
<td>80%</td>
<td>84%</td>
<td>78%</td>
<td>81%</td>
</tr>
<tr>
<td>Indoor Luminaires</td>
<td>Indoor Troffer</td>
<td>88%</td>
<td>85%</td>
<td>76%</td>
<td>86%</td>
</tr>
<tr>
<td>Indoor Linear Ambient</td>
<td>Indoor High-Bay</td>
<td>80%</td>
<td>84%</td>
<td>77%</td>
<td>83%</td>
</tr>
<tr>
<td>Indoor Case Lighting</td>
<td>Indoor Interior Directional</td>
<td>29%</td>
<td>94%</td>
<td>92%</td>
<td>45%</td>
</tr>
<tr>
<td>Indoor Retrofit Kit</td>
<td>Indoor Troffer</td>
<td>82%</td>
<td>81%</td>
<td>73%</td>
<td>81%</td>
</tr>
<tr>
<td>Indoor Linear Ambient</td>
<td>Indoor High-Bay</td>
<td>81%</td>
<td>88%</td>
<td>90%</td>
<td>84%</td>
</tr>
<tr>
<td>Indoor High-Bay</td>
<td></td>
<td>88%</td>
<td>96%</td>
<td>63%</td>
<td>70%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>&lt;40</th>
<th>40-75</th>
<th>75+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor</td>
<td>60%</td>
<td>66%</td>
<td>70%</td>
<td>68%</td>
</tr>
<tr>
<td>Outdoor Luminaires</td>
<td>60%</td>
<td>66%</td>
<td>71%</td>
<td>68%</td>
</tr>
<tr>
<td>Outdoor Low Output</td>
<td>60%</td>
<td>61%</td>
<td>33%</td>
<td>61%</td>
</tr>
<tr>
<td>Outdoor Mid Output</td>
<td>61%</td>
<td>68%</td>
<td>63%</td>
<td>66%</td>
</tr>
<tr>
<td>Outdoor High Output</td>
<td>100%</td>
<td>61%</td>
<td>69%</td>
<td>69%</td>
</tr>
<tr>
<td>Outdoor Very High Output</td>
<td>76%</td>
<td>76%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor Retrofit Kit</td>
<td>61%</td>
<td>62%</td>
<td>62%</td>
<td>62%</td>
</tr>
<tr>
<td>Outdoor Low Output</td>
<td>59%</td>
<td>62%</td>
<td></td>
<td>60%</td>
</tr>
<tr>
<td>Outdoor Mid Output</td>
<td>100%</td>
<td>64%</td>
<td>68%</td>
<td>66%</td>
</tr>
<tr>
<td>Outdoor High Output</td>
<td></td>
<td>23%</td>
<td>52%</td>
<td>61%</td>
</tr>
<tr>
<td>Outdoor Very High Output</td>
<td></td>
<td>62%</td>
<td></td>
<td>62%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Type</th>
<th>&lt;40</th>
<th>40-75</th>
<th>75+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four Pin-Base Replacement Lamps for CFLs</td>
<td>Lamp: Four-Pin CFL Replacement</td>
<td>33%</td>
<td></td>
<td></td>
<td>33%</td>
</tr>
<tr>
<td>Linear Replacement Lamps</td>
<td>Lamp: Linear Replacement</td>
<td>20%</td>
<td>15%</td>
<td></td>
<td>20%</td>
</tr>
<tr>
<td>Mogul (E39) Screw-Base Replacements for HID Lamps</td>
<td>Indoor High-Bay</td>
<td>4%</td>
<td>6%</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Outdoor Low Output</td>
<td>10%</td>
<td>8%</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Outdoor Mid Output</td>
<td>14%</td>
<td>4%</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Outdoor High Output</td>
<td>2%</td>
<td>2%</td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Outdoor Very High Output</td>
<td>50%</td>
<td></td>
<td></td>
<td>50%</td>
</tr>
</tbody>
</table>
Dimming exemptions need further consideration

Comments
• Exempt low power products, potentially by PUD; see CA Title 24
• Exclude certain PUDs like bollards, decorative, and MogLEDs
• Exclude all outdoor; the selection of dimmable drivers is inadequate
• Step dimming should be allowed for indoor PUDs
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Icebreakers
• Let’s look at power and PUDs.
• Let’s put a price on that dimming exemption. What does that energy pencil out to over 10 years?
• Are outdoor drivers less dimmable than interior drivers?
• What other PUDs should be exempted?
• Are application-specific dimming requirements enforceable by DLC?
Dimming and flicker will have interactive effects

Comments
• Dimming can introduce flicker
• Need to specify the lowest level of stable dimming

Icebreakers
• Require flicker standards compliance at full power and . .
  • 20%?
  • Min dim?
• Require reporting of lowest stable min dim? How do we define “stable”??
Integral controls reporting

Comments
- Keep options limited to avoid confusion
- Maintain support for “wild-carding” to avoid additional product listings
- Multiple product listings could increase burden on the manufacturers and create confusion on which model is on the QPL
- Document compatibility with NLC system(s)
- DLC should not differentiate control capability
- Report on sensors separately from controls
- Report on dimming protocol, compatible dimmers, and dimming performance

Icebreakers
- What are examples of reporting that is too detailed?
- What are examples of reporting that is not detailed enough?
- What should we present as picklist options?
- What should we *not* present as picklist options?
- Should we allow sensors as a separate subunit? They may or may not be explicitly tied to controls.
Miscellaneous concerns

Comments
• Additional controllability aspects should be addressed
  • Stand-by power
  • Color changing
  • Lumen maintenance correction
  • Dimming protocol
  • ANSI C136.41 (pin usage)
  • Ease of use

Icebreakers
• Stand-by power – who defines and tests for this? Does this matter?
• Should we allow for self-declaration of dimming protocol? This could encourage less friction and allow for the wide range of available options.
• How does one define “ease of use”?
Next Steps

Now:
• We will summarize this group’s comments for today’s report to the conference

Next Days:
• We continue to collect your feedback throughout the conference

Coming Months:
• We will develop draft 2 for the V5.0 policy, and will reach out for targeted follow-up conversations
Thank You!

Questions? Feedback?

Please feel free to find us throughout the conference or
Send questions and comments to:

Comments@designlights.org

DesignLights Consortium®
www.designlights.org