

**INITIAL STATEMENT OF REASONS  
FOR PROPOSED BUILDING STANDARDS  
OF THE STATE FIRE MARSHAL  
REGARDING THE 2019 CALIFORNIA RESIDENTIAL CODE  
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2.5  
(SFM 02/19)**

The Administrative Procedure Act (APA) requires that an Initial Statement of Reasons be available to the public upon request when rulemaking action is being undertaken. The following information required by the APA pertains to this particular rulemaking action:

**STATEMENT OF SPECIFIC PURPOSE, PROBLEM, RATIONALE and BENEFITS**

Government Code Section 11346.2(b)(1) requires a statement of specific purpose of each adoption, amendment, or repeal and the problem the agency intends to address and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose and address the problem for which it is proposed. The statement shall enumerate the benefits anticipated from the regulatory action, including the benefits or goals provided in the authorizing statute.

**Item 1. CHAPTER 2**

**DEFINITIONS**

**SECTION R202**

**DEFINITIONS**

**Section: Battery System, Stationary Storage (Delete), Energy Storage System ESS (New)**

**Reason:** The proposal for the new definition of Energy Storage System is to correlate with the definition in the California Fire Code. Constancy in the codes is beneficial for the code user.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Item 2. CHAPTER 3**

**BUILDING PLANNING**

**SECTION R327**

**~~STATIONARY~~ ENERGY STORAGE ~~BATTERY~~ SYSTEMS**

**Sections:** R327, R327.1, R327.2, R327.3, R327.3.1 (New), 327.4 (New), R327.5 (New), R327.6, R327.7 (New), R327.8, R327.9, R327.10 (New)

**Reason:**

The SFM is proposing to bring in regulations for Energy Storage Systems (ESS) for California based on the growing interest in the installation of home systems. As this industry advances in technology it is important to recognize the safe guards that are in place by testing's laboratories and industry experts. The need for requirements was also highlighted by the recent October 2019 Pacific, Gas and Electric power shut off. This proposal gives Building and Fire departments the minimum safety requirements for these systems installed for residential occupancies.

This proposal reflects what is believed to be a consensus of all proponents of the different Energy Storage System (ESS) proposals heard at the International Code Council's Group A and B code hearing for the 2021 I-codes. Comments on individual sections are as follows:

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.1**

**Reason:**

This section includes the current 1 kWh threshold, and exempts a UL 9540 listed ESS that will not go into thermal runaway or produce flammable gas when subject to the UL 9540A Cell Level test. See proposal RB157-18.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.2**

**Reason:**

The equipment listing requirements are based on R327.2 in the 2018 IRC. The reference to "residential use" was removed since this is not a specific requirement in UL 9540, the standard used to list the equipment.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.3**

**Reason:**

Installation requirements are unchanged from the 2018 IRC (R327.3)

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.3.1 (New)**

**Reason:**

Spacing between ESS are identical to spacing requirements in the 2021 IFC and NFPA 855, including an exception for decreasing spacing based on UL 9540A large scale fire

testing.

**Section: 327.4 (New)**

**Reason:**

The locations where ESS are allowed is similar to the 2021 IFC and NFPA 855, with the following modifications:

Item 3 corrected an oversight and allows ground mounted ESS to be installed adjacent to buildings on the property.

Item 4 addressed concerns raised in ICC Group B 2021 proposals RB154, RB155, RB156, RB157 about ESS installations in utility closets, basements, storage or utility spaces.

The last sentence clarifies that ESS is not allowed in sleeping rooms or closets or spaces opening directly into them.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.5 (New)**

**Reason:**

Energy ratings are identical to the values included in the in the 2021 IFC and NFPA 855. Allowing ESS with energy ratings above the values described to comply with ESS requirements for commercial systems (i.e. the IFC requirements) is allowed in NFPA 855.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.6**

**Reason:**

Electrical installation requirements are unchanged from the 2018 IRC. (R327.4)

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.7 (New)**

**Reason:**

Fire detection includes the same requirements as the 2021 IFC and NFPA 855, with minor edits. Per public comments that were heard at the CAC hearings, SFM has removed the requirement for interconnection of heat detectors to smoke alarms. The Residential code does not require interconnection.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.8**

**Reason:**

Vehicle impact protection requirements are unchanged from the 2018 IRC. (R327.6)

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.9**

**Reason:**

Ventilation requirements are based on R327.5 of the 2018 IRC. ESS utilizing battery technologies such as lithium-ion batteries do not require mechanical ventilation since they do not produce flammable gases during charging.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**Section: R327.10 (New)**

**Reason:**

During the CAC discussion regarding Energy Storage Systems for residential use, a person commented that the SFM should better connect the California Fire Code and the California Residential Code. In response to that comment SFM proposes to add this section. This proposal, developed by a large industry and code official work group, more effectively protects ESS installations based on knowledge gained since last code cycle. It provides protection customized for the types of installations that are being deployed today, instead of using the “one size fits all” type of protection in the IRC 2018 code.

**Response to Code Advisory Committee (CAC): Not heard by CAC**

Per the public comments heard while the CAC was reviewing the Energy Storage System requirements, the SFM is proposing to add a new section to correlate with the California Fire Code, Part 9 requirements for ESS installations in Group R-3 and R-4 occupancies by adding the section for “Toxic and highly toxic gas”.

**Section: R327.11 (New)**

**Reason:**

Electric vehicle use is based on R327.2 (2) of the 2018 IRC, and the 2021 IFC and NFPA 855. Initially submitted as Section R327.10, renumbered to R327.11 when the new section for “Toxic and highly toxic gas” was added above.

**Cost Impact:** The net effect of the public comment and code change proposal will increase the cost of construction. The new requirements have the potential to increase the cost of an ESS installation, but only if the homeowner chooses to have ESS installed.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**[ENERGY STORAGE SYSTEMS 2019 INTERVENING PROPOSALS]**

**[Associated sections in Part 2.5, California Residential Code]:**  
R202 (New definition), R327, R327.1, R327.2, R327.3, R327.3.1 (New), 327.4  
(New), R327.5 (New), R327.6, R327.7 (New), R327.8, R327.9, R327.10 (New)

**SECTION R337**  
**MATERIALS AND CONSTRUCTION**  
**METHODS FOR EXTERIOR WILDFIRE EXPOSURE**

**SECTION R337.1**  
**SCOPE, PURPOSE AND APPLICATION**

**Section: R337.1.1**

**Reason:** Editorial correction.

**Response to Code Advisory Committee (CAC): Approve as Submitted**  
SFM agrees with the CAC recommendation.

**SECTION R337.5**  
**ROOFING**

**Section: R337.5.1**

**Reason:**

The proposal from the State Fire Marshal Wildland Urban Interface (WUI) workgroup is to require Class A roof assemblies. Currently Class A, B or C roofs are installed depending on the level of fire hazard severity that is designated by the adopted Fire Hazard Severity Zone maps. The change affects areas that are designated as moderate or high fire severity zones. The very high fire severity zone already requires a Class A roof. It must also be noted the many of the local jurisdictions already have local ordinances that require a Class A roof in all wildland areas identified. In these jurisdictions, these regulations will have no change.

When the regulations for roofing requirements were created over a decade ago the cost was a significant issue that allowed the use of Class B and C roofing material in moderate and high fire severity zones within the wildland urban interface areas. Now with the increased production of Class A rated roof assemblies the cost is no longer a controlling factor and there is little to no cost difference for the change.

Reports from the 2017 and 2018 fire data recognize that not only the designated very high fire severity zone areas require a higher level of protection, but all designated areas will benefit from the installation of a Class A rated roof assembly.

**Response to Code Advisory Committee (CAC): Approve as Submitted**  
SFM agrees with the CAC recommendation.

## **Sections: R337.5.2**

### **Reason:**

R337.5.2 section is slightly confusing as currently written and is being proposed to make the regulation more understandable and clear. Note, that it is not the air space that is to have the layer of cap sheet, but the roof covering assembly. Also, the roof covering assembly is what needs to resist the intrusion of flames and embers and not the air space. Thus, changes are being made for clarification and to require both the cap sheet and the firestopping.

The use of the nonperforated cap sheet alone has been found not to be sufficient to prevent the intrusion of embers and for that reason the recommendation is to do both, namely use the cap sheet and firestop the opening.

The exception to use mineral wool board or other non-combustible material is intended to give an option to the designers and builders to achieve the same outcome based on the insulation and fire resistance it provides. These materials could be applied over a standard underlayment thus, protecting it and there would be no need for the cap sheet.

Mudded hip and ridge caps refer to a tile roof but there are other examples where roofs have an airspace under the roof covering such as corrugated steel or standing seam or other metal roofing on wood strips. In any case an acceptable option could be to put one or more layers of mineral wool board between the roofing (with airspace) and over the roof underlayment which is over the solid wood roof deck, purlins, girts or battens.

With one or more continuous layers of mineral wool there is no need for the cap sheet and ventilation can be encouraged through the airspace from the roof edge up through the hips and ridge which serves to improve the performance of the space under the roof along with the continuous insulation board to draw moisture through and out of the roof system.

Having the continuous mineral insulation encourages movement of moisture by moving the dew point outside of the wood in cold climates while adding an extra measure of fire resistance insulating the underlying decking from transmitted heat from the exposed noncombustible roofing. It is possible with the mineral wool there is no need for mudded hip and ridge caps if the mineral board is continuous under the roofing protecting the deck or other underlying wood construction.

### **Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

## ***SECTION R337.6*** ***VENTS***

### **Sections: R337.6.2, R337.6.2.1 (New), R337.6.3**

#### **Reason:**

It is important to ensure that vents fully protect against penetration of embers and of flames. This applies both to sections R337.6.2 and R337.6.3.

R337.6.2 Testing and data indicate that protecting openings with noncombustible materials

with 1/8th inch or 1/16th inch openings, does not ensure that flames or small embers will not penetrate that opening. Reports from industry show that openings protected while complying with the requirements associated with standard ASTM E2886, will provide that assurance. Note: that it is essential that the fire test criteria for ASTM E2886 are included in the code proposal because they are not included as requirements in the standard.

Two options are being provided: vents listed by the California State Fire Marshal as Wildland Flame and Ember Resistant (WUI) vents and Wildland Urban Interface vents listed to ASTM E2886. In both cases, the vents must comply with the same three requirements.

Section R337.6.2.1 was added to ensure that all openings are covered by the requirements of R337.6.2.

R337.6.2.3 is correlated to require the same criteria of section R337.6.2 because the scope of ASTM E2886 is broad enough that it applies to all types of vents.

The first section of the scope reads as follows: “1.1 This fire-test-response standard prescribes two individual methods to evaluate the ability of a gable end, crawl space (foundation) and other vents that mount on a vertical wall or in the under-eave area to resist the entry through the vent opening of embers and flame. The ability of such vents to completely exclude entry of flames or embers is not evaluated.

Roof ridge and off-ridge (field) vents are excluded from this standard. Acceptance criteria are not provided in this standard.”

It was determined by the State Fire Marshal WUI work group that the exceptions in the current existing code language were not exceptions but requirements. The arrangement of the exceptions was to renumber and provide two exceptions. The first exception provides the authority having jurisdiction to approve special conditions or technology that meets the intent of preventing the intrusion of flame and embers. The second exception is for vents serving a fully sprinklered attic and located more than 12 feet in distance from other combustibles. The exception also includes the exterior wall covering and underside of the eave be protected with noncombustible or ignition resistant materials. The exception meets the intent because of the additional protection of an automatic fire suppression system.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

***SECTION R337.9  
DECKING***

**Sections: R337.9.1.1 (New)**

**Reason:**

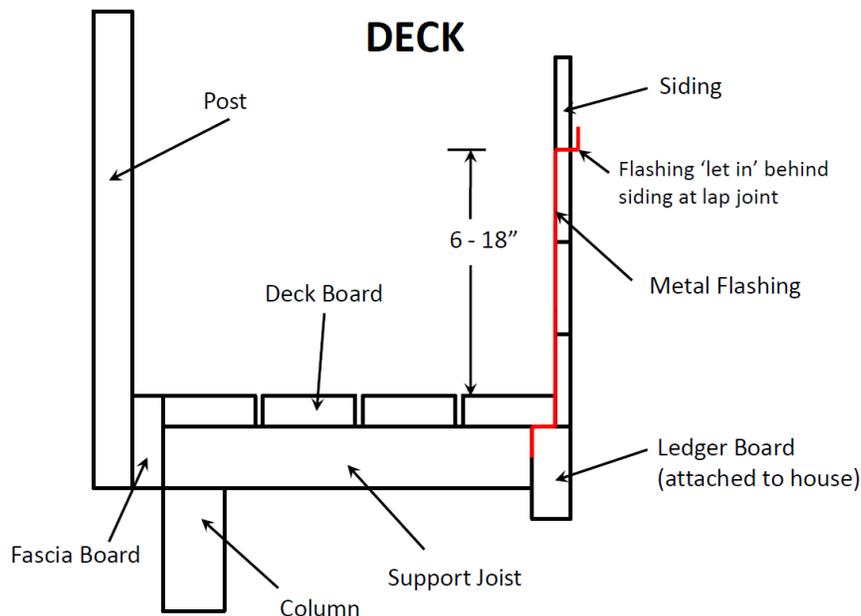
It has been shown that applying metal flashing to the intersection of the wall and the deck will protect the wall from flame spread along the deck, at a small additional cost.

For further information, NFPA 1144 (Standard for Reducing Structure Ignition Hazards from Wildland Fire) contains the following wording:

Section 5.6.4 A minimum of 6 in. (150 mm) noncombustible vertical separation between a horizontal surface and siding shall be maintained.

The examples 1 and 2 are show for reference only on to how one may achieve compliance with the code proposal. The code was written as a generic regulation to leave it up to the designer, architect or owner to create a desirable look to meet the intent, which is to prevent the accumulation of debris at the base of the intersection of the exterior wall and deck surface.

### Example 1



**Response to Code Advisory Committee (CAC): Approve as Submitted**  
SFM agrees with the CAC recommendation.

### Section: R337.9.3

#### Reason:

The proposal is editorial and simply does two things:

1. Replaces the non-mandatory term “may” by the mandatory phrase “shall be permitted to”. This creates clarity for the code user.
2. Replaces the term “flame spread rating” by the term “flame spread index”, which is the term used in the ASTM E84 standard. Correlation with the standard language ensures clarity for the code user.

**Response to Code Advisory Committee (CAC): Approve as Submitted**  
SFM agrees with the CAC recommendation.

## [WILDLAND URBAN INTERFACE 2019 INTERVENING PROPOSALS]

**[Related Sections in Part 2.5, California Residential Code]:**

R337.5.1, R337.5.2, R337.6.2, R337.6.2.1 (New), R337.6.3, R337.9.1.1 (New),  
R337.9.3

**Item 3. CHAPTER 44  
REFERENCED STANDARDS**

**NFPA**

**Section: 68-13**

**Reason:**

The proposed adoption of the standard NFPA 68 is to correlate to the California Fire Code sections for energy storage systems that refer to it for compliance. The benefit is to create consistence in the codes.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**UL**

**Section: 1974-17, 9540A-17**

**Reason:**

The proposed adoption of the standard UL 1974 and 9540A is to correlate to the California Fire Code sections for energy storage systems that refer to it for compliance. The benefit is to create consistency in the codes.

**Response to Code Advisory Committee (CAC): Approve as Submitted**

SFM agrees with the CAC recommendation.

**[ENERGY STORAGE SYSTEMS 2019 INTERVENING PROPOSALS]**

**[Associated sections in Part 2.5, California Residential Code]:**

R202 (New definition), R327, R327.1, R327.2, R327.3, R327.3.1 (New), 327.4  
(New), R327.5 (New), R327.6, R327.7 (New), R327.8, R327.9, R327.10 (New)

**TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS**

Government Code Section 11346.2(b)(3) requires an identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the regulation(s).

The SFM used the justification that was provided through the International Code Council (ICC) rulemaking process. The text is included in the this document.

## **STATEMENT OF JUSTIFICATION FOR PRESCRIPTIVE STANDARDS**

Government Code Section 11346.2(b)(1) requires a statement of the reasons why an agency believes any mandates for specific technologies or equipment or prescriptive standards are required.

The SFM proposals have prescriptive regulations that recognized national testing standards. Alternates were considered and included where appropriate where the level of safety needed to be maintained.

## **CONSIDERATION OF REASONABLE ALTERNATIVES**

Government Code Section 11346.2(b)(4)(A) requires a description of reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives. In the case of a regulation that would mandate the use of specific technologies or equipment or prescribe specific action or procedures, the imposition of performance standards shall be considered as an alternate. It is not the intent of this paragraph to require the agency to artificially construct alternatives or describe unreasonable alternatives.

The SFM has determined that no reasonable alternative considered by the SFM or that has otherwise been identified and brought to the attention of the SFM would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

## **REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS**

Government Code Section 11346.2(b)(4)(B) requires a description of any reasonable alternatives that have been identified or that have otherwise been identified and brought to the attention of the agency that would lessen any adverse impact on small business.

The SFM has determined that no reasonable alternative considered by SFM or that has otherwise been identified and brought to the attention of the SFM would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected on small business than the proposed action, or would be more cost-effective to affected small business and equally effective in implementing the statutory policy or other provisions of law.

## **FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE IMPACT ON BUSINESS**

Government Code Section 11346.2(b)(5)(A) requires the facts, evidence, documents, testimony, or other evidence on which the agency relies to support an initial determination that the action will not have a significant adverse economic impact on business.

The impact to business is described in the Economic and Fiscal Impact Statement.

## **ASSESSMENT OF EFFECT OF REGULATIONS UPON JOBS AND BUSINESS EXPANSION, ELIMINATION OR CREATION**

Government Code Sections 11346.3(b)(1) and 11346.5(a)(10)

The State Fire Marshal has assessed whether or not and to what extent this proposal will affect the following:

- A.** The creation or elimination of jobs within the State of California.

The SFM did not identify a change in the number of jobs within the state.

- B.** The creation of new businesses or the elimination of existing businesses within the State of California.

The SFM did not identify a change in the number of businesses within the state.

- C.** The expansion of businesses currently doing business within the State of California.

The SFM workgroup identified that the use and manufacturing of Wildland Urban Interface (WUI) listed vents would increase to meet a larger demand.

- D.** The benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment.

The SFM worked with various stakeholders to propose regulations that provide an acceptable level of fire and life safety. These proposals include standards for the protection of structures from wildland fires and the residential use of energy storage systems.

## **ESTIMATED COST OF COMPLIANCE, ESTIMATED POTENTIAL BENEFITS, AND RELATED ASSUMPTIONS USED FOR BUILDING STANDARDS**

Government Code Section 11346.2(b)(5)(B)(i) states if a proposed regulation is a building standard, the initial statement of reasons shall include the estimated cost of compliance, the estimated potential benefits, and the related assumptions used to determine the estimates.

The SFM Wildland Urban Interface workgroup (WUI) proposed regulations estimate an increase of approximately \$1,150 per structures that are built in the fire severity zone. The regulations have no fiscal impact for other structures.

The WUI proposal will require a cap sheet under roof assemblies that contain an airspace. The cost of the 72-pound cap sheet sells for an average of \$21.00 to \$25.00 per 100-foot roll. The cap sheet which is used to achieve a "Class A" assembly for several different roofing materials. Taking the high cost of \$25.00 a roll, this comes out to \$0.25 per square foot.

Installation of the cap sheet material would add about \$10.00 per roll or \$0.10 per foot cost. Total installation would be \$0.35 per foot or \$35.00 per square foot. A 1,500-square foot, one-story house would cost \$525.

The WUI workgroup proposal will require vents to be listed to ASTM E2886 for new structures that are built in the areas that have been identified as a Fire Severity Zone.

The cost for the vents would be \$20 to \$25 per vent. This would add an additional cost of approximately \$600 for a 2,000-square foot structure. This can vary based on the design of the structure's exterior venting.

The WUI workgroup proposal would require flashing installed at the wall and deck intersection; covering six inches above the deck on the wall. The cost of flashing is approximately .80 cents a foot. A 20-foot deck would add an additional \$16 in materials.

### **DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS**

Government Code Section 11346.2(b)(6) requires a department, board, or commission within the Environmental Protection Agency, the Resources Agency, or the Office of the State Fire Marshal to describe its efforts, in connection with a proposed rulemaking action, to avoid unnecessary duplication or conflicts with federal regulations contained in the Code of Federal Regulations addressing the same issues. These agencies may adopt regulations different from these federal regulations upon a finding of one or more of the following justifications: (A) The differing state regulations are authorized by law and/or (B) The cost of differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment.

The SFM has determined that there are no comparable federal regulations or statutes addressing the fire and life safety requirements as presented in this notice.