DOCKETED

Docket Number:	17-BSTD-01
Project Title:	2019 Building Energy Efficiency Standards PreRulemaking
TN #:	220004
Document Title:	Hospitals New Measure Proposal
Description:	BUILDING ENERGY EFFICIENCY MEASURE PROPOSAL TO THE CALIFORNIA ENERGY COMMISSION FOR THE 2019 UPDATE TO THE TITLE 24 PART 6 BUILDING ENERGY EFFICIENCY STANDARDS CALIFORNIA ENERGY EFFICIENCY BUILDING STANDARDS FOR LICENSED HEALTHCARE FACILITIES IN 2020
Filer:	Hilary Fiese
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	7/3/2017 9:17:32 AM
Docketed Date:	7/3/2017

BUILDING ENERGY EFFICIENCY MEASURE PROPOSAL TO THE

CALIFORNIA ENERGY COMMISSION

FOR THE 2019 UPDATE TO THE

TITLE 24 PART 6 BUILDING ENERGY EFFICIENCY STANDARDS

CALIFORNIA ENERGY EFFICIENCY BUILDING STANDARDS FOR LICENSED HEALTHCARE FACILITIES IN 2020

Nonresidential Envelope, Nonresidential HVAC, Nonresidential Water Heating, Nonresidential Lighting, Process Loads

Prepared by: California Energy Commission June 29, 2017

CEC-400-2017-007

TABLE OF CONTENTS

List of Tables and Figures

Document Information

Category: Codes and Standards

Keywords: Statewide Codes and Standards, Title 24, 2019, efficiency, Occupancy Group I, hospital, health care, healthcare, healthcare facility, nursing homes, foster care facilities, detoxification facilities

EXECUTIVE SUMMARY

Introduction

This proposal presents recommendations to support the California Energy Commission's efforts to update the Title 24 Standards to include or upgrade requirements for various technologies in California's *Building Energy Efficiency Standards*. The Energy Commission sponsored this effort. This proposal seeks to create new measures that will result in cost-effective enhancements to energy efficiency in buildings. This report and the code change proposal presented herein are part of the Energy Commission's effort to develop technical and cost-effectiveness information for proposed regulations on building energy-efficient design practices and technologies.

This report proposes expanding the scope of the building standards to include hospitals and healthcare facilities. The report contains pertinent information that justifies the code change.

Scope of Code Change Proposal

California Energy Efficiency Standards for Healthcare Facilities will affect the following code documents listed in Table 1.

Table 1: Scope of Code Change Proposal

Standards Requirements (see note below)	Compliance Option	Appendix	Modeling Algorithms	Simulation Engine	Forms
M, Ps, and Pm	No	No	No	No	Yes

Note: An (M) indicates mandatory requirements, (Ps) Prescriptive, (Pm) Performance.

Measure Description and Background

The 1974 Warren-Alquist State Energy Resources Conservation and Development Act, which created the California Energy Commission, directs the Commission to set energy efficiency standards for residential and nonresidential buildings. The first standards were adopted in 1977 and went into effect in 1978. Those standards defined the scope of residential and nonresidential buildings that are subject to the standards, including hospitals. The scope remained the same until 1982, when the standards were updated, and hospitals were incorrectly excluded from the nonresidential building definition. There is no record of why this change was made. Unfortunately, subsequent versions of the standards also incorporated this definition, effectively excluding hospitals from energy efficiency standards.

Many licensed medical facilities built in California have been awarded recognition in energy efficiency and environmental excellence or received certification as Leadership in Energy and Environmental Design (LEED) facilities. There are numerous hospital campuses that use combined heat and power (CHP), cogeneration, fuel cells, and microturbines. Just as with other nonresidential buildings, it is increasingly the norm rather than the exception for healthcare facilities to install solar energy collectors on their roofs and parking lots. The healthcare industry continues to pursue environmental sustainability and energy cost management, but without jeopardizing their primary responsibility to treat patients.

The Energy Commission has spent more than forty years developing building energy efficiency standards for California and is known both nationally and internationally for its work in this area. The Commission is in a position to support the community of healthcare facility developers and operators by providing consistent and frequently updated energy efficiency guidance. Through the careful application of the energy code, the Commission can support healthcare facility energy goals while allowing developers to focus on their primary responsibility of building facilities that help patients heal and healthcare workers perform at their peak.

Energy Commission staff, in consultation with the staff of the Office of Statewide Health Planning and Development (OSHPD), recommends a phased introduction to nonresidential energy efficiency codes for licensed medical facilities to allow for the thorough education of affected stakeholders and to ensure that the proposed measures will have no negative impact on patient or healthcare staff health and welfare. The first phase would begin with the 2019 code cycle (going into effect on January 1, 2020). The proposed first phase would not introduce significant new healthcare facility-specific code, but rather add relevant definitions and extend a subset of existing and proven commercial building energy efficiency standards that have no potential adverse effect on patient health. By extending the scope of the building standards, developing appropriate code definitions, and then applying exceptions where necessary, the 2019 code cycle can lay the foundation for sensible and cost-effective future energy building codes for hospitals and licensed medical facilities in the state.

Market Analysis and Regulatory Impact Assessment

All these measures have previously been proven cost-effective for comparable nonresidential buildings. As discussed in Section 3 below, this proposal would increase the wealth of the State of California and should help support efforts to manage healthcare costs for the people of the state.

Statewide Energy Impacts

Staff incorporates by reference the analyses and findings in the reports prepared for each of the measures identified. See Section 4 for links to the respective analyses.

Cost-Effectiveness

To prove the cost-effectiveness of the proposed energy efficiency standards for licensed healthcare facilities, Energy Commission staff relies on the existing analysis of cost-effectiveness for nonresidential buildings. Licensed healthcare facilities are a subset of nonresidential buildings that generally operate 24/7 and generally have a higher energy use intensity compared to other nonresidential buildings. This is a conservative assumption because the costs of nonexempted code sections applied to hospitals will be comparable to other nonresidential buildings, while energy savings will be the same or greater. In areas where cost-effectiveness is in question, staff proposes exemptions for this code cycle and will conduct a rigorous analysis and public review process in a future code cycle.

Greenhouse Gas- and Water-Related Impacts

Staff incorporates by reference the analyses and findings in the reports prepared for each of the measures identified. See Section 4 for links to the respective analyses.

1. INTRODUCTION

The California Energy Commission sponsored this effort, in consultation with the Office of Statewide Health Planning and Development (OSHPD), to prepare and submit a proposal that will promote cost-effective enhancements to energy efficiency in hospitals and similar healthcare facilities. This report and the code change proposal presented herein are part of the effort to develop technical and cost-effectiveness information for proposed regulations on building energy efficiency design practices and technologies.

This code change proposal described in this report would expand the scope of the building standards to include Occupancy Group I buildings. The report contains pertinent information that justifies the proposed code change.

2. MEASURE DESCRIPTION

2.1 Measure Overview

Licensed healthcare facilities and hospitals have historically been interpreted to be outside the scope of building energy efficiency standards in California. Recent analysis by the Energy Commission and OSHPD has determined that this exclusion is in error. The Commission proposes to expand the scope of the standards to include Occupancy Group I buildings, with an exception for Occupancy Groups I-1, I-3, and I-4.

2.2 Measure History

The Warren-Alquist Act directs the Energy Commission to set standards for residential and nonresidential buildings. The act defines a "nonresidential building" as follows:

> § 25130. Nonresidential building
> "Nonresidential" building means any building which is heated or cooled in its interior, and is of an occupancy type other than Type H, I, or J, as defined in the Uniform Building Code, 1973 edition, as adopted by the International Conference of Building Officials.

In the 1973 Uniform Building Code (UBC), Group (or Type) H buildings are hotels and apartment houses, and Group I buildings are residential occupancies; Group J are miscellaneous structures that are not usually conditioned, such as garages, carports, tall fences, and storage tanks. By referencing the 1973 UBC, the statute definition essentially says that nonresidential buildings are everything except residential buildings and unconditioned spaces. In 1976, the UBC dramatically changed the category definitions to more closely align the letter codes with the types of buildings represented, redefining Group I occupancies as "Institutional" buildings.

When the Energy Commission was created in the second half of 1975, staff began developing the first building energy efficiency standards, which were adopted in 1977 and went into effect

in 1978. Those standards defined nonresidential buildings consistently with the statute and included a “crosswalk” to the 1976 UBC codes:

> "Nonresidential Building" means any building having conditioned space with an occupancy group other than Group H, I, or J as defined in the Uniform Building Code, 1973 edition, as adopted by the International Conference of Building Officials. These occupancies are equivalent to occupancy groups R1, R3, and M as defined in the Uniform Building Code, 1976 edition.

The 1980 revision of the standards kept this definition, but when the standards were updated in 1982, this critical definition was changed. The 1982 standards incorrectly state the scope of nonresidential buildings as being defined by the 1979 UBC:

> "Nonresidential building" means any building which is of an occupancy type A, B, E, and/or H as defined in the Uniform Building Code, 1979 Edition.

There is no record of why the change was made. Unfortunately, subsequent versions of the standards incorporated the 1982 definition, which had the effect of erroneously excluding Type I (Institutional) buildings, including hospitals. This was discovered in 2015 during a discussion between OSHPD and the Energy Commission on the problem of some new hospitals in California not meeting minimum national energy efficiency standards and thus having higher operating costs than similar facilities in other states.

2.3 Summary of Proposed Changes to Code Documents

The sections below summarize the proposed changes to Title 24.

2.3.1 Standards Change Summary

This proposal would modify the following sections of the *Building Energy Efficiency Standards*. See *Section 7* of this report for the detailed proposed revisions to the standards language.

SECTION 100.0 – SCOPE

Subsection 100.0(a) Buildings Covered: In addition to the currently covered Occupancy Groups A, B, E, F, H, M, R, S, and U, this section will be expanded to include Occupancy Group I (California Code of Regulations, Title 24, Section 2, Chapter 3 Use and Occupancy Classification), however at this time Occupancy Groups I-1, I-3, and I-4 will be exempted so only I-2 (§308.4) and I-2.1 (§308.4.1) are addressed in this proposal. For reference the two sections addressed here are:

> **308.4 Institutional Group I-2.** Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation or classified as nonambulatory or bedridden. This group shall include, but not be limited to, the following:
>
> Foster care facilities
> Detoxification facilities
> Hospitals

Nursing homes
Psychiatric hospitals

308.4.1 Institutional Group I-2.1 Ambulatory health care facility. A healthcare facility that receives persons for outpatient medical care that may render the patient incapable of unassisted self-preservation and where each tenant space accommodates more than five such patients.

Adding Occupancy Group I to Section 100.0 will result in necessary changes to the following sections (and their associated requirements):

Table 2: Sections of Standards Affected by Proposed Code Change

Title 24, Part 6 Section Number	Section Title	Mandatory (M) Prescriptive (Ps) Performance (Pm)	Modify Existing (E) or New Section (N)
100.1(b)	Definitions and Rules of Construction	M	E
120.1	Requirements for Ventilation	M	E
120.2 (b)	Criteria for Zonal Thermostatic Controls	M	E
120.2 (e)	Shut-Off and Resent Controls for Space-Conditioning systems	M	E
120.2 (h)	Automatic Demand Shed Controls	M	E
120.4	Requirements for Air Distributions Systems Ducts and Plenums	M	E
120.5	Required Nonresidential Mechanical System Acceptance	M	E
120.6(e)	Mandatory Requirements for Compressed Air Systems	M	E
120.6(f)	Mandatory Requirements for Elevators	M	E
120.10	Mandatory Requirements for Demand Management	M	E
130.1(a),(c),(e)	Mandatory Indoor Lighting Controls	M	E
130.3(a)2	Sign Lighting Controls	M	E
130.5(b),(d)	Electrical Power Distribution Systems	M	E
140.4(b)	Calculations [for Space Conditioning Systems]	Ps	E
140.4(c)	Power Consumption of Fans	Ps	E
140.4(d)	Space-Conditioning Zone Controls	Ps	E

Title 24, Part 6 Section Number	Section Title	Mandatory (M) Prescriptive (Ps) Performance (Pm)	Modify Existing (E) or New Section (N)
140.4(e)	Economizers	Ps	E
140.4(f)	Supply Air Temperature Reset Controls	Ps	E
140.4(n)	Mechanical System Shut-Off	Ps	E
140.6(a)3	Calculation of Actual Indoor Lighting Power, Lighting Wattage Excluded	Ps	E
TABLE 140.6-B	Complete Building Method Lighting Power Density Values	Ps	E
TABLE 140.6-C	Area Category Method – Lighting Power Density Values	Ps	E

While changes to the efficiency requirements of these sections are not a part of this proposal, because these sections would now apply to buildings within a new occupancy group, new definitions, new exceptions, and new clarifying language specific to this occupancy group will be added as follows:

Table 3: Summary of Code Changes

Title 24, Part 6 Section Number	Section Title	Description of Change
100.0	Scope	Expand scope to include Occupancy Group I, excluding I-1, I-3, and I-4
100.1(b)	Definitions and Rules of Construction	Add a definition for “healthcare facility” and delete the definitions of “medical and clinical care areas” and “medical buildings and clinical buildings”
120.1	Requirements for Ventilation	Add an exception for healthcare facilities.
120.2 (b)	Criteria for Zonal Thermostatic Controls	Add an exception for healthcare facilities.
120.2 (e)	Shut-Off and Resent Controls for Space-conditioning systems	Add an exception for healthcare facilities.
120.2 (h)	Automatic Demand Shed Controls	Add an exception for healthcare facilities.
120.4	Requirements for Air Distributions Systems Ducts and Plenums	Add an exception for healthcare facilities.
120.5	Required Nonresidential Mechanical System Acceptance	Add an exception for healthcare facilities.
120.6(e)	Mandatory Requirements for Compressed Air Systems	Add an exception for healthcare facilities.
120.6(f)	Mandatory Requirements for Elevators	Add an exception for healthcare facilities from occupancy fan shutoff requirements

Title 24, Part 6 Section Number	Section Title	Description of Change
130.1	Mandatory Indoor Lighting Controls	Add a general exception for lighting connected to a Life Safety Branch or Critical Branch per Section 517 of the Electrical Code. Add exceptions to exclude patient and emergency care areas from automatic shutoff and demand responsive requirements to avoid disruption to medical care services.
130.1(a)	Mandatory Indoor Lighting Controls – Area Controls	Add exceptions to exclude psychiatric patient care areas from area control requirements.
130.1(c)	Mandatory Indoor Lighting Controls – Shut-OFF Controls	Add exceptions to exclude patient areas from automatic shutoff control requirements to avoid disruption to medical care services.
130.1(e)	Mandatory Indoor Lighting Controls – Demand Responsive Controls	Add exceptions to exclude patient care areas from demand responsive control requirements to avoid disruption to medical care services.
130.3(a)2	Sign Lighting Controls	Modify exception to exclude outdoor signs for healthcare facilities that stay on at all times.
130.5(b)	Electrical Power Distribution Systems – Separation of Circuits for Energy Monitoring	Add exception for electrical power distribution systems subject to California Electrical Code Article 517.
130.5(d)	Electrical Power Distribution Systems – Controlled Receptacles and Circuit Controls for Receptacles	Add an exception for receptacles in healthcare facilities.
140.4(b)	Calculations [for Space Conditioning Systems]	Add an exception for healthcare facilities.
140.4(c)	Power Consumption of Fans	Add an exception for healthcare facilities.
140.4(d)	Space-Conditioning Zone Controls	Add an exception for healthcare facilities.
140.4(e)	Economizers	Add an exception for healthcare facilities.
140.4(f)	Supply Air Temperature Reset Controls	Add an exception for healthcare facilities.
140.4(n)	Mechanical System Shut-Off	Add an exception for healthcare facilities.
140.6(a)3F	Calculation of Actual Indoor Lighting Power, Lighting Wattage Excluded	Clarify the lighting power exemption for special task lighting is applicable for “healthcare facilities” and medical equipment in “office buildings”. Exclude lighting connected to a Life Safety Branch or Critical Branch per Section 517 of the Electrical Code.
TABLE 140.6-B	Complete Building Method – Lighting Power Density Values	Revise lighting power density values (LPD)
TABLE 140.6-C	Area Category Method – Lighting Power Density Values	Revise lighting power density values (LPD)

2.3.2 Reference Appendices Change Summary

This proposed code change will not modify the appendices of the standards.

2.3.3 Alternative Calculation Method (ACM) Reference Manual Change Summary

Because this code change is to extend existing requirements to buildings and does not add any new requirements, it will not modify the appendices of the standards.

2.3.4 Compliance Manual Change Summary

This code change will require that each section of the nonresidential compliance manual be reviewed and updated to include relevant examples and guidance for licensed healthcare facilities. This code change will result in minimal or no changes where existing nonresidential guidance applies to licensed healthcare facilities; however, in areas where licensed healthcare facilities are very different from other nonresidential buildings, there will need to be substantial revisions.

This code change will not result in any changes to the residential compliance manual.

2.3.5 Compliance Forms Change Summary

The proposed code change will modify the following compliance forms listed below. No new forms will be added.

- NRCC-MCH-03-E – Mechanical Ventilation and Reheat. A new version of this form will be created to document the ventilation requirements for healthcare facilities.
- NRCC-MCH-07-E – Fan Power Consumption. Language will be revised to reflect the changes to the fan power adjustment index.
- NRCC-PRC-12-E – Elevator Lighting and Ventilation Controls. Language will be revised to exempt ventilation for elevators in healthcare facilities.
- NRCC-LTI-01-E – Indoor Lighting. Language will be revised to add healthcare facilities as one of the building types.
- NRCC-LTS-01-E – Sign Lighting. Language will be revised to exempt outdoor signs that may not be turned off due to emergency care service at healthcare facilities.

2.4 Regulatory Context

2.4.1 Existing Standards

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1 provides minimum energy efficiency requirements for all buildings other than residential buildings (ASHRAE 90.1 §2.1 – 2.2). ASHRAE Standard 90.1 allows some exemptions, but only for (a) buildings that do not use electricity or fossil fuels; (b) buildings that are specifically exempted; and (c) where such regulations would circumvent safety, health, or environmental requirements. ASHRAE 90.1 does not contain exemptions for hospitals, and ASHRAE 90.1 has been found not to circumvent safety, health, or environmental requirements in most other states.

2.4.2 Relationship to Other Title 24 Requirements

This code change proposal extends the scope of Title 24, Part 6, nonresidential building standards to include licensed healthcare facilities, but it will neither overlap with other sections of Title 24 nor require changes to existing code language in other sections.

2.4.3 Relationship to Federal Laws

The federal "Energy Conservation Standards for New Buildings Act of 1976" (U.S. Code Title 42, Chapter 81, Subchapter II) regulates the minimum state requirements for energy efficiency in all states, as well as in federal buildings. These regulations distinguish only two kinds of buildings: residential and commercial (42 U.S. Code §6832(4) and (9)). These regulations define "Commercial Building" as "any building other than a residential building, including any building developed for industrial or public purposes." Thus, the federal energy regulations apply to hospital buildings, as a subset of commercial buildings.

These regulations require each state to "certify to the Secretary [of Energy] that it has reviewed and updated the provisions of its commercial building code regarding energy efficiency. Such certification shall include demonstration that such State's code provisions meet or exceed the requirements of ASHRAE Standard 90.1."

Federal regulations further require the U.S. Secretary of Energy to determine whether revisions to ASHRAE 90.1 improve energy efficiency in commercial buildings, and to publish notice of findings in the *Federal Register* (42 U.S. Code §6833(b)(2)(A)). In 2014, the secretary published findings that the 2013 version of ASHRAE 90.1 would "improve energy efficiency in buildings subject to the code" and that states are therefore "required to certify that they have reviewed their commercial building code regarding energy efficiency, and, as necessary, update their codes to meet or exceed Standard 90.1-2013." (*Federal Register* 2014-22882).

2.4.4 Relationship to Industry Standards

The Facility Guidelines Institute (FGI) *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* and *Guidelines for Design and Construction of Residential Health, Care, and Support Facilities* provide general recommendations for sustainability and energy efficiency in hospitals and healthcare facilities. The proposed changes to Title 24 are consistent with the FGI recommendations; however, they are proposed as specific requirements where they are cost-effective and represent no risk to the primary function of healthcare facilities.

2.5 Compliance and Enforcement

Hospital construction is overseen by OSHPD, which fills the role (and assumes the responsibilities) that ordinarily fall to the local building official in other building types. This oversight ensures a highly rigorous level of compliance, verification, and enforcement with respect to all building code requirements that apply to hospitals.

In addition, since this proposed code change does not introduce new requirements, but rather expands the scope of existing requirements to new building types, existing compliance and enforcement tools will be available to support both the hospital construction industry and OSHPD's implementation of these requirements.

3. MARKET ANALYSIS

3.1 Market Structure

The market structure (principal manufacturers/suppliers) for hardware required due to this proposal is the same as for those proposals when applied to other nonresidential buildings. Staff relies on the existing analysis of these standards for other nonresidential buildings.

3.2 Technical Feasibility, Market Availability, and Current Practices

All the proposed standards are applied to nonresidential buildings or have been proven technically feasible for nonresidential buildings. Staff relies on the existing analysis of these standards for other nonresidential buildings. In areas where either technical feasibility or market availability is in question, staff proposes exemptions for this code cycle and will conduct a rigorous analysis in a future code cycle.

3.3 Market Impacts and Economic Assessments

3.3.1 Effect on Building Designers

Hospital building designers will need to learn and apply the new requirements, potentially incurring some additional short-term costs for those designers who are not accustomed to designing nonresidential buildings other than hospitals. However, current hospital construction practices include a consideration of ASHRAE 90.1, which contains many similarities with Title 24, Part 6, so hospital designers should be at least familiar with many of the newly relevant concepts.

3.3.2 Effect on Energy Consultants

This proposal will have little to no effect on energy consultants.

3.3.3 Effect on Occupational Safety and Health

The proposed code change does not alter any existing federal, state, or local regulations pertaining to safety and health, including rules enforced by the California Department of Occupational Safety and Health (Cal/OSHA). All existing health and safety rules will remain in place. Complying with the proposed code change is not anticipated to have any effect on the safety or health of occupants or those involved with the construction, commissioning, or ongoing maintenance of buildings.

3.3.4 Effect on Building Owners and Occupants

Builders incurring higher initial costs of construction may pass on those costs; however, the new requirements result in savings to the building owner over the lifetime of the measure that will offset those potential increased costs. The proposed energy efficiency standards will reduce costs of energy to hospital owners and operators, reducing operating costs and potentially reducing the overall costs of care.

3.3.5 Effect on Building Component Retailers

Retailers, manufacturers, and distributors may see a small increase in demand for certain products, but the overall effect relative to statewide construction will be small.

3.3.6 Effect on Building Inspectors

These changes will have a small but likely insignificant effect on building inspectors. The measures proposed for application to licensed healthcare facilities are the same that inspectors are already familiar with for other nonresidential buildings. In addition, building inspectors already coordinate their review of nonresidential buildings with OSHPD when those buildings and areas are associated with the construction of a hospital. Since OSHPD will maintain a lead role in the inspection and permitting of licensed healthcare facilities, these new standards should create a relatively small amount of additional work for local building inspectors.

3.3.7 Effect on Statewide Employment

This proposal will have little to no effect on statewide employment.

3.4 Economic Impacts

The proposed Title 24 code changes, including this expansion of scope to include buildings in Occupancy Group I-2, are expected to increase job creation, income, and investment in California. Because of the proposed code changes, it is anticipated that California residents and businesses will spend less money out of state to fund energy imports, and local spending is expected to increase due to higher disposable incomes due to reduced energy costs.[1] In addition, more dollars will be spent in the state on improving the energy efficiency of new buildings.

Macroeconomic analysis of past energy efficiency programs and forward-looking analysis of energy efficiency policies and investments similarly show the benefits to California's economy of investments in energy efficiency (Roland-Holst 2008; UC Berkeley 2011).

3.4.1 Creation or Elimination of Jobs

This proposal will not create or eliminate a significant number of jobs.

3.4.2 Creation or Elimination of Businesses Within California

This proposal will not create or eliminate a significant number of businesses in California.

3.4.3 Competitive Advantages or Disadvantages for Businesses Within California

Hospitals in California are expected to benefit from an overall cost-effective reduction in energy costs.

[1] Energy efficiency measures may result in reduced power plant construction, both in state and out of state. These plants tend to be highly capital-intensive and often rely on equipment produced out of state; thus, the authors expect that displaced power plant spending will be more than offset by job growth in other sectors within California.

3.4.4 Increase or Decrease of Investments in the State of California

Since energy expenditures generally result in a net export of capital from California, reduced energy costs may result in an increase of available capital for investment in state.

3.4.5 Effects on Innovation in Products, Materials, or Processes

Since the measures proposed here for licensed healthcare facilities are the same proven cost-effective measures in use for other nonresidential buildings in California, this proposal is not expected to have a significant effect on products, materials, or processes.

3.4.6 Effects on the State General Fund, State Special Funds, and Local Governments

This measure is expected to have a small but positive effect on state and local government revenues. Lower energy costs for licensed healthcare facilities will help keep healthcare operating costs down, which should help keep overall healthcare costs down. Lower healthcare costs will have a positive impact on both local business profit and on gross taxpayer incomes. Both outcomes should have a positive impact on state and local tax revenue.

3.5.6.1 Cost of Enforcement

Cost to the State

This measure is expected to result in a small increase in the cost of enforcement for OSHPD, since that agency has lead enforcement responsibility for hospital construction. The Energy Commission will support OSHPD staff as it moves to implement these requirements.

Cost to Local Governments

This measure should present no significant additional costs to local governments since the enforcement of building standards on licensed healthcare facilities is handled by OSHPD. In the long term, this measure may reduce local enforcement responsibilities for building areas associated with hospital projects once OSHPD becomes experienced with Title 24, Part 6.

3.5.6.2 Effects on Specific Persons

This proposal is not expected to affect a specific person or protected class. In the long term, this proposal should support efforts to minimize healthcare costs and, thus, have a positive effect on patients.

4. Energy Savings

All the measures that would become applicable following this amendment to Part 6 were found, at the respective adoptions, to save energy when applied to new nonresidential construction. These findings were based on analyses included in the documents relied upon in each rulemaking record. Staff finds that these analyses are also accurate in describing energy savings expected for newly constructed licensed healthcare facilities: staff finds that the ways in which hospital buildings differ from other types of nonresidential buildings do not negatively affect the efficacy of building energy efficiency measures nor create situations where efficiency measures cease being effective.

Therefore, staff incorporates by reference the analyses and findings in the reports prepared for the measures identified as demonstrating that the measures save energy in licensed healthcare facilities. The reports containing these analyses are available here:

2016 Documents Relied Upon:
http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/dru_title24_parts_01_06/
2013 Documents Relied Upon:
http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/docs_relied_upon.html
2008 Documents Relied Upon:
http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/docs_relied_upon.html
2005 Documents Relied Upon:
http://energyarchive.ca.gov/title24/2005standards/archive/rulemaking/documents/document_list.html
2001 Documents Relied Upon:
http://www.energy.ca.gov/title24/archive/2001standards/associated_documents/index.html

5. Life-Cycle Cost and Cost-Effectiveness

The same rationale discussed in Section 4, Energy Savings, applies to the life cycle and cost-effectiveness of these measures when applied to licensed healthcare facilities.

6. First-Year Statewide Impacts

The same rationale discussed in Section 4, Energy Savings, applies to the first year statewide impacts of these measures when applied to licensed healthcare facilities.

7. PROPOSED REVISIONS TO CODE LANGUAGE

The proposed changes to the standards, reference appendices, and the *ACM Reference Manuals* are provided below. Changes to the 2013 documents are marked with underlining (new language) and ~~strikethroughs~~ (deletions).

7.1 Standards

SECTION 100.0 – SCOPE

(a) Buildings Covered. The provisions of Part 6 apply to all buildings:

1. That are of Occupancy Group A, B, E, F, H, I, M, R, S, or U; and

[…]

EXCEPTION 3 to Section 100.0(a): Buildings in Occupancy Group I-1, I-3, and I-4.

SECTION 100.1(b) – DEFINITIONS

NONRESIDENTIAL BUILDING is any building which is identified in the California Building Code Table; Description of Occupancy as Group A, B, E, F, H, I, M, R, S, or U; as defined by Part 2 of ~~Title24~~ Title 24 of the California Code of Regulation.

HEALTHCARE FACILITY is any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, §1204 or Chapter 2, §1250

The definitions of "Medical Buildings and Clinic Buildings" and "Medical and Clinical Care Area" will be deleted, any medical and clinic buildings that do not fit in the definition for healthcare facility will be considered "office buildings":

~~**MEDICAL BUILDINGS AND CLINIC BUILDNGS** are non "I" occupancy buildings in which a minimum of 90 percent of the building floor area are rooms where medical or clinical care is provided, does not provide overnight patient care, and is used to provide physical and mental care through medical, dental, or psychological examination and treatment.~~

~~**MEDICAL AND CLINICAL CARE AREA** is a non "I" occupancy room or area in a building that does not provide overnight patient care and that is used to provide physical and mental care through medical, dental, or psychological examination and treatment, including, but not limited to, laboratories and treatment spaces.~~

The code already references California Code of Regulations, Title 24, Part 2 for other relevant definitions.

SECTION 110.3 – MANDATORY REQUIREMENTS FOR SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT

(a) Certification by Manufacturers. Any service water-heating system or equipment may be installed only if the manufacturer has certified that the system or equipment complies with all of the requirements of this subsection for that system or equipment.

1. Temperature controls for service water heating systems. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 3, Chapter 50 of the ASHRAE Handbook, HVAC Applications Volume or Table 613.1 of the California Plumbing Code for healthcare facilities.

SECTION 110.10(a)4 – MANDATORY REQUIREMENTS FOR SOLAR READY BUILDINGS

(a) **Covered Occupancies.**

4. **All Other Nonresidential Buildings**. All other nonresidential buildings with three habitable stories or fewer shall comply with the requirements of Section 110.10(b) through 110.10(d).

EXCEPTION to Section 110.10(a)4: Healthcare facilities.

SECTION 120.1 – REQUIREMENTS FOR VENTILATION

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the requirements of Section 120.1(a) through 120.1(e).

(a) **General Requirements.**

1. All enclosed spaces in a building shall be ventilated in accordance with the requirements of this section and the California Building Code.

EXCEPTION 1 to Section 120.1(a)1: Refrigerated warehouses and other spaces or buildings that are not normally used for human occupancy and work.

EXCEPTION 2 to Section 120.1(a)1: Healthcare facilities shall be ventilated in accordance with Chapter 4 of the California Mechanical Code, as amended by OSHPD.

[…]

(c) **Operation and Control Requirements for Minimum Quantities of Outdoor Air.**

3. Required Demand Control Ventilation. HVAC systems with the following characteristics shall have demand ventilation controls complying with 120.1(c)4:

[…]

EXCEPTION 1 to Section 120.1(c)3: Classrooms, call centers, office spaces served by multiple zone systems that are continuously occupied during normal business hours with occupant density greater than 25 people per 1000 ft² as specified by Section 120.1(b)2B, healthcare facilities ~~and medical buildings~~, and public areas of social services buildings are not required to have demand control ventilation.

SECTION 120.2 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS

(b) **Criteria for Zonal Thermostatic Controls.** The individual thermostatic controls required by Section 120.2(a) shall meet the following requirements as applicable:

1. Where used to control comfort heating, the thermostatic controls shall be capable of being set, locally or remotely, down to 55°F or lower.

2. Where used to control comfort cooling, the thermostatic controls shall be capable of being set, locally or remotely, up to 85°F or higher.

3. Where used to control both comfort heating and comfort cooling, the thermostatic controls shall meet Items 1 and 2 and shall be capable of providing a temperature range or dead band of at least 5°F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

EXCEPTION to Section 120.2(b)3: Systems with thermostats that require manual changeover between heating and cooling modes.

4. Thermostatic controls for all single zone air conditioners and heat pumps, shall comply with the requirements of Section 110.2(c) and Reference Joint Appendix JA5 or, if equipped with DDC to the Zone level, with the Automatic Demand Shed Controls of Section 120.2(h).

   EXCEPTION 1 to Section 120.2(b)4: Systems serving exempt process loads that must have constant temperatures to prevent degradation of materials, a process, plants or animals.

   EXCEPTION 2 to Section 120.2(b)4: Package terminal air conditioners, package terminal heat pumps, room air conditioners, and room air-conditioner heat pumps.

EXCEPTION to Section 120.2(b): Systems serving healthcare facilities.

[…]

(e) **Shut-Off and Reset Controls for Space-Conditioning Systems.** Each space-conditioning system shall be installed with controls that comply with the following:

1. The control shall be capable of automatically shutting off the system during periods of nonuse and shall have:

   A. An automatic time switch control device complying with Section 110.9, with an accessible manual override that allows operation of the system for up to 4 hours; or

   B. An occupancy sensor; or

   C. A 4-hour timer that can be manually operated.

   EXCEPTION to Section 120.2(e)1: Mechanical systems serving retail stores and associated malls, restaurants, grocery stores, churches, and theaters equipped with 7-day programmable timers.

2. The control shall automatically restart and temporarily operate the system as required to maintain:

   A. A setback heating thermostat setpoint if the system provides mechanical heating; and

   EXCEPTION to Section 120.2(e)2A: Thermostat setback controls are not required in nonresidential buildings in areas where the Winter Median of Extremes outdoor air temperature determined in accordance with Section 140.4(b)4 is greater than 32°F.

   B. A setup cooling thermostat setpoint if the system provides mechanical cooling.

   EXCEPTION to Section 120.2(e)2B: Thermostat setup controls are not required in nonresidential buildings in areas where the Summer Design Dry Bulb 0.5 percent temperature determined in accordance with Section 140.4(b)4 is less than 100°F.

3. Multipurpose room less than 1000 square feet, classrooms greater than 750 square feet and conference, convention, auditorium and meeting center rooms greater than 750 square feet that do not have processes or operations that generate dusts, fumes, vapors or gases ~~gasses~~ shall be equipped with occupant sensor(s) to accomplish the following during unoccupied periods:

   A. Automatically setup the operating cooling temperature set point by 2°F or more and setback the operating heating temperature set point by 2˚F or more; and

   B. Automatically reset the minimum required ventilation rate with an occupant sensor ventilation control device according to Section 120.1(c)5.

EXCEPTION to Section 120.2(e): Systems serving healthcare facilities.

[…]

(h) **Automatic Demand Shed Controls.** HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for non-critical zones as follows:

[…]

EXCEPTION to Section 120.2(h): Systems serving healthcare facilities.

SECTION 120.4 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.4(a) through 120.4(f).

EXCEPTION 1 to Section 120.4: Systems serving healthcare facilities shall comply with the applicable requirements of the California Mechanical Code, as amended by OSHPD.

SECTION 120.5 – REQUIRED NONRESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.5(a) and 120.5(b).

EXCEPTION 1 to Section 120.5: Systems serving healthcare facilities.

SECTION 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES

(e) **Mandatory Requirements for Compressed Air Systems**. All new compressed air systems, and all additions or alterations of compressed air systems where the total combined online horsepower (hp) of the compressor(s) is 25 horsepower or more shall meet the requirements of Subsections 1 through 3. These requirements apply to the compressors and related controls that provide compressed air and do not apply to any equipment or controls that use or process the compressed air.

EXCEPTION 1 to Section 120.6(e): Alterations of existing compressed air systems that include one or more centrifugal compressors.

EXCEPTION 2 to Section 120.6(e): Compressed Air Systems, including medical gas, serving healthcare facilities

(f) **Mandatory Requirements for Elevators**

1. The light power density for the luminaires inside the elevator cab shall be no greater than 0.6 watts per square foot.

   EXCEPTION 1 to Section 120.6(f)1: Interior signal lighting and interior display lighting are not included in the calculation of lighting power density.

   EXCEPTION 2 to Section 120.6(f)1: Elevators in healthcare facilities.

2. Elevator cab ventilation fans for cabs without space conditioning shall not exceed 0.33 watts per CFM as measured at maximum speed.

   EXCEPTION to Section 120.6(f)2: Ventilation rates for elevators in healthcare facilities shall comply with Chapter 4 of the California Mechanical Code.

3. When the elevator cab is stopped and unoccupied with doors closed for over 15 minutes, the cab interior lighting and ventilation fans shall be switched off until elevator cab operation resumes.

   EXCEPTION to Section 120.6(f)3: Elevators in healthcare facilities shall only switch off the elevator cab lighting.

[…]

SECTION 120.10 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 120.10(a) through 120.10(d)

EXCEPTION to Section 120.10: Healthcare facilities.

SECTION 130.1 – MANDATORY INDOOR LIGHTING CONTROLS

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 130.1(a) through 130.1(e).

EXCEPTION to Section 130.1: Lighting connected to a Life Safety Branch or Critical Branch as specified in Section 517 of the California Electrical Code.

(a) **Area Controls**

EXCEPTION 3 to Section 130.1(a)2: In psychiatric and secure areas in healthcare facilities, the lighting control may instead:

1. Be located so that a person using the lighting control can see the lights or area controlled by that lighting control; or
2. Provide a display that shows the current state of the controlled lighting.

[…]

(c) **Shut-Off Controls**

EXCEPTION 6 to Section 130.1(c): Patient care spaces in healthcare facilities.

[…]

(e) **Demand Responsive Controls**

1. Buildings larger than 10,000 square feet, excluding spaces with a lighting power density of 0.5 watts per square foot or less, shall be capable of automatically reducing lighting power in response to a Demand Response Signal; so that the total lighting power of non-excluded spaces can be lowered by a minimum of 15 percent below the total installed lighting power when a Demand Response Signal is received. Lighting shall be reduced in a manner consistent with uniform level of illumination requirements in TABLE 130.1-A.
2. Demand responsive controls and equipment shall be capable of receiving and automatically responding to at least one standards-based messaging protocol by enabling demand response after receiving a demand response signal.

EXCEPTION 1 to Section 130.1(e): Lighting not permitted by a health or life safety statute, ordinance, or regulation to be reduced shall not be counted toward the total lighting power.

EXCEPTION 2 to Section 130.1(e): Healthcare facilities.

SECTION 130.3 – SIGN LIGHTING CONTROLS

(a) **Controls for Sign Lighting.** All sign lighting shall meet the requirements below as applicable:

1. **Indoor Signs.** All indoor sign lighting shall be controlled with an automatic time-switch control or astronomical time-switch control.

   EXCEPTION to Section 130.3(a)1: Sign lighting in healthcare facilities.

2. **Outdoor Signs.** Outdoor signs lighting shall meet the following requirements as applicable:

   A. All outdoor sign lighting shall be controlled with a photocontrol in addition to an automatic time-switch control, or an astronomical time-switch control.

   EXCEPTION to Section 130.3(a)2A: Outdoor signs in tunnels, in healthcare facilities, and ~~signs~~ in large permanently covered outdoor areas that are intended to be continuously lit, 24 hours per day and 365 days per year.

   B. All outdoor sign lighting that is ON both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign lighting power by a minimum of 65 percent

during nighttime hours. Signs that are illuminated at night and for more than 1 hour during daylight hours shall be considered ON both day and night.

EXCEPTION to Section 130.3(a)2B: Outdoor signs in tunnels, in healthcare facilities, and in large covered areas that are intended to be illuminated both day and night.

3. **Demand Responsive Electronic Message Center Control.** An Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal.

   EXCEPTION to Section 130.3(a)3: Lighting for EMCs that is not permitted by a health or life safety statute, ordinance, or regulation to be reduced by 30 percent.

SECTION 130.5 – ELECTRICAL POWER DISTRIBUTION SYSTEMS

[…]

(b) Separation of Electrical Circuits for Electrical Energy Monitoring. Electrical power distribution systems shall be designed so that measurement devices can monitor the electrical energy usage of load types according to TABLE 130.5-B.

EXCEPTION 1 to Section 130.5(b): For each separate load type, up to 10 percent of the connected load may be of any type.

EXCEPTION 2 to Section 130.5(b): Electrical power distribution systems subject to California Electrical Code Article 517.

[…]

(d) Circuit Controls for 120-Volt Receptacles and Controlled Receptacles. In all buildings, both controlled and uncontrolled 120 volt receptacles shall be provided in office areas, lobbies, conference rooms, kitchen areas in office spaces, and copy rooms. Additionally, hotel/motel guest rooms shall comply with Section 130.5(d)4. Controlled receptacles shall meet the following requirements, as applicable:

1. Install a control capable of automatically shutting OFF the controlled receptacles when the space is typically unoccupied, either at the receptacle or circuit level. When an automatic time switch control is installed it shall incorporate an override control that allows the controlled receptacle to remain ON for no more than 2 hours when an override is initiated and an automatic holiday "shut-OFF" feature that turns OFF all loads for at least 24 hours and then resumes the normally scheduled operation. Countdown timer switches shall not be used to comply with the automatic time switch control requirements; and
2. Install at least one controlled receptacle within 6 feet from each uncontrolled receptacle, or install a splitwired receptacle with at least one controlled and one uncontrolled receptacle. Where receptacles are installed in modular furniture in open office areas, at least one controlled receptacle shall be installed at each workstation; and
3. Provide a permanent and durable marking for controlled receptacles or circuits to differentiate them from uncontrolled receptacles or circuits; and
4. For hotel and motel guest rooms, install controlled receptacles for at least one-half of the 120-volt receptacles in each guestroom. Electric circuits serving controlled receptacles in guestrooms shall have captive card key controls, occupancy sensing controls, or automatic controls so the power is switched off no longer than 30 minutes after the guestroom has been vacated.

NOTE: A hardwired power strip controlled by an occupant sensing control may be used to comply with Section 130.5(d). Plug-in strips and other plug-in devices shall not be used to comply with the requirements of this Section.

EXCEPTION 1 to Section 130.5(d): Receptacles that are only for the following purposes:

i. Receptacles specifically for refrigerators and water dispensers in kitchen areas.

ii. Receptacles located a minimum of six feet above the floor that are specifically for clocks.

iii. Receptacles for network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms.

iv. Receptacles on circuits rated more than 20 amperes.

v. Receptacles connected to an uninterruptible power supply (UPS) that are intended to be in continuous use, 24 hours per day/365 days per year, and are marked to differentiate them from other uncontrolled receptacles or circuits.

EXCEPTION 2 to Section 130.5(d): Receptacles in healthcare facilities.

SECTION 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE CONDITIONING SYSTEMS

(b) **Calculations.** In making equipment sizing calculations under Subsection (a), all of the following rules shall apply:

1. **Methodology.** The methodologies, computer programs, inputs, and assumptions approved by the Commission shall be used.

2. **Heating and cooling loads.** Heating and cooling system design loads shall be determined in accordance with the procedures described in the ASHRAE Handbook, Fundamentals Volume, or as specified in a method approved by the Commission.

   EXCEPTION to Section 140.4(b)2: Healthcare facilities.

3. **Indoor design conditions.** Indoor design temperature and humidity conditions for general comfort applications shall be determined in accordance with ASHRAE Standard 55 or the ASHRAE Handbook, Fundamentals Volume, Chapter 8, except that winter humidification and summer dehumidification shall not be required.

   EXCEPTION to Section 140.4(b)3: Healthcare facilities.

(c) **Power Consumption of Fans.** Each fan system used for space conditioning shall meet the requirements of Items 1, 2, 3 and 4 below. Total fan system power demand equals the sum of the power demand of all fans in the system that are required to operate at design conditions in order to supply air from the heating or cooling source to the conditioned space, and to return it back to the source or to exhaust it to the outdoors; however, total fan system power demand need not include (i) the additional power demand caused solely by air treatment or filtering systems with final pressure drops more than 245 pascals or one-inch water column (only the energy accounted for by the amount of pressure drop that is over 1 inch may be excluded), or (ii) fan system power caused solely by exempt process loads.

EXCEPTION to Section 140.4(c): Systems serving healthcare facilities.

(d) **Space-Conditioning Zone Controls.** Each space-conditioning zone shall have controls that prevent:

1. Reheating; and

2. Recooling; and

3. Simultaneous provisions of heating and cooling to the same zone, such as mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled either by cooling equipment or by economizer systems.

[…]

EXCEPTION 6 to Section 140.4(d): Systems serving healthcare facilities.

(e) **Economizers.**

1. Each cooling air handler that has a design total mechanical cooling capacity over 54,000 Btu/hr shall include either:

   A. An air economizer capable of modulating outside-air and return-air dampers to supply 100 percent of the design supply air quantity as outside-air; or

   B. A water economizer capable of providing 100 percent of the expected system cooling load as calculated in accordance with a method approved by the Commission, at outside air temperatures of 50°F dry-bulb and 45°F wet-bulb and below.

[...]

EXCEPTION 6 to Section 140.4(e): Healthcare facilities.

[...]

(f) **Supply Air Temperature Reset Controls.** Space-conditioning systems supplying heated or cooled air to multiple zones shall include controls that automatically reset supply-air temperatures. Air distribution systems serving zones that are likely to have constant loads, such as interior zones, shall be designed for the air flows resulting from the fully reset supply air temperature. Supply air temperature reset controls shall be:

1. In response to representative building loads or to outdoor air temperature; and

2. At least 25 percent of the difference between the design supply-air temperature and the design room air temperature.

[…]

EXCEPTION 4 to Section 140.4(f): Systems serving healthcare facilities.

[…]

(j) **Limitation of Air-Cooled Chillers.** Chilled water plants shall not have more than 300 tons provided by air-cooled chillers.

[…]

EXCEPTION 4 to Section 140.4(j): Systems serving healthcare facilities.

[…]

(n) **Mechanical System Shut-Off.** Any directly conditioned space with operable wall or roof openings to the outdoors shall be provided with interlock controls that disable or reset the temperature setpoint to 55°F for mechanical heating and disable or reset the temperature setpoint to 90°F for mechanical cooling to that space when any such opening is open for more than 5 minutes.

[…]

EXCEPTION 3 to Section 140.4(n): Healthcare facilities.

SECTION 140.6 – PRESCRIPTIVE REQUIREMENTS FOR INDOOR LIGHTING

(a) **Calculation of Actual Indoor Lighting Power.** The actual indoor lighting power of all proposed building areas is the total watts of all planned permanent and portable lighting systems in all areas of the proposed building; subject to the applicable adjustments under Subdivisions 1 through 3 of this subsection and the requirements of Subdivision 4 of this subsection.

[…]

3. **Lighting Wattage Excluded.** The watts of the following indoor lighting applications may be excluded from actual indoor lighting power density. (Indoor lighting not listed below shall comply with all applicable nonresidential indoor lighting requirements in Part 6.):

   […]

   F. In office buildings and healthcare facilities ~~medical and clinical buildings~~: Examination and surgical lights, low-ambient night-lights, and lighting integral to medical equipment, provided that these lighting systems are additions to and separately switched from a general lighting system.

   […]

   V. Lighting connected to a Life Safety Branch or Critical Branch as specified in Section 517 of the California Electrical Code

TABLE 140.6-B COMPLETE BUILDING METHOD LIGHTING POWER DENSITY VALUES

TABLE 140.6-C AREA CATEGORY METHOD – LIGHTING POWER DENSITY VALUES

Lighting Power Density (LPD) values for general lighting in healthcare facilities will be developed during this rulemaking. As proposed in §140.6(a)3F, healthcare facility lighting relating to patient care that is not considered general lighting would be exempt from LPD calculations.

7.2 Reference Appendices

No changes proposed.

7.3 ACM Reference Manual

No changes proposed.

7.4 Compliance Manuals

No changes proposed.

7.5 Compliance Forms

Changes to compliance forms will be developed in consultation with OSHPD once the final code changes are adopted.

8. REFERENCES

Roland-Holst, David. *"Energy Efficiency, Innovation, and Job Creation in California"*. 2008. http://are.berkeley.edu/~dwrh/CERES_Web/Docs/UCB%20Energy%20Innovation%20and%20Job%20Creation%2010-20-08.pdf . Accessed March 14, 2017.

[UC Berkeley] Donald Vial Center on Employment in the Green Economy. *"California Workforce Education and Training Needs Assessment for Energy Efficiency, Distributed Generation, and Demand Response"*. 2011. http://laborcenter.berkeley.edu/california-workforce-education-and-training-needs-assessment-for-energy-efficiency-distributed-generation-and-demand-response/ . Accessed March 14, 2017.

[FGI] Facility Guidelines Institute. 2014a. *"Guidelines for Design and Construction of Hospitals and Outpatient Facilities"*. Published by the American Society for Healthcare Engineering of the American Hospital Association. Chicago, IL.

__. 2014b *"Guidelines for Design and Construction of Residential Health, Care, and Support Facilities"*. Published by American Society for Healthcare Engineering of the American Hospital Association. Chicago, IL.