CHAIRPERSON PRESENT:

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

MEMBERS PRESENT:

Eric Banks, Technical Specialist- BASF Corporation, representing the Spray Foam Coalition of the Center for the Polyurethanes Industry (CPI)
George Combs, Senior Principal Scientist, Product Development and Technical Support, Rigid/Specialties and Raw Materials, Polyurethanes, Bayer Material Science LLC
Steve Fischer, Ph.D. Chemist- Department of Consumer Affairs, Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI)
Gene Gantt, Executive Director- CA State Firefighters' Association (CSFA)
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)
Michael D. Fischer, Director of Codes & Regulatory Affairs- Kellen Company, representing the Polyisocyanurate Insulation Manufacturers Association (PIMA)
Avery Lindeman, Science & Policy Associate- Green Science Policy Institute
Justin Malan, Principal/Owner- ECO Consult, representing the U.S. Green Building Council of California (USGBC)
Donald Lucas, Ph.D., Combustion Scientist- Environmental Energy Technologies Division- Lawrence Berkeley National Laboratory
Ernie Pacheco, District 9 Environmental Programs Coordinator- Communication Workers of America
Walter Reiter, Deputy Director- Expanded Polystyrene (EPS) Industry Alliance
Lorraine A. Ross, President- Intech Consulting Inc., representing the Extruded Polystyrene Insulation Manufacturers Association (XPSA)
Adria Smith, Deputy Fire Marshal- Fountain Valley 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)

MEMBERS ON THE TELEPHONE:

Robert Raymer, P.E., Senior Engineer /Technical Director- California Building Industry Association (CBIA)
John Woestman, Codes & Standards Director- Extruded Polystyrene Foam Association (XPSA)
I. CALL TO ORDER

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

II. REVIEW/APPROVE MAY 29, 2014 MEETING NOTES

Chief Reinertson advised the group that he did not receive many emails during the past month regarding prior meeting notes. Marcelo Hirschler stated that the last sentence of the second paragraph on page 4 which states that he said “Every time that flame retardants are added to a system, heat release will be decreased and fire performance will be improved which has been demonstrated repeatedly” is untrue. Marcelo would like the minutes to be amended to indicate that he thinks that every time the appropriate set of flame retardants are added at the appropriate levels to a polymeric system, then heat release will be decreased and fire performance will be improved. It is essential that flame retardants have to be tailored to a system and the appropriate levels have to be used; for every system, it can be done. Marcelo thinks that the term “flame retardant” when used to discuss foam or other types of flame retardants is a nonsensical term in that a material can be “flame-retarded” because flame retardants have been added which may or may not cause an improvement in fire performance. If the appropriate system is used, then yes, there will always be an improvement in fire performance. Paul Wermer stated that the fourth sentence in paragraph four on page 5 which states that “In order to use the non-fire retardant treated foam, it has to be in both sides of the assembly” is vague. Paul thinks that the group was discussing the fact that the thermal barrier needs to be on both sides of the assembly thus the sentence should state “In order to use the non-fire retardant treated foam, the thermal barrier has to be on both sides of the assembly”. Also, Paul indicated that the last sentence of the fourth paragraph on page 9 which states “It’s recommended to leave a 1” maximum airspace” is also vague and should state “It’s recommended that any airspace should not be greater than 1” in size”. The recommendation is not to include an airspace but rather that if there is an airspace, then it should not be greater than 1” in size. Chief Reinertson advised the working group members to email any comments regarding the May 29th notes to him and he will make the appropriate changes before finalizing them.

III. PRESENTATIONS (OPEN AGENDA ITEM)

A. Justin Malan’s Letter: Justin Malan brought copies of a letter written by members of the U.S. Green Building Council (USGBC), Green Science Policy Institute (GSPI), Natural Resources Defense Council (NRDC), Professional Firefighters, and other groups that acknowledges what they think is an appropriate recognition by the AB127 Working Group and SFM of the original intent of AB127 which is to consider either an alternative to the current test or the current methods of doing things. Justin thinks that the discussions during the last few meetings have been more constructive than they were during the first couple of meetings.

B. Lorraine Ross’s Budget and Timing Questions: Lorraine Ross stated that the working group members became aware last week that Governor Brown signed the budget and the $253,000 appropriation that was requested for this project was approved. Lorraine inquired how the project is going to be done,
where it’s going to be done, what the funds are going to be used for and if the working group members are going to be reimbursed for travel expenses, lunches, dinners, etc. Lorraine also requested to discuss the issue of the potential timing readjustment for the working group to complete the project. Chief Reinertson responded that the working group needs to further develop the assemblies in order to move forward and he thinks that several more need to be completed in addition to the wall assembly. Regarding the timing, proposed recommendations from this working group to the SFM are taking time. Chief Reinertson does not see the working group finishing the project for recommendations by the next meeting (July 24th); possibly by the August 28th meeting but not the July meeting. The Building Standards Commission (BSC) came out with their timelines for the 2015 triennial rulemaking cycle which is for the 2016 California Codes and the deadline to submit a rulemaking package to the BSC is April 1, 2015. All assemblies do not have to be done and tested by then but in order for SFM to move something forward, there must be quite a bit of substantiation. The Code Advisory Committee hearings will be the BSC’s first activity. The BSC’s technical experts on the agency’s rulemaking package will review the package during June, 2015. The working group should submit the report and draft recommendations to Chief Hoover by the end of August, 2014 in order for SFM to be able to complete internal reviews and submit the package to the BSC; the AB127 working group meetings may have to be doubled up on in order to accomplish the goal.

Bob Raymer with CBIA advised that the 2016 triennial code takes effect on January 1, 2017.

Chief Reinertson stated that he doesn’t think that the working group is going to achieve what’s necessary by July 24th thus he’s going to push the timelines out. Based on discussions during the last two meetings, testing will need to be done on the proposed assemblies. So, the next item of discussion is funding; how will the testing be funded? The budget that was recently signed allocated approximately $253,000 for this project. SFM is planning on hiring a Retired Annuitant (R.A.) to assist with this project because there isn’t currently enough existing staff to accomplish the objectives. The R.A. will start the contract work with labs that will be necessary in order to perform testing. The working group is going to determine the appropriate test(s). The working group members have discussed the ASTM E119 and completing a comparative analysis between existing types of assemblies and the proposed assemblies which will have to be included in the recommendation report. The length of time necessary to get the contracts together, when the testing will actually start and which labs will perform the testing is information that is currently unknown. Chief Reinertson advised that the R.A. that he’s going to hire for this project is a Mechanical Engineer who worked for SFM in the past for quite a few years.

C. The Testing Process: Justin Malan asked if the working group is going to create a proposal for an alternative assembly if certain tests are met without actually having conducted those tests or is the working group going to run a battery of tests before a recommendation is made. Chief Reinertson advised that the working group is going to run a battery of tests prior to making a recommendation to the BSC. Justin asked if developing a game plan that specifically states the framework that the SFM can accept is an option. For example, stating that “if there are multiple assemblies, then they need to be subjected to the following type(s) of test(s)” could be the recommendation so that the approval by either the SFM or the BSC is conditioned. Chief Reinertson responded that there are options for going down that kind of pathway. For example, if SFM is unable to move a regulatory package forward because the testing cannot be done in time to demonstrate the material’s fire safety, just as is the case with any existing product, the option does exist to go before a building or fire official in the permitting process and say “in lieu of this, I want to use this as an alternative and here’s my testing that justifies that it’s equivalent”. It’s possible to write a regulation that allows something similar to that if the parameters are known. Justin is concerned that the working group will only be able to test one assembly or a very limited number of assemblies given the limited budget and timeframe. It may be more beneficial to state that a certain standard must be met in lieu of adding a fire retardant material. There’s a possibility that even one full test will not be completed by August which would render the group’s work inconclusive. Chief Reinertson stated that the first issue of concern is timing. The legislation requires the working group to move regulations forward within a certain amount of
time, but if the working group is unable to accomplish that, then the outcome may be to advise that it’s an impossible task. If the working group were to exercise the option that Justin suggested regarding discussing whether or not the alternative assembly meets “X, Y and/or Z” standards, then a significant increase in the workload would result. If such a discussion were started now, it would put the development of the assemblies on hold.

Mike Fisher asked how much of the budget will be spent on the R.A. Chief Reinertson responded that the R.A.’s salary will be between $30,000 - $44,000 which will leave between $200,000 - $220,000 to be used for testing, etc. He does not know what U.L., NIST or other labs may charge or if there’s additional funding that may be kicked in elsewhere to assist. It’s hard to get an accurate cost estimate from a lab employee for unspecific tests of assemblies that don’t yet exist.

Paul Wermer stated that the summary of testing requirements for materials that Lorraine provided during one of the working group’s first meetings clearly demonstrates that E84 is insufficient to prove fitness for purpose in various assemblies. Given that standard assembly test procedures exist that show fitness for purpose of the material, why is it that those procedures are not sufficient to apply to an assembly that contains a non-flame retardant foam. For example, there are specifications for foam roof insulation and the E119 for the wall/roof-ceiling/floor-ceiling assemblies for rated walls. If those tests are sufficient to prove safety for a material that has passed E84, then aren’t they also sufficient to prove safety for a material that has not undergone E84 testing? Chief Reinertson responded that the working group discussed running comparative tests at the last meeting; a battery of tests can be run for a wall that’s built with FR-treated material and the ASTM-E119 test can be run for a wall that does not contain FR-treated material. The specific tests that will be used depend on the application.

Marcelo stated that E119 is a fire-resistance test but in 90% of the cases when dealing with foam plastic, the foam plastic itself is not intended to provide fire resistance- it doesn’t; it’s part of the reaction to fire. This is why a combination of tests is used; the thermal barrier with its associated tests and the E84 is conducted on wall insulation. The ASTM E108 and the E84 are conducted on roofing materials. The E119 is a fire-resistance test; it’s not what the working group is discussing.

Lorraine stated that it’s not true that the assembly tests are “in lieu of” E84; in fact, in the case of E119, all of the materials that go into it must first be qualified. Substitutions of components are not allowed; there must be some type of qualifying test to get to a certain point. Lorraine would like to know UL’s opinion about this issue.

Chief Reinertson stated that there is an assembly test- the ASTM E119; the working group would like to see how a wall that contains FR performs compared to a wall that does not contain FR. The working group is only concerned with one and two family dwelling type V non-rated construction and will basically be determining how a fortified one-hour wall will perform. It’s common knowledge that a single family dwelling that burns for longer than one hour will burn down to the foundation. The issue that the working group is considering is whether or not a non-FR treated foam assembly wall works and performs equally to an E84 foam assembly wall. Conducting the ASTM E119 on the wall assembly seems appropriate. Is there a better, different test to demonstrate what the working group is trying to accomplish?

Justin Malan stated that it may be helpful to establish the parameters of a test because it would automatically limit the number of assemblies and would also prevent the need to engage in the rulemaking process repeatedly for subsequent assemblies. Another challenge to consider is if the State is willing to pay for all of the tests. Assuming that there will be other applicable assemblies in addition to the current one, the State will probably not be willing to fund all of those tests. The working group should collectively attempt to establish the criteria for those tests; there may be a financial interest for the testing labs to complete the tests without SFM funding. Justin understands that the working group is trying to break the mold and get
the ball rolling by potentially using State funds but perhaps a more helpful tactic would be for the working
group to devise criteria stating that if a test is developed and a product passes the test, then it would be
functionally equivalent to adding fire retardants or to the E84 test. Justin is concerned that if the working
group continues along the current path, then one particular assembly will be proposed that has been run
through a test that’s State-funded and if/when other assemblies are added, then the process will have to be
emulated or duplicated which doesn’t seem like the most effective way to go. Is there a way to create an
alternative test to the E84 in process but not in detail and then leave it to the experts to fill in the blanks and
make any approval conditional upon the filling in of those blanks?

Marcelo stated that the group keeps discussing an alternative to the E84 test but that’s not what the
discussion should be about. An alternative to E84 is not acceptable for code use. Paul agreed and stated that
the group is not looking at an alternative materials test. The USGBC’s position is that the E84 is not a
sufficient or necessary assembly test; there are other established assembly tests. The suppliers may choose
to use E84 because it gives them more confidence that the material will pass the assembly test but no
evidence has been provided that the E84 predicts performance in the firewall in large part because there’s
been no testing of materials without FR’s in that same assembly.

Lorraine advised that if a supplier wants to test foam insulation in a fire-resistive rated system, an E119, it’s
not the supplier’s choice to perform an E84 test on the foam- it’s the testing lab’s requirement. Nobody
thinks that the E84 is predictive of actual fire performance which is part of the E84 and any fire test in E5;
those tests are not predictive. Regarding Justin’s point, Lorraine asked Eric to look up the acceptance
criteria for foam plastic insulation, AC12, which is what the ICC Evaluation Service uses to issue the
evaluation reports for foam and is used as proof of code compliance by every code official in the country
who uses ICC Codes. It was originally issued in April, 1980 and revisions were made because there are new
applications of foam so there was new testing added in October 1982, April 1992, January 1995, January
1996, June 1998, September 1999, etc. The acceptance criteria change when a supplier introduces a new
application for foam that’s not currently in the code and it must be proven to be fire safe. The supplier in
this case will have to obtain approval for use without FR’s; how can that happen? The test report will then
have to be produced. The process can take years.

Paul asked if there’s a reason why the E119 requires the test report as a prerequisite. Chief Reinertson
responded that the development of codes and standards over the past 100 years has evolved to require the
test report.

Marcelo stated that the industry performed tests during the 1960’s and it was discovered that when the E84
is run on non-FR standard traditional foams, the results are a disaster. In order to get the foams to perform
well, FR’s were added. The information about the fact that non-FR traditional foams such as polystyrene or
polyurethane fail or perform very poorly in the E84 was generated many years ago and that’s why those
foams are no longer being produced.

Paul thinks that his point was misunderstood. He has not seen any information that demonstrates a
correlation between E84 performance and E119 performance. The working group members agreed with
Paul that there’s no information that demonstrates a correlation between E84 performance and E119
performance. So, if there’s no correlation and if the E84 is not a sufficient qualifier for use of the foam, then
why is that requirement included? Some applications may require the E84 test but for the assemblies that
the working group is discussing, it’s neither necessary nor sufficient, so why include it?

Chief Reinertson advised that the working group will direct the labs to test the assembly in a certain way.
Even though the standard ASTM E119 requires that the foam be tested with E84, the working group is
going to direct the labs to remove it. The working group will not be concerned with what ICCES, ASTM,
NFPA, UL or any other testing lab is doing or how it’s done at the national level. The State of CA/SFM has
direction to move forward with the legislation and the working group can create the parameters. Chief Reinertson advised the working group to further discuss Justin’s point about creating a new parameter.

Marcelo stated that the panacea of trying to create an alternative test to E84 for code use is similar to when people were trying to convert lead into gold during the Middle Ages. People have been trying to do this for 60-80 years and have discovered that some tests work while others don’t and the search will continue well into the future.

Mike Fischer responded to Justin’s question regarding what can be delivered in terms of an interim report knowing that testing will take more time. Absent research data, it will be hard to move anything forward and no working group member would support that. Simply stating that testing will be done and that’s satisfactory is unacceptable; the specific details of the testing must be laid out. The devil will be in the details of what the group commits to; Mike thinks that it will take longer than one more month to develop a test protocol. He’s served on research project teams in the past that have taken six months just to get to a point of agreement regarding what’s going to be taken to the lab.

Justin asked if the rulemaking regulators establish the protocols and standards for the development of a test that a third party will conduct. Is there an expectation of performance that’s articulated to the testing lab that explains what’s expected for the test to demonstrate and that asks them to figure out the appropriate protocol and how to develop a test? As defenders of public safety, will the working group direct the lab to put the materials through a test that will have a specified outcome? If the material meets a standard and if someone can perform a test that will verify that it’s met that standard, then will that be good enough for the working group?

Marcelo explained that the typical manner in which codes have developed in the U.S. is: 1.) A test is invented. 2.) The test becomes standardized in some manner. 3.) The AHJ and/or code body develops the requirements. The AHJ and/or code body decide the pass/fail criteria. Decisions regarding criteria cannot be made until it’s known exactly what’s being done. In Europe, when the EU issued their initial criteria, it was stated that the building shall be safe in case of fire which is a wonderful concept but the test needs to be done first before the criteria is issued.

Lorraine advised that E84 is a test method that exists in the code today; there’s no pass/fail for E84. The test is run in a specific manner and a number is generated. The code determines what’s safe for a particular application. For example, for foam plastics, the limit is 75 flame spread with the thermal barrier. For an interior finish material, it’s 25 for the same test (E84). The test method is just the standardized way of performing the test. The code determines the performance criteria and what the right number needs to be based on the application. She was involved in a recent UL project and questions arose about whether or not installing solar panels on a roof was affecting the fire rating of the roof system; was it making it more flammable or combustible or was there no effect? The project was turned over to UL’s research team who formed an advisory panel, called the Solar ABC’s Project and developed a modified test that was turned into a UL consensus standard that was recently included in the building codes (UL 1703). That process from start to finish took six to eight years to complete. This process of completing this project will be similar and it’s not simple; the code relies on data- not assumptions.

Eric Banks advised that fire testing begins with determining “what kind of fire” it is that’s going to be involved in the test- not what should be measured but what kind of fire is being considered and then mimicking that fire as closely as possible. The acceptance criteria are developed after it’s demonstrated how materials burn.

Lorraine advised that a major complication with this project is that there’s a lot of fire testing that will need to be done. There are a lot of fire tests, assembly tests and individual tests that are in the standard so there
will not be just one change. The group would have to get absolved from the labs or the codes in order to be able to refrain from conducting the E84 on the other assemblies.

Avery asked why there’s an issue with developing an alternative- not changing anything existing in the code- in which the requirements for the foam are not the same as they are for all of the other materials. Lorraine responded that it’s an issue because to date, nobody has been able to identify what fire safety criteria is important. What’s the baseline against which new assemblies should be measured? This is the reason why the working group defaulted to performing an E119 on the wall assembly. Marcelo recounted a story about a fire that occurred at the Monte Carlo hotel in Las Vegas a couple of years ago as an example of what he thinks summarizes the problem that the working group is facing in completing this project. There was a significant amount of non-compliant foam inside the façade of the building next to the eaves. The non-compliant foam melted and dripped into the eaves which resulted in a massive disaster. The foam itself met the E84 Class B requirements but it was located in the wrong place and was not supposed to be uncovered in an assembly that was not code-compliant. Also, an Australian company recently completed a survey for the NFPA Fire Protection Research Foundation that showed many incidents throughout the world of places where foam is used in a non-code compliant manner which results in many problems. Some of the working group members have spent thirty plus years trying to implement the generic concept of establishing safety in case of fire.

Chief Reinertson discussed a well-funded project in which SFM developed tests with U.C. Berkeley during approximately 2003. The tests were specific to buildings that were constructed in the Wildland Urban Interface (WUI) and took several years to create. Chief Reinertson showed the working group members an example of one exterior wall siding and sheathing test that was created during the project. The group started out with a lot of anecdotal data because Cal Fire, CDF and local fire had identified the problem and knew how they wanted the materials to perform. So, they were able to give the lab parameters and ask for a test that would reflect the desired performance. Current codes regarding foam require them to perform in “X” way. Chief Reinertson does not know where to start in creating different parameters for a different test. It took SFM several years to develop the tests with U.C. Berkeley.

Eric Banks asked Chief Reinertson if the tests started out with a fire exposure scenario that California wanted to figure out how to evaluate rather than the removal of a component as AB127 requires. Chief responded that the developers knew up front that they needed to create something that was going to minimize the impact of wildland fires. They were not trying to prevent 100% of the homes from burning down; they were trying to give firefighters the opportunity to defend homes in specific scenarios so that when buildings are constructed to the specified parameters and when there’s correct vegetation management per the regulations, the firefighters would have the opportunity to protect the homes. Marcelo stated that the concept that was primarily put in place was that nobody wants fire-resistant construction exclusively; they want to be able to work with reactions to fire tests and not have only one-hour fire resistant exterior walls. For example, the ignition-resistant materials that Marcelo worked on adding to the code seven or eight years ago. Chief Reinertson agreed with Marcelo and added that cost-effectiveness was another consideration. In addition, they did not eliminate certain types of materials or construction but rather created a prescriptive approach (use X, Y, Z materials and comply with the code) and, if another type of material was going to be used, then they asked that it be tested in accordance with certain performance standards. Vents for attic ventilation were just finished at ASTM and SFM has been pushing the vent industry for over five years.

Bob Raymer with CBIA stated that the dual-compliance approach that was implemented in the WUI standards worked out very well. The prescriptive approach was created early on during the project which allowed time for those who had the wherewithal to work on the performance aspect to do so.
Chief Reinertson stated that if this working group agrees to move forward with recommending that these assemblies achieve compliance and would like testing to be done to justify that assertion, then the door will be open for looking at buildings other than one or two family dwellings. If a parameter is set that works for walls, then perhaps it would work for Type V one-hour construction or even Type 1 or FR construction.

Eric thinks that a surface-burning component needs to be added to whatever the working group develops. Not necessarily the E84 test, but some other method of determining that the materials meet some minimum fire reaction characteristic. Leaving it wide open is just not safe. Chief Reinertson responded that Type V non-rated construction can have vinyl, stucco, foam, tar paper, wood and basically any other material on the exterior facing. He then explained that regulations for straw bale homes will appear in the 2015 CA Residential Code as appendices. Lorraine advised that the straw bale must meet the E84 test. Eric advised that he completed a search at ASTM for E84 and specifications and there are over 500 material specifications that contain E84, even for non-combustible materials. Marcelo advised that one of the criteria that Walter addressed was that C578 requires an LOI as a quality control (QC) test. Standard polystyrene foam that’s not flame retardant has an LOI of roughly 16 or 17; it’s not required but that’s what it has. C578 requires all foam to have an LOI of 24. Perhaps this is a way for the group to move forward; it’s a QC test that’s easy to run. Chief Reinertson asked what purpose the surface burning characteristic would serve for the extremely robust Type V non-rated construction single family dwelling wall with many additional bells and whistles that the working group has created. Eric responded that it will help to put a box around materials; not anything and everything. The barrier is not always going to be there during construction; holes will be poked in the wall and there should be some kind of understanding of the surface burning characteristics of the materials. Marcelo is not going to debate Eric’s point in principle but he’s concerned with problems at the job site. Labeling requirements for foam are not comparable to those for glazing. Workers pick up an entire window to install; not just a little piece of the glazing. When people need foam, they will go to a website and randomly pick one type of foam. Chief Reinertson acknowledged Marcelo’s point and indicated that it’s another issue that the working group will need to address.

Lorraine stated that another aspect of this issue that the group has not yet addressed is that there are many types of foam and if one test such as the E119 is done with a spray foam (both with and without flame retardant) in the cavity, that’s just one type of foam. There are other types of foam. Regarding fitting boardstock between cavities, there’s polyiso boardstock, polystyrene boardstock, expanded polystyrene, extruded polystyrene and there should be some type of small screening test otherwise it will be necessary to run four replicate samples for each foam type because they may behave differently. Chief Reinertson advised that the type of foam that’s contained in one and two family construction that has the potential to result in a worse-case scenario is what should be tested first. Paul stated that there are two conditions with two different potential failure modes: thermosets and thermoplastics. The thermoplastics can melt and do strange things while they’re melting whereas the thermosets do not melt. So, it may well be that one representative case of each type needs to be examined in order to cover all of the issues. Lorraine stated that there’s also open-cell foam, spray foam and closed-cell foam and open-cell foam has a greater surface area than closed-cell foam does and there are chemical differences. Lorraine recommended going to ICCES and looking at the reports which will show that some foams have some approvals and others don’t. Paul thinks that the working group can look at the foams that are not suitable for certain applications because they’re more likely to ignite. Lorraine and Marcelo disagreed and advised that there are performance tests in the code that are either met or not met.

Chief Reinertson asked Eric to elaborate upon his idea of adding a surface burning component. Eric responded that he thinks that as the assembly tests are run, a concurrent evaluation of the materials in the assembly tests should be done with some other surface burning tests; it could be the lift. Lorraine suggested that it could be the E84 and if an unclassifiable number results, then that’s what it is. There’s no limit; a surface burning of 900 or unclassifiable (meaning it went so fast that it was unmeasurable) could result and that could be added to the code. So, with this system, E84 could be the test but the number will be really
high and will be reported. Eric advised that FM 4880 requires that the E84 be run but it doesn’t give the
criteria. Eric stated that in a Type V residential home, there are continuous insulation requirements for the
exterior and he thinks that it’s important to know the material’s surface burning characteristics for a
scenario in which the fire occurs on the outside. He does not want to eliminate any type of consideration,
evaluation or understanding of surface burning. Marcelo doesn’t think that it’s possible to run an E84
without some type of criteria. Adria stated that E84 is not part of the acceptance testing; Eric wants to see
what the E84 values are. Chief Reinertson advised that for the purposes of testing the new assembly, other
than getting that number, he doesn’t see what it would achieve. Eric does not think that it’s safe to not
understand the surface burning characteristics because the wall is not always going to be there; the fire
protection is not always going to be there. The limitations can be developed as the work is completed. Don’t
put the cart in front of the horse; find the data and then devise the criteria. Lorraine discussed the concept
of ignitability. When looking at a non-rated foam in a wall that has penetrations from electrical boxes, ducts,
etc., perhaps an ignitability number would be useful to have because there could be flames going through
the penetrations. Lorraine thinks that Marjorie’s idea about substituting out products could be used as a
screening test. Marjorie thinks that if E119 were used as a screening test right now to determine if the
assembly meets a standard that everyone is comfortable with, it doesn’t seem that given the testing
paradigm that currently exists today that anyone could quickly jump to having a test to test everything else.
So, if the group starts with the prescriptive approach, then it will be much further down the road when other
materials will be able to be substituted. Chief Reinertson advised that this may be the baseline for the other
materials and it may be the baseline for a certain foam manufacturer or insulation manufacturer who wants
to use his/her product which wasn’t tested by the working group. The aforementioned manufacturer creates
his/her assembly and tests it and if it meets the original parameters that were set through the working
group’s test, then that manufacturer will have a product. Eric stated that’s the process for a one-hour rated
assembly today in that if a person wants an hour, then he/she must show that it’s an hour. Chief suggested
utilizing UL’s engineering studies. Lorraine advised that the studies are based on UL’s history that’s
contained in their database and similar chemistries. Marjorie thinks that could be part of the longer process
of being able to pull in a multitude of materials.

D. Comparing European Foams to American Foams: Lorraine asked Chief Reinertson if he’s planning
on setting up an advisory group to design the testing program or if the test will be designed solely by SFM
and the lab. Chief responded that the working group’s recommendations should include that topic. Lorraine
thinks that the group will have a difficult time deciding upon the worse-case scenario foam. Chief asked the
working group to consider the availability of non-FR foam for typical one and two family dwelling
construction in the U.S. Avery has started researching Swedish insulation; she hasn’t actually found a
manufacturer yet but is planning on it unless Chief Reinertson isn’t interested in testing European foams. If
that’s the case, then she thinks that the working group members who represent insulation manufacturers
would probably be the best resource for finding non-FR foam. Chief responded that the issue with testing
European foam is that U.S. manufacturers may not be willing to duplicate it; he doesn’t want to test
something that won’t be available in the U.S. Eric responded that those are business decisions and Lorraine
suggested submitting the European foam to a C578 test panel and asking them for their equivalent to an
MSDS sheet because European blowing agents are different than American blowing agents. Lorraine
explained that CFC ozone depletion issues per the Montreal protocol were the catalyst for the blowing agent
changes. Because of the difference in standards, Europe changed blowing agents which are a major
component of foam. Poly-iso went from a CFC 11 to 141B to pentanes which increased the flammability of
the formulations so there were FR packages and catalysts that had to be changed in order to comply with
the ozone depletion requirements of the Clean Air Act. Extruded polystyrenes went from CFC 12 to 142 to
134A. In Europe, they went to CO2. In some cases, they were HFC’s or HFO’s which will affect the overall
flammability. Lorraine’s company had to undergo a whole panel of tests at UL in order to show
 equivalency with products when the blowing agents changed. The working group is going to have to know
the formulations which will affect the project. Don suggested approaching the international manufacturers,
such as Dow, and asking them to produce a non-FR foam. Marjorie has researched Swedish codes and the
requirements for protection of the foam and the assemblies that they’re made with and thinks that it would be reasonable for the working group to use those foams (Euro Class F non-FR) right now with the protection called out. Marcelo stated that there are virtually no applications for F-rated products in Europe. Marjorie responded that the Swedish building code states that if an insulation material is below a certain class, then protection of a certain type is required on either side. There are also some assembly ratings that are similar to American one-hour rated walls but their code does not call out a minimum flame spread rating for all materials in the wall. Lorraine stated that a strictly technical comparison could be done between two foams that have the same formulation but one would contain FR while the other one would not contain FR. Assumptions about whether or not those products would meet current U.S. standards would come into play; the working group cannot just declare that they’re “good enough”. One humongous difference between the U.S. and Europe is the amount of litigation that occurs in the U.S. and the FTC requirements regarding what kinds of claims can or cannot be made about products. The working group is going to have to have some kind of fire test or technical report that states that the product is good enough. Lorraine thinks that testing European foam will be a waste of time. Marjorie stated that a comparison should be done to set a standard such as what’s the minimum code standard right now for the E84 which in turn sets the standard for the alternative E119. The working group would then be able to look at the European foam without the flame retardants and decide if it can meet that minimum standard.

Nancy McNabb advised that comparing European foam to American foam is like comparing apples to oranges. Nancy’s scientists think that the weak point in a wall like the hypothetical wall is the penetration. An important factor to consider is the time before the material ignites which is used for egress. Europeans live in much smaller spaces than Americans do thus the time to egress in the typical European home is much less than what American homes require.

Marcelo agreed with Nancy’s point and stated that another pertinent difference to consider is the rate of fire fatalities that occur in Europe and especially the U.K. as opposed to America. Because of the difference in construction, more than 2/3 of the fire fatalities that occur in the U.S. happen outside the room of origin whereas 2/3 of the fire fatalities that occur in Europe happen within the room of origin.

D. Comparing European Foams to American Foams (Continued): Chief Reinertson advised that unless manufacturers in California, Nevada, New Jersey, etc. can create the non-FR foam, then he doesn’t know how valuable it will be to compare European foams to American foams. Marcelo advised that polystyrene foam has to comply with ASTM C578 which has many properties. If the working group were to ignore the fire property, then someone would have to run tests to determine if the foam complies with all of the other properties. Marjorie asked if it’s known that the blowing agents wouldn’t comply with the requirements of one of the fifty U.S. states. If the working group can outline the properties then there would be an opportunity to compare them. Chief agreed and asked what kind of flammability standards the European foams must comply with. Eric responded that European materials would be useful for a sensitivity study but he would not advise using them as the basis for design. Mike thinks that it’s unlikely that a manufacturer will give the working group materials without flame retardants for tests that they haven’t fully vetted through an entire battery of other tests and analyses. In his experience, a sample of something that may or may not be able to be reproduced is not handed out for testing in which the manufacturer must absolve control over the process. The manufacturers would have to commit to a miniature R & D program in order to declare that the product will comply with all of the other U.S. standards. Paul thinks that the working group doesn’t have enough information at this point to answer any questions accurately so it’s only possible to speculate. He has his own perceptions of what manufacturers will or will not be willing to do depending upon where they’re located. The working group should focus on what kind of assemblies to expand beyond and then complete homework on the material properties of some of the European foams so that they can be
compared to the advertised properties of American foams. Also, perhaps those who are representing the manufacturing world can ask some of the manufacturers if they would be willing to provide some test batches. Chief Reinertson agreed with Paul and mentioned that SFM representatives, rather than working group members, may have to approach the manufacturers. A working group member advised that SPF foams are going through a completely different process at DTSC concerning diisocyanates. Some of the AB127 Working Group’s members have attended the DTSC meetings in which industry representatives have indicated that they are not capable of producing an isocyanate free SPF. There’s an international manufacturer in Europe that has manufacturing plants in both America and Europe and because Sweden banned diisocyanates, they’ve created an alternative formula in Europe which is in commercial production and is being used by the industry. The same product is sold in the U.S. but because regulations have not required that it be diisocyanate-free, the American product contains diisocyanates. The manufacturer has indicated that there’s no market in America for the diisocyanate-free version of the product. If the market is created by the state of CA, then the manufacturer can move some vats around, change some of the chemicals that they’re bringing in and start producing what’s being produced in Europe. SFM / the State of CA can create the market demand to which the manufacturers will respond. Chief agreed but stated that the working group needs to create something to test first.

Steve Fischer asked if another issue to consider is what the current baseline is; what current products should be tested in the wall assembly to be used as a baseline for determining the minimum standard that any new products will be required to meet? There are a variety of products with different densities and other properties so a representative sample may be difficult to determine. Chief Reinertson responded that the working group needs to determine what’s commonly going to be seen in one and two family dwelling construction. What foam or other insulation is commonly being used as a fire retardant inside the wall cavity? Steve stated that some of the properties change under certain conditions such as R value; certain materials increase the R value and flammability is based on density- the material will absorb so much heat before it ignites and it takes more energy to ignite but once ignited, it burns more vigorously. Is the working group only interested in escape time? The denser materials may take longer to burn. Chief responded that once the working group is confident that the wall assembly is thoroughly complete, then it needs to be determined how that test is going to be applied to achieve a baseline. Eric stated that the material that’s going to be used in the stud cavity, foam plastic, is going to be spray foam 95-99% of the time- not board, not EPS, not XPS, not poly-iso. The standard is generally two pound density for closed-cell foam and ½ pound for open-cell foam but there are some exceptions.

E. The Alternative Wall Assembly: Chief Reinertson advised that he completed a review of the codes regarding wallboard vs. sheathing and the sheathing is on the exterior side while the wallboard is on the inside. The base generic listings contained in Chapter 7 differentiate between how wallboard and sheathing are tested. The working group will have to specify one vs. the other. The 2” x 4” or 6” wood stud construction is what’s being used right now; depending on what the CEC’s regulations will be in the future, the 2” x 4” and up to 2” x 8” studs staggered regs are coming. The alternative wall assembly consists of solid fill of a stud wall cavity with non-FR insulation, maximum 1” airspace, firestopping for all penetrations, notched board holes, drain-waste vents, plumbing, electrical, mechanical, ducting, fire sprinklers- whatever penetrations; it’s all-inclusive. The working group discussed using rated boxes for electrical insulations. The labeling and listing agency and identification by manufacturer is definitely going to be warranted and needed for both sides of the equation whether it will be going into a building that is or is not utilizing non-FR foam. The working group will have to create the testing parameters for the labeling and listing. Eric asked if the labeling and listing is strictly for content. Chief responded that if foam is being utilized, then it needs to be labeled and listed for the job site. Mike responded that the label would not have a classification but insulation that’s labeled to E84 may still be used. Chief Reinertson is concerned about installing non-FR foam in a building that’s required to have it. Identifying insulation as non-FR or non-E84-compliant or whatever the working group comes up with is what’s important when labeling and listing. There may be track homes that contain non-FR foam in the future but for right now, the individual who’s
designing a home and who does not want FR chemicals in that home will be sensitive regarding what’s going into the building and will not want an FR product accidentally installed. The working group will not identify every type of foam insulation that exists as being non-FR or FR but will target specific foams.

Chief Reinertson asked the working group if anything else needs to be addressed in this wall assembly. Eric asked if one of the assumptions is that it will only have interior fire exposure. Chief responded that it will not because the group is not looking at Wildland Urban Interface (WUI) issues; they have their own criteria. The group is looking at the complete assembly including exterior fire exposure. Eric asked if demising walls are included. Chief responded that’s another subject because the code requires the demising wall between two single family dwellings- a duplex for example- to be a one-hour rated wall. So, the working group would have to look at how a one-hour wall with FR compares to the assembly without FR; it would still have to be tested and comply with the one-hour and it could be 5/8” or something more. Eric asked if the assembly will have to be tested to symmetrical fire resistance. Marcelo advised that the group will have to be consistent; one hour on each side. Chief advised that it’s the next level up; this discussion is the same as the discussion that was held during last month’s meeting- location on property. Typical single family dwelling walls are being targeted; when the group gets to non-rated construction, different assemblies may need to be created because it’s unknown how the foam is going to react. Chief Reinertson advised that the working group cannot prevent homeowners from damaging one hour fire resistant walls. CA is adamant about having the self-closer on the garage between the garage and the dwelling. Some CA homeowners spoke at the Code Hearings a couple of years ago regarding their opposition to the door closer because it prevents the garage door from remaining open when they’re bring their groceries in the house or want to cool their homes down.

F. The Alternative Floor-Ceiling Assembly: Chief Reinertson advised that if everyone is ok with the first assembly for Type V non-rated construction for walls, then the group should look at the scenarios that Andrew Henning created for floor-ceilings, crawl spaces and attics. Does the working group want to create the parameters for all of the assemblies at once or start working on determining an appropriate test for the wall assembly? Should each assembly have its own unique parameters or should all of the assemblies have the same parameters? Marjorie asked if sub-grade assemblies (below slab, foundation walls, inside, outside, etc.) will be covered. Chief responded that no, they will not be covered; if there’s 4” of concrete, foam and then earth, then what’s the issue? The working group will have to include language regarding sub-grade assemblies. If there’s earth with 4” of concrete coverage and it’s not exposed anywhere, then there’s no reason why that assembly shouldn’t be used in a single family dwelling. Mike Fischer pointed out that logistics, storage and transportation should be considered. Marjorie stated that when the assembly is below the slab, there’s no issue and when it’s sub-grade along the foundation wall, there’s no issue, but at some point it becomes above-grade and then what are the parameters? Chief Reinertson asked if the assembly can be exposed and Marjorie responded that it’s usually covered with flashing or something that’s not 5/8” type X. Marjorie works on projects that have radiant slab insulation in which the edge of the slab comes up and goes into the same plane with the exterior insulation and must be continued up because of the mass of the radiant floor. The insulation must be placed wherever the concrete stops and there’s a transition to the wood framing and then it’s often continued just to have continuous insulation. Chief advised that the continuous insulation on the exterior wall is not significant because there’s no barrier on the exterior. The working group should include language for the concrete, though. It’s not one of the assemblies that the working group created; the parts that aren’t concealed and that are truly beneath earth and concrete are not going to be an issue although how to write the language regarding covering the exposed parts may be an issue.

Marjorie asked someone to identify the point of exposure. Chief responded that the insulation will be above the garage. Eric stated that it won’t usually be filled with plastic insulation; a 2” x 10” joist is an example. Chief stated that there are several climate zones in CA where there’s an R19 minimum insulation for the floor and it’s going to be higher in other parts of CA; there may have to be a 12” or 14” cavity just to get that insulation. Eric stated that his point is that other fill such as mineral fiber that can take up the maximum 1” airspace and act as an ignition source should be considered. Marjorie asked if a horizontal airspace is an
issue as much as a vertical airspace. Eric responded that a combustible concealed space that causes flame propagation that comes out of the underside of the floor is the problem. Chief advised that the code addresses this issue in fireblocking so even if there’s zero insulation, there would still be blocking. Eric advised that the maximum allowed space between the blocking is 100 square feet. Chief advised that fireblocking is required for combustible concealed spaces in Type V construction and wood construction is the trigger. If the 10” joist space was filled with 8.5” of foam, then there’s nothing in the code that would prohibit it so why would the additional fill be necessary? Eric stated that there’s likely going to be an excess of 1” airspace, especially when using closed-cell insulation. Mike advised that the 1” requirement stipulates that it be filled with something or add more insulation. Chief Reinertson asked what R value is given to 4” of spray foam. Eric responded that it could be anywhere from 21 to 25. Many closed-cell spray foams give an R value of 21 in a 2” x 4” wall whereas open-cell foams have an R value minimum that’s necessary to get 21 in a 2” x 6” wall filled. Marjorie advised that when she’s used just the amount of foam that’s needed for a vapor retarder to reach the dew point and then filled the rest of the assembly with cellulose, the contractors have requested to use foam throughout the entire assembly that’s constructed with 2” x 10”s. Her firm avoids foam insulation because of the FR’s; they use as little foam as necessary and cellulose for the rest. If the contractors’ attitudes are to fill it, then why can’t it just be filled? Eric said that if the homeowner is told that he/she will have to pay three times the cost for the insulation, then he/she will say no. Marjorie clarified that there’s no technical problem with them filling it; they could fill it to the 1” or use some other material. Chief agreed and said that they just can’t have more than 1” of airspace. Similar to the wall, firestopping for any penetrations must be included as well as electrical insulation such as canned lights. Chief Reinertson asked how the group would like to address ducting; flex duct is not used with typical spray foam insulation in a floor-ceiling assembly; is 19 gauge ducting running through it? The CEC is currently considering including ducting in the actual conditioned space due to heat loss when floor-ceiling assemblies separate non-conditioned space from conditioned space. Chief doesn’t know how prevalent it is to include ducting in 2” x 10” or 2” x 12” floor cavities. Donald was recently inside a new home in which the contractor used 1 ½” multiple tubes for ventilation. Chief advised that those tubes are treated with regular firestopping materials and that his reference was to 6” and 8” diameter duct that runs through a floor. Paul asked if that type of duct is installed before the spray foam is applied during a typical construction process because nobody will want to dig spray foam out to run duct. Why is this any different than what’s typically used to plug holes? Marjorie responded that the concern is what’s being added into the cavity itself. Chief advised that 19 gauge steel duct rigid duct is used in typical construction and the spray foam will be directly applied. He’s more concerned with those areas that are required to be fireblocked and how to seal those types of penetrations. Paul asked why, assuming that the gap is not going to be scaled proportionately to the duct size, this is different than any other foam or packing that would be used to seal smaller penetrations. Eric agreed with Paul and stated that it’s not any different. Paul thinks that it’s not an issue; assuming that the spray sealant or packing that would be used around any other opening is being utilized then it doesn’t need to be substantially larger. It may require a contractor to be a little bit more careful than he/she wants to be when putting up the gyp board but that’s the only issue. Eric advised Chief Reinertson to put the ducting issue in parentheses in the report as something that may come up during testing. Paul stated that there’s an entire market for snap-fit seals around ductwork. Marjorie stated that 3M produces every fire sealant product that anyone could ever want. Chief advised that the need to have conduit in one and two family dwellings is going a bit overboard so that will not be included. Labeling and listing will have to be included just as they are for the other assemblies. Donald advised that the group should pay special attention to the canned lights inside the rated boxes. Marjorie asked if the ceiling requirements for penetrations to the upper plywood on the floor side are the same as they are for gypsum board. Chief Reinertson advised that there will be firestopping but a single family dwelling won’t typically have floor outlets like an assembly building has; some do but it’s rare and if there are, then floor-rated assemblies will have to be used. Mike asked if appliances like fans should be considered. Chief advised that the only item that he can think of is a regular duplex outlet or junction box for something that may be planned for the future and they would have to be rated for the application. Marcelo asked if the exception that exists in the code for wood flooring with foam plastic insulation below it and no thermal barrier would...
apply. Marjorie advised that per the 2012 Code: 2603.4.1.14 Floors, the thermal barrier specified in Section 2603.4 is not required to be installed on the walking surface of a structural floor system that contains foam plastic insulation when the foam plastic is covered by a minimum nominal ½-inch (12.7-mm)-thick wood structural panel or approved equivalent. The thermal barrier specified in Section 2603.4 is required on the underside of the structural floor system that contains foam plastic insulation when the underside of the structural floor system is exposed to the interior of the building. Exception: Foam plastic used as part of an interior floor finish. So, ¾” plywood is definitely more than ½”.

G. The Alternative Crawlspace Assembly: This assembly consists of ¾” plywood on the top, floor joist, ¾” plywood on the underside, no thermal barrier requirement, solid fill, 1” firestopping and electrical insulation. Marcelo asked if a thermal barrier should be required since it’s required for all of the other assemblies. Marjorie stated that the code allows for a 1/4” thick wood structural panel for an ignition barrier. This crawlspace is more robust and it has non-FR foam. Eric asked if the group was referring to a floor joist gypsum board with a ¾” plywood floor finish. Marjorie advised that the group was discussing the ceiling finish in the crawlspace that’s below the joist. Marcelo doesn’t understand how it could be acceptable to use foam without a thermal barrier. Paul would like to see the test results with the ignition barrier performance to see if performance can be matched to the ignition barrier. Eric advised that it’s a five minute test with a very low bar. Chief asked what’s typically used for the ignition barrier. Eric and Marcelo advised that there are eight prescriptive materials and intumescent coating is primarily used with the spray-applied foams. Marjorie advised that the code lists 1 ½” thick mineral fiber insulation, ¼” thick wood structural panel, particle board or hardboard, 3/8” gypsum wallboard or any other approved material. Eric advised that the approvals are obtained with a room corner test- an AC-12 and an AC-377. Donald thinks that in most cases, FR’s don’t make a significant difference if the flames are big enough so if there’s no thermal barrier, then why not require the same ignition barrier? If the existing code isn’t good enough in regards to protection of the material, then change the code there but don’t make a special exception. Marcelo tried to change the code to eliminate the ignition barriers in FR foam which he thinks are a disgrace; they’re an even greater disgrace in non-FR foam. Mike stated that moisture management is another issue that must be considered in this assembly. Andrew thinks that it may be beneficial to delete the crawlspace assembly/construction item from the working group’s report because there would be one less test to run and would therefore saving funding for other tests. In addition, it could be listed in the future or rated as an assembly to show that it either does or doesn’t work. The floor-ceiling construction can be installed and if the working group includes crawlspace construction in the report, then there will be two very similar assemblies which would be a waste of the working group’s limited resources. Marjorie agreed and added that attics and crawlspaces are exceptions in the code; it would be better to use the floor-ceiling construction. Marcelo stated that .016” corrosion-resistant steel is one of the ignition barriers; a small piece of steel was added to appease inspectors. The corrosion-resistant steel barrier works (sort of) because the foam is treated. He was recently involved in a case where there was exposed foam and he thinks that it’s a disaster waiting to happen. Chief asked if the non-FR insulation is encapsulated in ¾” plywood on both sides. Marcelo replied that ¾” plywood burns very nicely. Chief advised the working group that he’d like to dig into this issue a bit more. Eric stated that there are some very specific limitations for these assemblies where the ignition barrier is permitted and there are some difficulties when discussing conditioned and unconditioned crawlspaces; there’s sometimes communication between the floor above and the crawlspace-these assemblies are not as simple as they may appear. Although it’s rare to see conditioned crawlspaces in which there’s communication between the floor above and the floor below, there are very real limitations for assemblies that are permitted to have crawlspaces with non-prescriptive materials like intumescent coatings. Andrew asked what the majority of construction in CA uses for this application. Chief Reinertson advised that the majority of CA uses raised wood floor construction- 18”, 20” or 30” or sloped elevation that might be 12” or 18” on one side of the home and slopes down to 3’ or 6’ non-useable crawlspace that contains dirt, exposed girders and exposed insulation.
Marcelo asked Chief Reinertson if his firestopping bullet is based on a thermal barrier; how is an ignition barrier that’s a piece of steel going to be firestopped? This is inconsistent. What’s being firestopped—something that burns around it? If there’s no thermal barrier, then what’s being firestopped? Marjorie responded that firestopping is being done at the topside and is following the floor exception to not have a thermal barrier at the top. Marcelo advised that the floor requirement doesn’t have a fire-resistance rating so a one hour firestop is being added for something that will burn around it. Paul is concerned that the working group may be raising an issue that’s not germane. The intent is to delay propagation of the fire to allow the occupants to escape and allow time for first responders to arrive and start working. The issue is not that anyone is expecting the fire not to burn for a very long period of time; if the building is burning for a very long period of time, then the slab components will be all that’s left when it’s done. Marcelo thinks that the working group included firestopping when there was a thermal barrier to ensure that the fire won’t penetrate through the openings. In this case, the wood structural panel, cellulose insulation or any other approved material will quickly burn and the firestop will ensure that the opening won’t burn but the entire assembly around it will burn. Chief Reinertson advised that the firestopping was added so that if there’s a room and contents fire or an exterior fire, then it won’t get into the assembly that contains the non-FR insulation. Marcelo stated that the fire won’t get in through the firestop but it will get in through the rest of the assembly because there’s no protection; the ignition barrier that’s being put in will not provide protection. The other construction includes a thermal barrier that provides protection. Chief asked how ¾” plywood compares to thermal barriers. Marcelo responded that ¾” plywood fails the thermal barrier test which is why it was added as an exception to the last edition of the Residential Code; it goes to flashover in the room corner test and burns the whole thing down. The wood industry admits that the tests have been conducted but they say that they don’t matter. Marjorie has read that ¾” plywood has been close but not quite good enough for the fifteen minute thermal barrier.

Mike asked how prevalent is the use of laminated beams with engineered floor trusses over a crawlspace? Marjorie said that it’s very common and is the norm unless there are rafters that have a lot of cuts which are usually made of solid lumber.

The discussion continued and Marcelo advised that 2603.4.16 does not contain a requirement for a thermal barrier; it instead contains an ignition barrier requirement for attics and crawlspaces and is an exception to 2603.4 which is the thermal barrier. Mike asked if it applies only to attics and crawlspaces that are used for utility access and not storage. Marcelo advised that the thermal barrier is not required. The FR foam is being eliminated and nothing is being added to replace it. Eric pointed out that the ignition barrier is not permitted in every type of attic and every attic is not the same; they’re linked to the code. Marjorie stated that this condition is different in that except for the floor-ceiling construction, the working group members allowed the exception for plywood at the floor surface whereas the exception is not being allowed for attics and crawlspaces. This is plywood located on the ceiling side rather than on the floor above the crawlspace; it’s the underside of that floor. Instead of the walking surface of the crawlspace, it’s still part of the floor-ceiling construction. Chief Reinertson would like to further address this at a later time. Marcelo stated that the firestopping is referring to a penetration of the thermal barrier. Chief Reinertson advised that the firestopping is inside the wall or the floor and it’s penetrating either the exterior or interior sheathing or the fireblocking. Eric asked Chief Reinertson if the group can make 2603 a Residential Code reference rather than a Building Code reference. Chief responded that both codes are used to construct R3’s thus the working group will reference both Codes in the report.

H. The Alternative Attic Assemblies: Chief Reinertson advised that this is a difficult topic because a typical attic in California has truss roof construction with insulation being put in at the ceiling line and above. The only assembly that could be created is the assembly that’s located at the top. There’s plywood roof sheathing, the top quarter of the truss and the barrier. Creating a barrier for foam insulation being installed at the ceiling line without incurring an extreme cost will be a tremendous challenge for the working group. The largest amount of foam insulation in California is inside attics therefore the barrier is
bigger. It’s very difficult to construct in those areas that come down to the eaves and pinch down. Mike stated that there will not be foam plastic in most cases. Paul said that there are cases where insulation is spread into a cathedral ceiling. Paul asked Chief Reinertson to clarify the “attic side” language that’s contained in bullet 3 regarding 5/8” type X gypsum; is it referring to the interior side of the attic space? Chief responded that yes, it’s referring to the interior of the attic space. Marjorie asked how an attic that’s conditioned and has walls should be addressed. Eric responded that a conditioned attic would require a thermal barrier on the exposed surfaces. He also pointed out that there’s a huge retrofit market for spray foam insulation in attic construction. Chief Reinertson advised that the market will grow when the new energy regulations are implemented. Eric inquired about the R value ranges; Chief advised that they start at 38 and increase from there depending on what type of points one is attempting to achieve and the A/C unit (14 SEER vs. 16 SEER). Some energy runs are going to be R38 or R42 and higher; the Energy Commission wants thicker amounts and more wall insulation.

Marjorie asked to outline the typical ignition barrier in attics. Eric responded that there are prescriptive materials and intumescent coatings for those attic spaces where it’s permitted to have an ignition barrier instead of a thermal barrier. Mike asked if they’re not covered in the code and have to be approved through alternate means and methods of construction agreements. Eric advised that they’re approved by a modified room corner test that industry developed with ICC which is the easiest and most common method of approval. There are some assemblies that meet the fifteen minute room corner test; the ignition barrier requirement is four minutes and eighteen seconds (five minutes). This is a different room corner test that doesn’t meet the fire resistance rating; NFPA 275 has two tests- the fire resistance test and the room corner test. Eric advised that a thermal barrier is made by two performance criteria: 1) The temperature transmission across the membrane of the barrier material; it’s not 250 degrees. 2) The material needs to stay in place for a fifteen minute room corner test. There are coatings that meet just the assembly test portion. In order for intumescent coatings to work and intumesce, they have to burn. Marjorie requested an explanation of the requirement for the ignition barrier and Eric advised that it’s a room corner test with acceptance criteria that’s essentially another evaluation with time to flashover.

Chief Reinertson stated that Andrew was unable to create an assembly for the typical insulation that gets put on the ceiling level of a typical truss; he instead created what’s basically a conditioned attic that has a plywood roof deck, roof rafters that have one layer of 5/8 type X gyp board and solid fill. Marcelo asked if it has to meet ASTM E108, FM 4450 or any other approval standard. Eric responded that it doesn’t have to meet any approval standards because since it’s below the roof deck. Eric advised that two, three or four inches of wet spray cellulose might be considered for protection but that would add significant moisture into the area as well as greater costs. Marcelo asked what the difference is between requiring non-FR foam plastic but no non-FR cellulose. Why doesn’t the working group use non-FR cellulose, too, in order to get it to burn? Chief Reinertson advised that the “no loose non-FR insulation” terminology was just a bad term to use. Andrew’s intention in using that terminology was to describe it as being unexposed. The group decided to change the terminology to “insulation must be enclosed in the above-mentioned assembly”. Eric stated that it’s important to specify if attics are limited access or fully-accessed and conditioned with storage and other components that don’t fall under the limitations. Chief Reinertson doesn’t think that the working group has gone far enough with this assembly; the floor-ceiling assembly was treated with two layers of 5/8” on the lower side. Attics are not protected by fire sprinklers in California; once an attic is on fire, it burns regardless of whether or not the home is sprinklered. Marcelo stated that the rate at which FR foam burns is much slower than the rate at which non-FR foam burns which is why FR’s are added. Chief Reinertson advised that it’s standard operating procedure for almost all firefighters to fight building fires from rooftop positions. Paul stated that regardless of whether FR foam or non-FR foam is used, there should be an adequate thermal barrier and protection to prevent a building from catching on fire in the first place. The kinetics and heat release from the FR foam are different and not as great as for the non-FR foam but that doesn’t change the fact that when FR foams ignite, there’s a real problem. The challenge is installing a barrier that keeps the foam from being exposed to the heat and oxygen that causes them to
ignite. Perhaps two layers of type X should be required for the attic space. Maybe the group should spend more time considering what kind of insulation really is safe in attics because the situation is so risky that none of the spray foams should be in attics. A rational conclusion could be that some validation testing is necessary. Marcelo stated that prior records demonstrate that significantly fewer losses are incurred when foam is used while following the appropriate code requirements. Paul agreed and stated that those same code requirements should work for non-FR foams because they stop the foams from igniting. Marcelo stated that the ignition barrier doesn’t stop anything. Marjorie asked if there’s a thermal barrier in the assembly and wanted to know if the group was discussing a double thermal barrier. Isn’t there a thermal barrier under the roof rafters? Eric advised that the thermal barrier is in the finished ceiling of the top floor which satisfies the thermal barrier requirement to separate the attic from the living space. When on top in the attic space, then there are various options: conditioned, unconditioned, trusses or rafters, finished or unfinished, insulation on the floor, insulation underneath the roof deck- there are many more permutations for these types of assemblies. When a fire starts in an attic, it’s usually not seen. Marjorie thinks that attic spaces should be treated like the rest of interior spaces and protected by a thermal barrier. Walter stated that perhaps attics should be limited to a 1” airspace in between the ceiling and the underdeck. If any kind of barrier is added, then it will be floored and will be inviting for storage and use. Mike stated that circulation of outside air throughout the attic space is one of the ventilation requirements.

Chief Reinertson displayed an attic drawing and advised that ¾” plywood may seem excessive; Marjorie responded that ¾” plywood is not uncommon for roofing. Chief replied that may or may not be common depending on what type of rafter spacing and roof deck is being installed. Paul asked to clarify if there are fire performance requirements for whatever is on top of the plywood. Chief responded that there’s a Class C minimum requirement in California that does not exist outside of California. Class A is required in WUI areas and addresses the roofing assembly: wood shingles, shakes, composition roofing, tile roofing, metal roofing- above deck. The UL 790 test addresses exterior fire exposure. Paul asked what it takes to pass the Class C test. Chief responded that a 2 x 2 x 2 square block of wood gets ignited and is windblown. Marjorie stated that the Class A metal roof sometimes requires the Dunns Deck below it but others can get a Class A composition shingle going over the plywood. Could roof classes address this or is the Dunns Deck needed? Chief Reinertson responded no; the roofing classification is an exterior fire exposure only that prevents burning. The working group should create something to meet existing fire safety standards and that has nothing to do with exterior fire exposure.

Chief Reinertson discussed a second application which is the norm and contains blown-in loose fill, foam insulation, and bat on the ceiling level and is exposed. The working group has not written anything specifically for it; it’s more like the floor-ceiling assembly. Marcelo stated that it’s exposed with an ignition barrier to the attic; it’s not exposed to the house. Chief Reinertson advised the group that this application has a typical truss system with webbing. In California, it’s not the norm unless it’s a custom home; 99% of homes constructed with an attic are going to have trusses. The webbing is going to create the penetration whether or not the construction is truss and the working group will have to address it with firestopping, fireblocking or some other method.

Another type of construction is the cathedral ceiling which will have a floor-ceiling assembly with spray foam applied to the underdeck. Structural Insulated Panels (SIPS) fall into this category; HCD regulates SIPS as part of factory-built housing. It has to comply with Title 24 but HCD regulates factory-built housing in California. Avery asked if, given the working group’s extreme time and financial limitations, is there any realistic expectation of being able to create ceiling assemblies and test them adequately or would it be more beneficial to set them aside and work on other constructions that pertain to cases in which thermal barriers would already be installed in homes? Donald agreed with Avery and stated that the places where non-FR foams should be used are behind thermal barriers. He doesn’t want to get this confused with the idea of changing the code to improve the ignition barriers. Also, Donald doesn’t think that the working group should address cases where foam that’s open and exposed with no ignition barrier is allowed to be
used because that’s an even bigger problem. Paul thinks that there’s reason to consider occupied attic spaces (spaces similar to the structure that’s up there); a lot of foam will be used in attics given that the entire energy efficiency world is requiring a higher R value in the attic. Mike asked Paul if he was referring to occupied or conditioned attic spaces. The CBC doesn’t clarify that; the CEC is holding a workshop on this topic the week before the AB127 Working Group’s July meeting. The use of topside insulation is going to be promoted; not for occupied space but for heat loss. It won’t be a mandatory requirement but it will require more R value in the ceiling than in the roof. Chief Reinertson advised that there’s a huge amount of heat loss in ducts and even without AB127’s existence, putting insulation on the topside is expensive with a truss roof system. Walter asked where the envelope is going to be located; will the ducts be laid on top of the horizontal? Mike advised that the envelope will be located at the roof deck. Walter asked if there will be a horizontal insulation requirement. Chief advised that it hasn’t yet been determined. Mike clarified that he’s more concerned about conditioned space than occupied space. Chief Reinertson advised that this topic touches on a discussion that the working group had during the first meeting when the building envelope was defined.

Chief Reinertson advised that the working group has three assemblies for attics; he thinks the group should look at what’s typically seen and whether or not to do something with it. In the scenario that includes typical truss roof construction and blown-in insulation, how much foam insulation is seen? Can the working group address this scenario with some type of assembly? Eric’s understanding is that the general intent regarding the use of spray foam in attics is to seal the underside of the roof deck. Mike stated that it’s not economical to put it on top of the ceiling; it’s not possible to reap all of the benefits. Marjorie advised that the other roof application is rigid foam over the roof deck. Chief doesn’t know how to protect that; he’s currently discussing this topic with the CEC because they’d like to have rigid foam with roofing material placed on top of it. California has a Class A, B or C minimum requirement. Marjorie advised that flat roofs often have a cover board that’s a gypsum product; would that be economical? Chief indicated that flat roofs comprise only 1/5 of a percent of one and two family dwelling construction. He’s discussing this topic with the CEC and has been advised that interjecting foam on top of roof decks violates 90% of the roofing listings out there. If the CEC is to require with foam, then all of the roofing manufacturers that produce Class A, B or C foams are going to have to retest their products. Mike advised that it’s not just for fire but also wind. It has nothing to do with WUI; it has to do types of construction which is a huge issue. Foam board with tile on the roof is really exposed; even the CH 7A WUI requirements with ceiling voids are difficult. Mike doesn’t know how to attach tile or FR singles directly through foam to a wind deck. Marjorie doesn’t think that the working group’s resources would be well-directed in looking at rigid foam over roof decks. The biggest scenario is plywood deck on the top part of the trusses with the barrier. The difficulty in doing this is that the top part of the trusses are 2” x 4”s and 2” x 6”s; even in snow-load areas, 2 x 6’s are what’s going to be seen because trusses are engineered with webbing. The thickness for an R42 is 7”. Mike asked if the same level will be required for the roof deck; he doesn’t think the number will be that high. Chief advised that the Sacramento area has an R38 value for the ceiling. Mike advised that there are two different R value requirements in most codes for ceilings and roofs. Chief responded that’s not the case in California; the conditioned spaces are being separated from the non-conditioned spaces. Eric advised that the R38 is 5.5” with the closed-cell products whereas it’s 11” with the open-cell products. Chief doesn’t know how to get a barrier in open-cell R38 2” x 6”s with typical trusses. Eric thinks that the trusses could be built out or other coverings could be broken into; mineral fiber could be sprayed. Marjorie thinks that this approach would apply more easily to the cathedral ceiling where there are typical TGI’s. Chief advised that could easily be achieved in a cathedral ceiling but the architect / builder would have to be more creative as to how they would do it for the 12” cavity for a TGI scenario. Marjorie suggested that the truss be built a bit differently; it could have a nails for the plywood- a cost-benefit analysis would have to be done. Eric reminded the working group that one of the specific points in the legislation is to be sure to evaluate and consider transmission of flame from one space to another; top plates and fireblocking should be addressed. Why is fireblocking not required in attic spaces and they don’t have to have ten foot compartments? Chief Reinertson advised that it’s called draft stopping, its 3000 square feet and it increases when there are certain
Chief Reinertson returned to the white board to continue his drawing of the assembly that contains plywood on the exterior side, roof rafters or trusses, 5/8” type X, solid fill and non-FR insulation. Eric advised that a lot of spray foam business is generated in the retrofitting of attics to seal them up and achieve better energy performance. The easiest way to upgrade an existing home’s insulation and save energy is to use spray foam on either walls or ceilings. Marcelo advised that he’s uncomfortable with the increased fuel load that’s going to result from changing to non-FR foam; there’s more potential for fuel load here than in the other areas. Chief advised that there’s a lot less compartmentalization going on in attics; even though there’s attic access, they are concealed spaces without smoke alarms or fire sprinkler provisions. When the requirements were implemented for cellulose loose-fill insulation and the ceiling surveys were run in Washington D.C. during one of their hot summers, they saw real problems with how these started burning and that’s how the ASTM E970 requirements came about. Marjorie asked if the working group should add language regarding the depth of the insulation. Chief said that will depend on the type of insulation that’s used; R38 could be achieved with 5.5” using closed-cell insulation vs. 11” for open-cell insulation. On one hand he would like to use a bigger reduction-type number but that would be contrary to what the CEC is doing and what the Governor’s office is trying to achieve with the Zero Net Energy (ZNE) program by 2020 or 2022. Marcelo stated that as soon as the working group adds a limit, then it will be changed during the next Code cycle so why bother adding one? Marjorie thinks that what will be tested will probably have the maximum R value that’s required in California and doesn’t need to be listed for the assembly now.

Chief Reinertson addressed bullet 3 regarding the single layer. The floor-ceiling assembly has two layers. There’s an occupiable space above the kitchen. Marjorie doesn’t think that it seems any different. Paul stated that cognizant of the cost issue, maybe it does make sense that there should be two layers and a wired fire alarm system that ties into the building given that people cannot see inside attic spaces. Not being able to see a potential ignition source is another kind of problem. Is this a case of not being able to control homeowners or some functional equivalent to that? Chief Reinertson has not previously considered controlling homeowners; the alternative assemblies address firefighter safety more than anything else. What will happen to the building when it catches on fire- not because of the foam insulation or any other type of insulation, but when there’s a kitchen fire that gets into the attic or wall and the non-FR insulation ignites? How will the actual fire (not the toxicity) affect the firefighters’ safety? Removal of the FR’s will open the door for the fire to spread more quickly.

I. The Testing Process (continued): What tests will be applicable given certain scenarios, what parameters does the working group want to set on them and what exceptions should be written?

1. The Wall Assembly: Paul referred to Lorraine’s “California Fire Tests for Insulation: 2013 CBC” document dated February 19, 2014 in which she cited ASTM E119 which has a range of provisions that can be used to show if insulation meets the one hour standard or can be used to see if it meets a shorter time standard. Perhaps that’s the appropriate test method and the same criteria can be used when testing the alternative wall assembly; does it last for ten, twenty or thirty minutes, an hour or an hour and a half? Marcelo stated that it’s not a one-hour rated assembly thus it’s not intended to meet the one hour standard. Paul asked what’s the minimum length of time that a foam contained in a typical non-rated wall has to withstand a fire test. Chief Reinertson understood Paul’s question and asked if the ASTM E119 were applied, what minimum time would the working group want to set the baseline time at? It needs to be set at something for the comparative. Adria stated that the working group needs to run the baseline of what’s currently done in code today, determine the degradation threshold, call it and then test the new assembly to it; find the standard in the middle after the baseline benchmark has been utilized. Walter asked if E119 has a thermal couples range like 285. Marcelo replied that it does and is
conducted by building a 10’ x 12’ wall, putting the burners on the back which causes the temperature to rise to approx. 1000 c (standard time temperature curve), measuring the temperature of the unexposed side (it contains something that’s similar to thermal couples and that measures temperature) and, when it increases beyond the threshold, running the hose stream test for half of the time that the test is supposed to achieve. Marcelo asked which barrier is going to be used- gyp board or something that meets the NFPA 275 thermal barrier test or one of the exceptions? Eric advised that ½” gypsum is the standard for a basic interior finished wall and will be used. Eric thinks that it would be beneficial to test it in a loaded / weight-bearing scenario. Marjorie thinks that the exterior standard wall is questionable because there’s nothing in the code about it. Should the wall that will be tested have plywood as well as gypsum? Marcelo pointed out that the working group is not only dealing with fire resistance, which this is addressing, but also reaction to fire. Is a reaction to fire test such as the NFPA 286 room corner test also going to be run to see what the difference is between the two test? Chief Reinertson thinks that both tests should be done. What’s being done to the building and the overall potential fire scenario when something that’s been required by the code is removed? Marcelo stated that the E119 will address the penetration from compartment A to compartment B but will not address the heat and smoke release from the actual product- the reaction to fire issue. An NFPA 286 needs to be run to address the reaction to fire issue.

Mike advised that arson is the third leading cause of residential fires in the U.S. Marcelo advised that NFPA has very clear statistics that show that unintentional fires usually start in the middle of the night between 2 AM – 5 AM.

Chief Reinertson asked Marjorie what the structural sheathing norm is- 3/8” or 7/16”? Marjorie replied that it depends on if plywood or oriented strand board (OSB) is being used but she thinks that it’s 7/16”. OSB doesn’t perform as well as plywood in terms of moisture. Marcelo advised that there are different types of OSB depending on which adhesives are used. When FR adhesives are used, it burns much less efficiently whereas non-FR adhesives burn very effectively. A lot of adhesive is used in OSB and the fire performance of the adhesive makes a massive difference. Chief primarily sees OSB in residential structures; there’s not a lot of structural plywood on residential structures. Mike advised that there’s another trend towards using continuous rigid insulation on the exterior of the framing wall which can be supplanted with structural sheathing, corner zones and lead embrace. Chief stated that cannot be done in California. Marjorie asked if the working group is going to create another assembly for continuous insulation of exterior walls. Chief Reinertson does not know how to address the example that has 3/16” of vinyl stucco sprayed on it. Marjorie advised that there’s also continuous insulation that has furring strips and the cladding is mounted to it. Mike asked if there’s a mandatory requirement for structural sheathing in California. Chief Reinertson responded that California has seismic requirements that forbid the use of lead embraces so plywood has to be used. The only lead embrace that Chief is aware of being used in California is the cinch and strong wall which is an engineered wall; the typical lead embraces were removed in the 1995 code. Chief advised that there’s a structural value for gyp board and three-coat stucco- not stucco over foam- has a sheer value but it’s basically gone to the wayside and most engineers are using plywood. Eric pointed out that’s an important aspect of advanced framing techniques with less wood and wood corners. Donald asked if the exterior sheathing will really make a difference in this test. Walter responded that it will make a difference if there’s a hose stream. Marcelo said that it will depend on how far it penetrates; he cannot predict. Eric said that to characterize the wall assembly in accordance with E119, it should be burned on both sides to establish the baseline. Regarding burning the sheathing on the inside, the working group should have some input from UL’s engineers whether or not it’s going to be possible to manage the furnace temperature properly. Marcelo thinks that the refractory materials that are used to construct them should not create a problem. As soon as the increase in temperature occurs and it fails, the assembly is immediately withdrawn and it’s stopped so it doesn’t matter. Eric pointed out that the assembly needs to be evaluated from both sides. Marcelo stated that it does not need to be evaluated from both sides for the NFPA 286. Which side
should be exposed? The working group members agreed that the thermal barrier / gyp board on the interior side should be exposed. Marcelo asked if the test should be run longer than fifteen minutes to see when failure occurs; perhaps run two failures? Eric suggested instrumenting the room for additional data. Measurements are obtained every five seconds continuously. Donald cautioned that the equivalency criteria is not total time to failure. Eric stated that the working group is pushing beyond the margins and conducting a robustness evaluation to see what happens beyond a certain point. Donald thinks that the data will be good to have but what’s the criteria for accepting one vs. the other? If one goes sixty minutes and the other goes sixty-one minutes then does the sixty-one minute test fail? Marcelo thinks that’s not significant if there’s an experimental error margin; if one test does 45 minutes and the other does sixty minutes then that would be significant. Eric has conducted a fire-rated wall assembly test and the criteria is sixty minutes; it can be turned off in sixty minutes and he ran to seventy-two minutes which is failure. This process educates the engineers and whomever else is going to be completing evaluations to discover the margin. Running the tests for a longer period of time than what is prescribed will provide a truer comparison outside of that limited window. Paul thinks that because the standard is a fifteen minute test, if it’s meeting the fifteen minutes then it’s met the standard. Walter disagreed and said that the directive is to maintain overall fire safety. Avery thinks that the standard that it’s being compared to is actually the worst case scenario. Eric thinks that there should be additional data by which to make larger comparisons- not to specifically say yes or no, but to have additional data. Marcelo suggested using the European approach for room corner tests which is the isolated 705 test. The difference between that test and the American approach is that America does not run to get flashover. If there’s flashover, then it’s failed. The European approach is to go wherever is necessary with the knowledge that flashover will occur at some stage and see how long it takes to get to flashover. American tests use 40 kilowatts and 160 kilowatts for the burner whereas Europeans use 100 kilowatts and then 300 kilowatts for the burner and it always goes to flashover. Chief Reinertson advised that the fifteen minute or occupant safety / getting people out of the building aspect is just one part of it. He thinks that running it to failure is the correct approach because firefighter safety is also a consideration and they might need longer than fifteen minutes to get out of a building. Having the data between the standard and the proposed wall assembly will be useful; it might not change the assembly but will reflect what to expect. Avery asked how many of the standard FR typical constructions will be compared; one and call it representative of all possible constructions? Chief Reinertson advised that the working group’s wall assembly contains a typical wall made of ½” gyp board, ¾” OSB or 7/16” sheathing. Avery said that there are a fair number of possible variations that need to be code compliant such as the type of insulation thus if the concern is ensuring that minimum safety is still maintained, how can the working group be sure that the alternative wall assembly is maintaining minimum safety standards? Should the working group test just one assembly or many? Should the worst performing assembly be used as a worse-case scenario to compare the non-FR constructions to? The working group members agreed that Howard Hopper /UL will be invaluable in sharing their breadth and scope of knowledge and experience and their Fire Resistance Directory that contains 100 years of data. Mike thinks that this is new ground and perhaps a whole other research project. Walter’s company performed testing in a conversion project and a recent 285 program and relied heavily upon fire engineers and the testing labs to formulate a representative bad-case scenario in order to have the most flexibility and the best basis to apply it to others through engineering evaluations. Equivalencies were established and other studies were examined and it was determined that certain densities from certain manufacturers were equivalent to others. The 285 program involved the testing of an assembly with a water-resistive barrier and different techniques such as flashing with a typical but large fire load scenario which Walter suggests doing in this project with the typical wall in order to maintain overall fire safety. The working group should not pick a current FR assembly that performs phenomenally because that’s not the intent. Chief Reinertson advised that the working group should pick an FR that has the worst performance to use as a comparison. Paul stated that perhaps these are questions that should be posed to UL to get around some of the confidentiality issues. For example, does UL have data for corner tests that have gone to failure or do they just test to fifteen minutes and deal with it strictly as a pass/fail? Marcelo said
that NFPA 286 has to be part of NFPA 275 to qualify a thermal barrier. The gypsum or whatever the thermal barrier material is put on the foam behind it and the thermal barrier is qualified; if the fifteen minute test is passed then it’s done. Nobody ever goes to failure. Walter advised that sometimes it fails before the end of the test; there are failed tests. Paul asked if the industry practice is to go to fifteen minutes, proclaim that it’s safe enough and then not go any further. Mike said that the length of the test meets the code requirement which is fifteen minutes for NFPA 286 and is specified in the ASTM E119. Eric advised that qualification tests are run to qualify and R & D tests are run to failure. Paul pointed out that according to industry practice, if someone is buying something on the market, then he/she has no idea where the failure point is; just that it’s passed a certain set of criteria. When performing a comparison test, the working group will be making an assumption that the universe of material that’s out there actually has a better performance. In one case, the working group will be testing to a completely different set of criteria than what the industry standard is for the products that the industry likes to sell. Marcelo stated that the working group is testing to what the legislation directs which is to ensure that fire safety is not decreased. In order to ensure that fire safety is not decreased, the working group does not need to know whether or not the manufacturer met the criteria for qualification but rather what level of fire safety that system provides and then compare the new system to it. Eric advised that at the end of the day, this is a research project. Paul agrees and thinks that doing the measurement to failure is a big deal. At some point a decision needs to be made regarding whether or not the data is acceptable. If there’s a universe of products out there that are qualified and sold into the industry based on a fifteen minute room corner test and that have been tested to thirty minutes in the E119 and the working group says no for one material, then that’s not acceptable for the materials that don’t have FR’s. The materials that don’t contain FR’s have to perform better than a comparison standard when the working group is not testing the universe of samples out there. There may be a false sense of security for the performance of standardly-used materials because it’s not known how they behave as they move towards failure. They may be fine to the test point but who knows what will happen after that. A working group member asked what the test costs might be and Chief Reinertson advised that twenty-five UL790 tests were conducted for $40,000 during a project that he worked on. A working group member reminded the group that Jesse Beitel had advised them that one test could cost as much as $25,000. It was agreed that the test costs vary and nobody knows how much these tests will cost. Chief Reinertson is planning on discussing test costs with the CEC to find out how they were able to achieve their sole sourcing. The working group will have to comply with government laws regarding funding.

IV. LITERATURE REVIEW

There was no literature review completed during this meeting.

V. WORKING GROUP UPDATES/REVISIONS TO WORKING DRAFT

Chief Reinertson added the NFPA 286 fifteen minute room corner test with the interior finish acceptance criteria from Chapter 8 / the Residential Code to the report: no flashover, 800 kilowatts, no burning to the extremities and 1000² meters of smoke.

VII. ADJOURNMENT

The next meeting will be held at SFM Headquarters (1131 S Street, Sacramento, CA 95811) on Thursday, July 24th from 10:00 AM – 4:00 PM. Chief Reinertson is planning on completing the assemblies and tests during the next meeting. He doesn’t know if the working group will be able to start drafting and formulizing the actual report and writing the recommendations but he hopes that a more definitive plan will be developed and that the R.A. will be on board and is able to attend the July 24th meeting. Chief asked the working group members to look at the assemblies and tests and start drafting language for the slab-to-earth
issue (including the exposed part) and email it to him so that it will be ready to be discussed at the beginning of the next meeting. The meeting was adjourned at 1600 hours.

August meeting was discussed, tentatively for the 28th, the meeting is now scheduled for August 22nd.