The Impact of Laws, Regulations and Codes on Future Healthcare Construction in California

October 15, 2009

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Deputy Director
FDD - California’s Building Department for Hospitals

“It’s a matter of life or death”

FDD’s Mission

“FDD safeguards the public health, safety and general welfare through regulation of the design and construction of healthcare facilities, to ensure they are capable of providing sustained services to the public.”
1,709 healthcare facilities under FDD jurisdiction statewide.
More than 4,000 buildings under FDD jurisdiction statewide.
213,013 licensed beds under FDD jurisdiction statewide.
2 office locations to serve clients:
   400 R Street, Sacramento, CA
   700 N. Alameda Street, Los Angeles, CA
243 positions – 57 positions are licensed structural engineers (23.5%).
Budget for FY 2009/10 = $56.3M

Seven areas of FDD responsibility:
- Plan reviews and approvals of hospital and skilled nursing construction projects.
- Building permits and construction observation of hospital and skilled nursing construction projects.
- Develop Building Standards for hospitals, skilled nursing, clinics and Correctional Treatment Centers.
- Hospital Seismic Retrofit Program (SB 1953).
- Hospital Building Safety Board.
- Research.
- Emergency response after an earthquake or other disaster.
The Impact of Laws Why Hospitals?

Olive View Medical Center after the San Fernando Earthquake
The Impact of Laws
Why Hospitals?

- Sylmar Earthquake (aka San Fernando Earthquake) caused the collapse of several hospitals

- Alfred E. Alquist Hospital Seismic Safety Act (HSSA 1973 - SB 519) required the state to review and inspect the structural system of hospital buildings.

- The HSSA requires that acute care hospitals be designed and constructed to withstand a major earthquake and remain operational immediately after the quake.

- The Alfred E. Alquist Hospital Facilities Seismic Safety Act was amended in 1983 (SB 961) to preempt local jurisdictions for hospitals
The Impact of Laws
Why Hospitals?

- Safety of patients and staff
- Provide medical assistance to earthquake victims
- Beacon of life and hope for a community
- Unique place in society’s survival capability
- Society remains all the more vulnerable
- Longer for a community to recover from an earthquake retards the area’s economic and social renewal
- Evacuation of seriously ill patients can be fatal
- Replacing a hospital building can take a decade or longer
- Important to protect the investment of taxpayer dollars
It was anticipated that hospitals would replace aging infrastructure, thus increasing the stock of complying hospital buildings in California.

Seismic Safety Act

1632 Pre-Act buildings
Northridge Earthquake
January 17, 1994
- Magnitude: 6.7
- Duration: 15 seconds
- Number of deaths: 51
- Number of injured: 9,000+
- Epicenter: 20 miles NW of LA
- Costs: 44 Billion
- 22,000 people left homeless
- Costliest disaster in US history to that date
The Impact of Laws
Why Hospitals?

Lessons learned from the Northridge Earthquake:

- Hospitals are not replacing their aging buildings as anticipated with the passage of the initial HSSA.

- The post-act hospital buildings performed very well structurally during the Northridge Earthquake with no buildings red tagged.

- The pre-Northridge special moment-resisting frames did not perform well resulting in one post-act hospital building being yellow tagged.

- The pre-act buildings performed very poorly during the Northridge Earthquake with 57% red or yellow tagged.

- If California is to have hospital buildings that comply with the HSSA, new legislation is required.
Initial SB 1953 Major Milestones

- **SB 1953 Enacted**
- **Seismic evaluations and plans for compliance submitted to OSHPD**
- **Improvements to allow evacuation 1.1.2002**
- **Extension SB1801 or Dim. Cap.**


- Prevent collapse and loss of life 1.1.2008
- By 1.1.2030

January 1, 2030

All buildings capable of continued operation
Extensions to SB 1953 Milestones

Seismic evaluations and plans for compliance submitted to OSHPD

Improvements to allow evacuation 1.1.2002

SB1801 or Dim. Cap.

SB 1661 & SB 499

SB 306 City/County Financial Cap.

Prevent collapse and loss of life 1.1.2009

All buildings capable of continued operation By 1.1.2030

August 18, 2009

2013 2015 2030

2008

1998 1999 2000 2001 2002
Hospitals with SPC-1 Buildings

271 facilities (65% of total facilities) contain 835 SPC-1 buildings (31% of total hospital buildings)
# 2001 Survey Services in SPC-1 Buildings

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number of SPC-1 Buildings</strong></td>
<td>1017</td>
<td></td>
</tr>
<tr>
<td><strong>No. of SPC-1 Bldgs w/ Lic. Beds</strong></td>
<td>516</td>
<td>55.0%</td>
</tr>
<tr>
<td><strong>No. of SPC-1 Bldgs w/Emerg. Trmnt. Srvs.</strong></td>
<td>178</td>
<td>19.0%</td>
</tr>
<tr>
<td>No. of Trmnt. Stns in SPC-1 Bldgs.</td>
<td>2005</td>
<td>39.3%</td>
</tr>
<tr>
<td>No. of Trmnt. Stns Statewide</td>
<td>5099</td>
<td></td>
</tr>
<tr>
<td>Percent of Trmnt. Stns in SPC-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No. of Bldgs w/O.R’s</strong></td>
<td>233</td>
<td>28.4%</td>
</tr>
<tr>
<td>No. of O.R’s in SPC-1 Bldgs.</td>
<td>1208</td>
<td></td>
</tr>
<tr>
<td>No. of O.R’s Statewide</td>
<td>2884</td>
<td>41.9%</td>
</tr>
<tr>
<td>Percent of O.R’s in SPC-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2001 Survey
Licensed Beds in SPC-1 Buildings

<table>
<thead>
<tr>
<th>Lic. Bed Type</th>
<th># Lic. Beds in SPC-1</th>
<th>Statewide Lic. Beds</th>
<th>% Lic. in SPC-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Med/Surg. Acute</td>
<td>26,725</td>
<td>47,672</td>
<td>56%</td>
</tr>
<tr>
<td>2. Pediatric</td>
<td>1,876</td>
<td>6,537</td>
<td>29%</td>
</tr>
<tr>
<td>3. Perinatal</td>
<td>2,874</td>
<td>3,670</td>
<td>78%</td>
</tr>
<tr>
<td>4. ICU</td>
<td>2,478</td>
<td>5,447</td>
<td>45%</td>
</tr>
<tr>
<td>5. CCU</td>
<td>731</td>
<td>1,630</td>
<td>45%</td>
</tr>
<tr>
<td>6. Acute Resp. Care</td>
<td>70</td>
<td>98</td>
<td>71%</td>
</tr>
<tr>
<td>7. N. I.C. U</td>
<td>1,083</td>
<td>3,123</td>
<td>35%</td>
</tr>
<tr>
<td>8. Burn Cntr.</td>
<td>104</td>
<td>170</td>
<td>61%</td>
</tr>
<tr>
<td>9. Rehab. Cntr.</td>
<td>1,293</td>
<td>2,723</td>
<td>47%</td>
</tr>
<tr>
<td>10. Psych. Acute</td>
<td>1,868</td>
<td>7,300</td>
<td>26%</td>
</tr>
<tr>
<td>12. SNF &amp; Intermed. Care</td>
<td>5,402</td>
<td>12,113</td>
<td>45%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>44,676</strong></td>
<td><strong>90,970</strong></td>
<td><strong>49%</strong></td>
</tr>
</tbody>
</table>
Are Hospitals Making Progress . . .?

- No requirements in SB1953 for hospitals to provide progress reports
- Several attempts made to quantify the ongoing Question:
  - Previous Efforts:
    - Budget Trailer Bill - 2001
      - Reporting of Hospital Seismic Safety Data Summary
    - Senate Budget Subcommittee No. 3 on Human Services, Labor and Veterans Affairs – 2006
      - Request for Information on SPC-1 Hospital Buildings
    - No Checks and Balances in place/Unquantifiable results
• Submittal deadline: June 30, 2009
• The report shall identify, at a minimum, all of the following:
  2. The project number or numbers for retrofit or replacement of each building.
  3. The projected construction start date or dates and projected construction completion date or dates.
  4. The building or buildings to be removed from acute care service and the projected date or dates of that action.
Summary of SB 1661 Reports

<table>
<thead>
<tr>
<th>Facilities with SPC-1 Buildings Required to Report:</th>
<th>% Facs</th>
<th>% Bldgs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Facilities with SPC-1 Bldgs (9/09): 271 (835*)</td>
<td>65%</td>
<td>31%</td>
</tr>
<tr>
<td>Unresponsive Facilities: 6 (13*)</td>
<td>2.2%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Total Facilities Reporting: 261 (819*)</td>
<td>96%</td>
<td>98%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Facilities Planning to Comply by Removing SPC-1 Buildings by:</th>
<th>2013</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
<th>No Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project #s</td>
<td>66 (218*)</td>
<td>9 (25*)</td>
<td>2 (2*)</td>
<td>33 (67*)</td>
<td>40 (91*)</td>
</tr>
<tr>
<td>No Project #s</td>
<td>60 (130*)</td>
<td>2 (3*)</td>
<td>9 (38*)</td>
<td>41 (86*)</td>
<td>79 (159*)</td>
</tr>
</tbody>
</table>

Summary of SB1661 Reports

| Likely Compliant Facilities: 75 (243*)                          | 29% | 30% |
| Possibly Compliant Facilities: 62 (133*)                        | 24% | 16% |
| Total Potentially Compliant Facilities: 123 (376*)             | 47% | 46% |
Senate Bill 499

Builds off existing statutory deadlines and extensions
- Short and long term solutions
- Based on revisiting seismic compliance

1. Emergency regulation status for HAZUS and NPC deadlines (short and long term)
   - Regulation changes, if any, to be developed jointly with the Hospital Building Safety Board

2. Possible 2–year construction extension for buildings submitted for HAZUS reassessment (short term)
   - Hospital submitted for HAZUS review by June 30, 2009
   - Plans submitted by July 1, 2010
   - Hospital obtains building permit by January 1, 2012
   - Hospital submits construction timeline by January 1, 2012
   - Hospital building is under construction at time of request
   - Hospital obtains a certificate of occupancy by the applicable deadline for the building
   - 85 facilities, approx 220 buildings

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. SPC-1 bldgs at start of program</td>
<td>1070</td>
<td>39%</td>
</tr>
<tr>
<td>No. SPC-1 bldgs. applied for HAZUS</td>
<td>551</td>
<td>51%</td>
</tr>
<tr>
<td>Completed HAZUS Reassessment</td>
<td>284</td>
<td>51%</td>
</tr>
<tr>
<td>Results:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPC-2</td>
<td>206</td>
<td>72%</td>
</tr>
<tr>
<td>SPC-1</td>
<td>78</td>
<td>27%</td>
</tr>
</tbody>
</table>
Senate Bill 499

3. Report #3 by November 1, 2010 (long term)

- For buildings to be retrofitted or replaced include:
  - the intended SPC level the applicable deadline for retrofit or replacement
  - projected construction dates
  - project number, projects status and approvals
  - number of inpatient beds and patient days by type of unit and type of service to be provided

- For building(s) to be removed from acute care service include:
  - projected date of removal from service
  - planned uses for the building
  - inpatient services currently delivered in the building
  - number of inpatient beds and patient days
  - indicate whether the acute care services and beds will be relocated to new or retrofitted building
For any building removed from acute care service include:
  - any net change in number of inpatient beds
  - type of unit and type of service, taking into account beds provided in buildings to be taken out of service, beds provided in buildings to be retrofitted or replaced, and beds provided in any other buildings used for acute care inpatient services that is rated SPC-1

Identify any general acute care hospital inpatient service that is provided in any general acute care hospital building that is rated SPC-1

The final configuration of all buildings on the hospital campus showing:
  - how each building will comply with the SPC-5/NPC-4 or 5 requirements, whether by retrofit or replacement
  - the type of services that will be provided in each general acute care hospital building

Hospitals that have not reported pursuant to this section are not eligible for the extension

A hospital that has not submitted a report pursuant to this section shall be assessed a fine of ten dollars ($10) per licensed acute care bed per day, but in no case to exceed one thousand dollars ($1,000) per day for each SPC-1 building not in compliance with this section until it has complied with the provisions of this section.
Higher Standards for Performance

- Commercial buildings may not be repairable or functional following a catastrophe (fire, earthquake, etc.)
- Hospitals must function following an incident
- Health philosophy:
  - Ventilation systems must provide comfortable healing environment
  - Does not facilitate the spread of contagious diseases
  - Does not adversely affect immune suppressed patients
- Fire philosophy:
  - Patients may be too ill to evacuate
  - “Defend in Place” by moving patients to adjacent “compartments”
- Earthquake philosophy:
  - Hospitals must be reasonably capable of providing services to the public
  - Limited damage
  - Critical equipment and systems remain operational
  - Requires hospitals to be built 1 ½ times stronger than most other buildings
Higher Standards for Performance

Sustained Operations philosophy:
- Adequate sanitation
- Adequate lighting
- Emergency power systems
- Medical Gas Systems

Achieving this high performance in hospital construction requires:
- Comprehensive building codes that are more complex
- Thorough plan review that takes more time than for other types of buildings
- Construction inspection and quality assurance which is more demanding on contractors and inspectors
The Impact of Regulations and Building Codes

- CBC 420A - Design requirements remained virtually unchanged for 35 years

- 2007 CBC 1224 – Based on the American Institute of Architects’ Guidelines for Design and Construction of Health Care Facilities
  - More consistent with a national model
  - More program driven – less prescriptive
  - Single patient bedrooms
  - Larger rooms/spaces
Recent PINs, CANs and FAQs

**PINs:**

44 - Senate Bill 306 Facility Master Plan Components and Submittal Approach (6/23/09)

**CANs:**

1-7-129 - Time Limitations for Approval (5/18/09)

1-7-153(a) - Materially Alter (4/21/09)

2-407.2.2 - Nurses’ Stations (4/21/09)

2-703.2 - Rebar in Lieu of Welded Wire Fabric in Fire-Resistance-Rated Assemblies (5/18/09)

2-703.3 - Engineering Judgments (5/20/09)
<table>
<thead>
<tr>
<th>CANs: (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1020.1 - Stairways Not a Part of Egress Element Convenience Stairs or Stairway (8/19/09)</td>
</tr>
<tr>
<td>2-1109B.2 - Occupancy Classification for Passenger Drop-Off and Loading Zones (8/19/09)</td>
</tr>
<tr>
<td>2-1224.14.3 - Handwashing Fixture and Lavatory Requirements for Airborne Infection Isolation and Protective Environment Rooms (4/21/09)</td>
</tr>
<tr>
<td>2-2508.2.1 - Weather Protection for Gypsum Wallboard (8/19/09)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FAQs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 new FAQs scheduled to be issued in October</td>
</tr>
</tbody>
</table>
This alone is worth the price of admission:

**Architectural:**

- Types of ceilings, esp. kitchen
- Patient toilet room doors must swing out – no sliding doors
- Clearance between handrails and wall at stairs
- Clear floor space each side of accessible doors
- Clear space at accessible door strike edge

**Fire Life Safety:**

- Clear door widths
- Clear door heights at closers
- Clear stair widths
- Door and other encroachments into required corridor clear width
- Plastic roof panels
Most Common Issues
Plan Review & Construction

**Mechanical:**
- Shower pans and curbs/dams
- Mixing valve at hands-free fixtures
- Medical gas valve locations
- Vacuum breaker, air gap and anti-siphon requirements/locations

**Electrical:**
- Switches and/or outlets in shower rooms, esp. combination patient shower/toilet room

**Structural:**
- Shot pins
- Concrete screw anchors
2009 Annual Code Cycle

45-day Public Comment Period August 28 – October 12, 2009

- California Electrical Code
- California Mechanical Code
- California Plumbing Code

45-day Public Comment Period October 2 – November 16, 2009

- California Administrative Code
- California Building Code
- California Green Building Code
2009 Annual Code Cycle Schedule (cont.)

- January 2010 - Commission Approval
- July 2010 - Publication Date
- January 2011 - Effective Date

Administrative Code Amendments effective February 2010
Part 1, California Administrative Code

ARTICLE 19
CERTIFICATION AND APPROVAL OF HOSPITAL INSPECTORS

7-214. Suspension or Revocation of Certification.

A Hospital Inspector Certificate issued by the Office may be suspended or revoked by written notice from the Office, if the certificate holder misrepresents or falsifies any facts presented to the Office, pursuant to these regulations; demonstrates incompetence while performing inspection duties; and/or demonstrates malfeasance, including but not limited to bribery, relating to the performance of inspection duties.
The Impact of Changes to Regulations and Building Codes

Part 2, California Building Code

Added Sound Transmission Limitations in Acute Care Hospitals. Minimum Sound Transmission Class (STC) ratings based on AIA Guidelines.

Updated Station Outlets locations for Oxygen, Vacuum and Medical Air based on AIA Guidelines.
The Impact of Changes to Regulations and Building Codes

Part 2, California Building Code

Amend code to incorporate the following CANs:

2-1613A.1  Component Importance Factor
2-1614A.1.2  Site-Specific Ground Motion Procedures
2-1708A.5  Certification of Equipment and Nonstructural Components

2-1802A.6.2  Next Generation Attenuation Relations
2-1912A.1  Qualification, Design, and Use of Anchors Installed in Concrete
2-1916A.8  Field Tests for Post-Installed Anchors in Concrete
Part 2, California Building Code

1) Require structural integrity check for high-rise buildings to prevent disproportionate collapse

2) Permit design of buildings with base isolation and damping system without response history analysis in low seismic areas

3) Limit site specific ground motion requirements to high seismic areas

4) Require Next Generation Attenuation (NGA) relations for ground motion, which generally will reduce ground motions

5) Permit Helical pier and Micropile foundations, which will increase options in selecting foundations
Part 2, California Building Code

6) Post-installed anchor design, inspection and testing will be covered fully in the building code for the 1st time

7) Triggers for upgrade of existing structural elements at component levels is changed to 10% from 5% for lateral forces (will increase the threshold for upgrade at component level only)

8) Nonstructural design requirements for Ceiling, Pipe, Duct, and Conduits updated to be consistent with ASCE 7-10

9) Earth retaining shoring using soldier piles and lagging with or without tie-backs added to code (No more AMC's)
Part 3, California Electrical Code

517.123(C)(3) Emergency Alarm System (Code Blue) [OSHPD 1,2,3 & 4]

Current language

A unique visual and audible signal at attending nurses’ station and above each patient room door.

Proposed language

A unique visual and audible signal at attending nurses’ station and a unique visual device above each entry door to the recovery room, intensive care unit, coronary care unit, and neonatal intensive care unit.
Part 3, California Electrical Code

Delete current amendments for Articles 700.27 and 701.18.

Revise definition of Coordination (Selective) in Article 100 as follows:

Coordination (Selective). Localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the choice of overcurrent protective devices and their ratings or settings, utilizing the .10 second level of the overcurrent protective device from the time current curve as the basis for the lower limit of the calculation method.

Language is based on the 2010 edition of NFPA 99. Revised definition will allow the requirements of selective coordination in Articles 700.27 and 701.18 to be enforceable and eliminate problems associated with former language.
Part 4, California Mechanical Code

Repeal laboratory hood Sections 410.2, 410.3, and 410.4 (OSHPD amendments) and adopt requirements from 2006 AIA Guidelines, Chapter 2.1, Section 10.2.4.5.


Part 5, California Plumbing Code

Section 402.3.1 Nonwater Urinals. [Not Permitted for OSHPD 1, 2, 3 & 4]

Section 613.1: Add polyvinylidene fluoride piping (PVDF) as an acceptable pipe material for dialysis systems.

Remove prohibition of CPVC for water distribution and ABS and PVC sanitary drainage, vents, and storm drainage piping.
The Impact of Changes to Regulations and Building Codes

Part 11, California Green Building Standards Code

- All requirements are measures are voluntary
- Adopted language from Title 24, Part 6, California Energy Code
- Mechanical, Electrical, and Building Envelope Requirements
- Building Commissioning
The Impact of Processes
Phased Plan Review

Project Start Meeting
  Prepare Draft Phase Review Matrix
  Phase Review Matrix Meeting
  Final Phase Review Matrix

CONCEPTUALIZATION

Acceptable

Yes

50% Detailed Design Submittal (Struct only)
Review for 50% DD elements, fix 100% DD and return with Deal-Breakers identified.
Deal-Breakers Resolved?

No

Yes

100% Criteria Design Submittal
Review for 100% C&D elements and return with Deal-Breakers identified.
Deal-Breakers Resolved?

Yes

No

100% Detailed Design Submittal (All AE)
Review for 100% DD elements, fix all and return with Deal-Breakers identified.
Deal-Breakers Resolved?

No

Yes

100% Detailed Design Submittal (INC 1 Fnd and Frame)
Review for all disciplines for Fnd and Frame.
Deal-Breakers Resolved?

No

Yes

FDN & FRM Permit

100% Implementation Docs Submittal (INC 2 TI)
Review for 100% ID elements, fix all and return with Deal-Breakers identified.
Deal-Breakers Resolved?

No

Yes

TI Permit

100% Implementation Docs Submittal (INC 3 Anchorage)
Review for all disciplines for Anchorage.
Deal-Breakers Resolved?

No

Yes

Anchorage Permit

100% Detailed Design Submittal (INC 2 TI)
Review for 100% DD elements, fix all and return with Deal-Breakers identified.
Deal-Breakers Resolved?

No

Yes

100% Implementation Docs Submittal (INC 3 Anchorage)
Review for all disciplines for Anchorage.
Deal-Breakers Resolved?

No

Yes

END REVIEW

CRITERIA DESIGN
DETAILED DESIGN
IMPLEMENTATION DOCUMENTS (CONSTRUCTION DOCS)
Design and Permitting - Traditional

- Owner
- Designer
- OSHPD
- Contractor
  - General
  - Subs

Year 0 1 2 3 4 5 6 7