

Demand Response Measures in Title 24: 2016 Standards and Beyond

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PRESENTED TO

OpenADR Webinar Series

PRESENTED BY

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ENERGY SOLUTIONS

Agenda

- Schedule for 2016 Title 24 Code Change Cycle
- Proposed Changes for 2016 Title 24 Standards
 - Update Technical Specifications for Occupant Controlled Setback Thermostats (OCST)
 - Recommend requirements for Direct Digital Controls (DDC) in certain applications
 - Update Compliance Manuals
- Looking Forward to the 2019 Code Change Cycle



Proposed Revisions for 2016 Title 24

- The Statewide Utility Codes and Standards (Statewide C&S) Team advocates for revisions to Title 24.



- The Statewide C&S Team is supporting 18 unique revisions for the 2016 code cycle.
- You can learn more about all of the proposals by visiting the Statewide C&S Team's website:
<http://title24stakeholders.com/>



2016 Title 24 Schedule

CEC Pre-rulemaking	CEC hosts first round of pre-rulemaking workshops	April – Aug 2014
	Utility sponsored stakeholder workshops	May 2014
	CEC releases draft proposed standards	October 23, 2014
	CEC holds final pre-rulemaking workshop	November 3, 2014
CEC Rulemaking	CEC releases 45-day language and staff reports	February 2015
	CEC holds 45-day language workshop	March 2-3, 2015
	CEC releases 15-day language	April 2015
	CEC adopts standards	May 2015
	Standards take effect	January 1, 2017



Scope of DR Revisions for 2016 Cycle

- Significant revisions to DR requirements is outside of California Energy Commission's scope for the 2016 code cycle.
 - Focus of the 2016 Code Change Cycle is to improve residential efficiency requirements in support 2020 Residential ZNE Goals.
- Statewide C&S Team proposals include:
 - Improving to Technical Specifications OCSTs.
 - Establishing requirements that Direct Digital Controls (DDC) be installed in specific applications.
 - Improve Compliance Manuals.



UPDATE TECHNICAL SPECIFICATIONS FOR OCCUPANT CONTROLLED SETBACK THERMOSTATS



Justification for OCST Improvements (1 of 3)

- Improve Interoperability
 - Communication between customer, utility, third-party signaler, and/or DR aggregator is essential for a customer to participate in a DR event.
 - Proposed revisions aim to improve confidence that a communication will occur seamlessly.
 - Communication is improved by simplifying information and data exchanges by using open, non-proprietary, technologies and communication protocols.
 - Changes will minimize risk of stranded assets.



Justification for OCST Improvements (2 of 3)

- Reduce Barriers to Participation in DR Events
 - Code requirements can ensure that buildings are capable of participating in a DR Event, but code cannot require that customers actually participate in events.
 - Well-structured code requirements can lead to DR-ready systems that are installed as intended, thereby positioning customers to take advantage of utility DR programs with minimal additional revisions to building systems.



Justification for OCST Improvements (3 of 3)

- Improve Compliance
 - Stakeholders have provided feedback that the 2013 Title 24 Standards are difficult to understand.
 - Confusion about how to comply with the code can result in systems not being installed as intended.
 - The proposed revisions aim to provide necessary guidance and improve compliance.
 - *Education and outreach is an important aspect of compliance improvement that we are not addressing today.*



Summary of Revisions to JA5 (1 of 5)

- **Background**

- Proposed change will make revisions to Joint Appendix 5 (JA5): Technical Specifications for Occupant Controlled Setback Thermostats
- There are no recommended changes to the Standards (i.e., when OCSTs are required).
- Changes are intended to be minimal.

1. **General Clean-up**

- Improve overall clarity and readability without modifying intent.



Summary of Revisions to JA5 (2 of 5)

2. Clarify Definitions Communications Interfaces

- Define physical and logical communications interfaces more clearly:
 - Physical Interface is the physical connection that enables communication.
 - Logical interface is the information model and messaging protocol used to represent and interprets signals.

3. Clarify Requirements for Physical Communication

- OCSTs shall be capable of connecting to either a Wi-Fi network or a Zigbee network.
 - OCSTs can communicate with additional networks.
- Physical communication interface must be capable of sending and receiving information (two-way communication).



Summary of Revisions to JA5 (3 of 5)

4. Clarify Logical Communication Requirements

- OCSTs must be compliant with either OpenADR 2.0 or Smart Energy Profile (SEP) 1.1.
 - OCST can use additional protocols.
- Applicant (builder) should check with the local utility for guidance on which logical communication protocol should be used in the utility's service territory.

5. Clarify Requirements for Thermostats using Expansion Ports

- If an OCST uses an expansion port, the port must be populated with the removable communication module at the time of permitting.



Summary of Revisions to JA5 (4 of 5)

6. Clarify Requirements for Demand Responsive Control

- OCSTs must be capable of responding to all Demand Response Signals (as defined by Title 24), not just price signals.

7. Eliminate Requirements for Demand Response Event Delay

- Strikes requirements that the OCST include ability to control how buildings return to normal operation after a DR event.
- The Statewide C&S Team prefers that event restoration responsibilities fall with the utilities and how signals are sent to customers, not within the OCST itself.



Summary of Revisions to JA5 (5 of 5)

8. Add Requirements for Default Restart Settings and Automatic Rejoin

- Ensure OCSTs restore correctly after it loses power, restarts, or loses connection with the signaler.
- After power loss or restart, OCST will restore to most recently programmed settings.
- If physical or logical communication is lost, OCST automatically attempt to restore communication.



REQUIRE DIRECT DIGITAL CONTROL IN CERTAIN APPLICATIONS



Justification for DDC Requirements

- Federal laws requires that state building standards for nonresidential buildings be at least as stringent as ASHRAE 90.1-2013.
- The primary objective of the proposed requirements for Title 24 to “keep up” with ASHRAE.
- Proposed requirements are based on a measure included in ASHRAE 90.1-2013.



Summary of Revisions to DDC Requirements

- Summary of 2013 Title 24 Standards
 - 2013 Title 24 Standards do not require DDC systems in any applications.
 - *IF* a DDC system is installed to the zone level voluntarily, then the system must be capable of:
 - Demand Control Ventilation – Title 24 Section 120.1(c)
 - **Automatic demand shed control – Title 24 Section 120.2(h)**
 - Set point reset for Variable Air Volume (VAV) systems – Title 24 Section 140.4(c)2C
- Proposed changes will add a mandatory requirement that DDC systems to be installed in certain building applications.



Summary of Revisions to DDC Requirements

DDC Will be Required in the Following Applications

BUILDING STATUS	APPLICATION	QUALIFICATIONS
New building	Air-handling system and all zones served by the system	Individual systems supplying more than three zones and with fan system bhp of 10 hp and larger
New building	Chilled-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design cooling capacity of 300,000 Btu/h and larger
New building	Hot-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design heating capacity of 300,000 Btu/h and larger
Alteration or addition	Zone terminal unit such as VAV box	Where existing zones served by the same air-handling, chilled-water, or hot-water system have DDC
Alteration or addition	Air-handling system or fan coil	Where existing air-handling system(s) and fan-coil(s) served by the same chilled- or hot- water plant have DDC
Alteration or addition	New air-handling system and all new zones served by the system	Individual systems with fan system bhp of 10 hp and larger and supplying more than three zones and more than 75% of zones are new
Alteration or addition	New or upgraded chilled-water plant	Where all chillers are new and plant design cooling capacity is 300,000 Btu/h and larger
Alteration or addition	New or upgraded hot-water plant	Where all boilers are new and plant design heating capacity is 300,000 Btu/h and larger

COMPLIANCE MANUAL UPDATES



Summary of Compliance Manual Updates

- Compliance Manuals will be updated with the goal of providing clearer guidance on the DR requirements included in the 2013 Title 24 Standards.
- Compliance Manuals should be written in laymen's terms (i.e., not code language).
- Compliance Manuals can include graphics.
- Compliance Manuals can include Q&As.
- ***We would like input on how compliance manuals can be improved.***



Compliance Manual Update Schedule

Utility Team (and others) provide input to CEC	April 2015 (residential manual) May 2015 (nonresidential manual)
CEC releases first draft of manuals for public review	May 2015
CEC releases second draft of manuals for public review	Fall 2015
CEC approves 2016 Title 24 Compliance Manuals	December 2015



LOOKING FORWARD TO 2019 TITLE 24 CODE CYCLE



Ideas for Future Title 24 Code Changes

- Improve compliance with existing DR requirements
 - Establish acceptance test for OCSTs
 - Improve acceptance tests for other DR measures
 - Third-party Certification Requirement
- Establish minimum response time for DR controls
- Establish submetering requirements for curtailable loads
- Mandatory requirement for OCST in residential buildings
- DR control requirements for forklift chargers in warehouses
- DR control requirements for 220v loads in residential buildings



Title 24 Resources

- CEC Websites
 - Main Title 24 Page
 - <http://www.energy.ca.gov/title24/>
 - 2013 Standards Main Page
 - <http://www.energy.ca.gov/title24/2013standards/index.html>
 - 2016 Standards Main Page
 - <http://www.energy.ca.gov/title24/2016standards/index.html>
- Statewide Utility Codes and Standards Team Websites
 - Compliance improvement website for current code: <http://energycodeace.com/>
 - Stakeholder website of proposed code changes: <http://title24stakeholders.com/>
- Statewide C&S Team Proposals for OCST and DDC
 - OCST:
http://www.energy.ca.gov/title24/2016standards/prerulemaking/documents/2014-11-03_workshop/comments/Utility_Team_Proposed_Revisions_to_JA5_20-0-14_TN-74068.pdf
 - Proposals based on ASHRAE 90.1-2013 (DDC):
http://www.energy.ca.gov/title24/2016standards/prerulemaking/documents/2014-06-12_workshop/final_case_reports/2016_Title_24_Final_CASE_Report_Proposals_Based_on_ASHRAE_90-1-2013.pdf



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Q&A

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