

2007 CALIFORNIA BUILDING AND FIRE CODE UPDATE

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PURPOSE

- To inform and educate Research and Development facilities how proposed changes to the California Building and Fire Codes may impact laboratory construction.
- To initiate a dialogue between industry and regulators to establish consistent design, plan review, construction and inspection requirements.

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OUTLINE

- Building & Fire Code Adoption Process and Schedule
- Major Impacts of the Code Changes on Laboratory Buildings
- Analysis of Potential Operational, Design, Feasibility, and Cost impacts
- Open Discussion of Industry Response and Participation in the Code Adoption Process

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California Code Adoption Process & Schedule



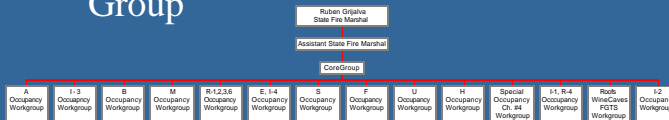
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California Code Adoption Process & Schedule

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- June, 2005
 - State Fire Marshal, Rueben Grijalva establishes work groups, based on occupancy, to review 2006 International Building and Fire Code
 - Work Groups based on Occupancy make recommendations to a Core Group



California Code Adoption Process & Schedule

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- January, 2006
 - Core Group submits recommendations for amendments to 2006 International Codes to State Fire Marshal (SFM) for review.



California Code Adoption Process & Schedule

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- June, 2006
 - SFM proposed code changes submitted to California Building Standards Commission (BSC)
 - BSC establishes code advisory committees to review proposed amendments
 - SFM amendments to be reviewed by Building, Fire and “Other” code advisory committee
 - July 7
 - July 24, 25, 26
 - August 7, 8
 - Future dates TBD



California Code Adoption Process & Schedule

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- December, 2006 (tentative)
 - BSC code advisory committees to submit recommendations for adoption to BSC.
 - BSC publishes recommendations and establishes a 45 day public comment period.



California Code Adoption Process & Schedule

- July, 2007 (tentative)
 - BSC to publish State code
 - Six month local adoption process begins

Note: Local amendments must be more restrictive / specific
- January 1, 2008 (tentative)
 - Statewide effective date

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L-Occupancy

- Group H work group proposed changes to SFM based on current H-8 code requirements for laboratory research and development facilities.
- Work group proposed changing H-8 Occupancy to L-Occupancy to clarify omissions or conflicts.
 - H-Occupancy General Provisions used as default for H-8
 - Intent of L-Occupancy was to specifically reference B-Occupancy requirements as default for any omissions or conflicts.

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L-Occupancy

- SFM version originally submitted to BSC limited scope to “post secondary institutions”
- July 24, 2006
 - Based on input from BayBio and other industry groups SFM agreed to revise scope to omit exclusive application to “post secondary institutions”

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L-Occupancy

- Although scope of L-Occupancy was revised to omit exclusive application to “post secondary institutions” the wording specifies that the application of the L-Occupancy would be in accordance with CBC Section 111.
- CBC Section 111 applies only to facilities regulated by Office of the State Fire Marshal, i.e.
 - State Institutions
 - State Occupied buildings

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L-Occupancy

- Since CBC Section 111 limits application of L-Occupancy provisions to SFM regulated facilities, applicability to non SFM regulated facilities must be made through amendments to the model code or local amendments.
 - SFM to establish Ad-hoc committee to continue development of L-Occupancy requirements for SFM regulated facilities as well as model code development

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Local Code Adoption Process & Schedule

- Once BSC publishes 2006 Codes local jurisdictions have 6 months to adopt local amendments.
- To facilitate local adoption in 2007 industry needs to:
 - continue development of L-Occupancy requirements in conjunction with SFM Ad-hoc committee
 - initiate a dialogue between industry and local regulators to have L-Occupancy provisions adopted in local ordinances

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IMPACT ON LABORATORIES



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2001 California Codes

- Based on 1997 Uniform Building Code and 2000 Uniform Fire Code.
- Control Area Concept
 - 4 Control Area per Building
 - Not restricted by floors, i.e. may be vertical or horizontal through building.
 - Up to 100% of exempt amounts for each control area
 - 1-Hour Vertical and Horizontal Occupancy Separations

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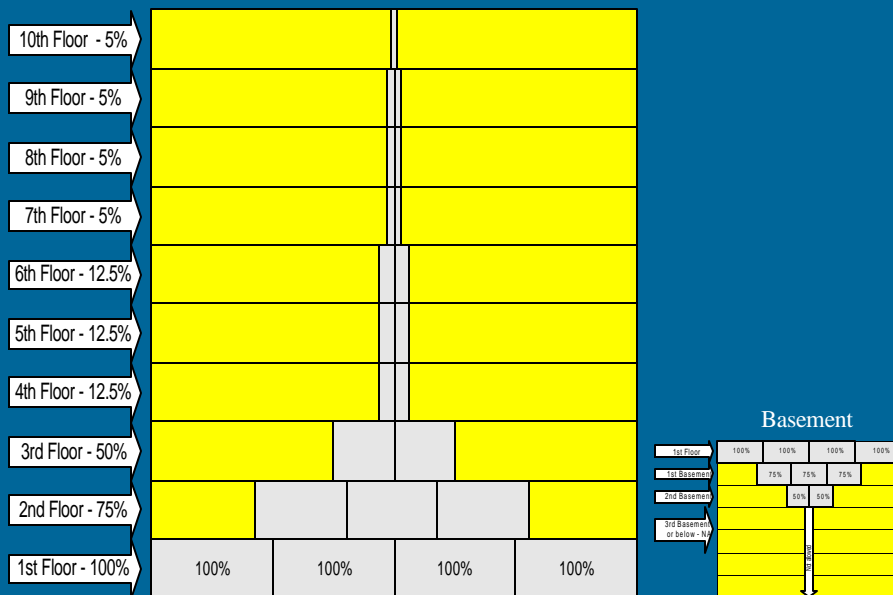
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- Based on 2006 International Building Code and International Fire Code
- Control Area Concept
 - Allows multiple controls areas per floor
 - Limits control areas from extending vertically through floors
 - Maximum allowable quantity per control area, e.g. “exempt amount” based on prorated percentage per floor.



ICC CONTROL AREA CONCEPT



Practical Difficulties

- Maximum allowable quantity, e.g. “exempt amount” limited based on prorated percentage per floor.
 - Class 1B Flammable Liquids above 3rd floor limited to
 - 7 ½ Gallons in use per control area¹
 - 30 Gallons total per control area²
 - Practically limits PI’s to 2 to 4 per control area³
 - Maximum 2 control areas

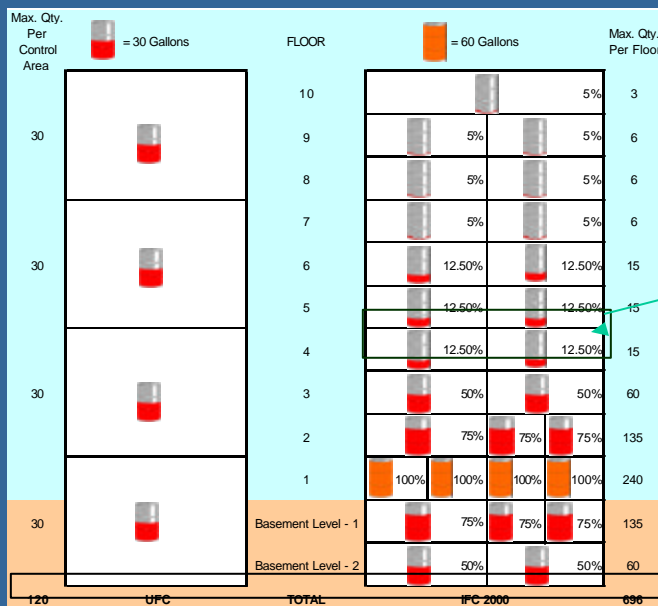
¹ Sprinklered building, open use

² Sprinklered building, may be doubled when stored in fire-rated cabinet.

³ Based on average of 8 gallons flammable liquids per PI.



FL-1B USE OPEN



Practical Difficulties

- Requires 2-hour fire resistant floor rating.
 - Exception:
 - 3 stories or less in height, and
 - Full automatic fire protection system, and
 - Type IIA, IIIA, VA, e.g. 1-hour Construction
- 2-hour fire resistant construction must extend to supporting structural elements to grade



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Potential Operational, Design, Feasibility, and Cost impacts



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Impact on New Construction

- New 2 hour fire resistive floor construction requires additional:
 - Fire proofing
 - Shaft construction
 - Penetration protection
 - Design Fees
 - Permit & Inspection Fees
- Cost Impact
 - \$6 per square foot
 - \$500,000 (for 4 story building with 20,000 sf floor template)

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Case Study

- Large R&D Company
 - New Construction
 - 82,300 sq. feet.
 - Cost impact based on new codes
 - \$500,000 additional cost
 - Approximately 10% increase.



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Impact on Existing Construction

- Upgrade existing construction to 2 hour fire resistive floor assembly
 - Need to vacate floor(s) below out to point beyond structural bay affected
 - Remove MEP as needed to gain access to underside of floor(s)
 - Open up all supporting columns
 - Fire proof underside of floor(s) and supporting columns.
 - Reconstruct floor(s) below.
- Cost Impact
 - \$250 per square foot
 - \$500,000 for 2,000 sf lab remodel above 1st floor
- **Excludes relocation cost and business interruption**

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Case Study

- Large R&D Company
 - TI Projects
 - Small Projects: 6,800 sq. feet
 - Medium Projects: 25,200 sq. feet.
 - Cost impact based on new codes
 - \$8,000,000 additional cost
 - Approximately 200% increase.



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L-OCCUPANCY PROVISIONS

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L-Occupancy

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- Based on H-8 Occupancy Criteria
- Substitutes “Laboratory Suite” for Control Area Concept
 - Defines “Laboratory Suite” similar to control area
 - Establishes no limit on the number of laboratory suites that may be constructed within a building or on a floor.



L-Occupancy

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- Laboratory Suites
 - Laboratory suites may span floor
 - Laboratory suite may encompass ancillary support areas, including offices, storage areas, etc.
 - Areas > 200 sq.ft. require 2 exits or exit access doors.
 - Exits or exit access doors shall swing in direction of egress



L-Occupancy

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- Construction Requirements
 - Requires Type-I or Type-IIA for buildings 4 stories or greater
 - Building 3 stories or less shall be minimum Type VA construction
 - Requires Fire Sprinklers throughout
 - Requires emergency power for ventilation system and other required electrical equipment
 - Requires only 1 hour vertical and horizontal separations.



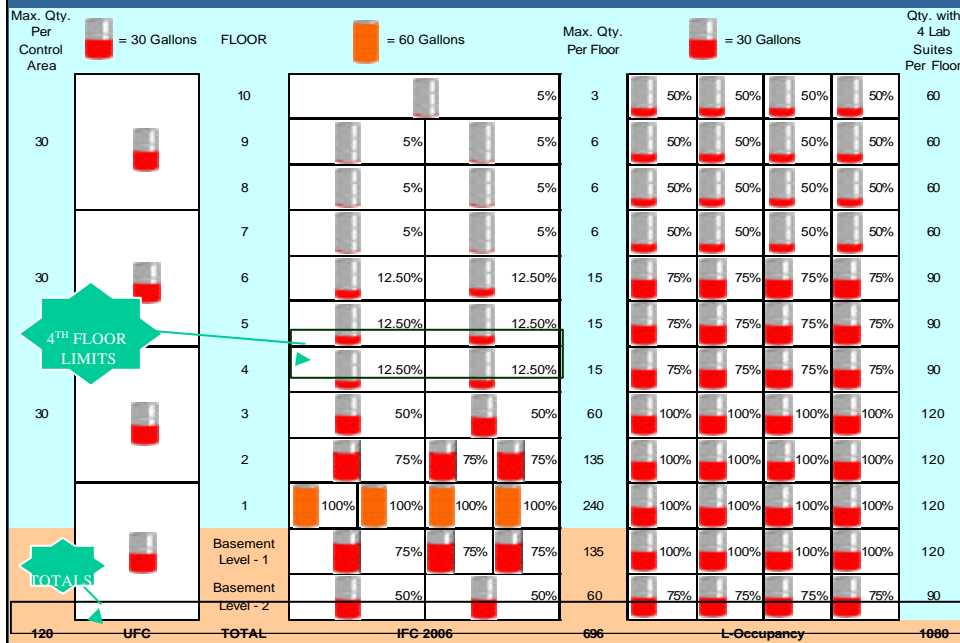
L-Occupancy

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- Hazardous Material Restrictions
 - Maximum allowable quantity per laboratory suite prorated by floor
 - Floors 1 – 3
 - 100% of base exempt amount
 - Floor 4 – 6
 - 75% of base exempt amount compared to 12.5% per ICC.
 - Floor 7 and more
 - 50% of base exempt amount compared to 5% per ICC.



FL-1B USE OPEN



CONCLUSION

- Deficiencies in current L-Occupancy provisions submitted by SFM to BSC necessitates continuing development.
- **Industry needs to support continuing development of L-Occupancy requirements in conjunction with SFM Ad-hoc committee, and**
- **Initiate dialogue with local regulators to have L-Occupancy concept adopted in local ordinances**

