

Title 24 2016 Stakeholder Webinar: *Modifications to Joint Appendix 5: Technical Specifications for Occupant Controlled Smart Thermostats (OCSTs)*

Hosted by SMUD

October 7, 2014

1:00 PM – 3:00 PM

Webinar Participation Instructions

URL: <https://join.me/codes-standards>

Phone: (860) 970-0010

Access Code: 940-290-811#



Meeting Ground Rules

- Phone rules
 - Please mute your microphone, unless you want to speak
 - Please do not place your phone on HOLD
 - Ask questions/comment by “chat” in WebEx or by voice
 - To unmute you line:
 - If you called in on a phone, press *6
 - If you called in via internet



Meeting Ground Rules (continued)

- We want to hear your thoughts
 - Supporting and opposing viewpoints are welcome
 - We may not be able to reach resolutions today
- When making comments
 - Clearly state your name and affiliation prior to speaking
 - Speak loudly for the people on the phone
- Notes and presentation material will be posted on our website www.Title24Stakeholders.com

Meeting Agenda

1:00 - 1:15	Introduction: Overview of 2016 Title 24 Development; Summary of stakeholder outreach purpose and procedure
1:15 - 2:30	Occupancy Controlled Smart Thermostat (OCST) (Modifications to Joint Appendix 5 only)
2:30 - 3:00	Review and wrap-up, next steps

Introduction: Overview of 2016 Title 24 Development

SUMMARY OF STAKEHOLDER OUTREACH PURPOSE AND PROCEDURE

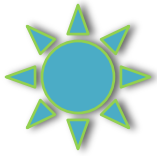
Request for Input

- We are requesting input from stakeholders
- We encourage stakeholders to respond by:
 - providing answers to specific questions
 - providing primary and secondary references (e.g., data, survey results, reports, etc.)
- Responses will help inform the final recommended code change proposal
- Email input to: info@title24stakeholders.com

Schedule: Key Dates (tentative)

November 3, 2014	CEC's last Pre-rulemaking Workshop
January 2015	CEC Releases 45-day Language
February 2015	CEC holds 45-day Language Workshop
April 2015	CEC Releases 15-day Language
May 2015	CEC Adoption at Business Meeting
January 1, 2017	Effective Date

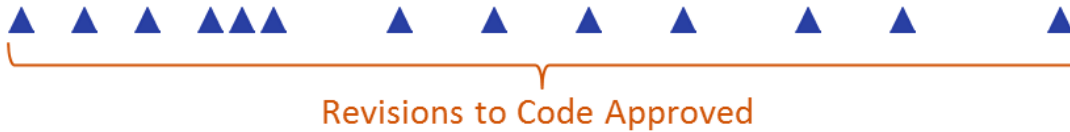
Warren-Alquist Act



- Enacted in 1974 (Assembly Bill 1575)
- Established California Energy Commission
- Instructed the CEC to establish building energy efficiency standards
 - Standards must be cost effective
 - CEC must report environmental impacts of proposed standards
- Established enforcement mechanism for building standards

Brief History of Title 24

▲ First Building Energy Efficiency Code Adopted



★ 2016 Code Change



Warren-Alquist Act

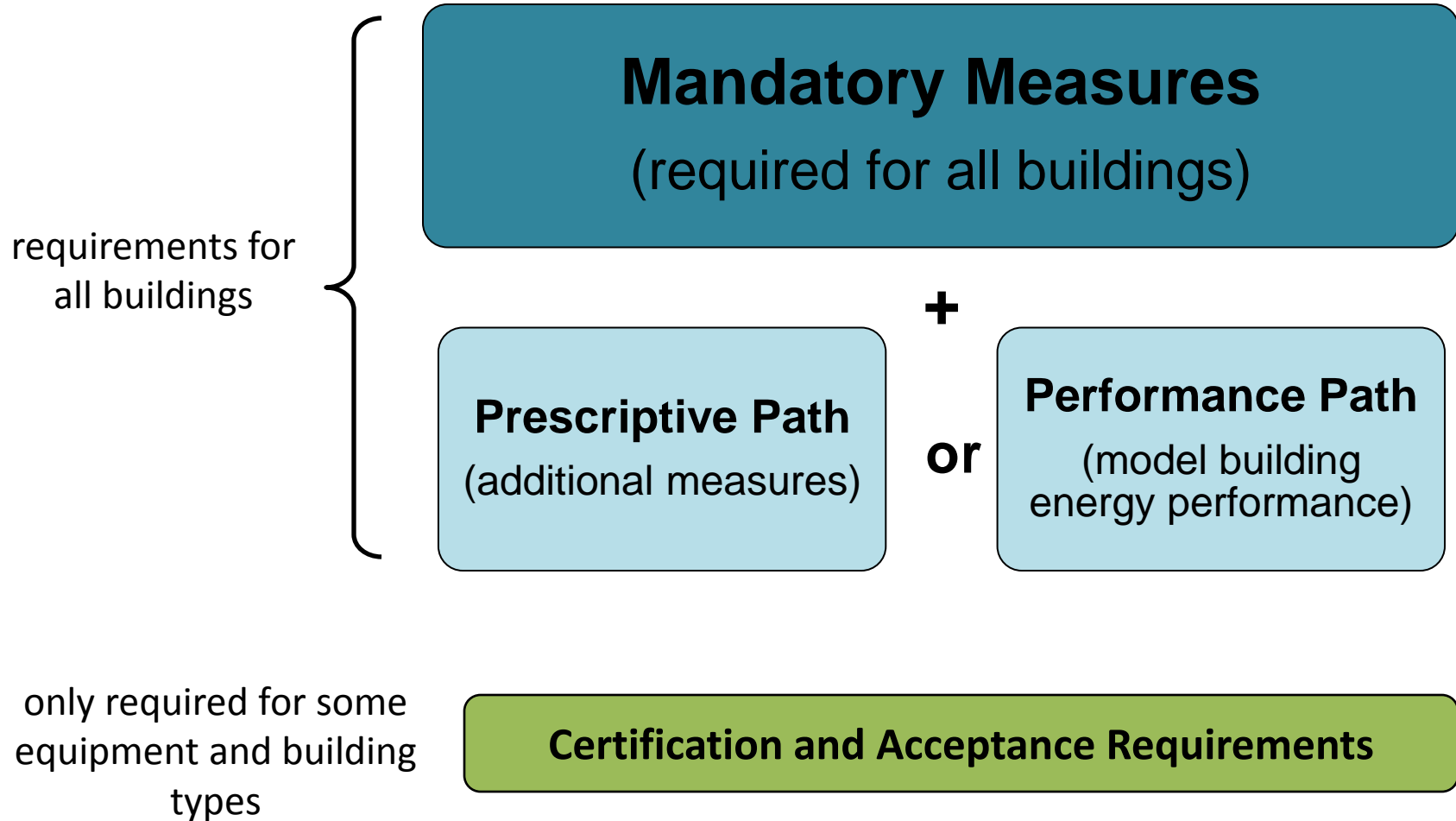
1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030

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General Structure of Title 24



Appendices to Title 24 Standards

- Title 24 has 9 appendices, which serve to:
 - Provide additional data and/or information underlying calculations
 - Provide additional technical specifications for measures

Requirements for a Successful Code Change

- Mandatory and prescriptive requirements must:
 - Be cost effective
 - Using CEC's Lifecycle Cost Methodology
 - Energy cost savings calculated using CEC's Time Dependent Valuation (TDV) factors
 - Be possible to implement using equipment that is readily available from multiple providers
 - *or that is reasonably expected to be available when the code goes into effect in January 2017*
- Changes to performance approach and appendices do not require cost-effectiveness or LCC analysis



Questions?

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Meeting Agenda

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Occupancy Controlled Smart Thermostat (OCST)
(Modifications to Joint Appendix 5 only)

OVERVIEW OF MEASURE AND PROPOSED MODIFICATIONS

Objectives of Today's Presentation/Discussion

- Present overview of proposed code change for OCST measure
- Review current code requirements
- Present proposed code requirements
- Solicit feedback from stakeholders
- Continue/begin a dialogue



Summary of Existing Standards

Title 24 2013 Occupant Controlled Smart Thermostat (OCST)

Overview	Requires that buildings with unitary, single zone AC/HP, or furnace fans without an EMCS, be equipped with OCSTs that meet a series of requirements laid out in Joint Appendix 5: Technical Specifications for OCSTs (JA5)
Scope	<ul style="list-style-type: none">• <i>Residential Sector:</i> Alternative compliance pathway to solar-roof ready requirements• <i>Non-Residential Sector:</i> Mandatory
Requirements in JA5	<i>To be discussed further</i>
Acceptance Testing	None. Requirements in JA5 are self-certified by the manufacturer.
Issues	<ul style="list-style-type: none">• Language regarding physical and logical communication is ambiguous and too open-ended, which could result in stranded assets among consumers• Terms are not well defined leading to confusion and multiple interpretations

Why Utilities Recommend Revisions

1. Modifications can support increased interoperability among thermostats and service providers (e.g., utilities, aggregators, and other third-party signalers). Code should not support proprietary technologies that could result in units becoming stranded assets.
2. Modifications can reduce barriers to participation in DR programs, better positioning customers to take advantage of these types of programs that could result in lower energy bills
3. Modifications can increase clarity around definitions and requirements for stakeholders involved, enhancing compliance to Title 24 and Joint Appendix 5

What utilities have done to date to develop proposed recommendations

1. Research and evaluation of Title 24 OCST measure requirements (*ongoing since Fall 2013*)
2. Workshop for California Utilities, hosted by SMUD on July 14th, 2014 to establish measure goals and discuss potential changes to meet goals
3. Weekly informal phone-meetings with utility representatives, consultants, and CEC staff to vet proposal (*August – September*)

Summary of Code Change Proposal

- Proposed change will make revisions to JA5
- There are no recommended changes to the Standards
- Changes are intended to be minimal
- Specific revisions to JA5 include
 1. Definitions for Physical and Logical Communication interfaces as well as price signals are clarified.
 2. *Physical communication*: The OCST shall be capable of connecting to a Wi-Fi network and/or a Zigbee network. Manufacturers may choose to include additional physical communication interfaces.
 3. *Logical communication*: The logical communication interface shall comply with any individual or combination of the following open-based standards: OpenADR 2.0, SEP 1.01.
 4. Requirements for *automatic re-join* and *default re-start* are added

Explanation of Changes:

1. Text was not changed.
2. New text was added.
3. ~~Old text was deleted.~~

Stakeholder Webinar on Modifications to OCSTs

MARKED-UP CODE LANGUAGE

(1) Physical & Logical Communication are definitions

- The Communications Interface is comprised of the (1) physical communication interface and the (2) logical communication interface.
- The physical communication interface describes the physical communication that enables receipt of Demand Response signals or price signals.
- The logical communication interface describes the information model and its messaging protocol used for representation and interpretation of signals received by the OCST.
- **Intention:** Increase clarity by defining key terms referenced throughout the document
- (page 2)

JA 5.2.3.1 Demand Responsive Control Price Signals *(renamed for increased clarity)*

- The OCST shall be capable of Demand Responsive Control for the Demand Response Period upon receipt of a Demand Response Signal, which is a signal sent by the local utility, Independent System Operator (ISO), or designated curtailment service provider or aggregator, to a customer, indicating a price or a request to modify electricity consumption, for a limited time period. A price signal is a type of Demand Response signal.
- **Intention (increase clarity):** Demand responsive control includes response to both price and demand response events and signals. We assert that a price signal is a specific type of demand response signal.

Changes to JA 5.2.5 – Other Required Capabilities

- **Demand Response Event Restoration Delay:** Unless the messaging protocol contains randomization or restoration delay logic, OCSTs shall provide a mechanism, such as a randomized delay, to prevent all of the OCSTs within a demand-response area from ending the demand-response event at the same time. This mechanism can be implemented within the control logic of the OCST, within the control logic of the demand-response signaling system, or within the control logic of the communication network between the OCST and the demand-response signaling system. The display of the thermostat shall accurately indicate the end of the event, accounting for any delays or advances provided by this mechanism. The specific maximum restoration delay for restoration after a Demand Response Period shall be 30 minutes or alternatively can be defined within the Demand Response Signal for that event.
- **Intention:** Add clarity to this paragraph by describing what is being required in succinct terms in the beginning.

Changes to JA 5.2.5 – Other Required Capabilities

- Default Restart Settings: In the event of a disruption of power to the device that results in power-off or restart, upon device restart, the device shall automatically restore the most recently programmed settings, including reconnection to a network, if the device was previously enabled and network connectivity is available.
- **Intention:** Ensure that programmed response to DR signals can be retrieved after unintended power loss (lower barrier to continued customer participation in DR transactions)

(Page 4)

Changes to JA 5.2.5 – Other Required Capabilities

- Automatic Rejoin: OCSTs are expected to connect, and remain connected in its communication path and control end point. OCSTs shall incorporate an automatic rejoin function where the OCST automatically seeks to rejoin its associated communication path and end points when communication is lost.
- **Intention:** For OCSTs that were previously connected to a utility, or third party signal provider, prior to power loss, this requirement will help ensure that a connection is restored upon restart.

(Page 4)

JA 5.3.1 Communication Interface

- The physical communications interface describes the physical connection through which event signals are received, and shall meet the following requirements:
 - The OCST shall be capable of connecting to a Wi-Fi network compliant with IEEE 802.11, and/or a Zigbee network compliant with IEEE 802.15.4. Manufacturers may choose to include additional physical communication interfaces compliant with open-based standards.
 - The physical communication interface shall be capable of bi-directional exchange of information over its communication path
- **Intention:** Provide greater clarity around acceptable physical communication protocols; reduce the risk of stranded asset by setting a minimum standard that reflects current and anticipated future market adoption of physical communication protocols.

JA 5.3.1 Communication Interface

- The logical communication interface within the OCST hardware, which describes the messaging protocol and information model used in representation and interpretation of demand response signals, shall comply with any individual or combination of the following open-based standards:
 - OpenADR 2.0 or SEP 1.1, which are listed in the Smart Grid Interoperability Panel (SGIP) Catalog of Standards (CoS):
 - Manufacturers may choose to include additional logical communication interfaces compliant with open-based standards.
 - Builders, HVAC installers, architects, and all other Title 24 professionals should check with the local utility (where the property is located) on guidance when choosing the DR signal standard for the OCST.
- **Intention:** Provide greater clarity around acceptable logical communication protocols; reduce the risk of stranded asset by setting a minimum standard that reflects current and anticipated future market adoption of logical communication protocols.

JA 5.3.1 Communication Interface

- <http://www.openadr.org/>
- <http://www.zigbee.org/Standards/ZigBeeSmartEnergy/Overview.aspx><http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIPCoSStandardsInformationLibrary>

JA 5.3.2 Expansion/Communication Port

- An expansion/communication port is a type of physical communication interface. This port is available to be used by a module supporting one-way or two-way communications using open standards-based communication protocols as described in Section 5.3.1.
- When the Expansion/Communication port is not enabled ~~unpopulated~~, the thermostat shall function as a programmable setback thermostat and shall meet the requirements of Sections 110.2(b) and (c).
- **Intention:** Clarify definition for expansion/communication port. The term “unpopulated” indicates whether or not there is a physical component in the port, not whether or not it is enabled to received signals.

JA 5.5 Terminology

- ~~• **Price Signal** is a signal sent by the local utility, Independent System Operator (ISO), or designated curtailment service provider, information update service or aggregator, to an enrolled or subscribed customer, indicating a price or other economic indicator that can trigger OCST Demand Responsive Control.~~
- **Intention:** A price signal is a type of demand response signal, as clarified in J.A. 5.2.3.1. In future code revisions, stakeholders could consider defining price signal in Section 100.1 – Definitions and Rules of Construction as “price signal” is also applicable to the Automated Demand Shed Control measure

Request for Input

- We are requesting input from stakeholders
- We encourage stakeholders to respond by:
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