



**DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
Flammability Standards for Building Insulation Materials
(AB 127) Working Group Meeting Notes
November 20, 2014
Office of the State Fire Marshal Headquarters
1131 S Street, Sacramento, CA 95811**



CHAIRPERSON PRESENT:

Kevin Reinertson, Division Chief- Office of the State Fire Marshal (SFM) Code Development & Analysis Division

MEMBERS & GUESTS PRESENT:

Eric Banks, Technical Specialist- BASF Corporation, representing the Spray Foam Coalition of the Center for the Polyurethanes Industry (CPI)
Jesse Beitel, Sr. Scientist / Principal- Hughes Associates, representing the American Chemistry Council (ACC)
Payam Bozorgchami, Contract Manager- Efficiency, Renewables, and Demand Analysis Division, California Energy Commission
Steve Fischer, Ph.D. Chemist- Department of Consumer Affairs, Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI)
Michael D. Fischer, Director of Codes & Regulatory Affairs- Kellen Company, representing the Polyisocyanurate Insulation Manufacturers Association (PIMA)
Andrew Henning, Deputy State Fire Marshal- Office of the State Fire Marshal (SFM) Code Development & Analysis Division
Marcelo M. Hirschler, President & Technical Director- GBH International, representing the American Chemistry Council's North American Flame Retardant Alliance (NAFRA)
Avery Lindeman, Science & Policy Associate- Green Science Policy Institute
Donald Lucas, Ph.D., Combustion Scientist- Environmental Energy Technologies Division- Lawrence Berkeley National Laboratory
Ingrid Neumann, California Energy Commission, Building Standards Office- Efficiency Division (morning substitute for Payam Bozorgchami who arrived to the meeting later)
Walter Reiter, Deputy Director- Expanded Polystyrene (EPS) Industry Alliance, Inc.
Lorraine A. Ross, President- Intech Consulting Inc., representing the Extruded Polystyrene Insulation Manufacturers Association (XPSA)
Paul Shipp, Ph.D. and Principal Engineer- U.S. Gypsum Company, representing ASTM
Adria Smith, Deputy Fire Marshal- Riverside County Fire Department, representing Cal Chiefs / SoCal Fire Prevention Officers Association
Paul Wermer, Principal- Paul Wermer Sustainability Consulting, representing the U.S. Green Building Council of California (USGBC)
Kevin White, Health and Safety Director- California Professional Firefighters
John Woestman, Kellen Company, representing the Extruded Polystyrene Foam Association (XPSA)

MEMBERS & GUESTS ON THE TELEPHONE:

George Combs, Senior Principal Scientist, Product Development and Technical Support, Rigid/Specialties and Raw Materials, Polyurethanes, Bayer MaterialScience LLC
Rian Evitt, Code Compliance Officer- San Ramon Valley Fire Protection District, representing the Northern California Fire Prevention Officers Association (NorCal FPO)
Richard Lam, Ph.D., Staff Toxicologist- California Environmental Protection Agency (Cal EPA),

I. CALL TO ORDER

Welcome / Self Introductions: Chief Kevin Reinertson called the meeting to order at 1000 hours and the participating working group members and guests introduced themselves.

II. REVIEW/APPROVE SEPTEMBER 4, 2014 MEETING NOTES

Marcelo Hirschler pointed out that Dwayne Sloan's first name was misspelled ("Duane") in the September 4th Meeting Notes and should be corrected. Mike Fischer motioned to accept the September 4th Meeting Notes (with the aforementioned correction); Lorraine Ross seconded the motion, there was no opposition and they were formally approved.

Chief Reinertson advised that there have been quite a few people who have attended only one or two of the AB 127 meetings and either participated or just observed; he is going to narrow down the initial membership list that was created when the working group first convened so that the Final Report and Recommendations accurately reflects who has actively participated on a regular basis throughout the process. He asked the working members to review the roster contained in the Final Report and provide feedback regarding who should be included.

III. OVERVIEW BUILDING MATERIALS LISTING PROGRAM FOR SFM

Supervising Deputy State Fire Marshal James Parsegian from Cal Fire's Office of the State Fire Marshal's Fire Engineering Division made a short presentation regarding the Building Materials and Listing Program, how SFM lists products, materials, assemblies, devices and the listing process may play a role in the AB 127 Working Group's project. Chief Reinertson explained that California has both voluntary and statutory mandates that require certain devices such as fire alarms to be approved and listed by The Office of the State Fire Marshal.

James explained that the Fire Engineering Division has several different programs including the Building Materials Listing and the Flame Retardant Program which addresses the use of decorative materials.

- A. **The Building Materials Listing Program's Mandatory Listing Section:** The mandatory section addresses fire alarm, shingles and carbon monoxide issues.
- B. **The Building Materials Listing Program's Voluntary Listing Section:** SFM requires the submission of a test report from one of the approved laboratories that indicates that the required test standard for the product or assembly has been passed. In this case, the BML Program will look at the standard developed by the AB 127 Working Group and look at the assembly and ensure that all of the tests that are required by the test standard are done in the test report, approve the assembly and then add it to the Building Materials Listing (BML) Program. When statewide Plan Reviewers look at the BML Program's listing sheet, they know that SFM has completed a technical review of the product / assembly and has made sure that it meets all of the proper requirements for that standard. If someone applies this year, then there's an annual \$150 listing fee thereafter for an assembly to remain listed. There are currently 3400 products and assemblies on SFM's Fire Engineering Division's website that are used throughout the state of California.

Questions and Answers:

- Lorraine Ross asked James how long the process takes to complete from the time that a test report has been submitted.
- James advised that the Fast Track program for fire alarm listings generally takes less than ten days while most other products take less than 30 days to list depending on the backlog; there are two employees who handle the program. The only time that this changes is from May – June during the renewal period when there's a large influx of reports.
- Lorraine asked how much the BML Program's fees cost.
- James advised that the initial submittal fee is \$320, the evaluation fee is \$170 and the listing fee is \$150. If the assembly doesn't pass, then the listing fee will be refunded but the review fee will not be refunded. The BML Program is a special-funded program that doesn't receive any tax dollars; it's self-funded thus the fees must be maintained.
- Walter Reiter asked if the listings are manufacturer-specific or product specific. His company manufactures one product but it's used by many different manufacturers who put their own label on it.
- James advised that the listings are under the names of the manufacturers who obtain the test reports; the products are listed under the company's name that's on the test report. A third party can be included in the process via a multiple listing sheet. For example, if one company manufactures a spray-on foam or some other product and it's bought and labeled by another company, then the lab report indicates who made the product and who labeled it.
- Walter explained that his company ran an NFPA 285 in conjunction with 11 other companies and coordinated it through the labs with the objective of getting ICCES listings. He asked if trade associations ever submit reports that include substantiation that all of the products are the same.
- James responded that he doesn't think that's ever occurred; it's something that would have to be looked at. The BML Program is generally product-specific whereas Walter's scenario is assembly-specific. A fire alarm panel is usually made by only one company. James advised that the BML Program is recognized outside of California, also, and it's important to ensure that the products that are on the listing sheet are what they say they are.
- Lorraine asked if there's a follow-up certification on annual renewal; does the manufacturer have to certify that the product hasn't changed?
- James advised that a listing requires a third party inspection so if one of the major labs (UL, FM, ETL) are used, then they will perform quarterly plant inspections. There used to be an approval process specific for the 7A requirements until the manufacturers who make the wood products could get into the system again but it was a very complicated process that James does not anticipate ever doing again.

Chief Reinertson advised that there's a lot of information contained on SFM's web page. Each Division is listed under the "Divisions" tab that's on the home screen; choose "Fire Engineering" and the Building Materials Listing Program link is on the right side of the screen under "Related Program Links". This link contains contact information, an application for listings, FAQ's on Carbon Monoxide Devices, the WUI 7A requirements and printouts. Chief Reinertson used Fire-Rated Doors as a search example. James explained that there are multiple companies that manufacture fire-rated doors. A search can be done either by company number or alphabetical by product name. The listing sheet itself can be populated which shows who the company is, the design criteria for the product, how to install the product, how it's marked and the approval rating. A Plan Reviewer can use the listing sheet instead of pulling up a 5,000 page technical report in the course of his / her work.

- Lorraine asked if there are any labeling requirements for the listing number on an assembly; does it have to be shown on the product?

- James advised that yes, the product must be labeled with the listing number. He's not sure how it will be done in an assembly that contains multiple components but it will have to be done. Chief Reinertson advised that the working group used generic materials for the baseline wall that don't specifically require any labeling or listing such as 1/2" gyp board, typical blue-rated boxes, 2" x 4" or 2" x 6" stud walls. None of those components are actually labeled themselves but the insulation inside may have some type of label on it if it's rigid foam. Spray foam is different and cannot be labeled. How does spray foam get labeled and listed today? It would be no different than how it's done today. James advised that spray foam is in a container and the listing for an assembly is different because there are multiple components.
- Eric Banks asked James to look at the BML listing for a roof covering.
- James advised that some categories are voluntary and have no listing because there may have been a listing at one time but now there's no listing. Categories are not eliminated in case another product(s) that belongs in that category is listed at a later date.

Chief Reinertson advised that the primary reason for James' presentation is to provide information about SFM's BML Listing Program since there isn't a national listing service; the use of this service will be an option for the working group to pursue if the members decide that it would be beneficial.

James advised the BML Program is recognized throughout the state and his Division receives many phone calls inquiring about the 7A requirements because it's a new area of concern to the building officials and they frequently need assistance in understanding what's expected of them.

- John Woestman asked what kind of collaboration, if any, is anticipated to occur between SFM's BML Listing Program and BEARHFTI's approval process for insulation products.
- James advised that BEARHFTI would not be interested in the assembly but rather the foam. So, SFM would look at the products inside the assembly to ensure that they are approved.
- Walter Reiter asked if SFM will look at the test results and engineering evaluations and basically bless the reports.
- James affirmed Walter's statement and advised that SFM merely gathers information and ensures that standards are met. SFM examines the test reports and ensures that they meet the standard; engineering evaluations are not usually allowed because different engineers use different evaluations / there's such a wide variety of different types of evaluations. The majority of the time, SFM wants to see the test for the initial listing; an engineering evaluation may be submitted to SFM after changes have been made to a product.

Walter stated that because SFM's fees are so reasonable, it's not a burden for the manufacturers to submit to SFM. In his case, the EPS foam meets ASTM C578 so it's a fungible product and that's why his members sometimes group together to complete tests to support evaluation reports and that's where the expense lies. Requiring each manufacturer to take their C578-compliant product and run it through the test is expensive. Walter's company met with the listing agencies ahead of time when they were performing the NFPA 285 test and asked if a specific approach was acceptable.

IV. WORKING GROUP REVIEW OF WORKING DRAFT REPORT

Chief Reinertson thanked the members of the two subgroups that were put together and Andrew Henning for pulling through, revising and completing the report which now flows much better. The report that's being discussed in this meeting contains internal edifications and suggestions that were made after the sub-

groups met and after what was sent out to the working group members on 11/17; there were no content revisions made.

Marcelo requested that the term “flame-retardant” be removed from the report; he’d like to use the term “flame-retarded” instead. The term “flame-retardant” is absolute and nothing is absolute; the foam is “flame-retarded” to meet some requirements. Marcelo marked all of the places in the report where the term “flame-retardant” was used. Chief Reinertson asked the working group members for their feedback regarding Marcelo’s concern; nobody voiced opposition.

A. Acknowledgments: Lorraine Ross pointed out that Chris Martin is employed with NAIMA- North American Insulation Manufacturers’ Association. Marcelo stated that the full names / complete words of the names of companies, associations and / or government organizations should be written in the report- not just acronyms.

Donald Lucas suggested sending the report out to each person whose name is included in it and obtaining their approval of how their name, title and affiliation(s) are presented in the report. Chief Reinertson advised that he’s done that a couple of times but nobody has responded to him.

Steve Risotto advised that the acronym “ACC” is fine to use for his affiliation but since he did not regularly participate in the meetings, he will not claim any credit for the report and would be fine with the deletion of his name.

Donald Lucas advised that Veena Singla requested that her name be removed from the report.

B. Abbreviations and Definitions: Andrew Henning advised that any of the abbreviated words that were not in the report were removed and any of them that were only in the report once were also removed; if they’re in the report multiple times, then they were left in the Abbreviations section.

Concerning the definition of “candidate assembly” Mike Fischer asked if the working group is certain that the insulation doesn’t meet the flame spread index or is that unknown because it’s not required to be tested? Marcelo advised that the working group agreed that the insulation inside a candidate assembly does not meet the flame spread index; no test is required. Andrew Henning advised that this definition is from the testing standards. Chief Reinertson advised that if there’s a product that meets ASTM E84 currently, then none of this has to be done. Mike understands Chief’s point but shouldn’t a test be required to demonstrate that it doesn’t meet the flame spread index?

John Woestman stated that the terms “candidate assembly” and “baseline assembly” are used later in the document and how they’re used in the document provides a better definition than the actual definition. Perhaps the working group should reexamine the definitions when reviewing the use of the terms in the report. Marcelo Hirschler advised that the working group went through and included the definitions in the test methods and that’s how they came out in the report. Andrew Henning advised that he copied and pasted the definition of a basic wall assembly from a testing report and then deleted the word “wall” or “floor” or “ceiling”.

Lorraine Ross advised that changes in formulation outside of flame retardants for the candidate assembly can occur. It’s possible to have flame retardants in both the baseline and candidate assembly’s insulations and there’s some change in the formulation that would not meet the flame spread index. Chief Reinertson advised that there will be no issue for the purposes of the test that’s going to be run to obtain the data for the proof of concept.

Marcelo stated that when AC 12 is discussed, the Appendix B should also be referenced.

C. **Executive Summary**: Chief Reinertson advised that this section is new to the report; he will send it out to the working group members after today's meeting. It sets up the flow regarding what the subgroups have worked on.

Marcelo asked if the July 1, 2015 deadline that's mentioned in this section means that the CBSC's April 1, 2015 deadline will not be met. Chief advised that the July 1, 2015 deadline is a reiteration of the statute that was written prior to the CBSC's timeline.

Lorraine Ross stated that she doesn't agree that the working group reached a consensus regarding the third bulleted point. Chief Reinertson agreed and Andrew Henning mentioned that it's highlighted in green at the end of the report and can be discussed when the group gets to the end of the report.

Marcelo Hirschler asked if the use of the word "updated" in the last sentence of the first paragraph should be changed to "additional". Chief advised that the sentence is taken directly from the first paragraph of the statute. Lorraine Ross reminded the working group that it was decided that updated standards could not be done so there was some testing regime that was considered as an alternative; the working group never got around to updating flammability standards. Chief advised that the context of the first paragraph is a reiteration of AB 127. Lorraine thinks that it should be stated in the recommendations rather than saying "updated flammability standards". Chief agreed and advised that the working group should bring the topic up again in the conclusion. Walter Reiter advised that the term is used differently in the statute than how the working group uses it.

Donald Lucas stated that he's not comfortable with the second bulleted point which states that "proof of concept testing must ensure...". In the performance standard, there's a statement that says "a means of interpreting such results has not yet been determined". How is something going to be ensured without a metric? Chief advised that the proof of concept testing needs to ensure that there's adequate, useable data to look at and work with. Mike Fischer stated that it doesn't say that there's a guaranteed performance- it merely indicates that some data must be obtained from it. The data must be useable otherwise why do it? It has to be adequate; a list can be set up regarding what needs to be gleaned from it and then the proof of concept testing is determined to be adequate. It doesn't mean that something else can't be done, but the rules for the testing need to be set and the SFM must agree on which tests will be conducted. Walter Reiter asked if that preserves the ability that if the proof of concept testing turns out for some reason to be a bust, then the working group will not be committed to making any conclusions or taking any action? Is part of the process to establish the reliability of the proof of concept testing? Mike affirmed that's correct. If it's not included, then the performance standard will be worthless. Donald Lucas asked to define "adequate data". When it's stated that proof of concept testing "must" ensure, but it cannot be ensured, then why keep that part of the sentence in the 2nd bullet? Paul Wermer asked if a proof of concept works or not; is it pertinent to the experimental design component and what should actually be paid attention to? Is the data sufficient in terms of the items that are being looked at and is the data quality good enough to inform the decisions? Will the tests that are going to be performed actually establish proof of concept? If the tests are run and a useful comparison cannot be come up with, then the wrong tests are being looked at and the test search must continue. Paul stated that this is a data quality issue; will the success items that have been identified in the performance test documents actually generate the information that the working group members believe they will and is the data good enough? Something can be measured three times and produce numbers that are all over the map and not meaningful because there are variables that cannot be understood or the measurement technique that was applied is incapable of measuring and a better measurement technique is necessary. The working group edited the second bulleted item to accurately reflect their intentions with regards to the proof of concept testing. The working group also edited the first and third bulleted items.

Chief Reinertson informed the working group members that once the testing has been completed, the working group will be reconvened and it will be similar to the AB 127 subgroups. Instead of having so many people / everybody involved, there will be a only few people representing the industry, a few people representing AB127, a few people representing the fire service and a few additional members will be pulled in from the operational side of the house. The working group has not heard a lot from operations and the test data will give them something to look at. Ultimately it will be up to Chief Hoover to decide what direction she wants to take the working group based on the data that's provided to her. There will be an internal review that will help steer Chief Hoover and SFM down the best pathway. Based upon some of the things that have been done in the past with SFM's reports and how recommendations for building standards have been developed, Chief Reinertson thinks that another subgroup will be created. If there's funding available, SFM may obtain a peer review from an outside party with no vested interests. Lorraine Ross asked if a tenth question regarding this topic specifically can be added to the list of questions because the working group did not agree to this condition. Chief advised that it could be removed from one of the four bullets and not be part of the recommendations that the working group developed for Chief Hoover's consideration but it's going to be in the report. The working group members advised that they would prefer that route because there was no place to adequately discuss it without adding a new section. Chief asked why it can't be done. Walter reminded the working group that Australia experimented with it and it didn't go well. Avery Lindeman stated that it's working fine in Europe. Walter advised that Norway is an outlying country that has only five million people and their geofoam is not truly FR'd. Where are they getting their resin? We don't know. Chief asked the working group members what they think about adding a tenth question. Avery does not feel positive about adding a tenth question. Lorraine advised that since the working group members are limited to a 250 word limit, they would be limited to one page. Avery stated that there was no question directed specifically to this issue but everyone has the same word limit and it could have been fitted into the answer to one of the questions. Chief advised that the issue was brought up and discussed quite a few times.

D. Working Group Direction: Andrew Henning advised that bullet points two and three that the subgroup completed were merged into bullet number two.

E. Sources of Data: Chief Reinertson advised that modifications have been made; there was one line that was tweaked a little bit. The two subgroups did an exceptional job in putting this section back together and making it flow well. A working group member mentioned that there are references in the footnotes to test data from outside of the United States thus the statement that test data from outside of the U.S. was not considered is false. The test data was considered in the context of insulation formation and installation requirements. Lorraine thinks that this section is ok as it's written. Chief Reinertson advised that the working group did not reference actual data. Paul Wermer pointed out that the working group looked outside the U.S. at practices that are in place but didn't really dig into test result data in any meaningful way and he doesn't know how to balance that. Chief Reinertson suggested qualifying it as test data relating to non-FR insulation. Marcelo stated that the working group considered test data and concluded that whatever has happened outside of the U.S. isn't pertinent; he thinks that this section should be left as is / not wordsmithed.

LUNCH BREAK 11:30 AM– 1:00 PM

IV. WORKING GROUP REVIEW OF WORKING DRAFT REPORT (CONTINUED)

- F. Working Group Scope:** Chief Reinertson advised that the edifications were extremely minor and asked the working group if they'd like to many any additional changes. Nobody suggested any more changes / this section was acceptable as written.
- G. Insulation Applications:** Paul Shipp requested clarification regarding the second bullet that states "Insulation that is continuous across all structural members without thermal bridges..."; down below under "Exclusions", it says that it does not include EIFS and EWIS systems which seems contradictory. Lorraine advised that in the Energy Code, there is discussion about continuous insulation meaning not like an EIFS which is a whole assembly; it's just putting foam in non-structural sheathing. Chief advised to think about typical one-coat stucco foam that gets applied over foam and is on the exterior of the assembly and is continuous. There's no way to provide that barrier on the exterior of the assembly so that's why it was left off of the table. Lorraine advised that the definition in the report is from the 2015 IECC.
- H. Material Flammability Standards:** The working group discussed whether or not to include the reference to the 2013 CBC and CRC that's included in the sentence that states that contractors may choose to continue to use foam with added FR chemicals "in accordance with the 2013 CBSC (CBC and CRC)". Chief Reinertson prefers keeping the reference because it's prescribed in the current code but omitting the reference to "2013". Donald Lucas stated that if the reference to meeting the code is omitted, then someone could add 10 parts per million / an infinitesimally small amount of FR's. Lorraine thinks that could be done even with the change and doesn't matter. Avery Lindeman stated that the choice is not going to go away in the next edition of the codes; that same option will still exist. Lorraine Ross is not concerned about the working group members understanding the reference but rather other people who may misinterpret the reference as being specific to the 2013 codes only. The working group removed the year "2013" from the CBC and CRC reference.
- I. Metrics:** Walter Reiter asked if the working group agrees that there isn't an existing metric to measure overall safety. Adria Smith stated that the metric that the working group has been discussing all along is generic in nature. If the report says that another group will define the metric after the testing, whether it's fifteen minutes or something else, then it appears that the working group didn't define anything and didn't work on any metric at all. Paul Wermer stated that it's not clear that the current codes establish fire safety. For example, there's nothing in the codes that really establishes the level of fire safety for the non-rated walls that are installed in much residential construction. It's known that the fifteen minute thermal barrier is required by the code but the actual performance of the wall is unknown. Chief Reinertson advised that's the purpose of the baseline test. Paul agreed and stated that a series of practices have been established through the Building Codes but it's unknown in quantifiable terms what those practices mean in terms of building fire safety performance. Donald Lucas agreed, especially when considering overall building fire safety. Marcelo Hirschler stated that the fire safety record of these materials and assemblies is what provides assurance that the requirements are acceptable. There are two methods of establishing fire safety: running tests that assess all scenarios and looking at the actual losses. If the losses are considered to be "low", then the requirements that led to them are deemed acceptable. Paul Wermer stated that Marcelo's method is totally unquantified. Chief Reinertson advised that there's an existing building and, through the progression of the codes, we've accepted that Type V non-rated construction is an acceptable level for residential buildings. Changes have been made in certain areas such as WUI standards and standards for the exterior to make the wall between the garage and dwelling more robust because of the hazard levels. Measurements were not taken, though; it was merely established that a certain wall performed at a certain level and needed to perform better thus more robustness was added. Paul Wermer understood Chief's point and asked to be shown data that demonstrates that when a standard non-rated wall is exposed to fire it fails within a certain window of time. Jesse Beitel stated that doesn't matter because the codes state what rated walls do and anything less than that is acceptable here. It doesn't matter if the wall has twenty minutes or fifty-five minutes;

the code made the decision not to require a rating on the wall. Paul responded that's not what he's heard in the discussions with fire service personnel regarding safety concerns. Avery Lindeman advised that type V construction has been determined to be acceptable for certain occupancies but what does that mean? There's a variety of different materials and specific assemblies that could result and that still meet the codes and still meet that level of safety. The premise is that if one thing inside the assemblies is changed and nobody knows what's happened, then in order to compare the new assembly's safety to the old assembly's safety, there needs to be some idea of the range of some criteria such as time to failure provided under the Type V B in the codes. Chief Reinertson advised that the existing legacy construction that the working group is going to test and obtain data from will establish the comparison information. Avery understood Chief's point but thinks that one baseline test alone cannot possible reflect the wide range of construction options that are code-compliant and that are seen in the real world. Chief Reinertson understood Avery's point and advised that this discussion occurred several months ago when the working group created the baseline wall and used the typical minimum code-standard gyp board, wood-studded wall with plywood on the exterior which is what exists in 90% of construction. There are other ways to construct a building; somebody could use 5/8" regular gyp board which would perform better in a fire than 1/2" gyp board. The working group established the typical minimum type of wall construction to test which would be the worst-case scenario. Other types of construction for one and two family dwellings such as concrete would perform much better than the minimum wall. Donald Lucas asked if the worse-case scenario assembly is used, then will any other assembly that's tested that performs better than the worse-case scenario assembly should be allowed. Chief Reinertson affirmed that's correct. Adria Smith stated that will be the metric; there is no empirical data yet and there's no point of comparison yet so all that's being stated in this section of the report is that the alternative that's being discussed is equivalent protection to the minimum that exists in the current code. Paul Wermer thinks that because the performance of a baseline non-rated assembly has not been quantified, the proof of concept comparison testing has been selected by the working group to move towards defining the performance metric. Walter Reiter advised that he understands that in order to fulfill the directive to maintain overall fire safety, it was agreed that baseline model testing is called for to develop data to determine if that directive is met. Paul agreed with Walter's statement. Jesse Beitel advised that the comparative tests will provide information about certain assemblies but won't necessarily provide information about the overall fire safety of a building. Paul Wermer advised that the CBC's don't prescribe specific performance for overall buildings; they prescribe building methods that lead to a performance that we judge acceptable but that's not quantified- it's a sum of the parts and a number of them have not been quantified. The working group further discussed how to best word this section and made additional edifications. Avery Lindeman requested that the meeting notes show that she's not totally comfortable with the wording contained in this section. Lorraine Ross asked Avery if she's uncomfortable with the baseline testing program. Avery responded that she hesitates at this point to make sweeping, decisive statements regarding what the testing might or might not show and she would like to move forward with the report. Lorraine Ross pointed out that it needs to be shown in the report that the metric isn't something that this working group developed; it came specifically from the law which states that anything that changes has to maintain overall building safety. The working group members agreed and it was stated that the report does indicate that the existing level of fire safety is being maintained.

- J. **History of Fire Testing of Foam Plastics in Codes:** Andrew Henning advised that this section was originally written as its own section, was located much further down in the document and seemed out of place so he edited its location and made it a sub-section of the Code Requirements for Insulation section. Chief Reinertson advised that the information fits really well in this section and is a precursor to what follows in the historical information. Nothing in the section was changed; it was merely moved to another place in the document. Mike Fischer pointed out that the first recognized energy crisis in the U.S. was the Arab oil embargo that occurred after the Yom Kippur War in 1973. Marcelo Hirschler stated that the introduction of foam plastic insulation into the construction market had nothing to do

with the first energy crisis. Lorraine Ross stated that it's a fact that foam plastic insulation was introduced into the construction market in the late 1960's and it rapidly expanded in use in response to the energy crisis. Avery Lindeman stated that it doesn't really matter why foam plastic insulation was introduced; it's here and is being used and that's all that matters. Lorraine advised that there were many companies that came into business at that point and that's when all kinds of applications started and there were no codes in place; it was an unregulated market. Chief Reinertson advised that the second bullet in the two bulleted items was broken into two and appeared that it needed to be combined into one which is what was done.

- K. Fire Performance in California Building Codes:** Chief Reinertson advised that this section was not changed from what the subgroup initially proposed.
- L. Use of Fire Test Standards in the Codes:** Lorraine Ross wrote this section. Andrew Henning advised that minimal edifications were made to this section.
- M. Flame Retardants Used in Insulation:** The working group discussed how to address the toxicity issue. It was agreed to write "Potential health effects relating to FR's used in insulation materials were considered to be outside the scope of the Working Group."
- N. Debated Key Points:** Chief Reinertson advised that no modifications were made to this section. Andrew Henning advised that there was a lot of debate regarding how both sides / multiple points of view could be included in the report and keep everyone satisfied. The subgroup decided to include a question and answer section that shows both points of view. SFM came up with a list of nine questions and limited the responses to 250 words or one column (as shown in the report). Both sides agreed not to include responses to the other side and not to look at what the other side wrote until a later time / after the responses had been submitted. The group decided that the sides should be called "Position 1" and "Position 2" and that the authors' and / or supporters' names should not be divulged; which side to support should be the reader's decision.
- O. Working Group's Pathway to Performance Standards:** Chief Reinertson asked the working group members what they think about expanding the first paragraph, providing a reference to all of the material following it and placing the material in an appendix. Walter Reiter supported that notion. Andrew Henning explained that the first couple of times the working group met, a lot of the key discussion points from the previous section were discussed in detail. The working group then moved on to creating the super assemblies and eventually decided that they wouldn't generate the needed results because explosive material could potentially be used in the walls. So, the baseline candidate assemblies were then devised. Chief Reinertson asked the working group members to read the language contained in this section and give their feedback. Walter Reiter asked if the State is going to be paying for the baseline assembly testing only or both the baseline and selected theoretical candidates' testing. Chief advised that the State will be paying for both the baseline and selected theoretical candidates' testing because the two will need to be compared to see if the baseline will work. Paul Wermer has spent time as a customer buying specified materials in a high-tech world and has found that there are a large number of specifications that come into play because this is what the current material set looks like but those specifications are not necessarily germane to the performance of a product; not all of a manufacturer's specifications are relevant to the performance of a product as the user uses it but there are advantages for the manufacturer. Walter Reiter stated that it creates a playing field and if everyone is making ASTM Type 2, then they can be compared against each other. Paul thinks that occasionally there are requirements that might not be significant. For example, in the residential construction arena, some of the mechanical parameters criteria for the spray foam might not be germane. Lorraine Ross understood Paul's point and recapped that what he's saying is that if an ASTM 1289 poly-iso foam has the compressive strength of 85, that really doesn't matter- the compressive strength could be 42 and that

wouldn't matter. Paul agreed and stated that the R value is what matters. Lorraine explained that the problems with Paul's logic when applied to her types of products is that: A) All products must be labeled as either meeting or not meeting the ASTM standards. B) Manufacturers must show data that they comply with standards when they submit reports to ICC Evaluation Services. So, it's not only the code requirements that come into play here. Paul understood and stated that he wanted to clarify that some exclusions that are not necessarily there may be created at least at the initial point. Also, if someone introduces an expanded PET board, for example, which is certainly within the realm of technical capability today since recycled PET is readily available on the market, there is no ASTM standard for that product. Lorraine Ross advised that her company faced that scenario when foam came on the market; there was no ASTM standard so, once the code parameters were established, they ended up using the Alternate Materials and Methods Section of the code. Lorraine's company then went to ICCES who devised acceptance criteria that had to be met until the ASTM standards were completed; her company then started a request for an ASTM standard process. Paul Wermer asked if it would be possible for the working group to use similar language in their report. He's concerned that if there are a bunch of foams whose performance is modulated specifically by their FR materials and it turns out that's not a critical parameter for the use in the building, then will it be excluded because the mechanical parameters aren't right? Lorraine stated that the mechanical properties got into the ASTM standards because people care about them. Marcelo Hirschler advised that Paul is focusing on foam insulation which isn't necessary. For example, PET is used as an insulation material and there are requirements but it's used as a loose-fill insulation material. There are requirements and test methods that need to be met. The working group has chosen to limit their scope to the commonly used foam plastic insulation materials; they aren't all the insulation materials, though. There are many insulation materials that are used in the world that the working group is ignoring. Paul asked that when looking at a lot of the residential use of insulation that's being put between the walls, if there's a choice between fiber glass vats, peanuts, loose cellulose spray, wet pack cellulose spray, board stock or spray polyurethane and any one of these can be put into a wall, what kind of mechanical parameters are critical? Marcelo stated that it depends on the type of insulation that's being used; the mechanical and other physical properties would have to be different. Paul agreed and stated that for the application, which is insulation, assuming that it doesn't instantly collapse in a very small pile at the bottom of the stud base...Mike Fischer interrupted and stated that's exactly why those properties must be determined and why the ASTM committees worked on these for years and years and years. Chief Reinertson asked how Paul's discussion point is related to the working group's assignment regarding FR chemicals and flammability standards for building insulation materials. Paul advised that his concern is that in the home market, there are parameters that may be over-specified and they're making the requirements much tighter than what's actually necessary for the particular purpose. Chief advised that the national standards drive the requirements and they don't necessarily exist solely for fire safety reasons. Paul stated that from the building perspective, there's a great deal of latitude on what goes into all of the mechanical properties that are not significant criteria. Chief advised that anyone who wants to use a particular insulation in any state where the international codes have been adopted must comply with the codes. Eric Banks stated that the statement allows the working group to literally change one thing and only focus on one thing that's different. Lorraine added that if it doesn't comply, then it won't be commercially viable / won't be able to be sold. Eric Banks stated that most of the material specifications do include critical aspects like thermal resistance that sets a performance standard for the materials. Paul agreed that it sets a standard but it doesn't necessarily set standards that fully relate to fitness for purpose. Chief Reinertson advised that the national standards that have been adopted in CA rely on those for what can be sold and used in a building and this working group cannot address all of the other parameters.

Eric Banks asked to discuss the highlighted portions of the document including the flammability requirements. Is it the working group's intent to say that it's strictly an E84 thing or any of the flammability requirements in the material specifications? For example, C578 has LOI. Chief Reinertson advised that the CBSC requires insulation to comply with ASTM E84. So, based on the last eleven

months, FR chemicals are added to insulation based on that test. Paul thinks that the language needs to specifically be material flammability requirements which would encompass flamespread, smoke generation and LOI. Chief Reinertson agreed and stated that if there's something else other than ASTM E84 compliance that drives utilizing chemicals, then it needs to be added to the document. Lorraine Ross advised that ASTM C578 has LOI. Walter Reiter agreed and stated that the numbers for flamespread, smoke generation and LOI will need to be exempted. Whatever test is chosen to measure is irrelevant; if those numbers are hit, then there's an FR. So, the working group must remove those numbers. Lorraine asked if in the case of EPS and XPS, will foam that doesn't really comply with C578 be used? Walter affirmed that's correct because there are two parts to the C578. Lorraine Ross asked if the CA version of XPS and EPS doesn't meet C578. Chief Reinertson advised that may be the case; if it turns out that it must be requested that BEARHFTI revise the standard. Steve Fischer advised that BEARHFTI is looking solely at what tests are required; right now there are products that are either vapor retarded or not and maybe meet flammability requirements (or not) and then are marketed on that basis. Lorraine Ross advised that a manufacturer in CA won't be able to label their products as meeting C578. Walter Reiter compared it to ordering auto ignition parts; it must be known whether it's a CA ignition or a federal ignition. Lorraine agreed and stated that it will wipe out all of the other mechanical properties contained in C578. Avery Lindeman asked if the working group could indicate that it meets C578 requirements except LOI? Marcelo advised that C578 requires that E84 be met. Avery doesn't understand the issue. Lorraine explained that meeting or not meeting C578 right now in ICCES reports and in the code is a "yes" or "no" situation; it's either met or it isn't met. Walter added that C578 has five elements to it so the working group is modifying it; perhaps they shouldn't even call it C578 but rather CA578. Lorraine explained that the group is working through the mechanics on what the manufacturer has to do and what has to be labeled and not labeled, etc. Eric Banks stated that all of the physical property requirements are still necessary except the flammability requirement contained in the relevant material standard. Chief Reinertson advised the working group to list the requirements. Walter Reiter stated that flamespread, smoke generation and LOI are the material flammability requirements. Paul asked if there are other material flammability results that are required as prerequisites in the ASTM or NFPA codes.

P. Performance Standards: Chief Reinertson advised that this section was not edited. Marcelo asked if the appropriate term to use in the seventh sentence ("These test results will be used to determine if there is an increased **risk** to firefighters during operations, increased **risk** of fire spread within the structure, and/or an increased **risk** to neighboring structures.") is "risk" or "hazard". Walter Reiter stated that if there's an increase, then the risk vs. hazard problem is avoided. Marcelo disagreed and stated that risk can increase because probability has increased while the hazard will remain the same; this scenario poses an increased hazard. Avery Lindeman stated that the working group needs to achieve increased risk- not hazard; it's the end result that's the whole point of performing assembly testing. Marcelo disagreed; he thinks that the working group is concerned about an increased hazard. We want to know that the firefighters will not be subjected to more hazard. Chief Reinertson advised that the subgroup discussed this terminology and decided that the word "risk" is the appropriate word to use here and he's inclined to agree with the subgroup / keep the word "risk" in this section.

Q. Recommendations: Andrew Henning directed the working group to discuss the green-highlighted portion regarding the tenth question that is going to be added to this section. Andrew explained that the Report Subgroup will draft the responses to a new tenth question within the Debated Key Points section. The question will be similar to some of the other questions contained in the Debated Key Points section in that it will address the issue of whether or not it's possible that non-FR foam underneath slab can maintain overall building safety. Chief Reinertson advised that the tenth question will be developed for both Position #1 and Position #2 to answer and it will be added as a bullet point.

Lorraine Ross pointed out that the first sentence in this section states that “The AB 127 Workgroup makes the following recommendations to Chief Hoover” but not all of the members agree that the tenth question needs to be part of the Recommendations. George Combs asked if Chief Hoover will have the option to either keep or not keep the tenth question as part of the final report. Chief Reinertson affirmed that’s correct; Chief Hoover can decide to keep or not keep the tenth question.

Chief Reinertson is going to review past meeting minutes because he doesn’t necessarily think that everyone either agrees or doesn’t agree; he brought up the topic of moving the issue contained in the tenth question forward in past meetings and doesn’t recall hearing opposition regarding moving it forward. When Chief asked the working group if it’s hazardous to place non-FR foam under slab or if there’s data out there regarding the issue, he recalls having received no feedback at all. Walter Reiter asked if the scope is limited to the built environment. The working group was directed not to be concerned with storage, manufacturing or job sites. Walter advised that when considering those restrictions that have been placed on the working group, their concerns are not with the build environment that’s under the slab, etc.; they’re concerned with getting the material there and building it. Chief Reinertson asked what the issue is when discussing the built environment and putting foam in the assemblies that Marjorie Smith created and showed to the working group and that were very specific and limited to their applications. If someone is building a single family dwelling slab-on-grade radiant floor barrier with foam underneath it and that person wants to use non-FR foam, then what’s the issue? Mike Fischer stated that if the home is remodeled and torn up, there could be issues. There could also be issues if they want to use it somewhere else. Chief Reinertson advised those are not issues that are of concern to the working group. Chief Reinertson added language regarding the fact that the proposal does not address the manufacture, distribution, site storage of, sale or construction. Lorraine takes issue with adding the tenth question to the section that states “The AB 127 Workgroup makes the following recommendations:”; it’s up to Chief Hoover to either propose or not propose something and she can make the recommendation but Lorraine strongly advises against the working group making that recommendation. Donald Lucas suggested working on the wording that will precede the tenth question so as to separate it from the recommendations. Mike Fischer suggested writing in the report that this issue was discussed but there was no consensus.

Lorraine reminded the working group that they had discussed fires in buildings that were under construction; there’s a lot of history regarding firefighters responding to large fires in buildings that were under construction which is part of overall building and firefighter safety and it involves (FR) foam insulation. Chief Reinertson does not disagree with Lorraine and asked the working group if they need to add recommendations to the report regarding site construction and/or manufacturing issues. Lorraine stated that the working group agreed that there’s no need to perform a fire test when looking at putting foam below grade and there is no existing fire test that could evaluate it. Jesse Beitel stated that it would depend on how the foam would be brought up “x” inches aboveground. Avery Lindeman advised that the details that Marjorie Smith provided accounted for protection of foam in any place that it may have come above the concrete / she tried to address those issues.

R. Conclusion, Appendix A, Appendix B, Appendix C, Appendix D and Appendix E: Chief Reinertson briefly recapped these sections. Andrew Henning asked Lorraine Ross if she has an update for Appendix E; he thought that she was going to send it to him but he never received it. Lorraine responded that she will send her update to Andrew.

S. Appendix F- Proposed Performance Tests: Marcelo Hirschler asked if he could change the title of this section to “Test Standards Proposed by the Working Group”? Chief Reinertson responded that yes, it can be changed. Marcelo changed his mind and asked that the section title be “Proposed Performance Tests”.

Chief Reinertson advised that he will go through the document and edit all of the references to performance tests, proposed tests, proposed performance tests and performance standards so that they all use the same terminology / the words "proposed performance tests". Andrew Henning advised that he started with a baseline from an existing already-approved WUI standard that's in Title 24, Part 12 of the Referenced Standards, copied the formatting and layout, had multiple members from the working group participate as well as UL and Intertek. They came up with the four standards and the baseline assemblies which were copied and pasted out of the UL Directory of already-existing assemblies (so they didn't start from scratch / the assemblies had already been approved and were common). They have wall assemblies, floor-ceiling assemblies, a crawlspace and a conditioned attic. Marcelo thanked Howard Hopper for providing the diagrams. Payam asked if the 1/2" gypsum board with a 3/8" ignition barrier that's mentioned in #4 of the Testing and Evaluation of floor-ceiling assemblies is baseline tested to that, does it have to be constructed to that? Chief advised that the standard isn't being written into the code for people to just go out and apply it. The baseline testing is created and then the candidate is tested. The SFM or the working group then analyzes the data and determines what the SFM will do next. The SFM may recommend moving forward; if the assembly looks fine, then move it forward; if not, then don't move it forward. SFM may say create a test standard for materials to utilize this that complies with certain criteria. So no, it will not be specified; why the concern? Payam thinks that if this system will be constructed out in the field, then there will be a serious moisture problem. Mold and other issues will arise because of air protrusions where the king truss systems and the wood truss systems have openings. Paul Shipp advised that it's not proposed that this system will be used in buildings; it's just intended to be used for evaluation purposes. Chief Reinertson advised that this was taken straight out of the IRC. Payam advised that it's for a vaulted ceiling- not an attic ceiling. Jesse Beitel advised that at the end of the day, the criteria that they developed for that test was like this criteria and firefighters don't necessarily look at building science. Chief Reinertson asked if there's anything in the current codes, whether it be the CBC, the CRC or the CEC that prohibits this type of construction based on moisture? Payam advised that there is; there needs to be a 1" airspace at the top where there's moisture. Jesse asked how that's done when spray is foamed in there? Payam advised that spray foam is non-permeable. Cold air gets to the deck and then it condenses and brings moisture in plus there's no ventilation due to WUI restrictions so there's moisture captured that does more damage to a person's health than FR's. Eric Banks stated that from a plastic foam perspective, plastic foams make that concern almost moot because even the open cells are 3.5" or basically air and are permeable. If there's boards, they would have to be sealed. Payam brought up the issue because if he thinks that testing should be practical. Eric advised that for air-permeable insulations, they put a poly fill on the backside between the gypsum and the stud bases.

Paul Shipp asked why Type X gypsum board hasn't been called out in any of this. E119 Type X boards are designed for how gypsum will behave in a post-flashover condition. That's not paid attention to for regular gypsum board; only the fire reaction properties are paid attention to. Unless it's specified to always use the same regular gypsum board, there could be large differences in how different manufacturers' regular gypsum board behaves. A situation could arise where differences in different batches of gypsum board are being measured and the foam won't be evaluated at all. Jesse Beitel stated that the same thing could be said about the wood studs. Paul stated that a valid E119 test was not completed. Jesse advised that they're the same products / assemblies except for the foams. Paul asked what will happen with the gypsum board. When there's a regular gypsum board, there's no control over the cracking so there are large fissures and pieces/chunks drop out which could happen at any location. So, there's a very uncontrolled type of failure which may or may not reflect differences in the foam plastic. If a Type X board is used, then at least there's a consistency in that component so that the difference between the two tests will be a closer comparison of the FR vs. non-FR foam insulation. There needs to be consistency in all of the other elements of the assembly in order to determine whether or not a change between one test and another test resulted from one component. Payam asked if that would be a worse-case scenario. Lorraine Ross stated that this is a modified E119 and isn't intended to generate a rating. Paul advised that the random nature of the failures will be such that, unless multiple

tests are run, there will not be a consistent comparison. One test will be compared to another test. Jesse Beitel suggested that the problem could be solved by specifying whose gyp board is being used. Walter asked if it's non-type X, even if the same batch is used on the candidate and the baseline, the results will still not generate a valid concern because if it's non-Type X then it will failure in such radically different ways- even gyp out of the same batch? Paul presented a scenario in which gypsum wall board is being manufactured at 600 feet per minute and a switch is being made from one product to another product which means that batches are coming in that are formulated for Type X. There's going to be a period of time when there's wall board made which is transitioning from regular to Type X; all of that wall board can be sold as regular but it's not going to all behave the same way- one will have superior fire performance but we don't sell it for that because it's non-Type X which has variability. That's not something that's monitored; the other physical properties are monitored but as far as that's concerned, that's just a bonus for whomever gets a particular board. The boards are stacked sequentially as they come off the line so there won't be much of a difference. However, if you go to the warehouse, even if you buy the same manufacturers' product, if you get it during a different week or month, those properties could vary for the regular board. The Type X board is watched much more closely. Chief Reinertson advised that he will ensure that this will be specced in the RFP. When the National Association of Fire Testing Labs did their round robin, all of the board was manufactured out of Paul's company's plant- there was a single run onto one truck, they took it to Western Fire Center and then that board was shipped to all of the labs. Avery Lindeman stated that this should be captured somewhere in the testing protocol or in the report with the results; it should indicate the exact batch of gypsum board and materials that were used in the testing. In terms of assembling a body of data that can be broadly applied and assumed to be representative, that may not be what the working group will end up with. The wood studs should also be sourced from the same location which is actually standard practice. Eric Banks asked what the variability is when switching from Type X to non-rated. What does the velcro look like and what's the difference in fire performance from worst to best? In terms of the E84 surface burning characteristics, they're all flamespread less than 15; performance in a room corner test shouldn't make a difference. The fire resistance test E119 test is where a difference will be seen.

Walter Reiter asked if there will be a requirement that the candidate wall assembly not meet flamespread, smoke generation and LOI? Does it have to be tested and fail? We have to know that the candidate insulation did not meet flamespread, smoke generation and LOI. Adria Smith advised that as long as it doesn't have FR chemicals in it, then it doesn't necessarily have to meet those requirements. The same criteria has to be tested across the board in all of the tests. Chief advised that when the candidate wall is tested against the baseline, the candidate wall must contain non-FR insulation otherwise the test will be pointless. Walter Reiter advised that the old blowing agent that's been banned provided a lot of flame resistant characteristics. Chief advised that it still needs to meet all of the other applicable standards. Jesse Beitel advised that they must be similar in chemical and physical properties. George Combs advised that his company performs audits when they administer standardized testing and certifications. There could be an audit to make sure that the foam is made in accordance with whatever formulations they're going to submit as part of the protocol. Chief advised that the only requirement that products that get tested don't have to comply with is the added chemical FR; they still have to comply with all of the other standards that are afforded for and required of them whether it be from the EPA, DOT, Dept. of Congressional Relations, Energy Commission and ASTM- all of them. If it's sold in California and has to meet those, then the only requirement that's going to be tweaked is the FR. Mike Fischer asked if a company manufactures a product that contains FR chemicals, how will it be known or not when the test is done? Chief asked why a manufacturer would lie about that fact? Mike Fischer asked if a statement from the manufacturer will be required which says there are no added FR's in the product. The only way to know that it doesn't meet E84 is to perform a test that will show that it failed the E84, otherwise it's just a guess. Paul thinks that doesn't have to be tested; either a product has FR or it doesn't. Avery Lindeman advised that this is written as though it will go into the codes and the distinction for that is hypothetically, if this group finishes something like that and that's the conclusion,

then it's just exempt from Steiner Tunnel LOI or whatever, but for testing purposes, it will not contain FR's. Mike Fischer stated that hypothetically, if there's a standard for alternate compliance for something that doesn't meet the requirements of E84, then how does a producer determine that a product doesn't meet the E84 requirements? The only way to do that is through a test. Avery advised that the standard merely says that E84 doesn't have to be run. Chief advised that this is not getting moved forward in the code as a code proposal; it was created only to be used in the working group's tests. Marcelo advised that no sane person would pretend that they don't meet and have to spend a lot more money to qualify their product; it makes no sense. Jesse Beitel stated that even if a manufacturer who makes the foam without FR's still performs the E84 and discovers that there's a 1,000 flamespread, then that's fine- the manufacturer then knows that alternate testing will have to occur. Steve Fischer pointed out that there are a few sections in the Working Group Report and Recommendations that require that the E84 be completed on both the baseline and candidate assemblies and proof of that testing should be contained in the test report that's required to be submitted after the test has been performed. Walter Reiter agreed that the Report says that in section 12-7-9.10.2 Part A- Test Report 1.c. Steve added that in other places it says "if tested in front of the candidate wall assembly...". The Report is inconsistent and it varies from the 119 to the 286. Steve asked if the purpose is only to test the fill- not develop a candidate assembly that would pass their particular product? Chief affirmed that's correct.

V. ADJOURNMENT

Chief Reinertson advised that he will revise the foam-under-slab / tenth question portion of the Report and send it out to the Working Group. Chief Reinertson and Andrew Henning have an extremely heavy workload during December due to their responsibilities in the 2016 CA Code Adoption process. The last AB 127 Working Group meeting will be a teleconference / GoToMeeting that will be held on Thursday, December 18th from 8:00 AM – 12:00 PM. Chief Reinertson and Andrew Henning will create question ten within the next couple of days after they've read the Australian reports that Walter is providing. The deadline for the working group members to submit their Position 1 and 2 responses is 5:00 PM PST on December 15th; the parameters will be the same as they were for questions 1 – 9. The responses will be incorporated into the Report and Recommendations which the working group will review in the December 18th meeting. Marcelo Hirschler advised that the people who would like to increase fire safety are working on a report that they are planning on having done within a week and that will be posted on the Working Group's website. There will be some Appendixes in their report, one of which will list the fire standards in the code.

The meeting was adjourned at 1600 hours.