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Pam Cole: I'd like to welcome everyone today. My name is actually Pam Cole, and I'm with the Pacific Northwest National Laboratory. And I wanna welcome you to Energy Code Commentators webinar series. We hold a webinar the second Thursday of every month at the same time, so you can keep a watch out on the building energy codes training page, and topics get added periodically, so keep a lookout out there on the training page. And if you have any topic suggestions that you'd like us to consider, you can e-mail them in to us using the webinar reminder messages that you've received.

So today's webinar is on the requirements of the Energy Rating Index compliance alternative performance path of the 2015 International Energy Conservation Code. Some learning objections for you is you're gonna learn how to obtain an overview of the Energy Rating Index. You're gonna be able to identify construction specifications –

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needed to complete compliance calculations to the ERI ratings. And you're gonna learn about the mandatory requirements that apply to the ERI compliance path. And then there's also gonna be an understanding of how the compliance path can be implemented into current plan review and inspection processes. For any of you that are on that or actually with the local jurisdiction code official plan review or field inspector, we're gonna provide some information on that as well.

So at this time, I would like to turn it over to our speaker, Shirley Ellis. She's with the Energy Systems Lab at Texas A&M. She is an excellent speaker, and I'm glad that she has taken the time today to share this information with us on these requirements that are in the 2015, and so I'm gonna let Shirley begin her presentation. Shirley, go ahead and take it away.

Shirley Ellis: Thank you so much, Pam, and thank all of you for attending and listening to this. I hope at the end of this we have a better understanding of what the new requirements –

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in the 2015 are as it applies to the ERI, the Energy Rating Index performance pass.

This is a graphic that a lot of people have seen, this flowchart, for residential compliance with the IECC. What it shows now is where this ERI actually fits into this system. So if I'm going to build under the IECC, first thing I need to find out is must my project comply with the IECC. That you'll find in Chapter 1 of the Energy Conservation Code. Then you must comply with all mandatory provisions concerning air leakage and your building system, such as your mechanical, water heating and electrical system. Then there historically were two paths: prescriptive and performance. Prescriptive had to do with Delta T –

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tradeoff primarily, UA tradeoff for your building thermal envelope. And then you had the performance path, which was a simulated performance alternative using software. As you can see in the gray box, we've now added the ERI index compliance alternative.

As with all three of these pathways, there is documentation compliance required. Whether you do – if you're doing the prescriptive path, whether you do the R value, the total UA or the total UA alternative will require different documentation. The ERI index compliance alternative and the simulated performance alternative both require software and documentation compliance to be submitted that's approved for use, and the code has specific requirements. We're gonna go into what they require for the ERI later in this presentation. Submit your documentation –

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with your application to your authority having jurisdiction, and they will then do their plan review and their field inspect.

So when we look at Section 406, that's the ERI compliance. This is just an additional option for a compliance pathway. It gives builders yet another option in addition to prescriptive and performance paths and now have the option of meeting a target ERI score. There's several performance options that you can choose. This is a very flexible means of getting code compliant, and it requires them to achieve some mandatory requirements that are listed in the 2015. We will go over those later also so that you're very familiar with what they are. And then comply with minimum –

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insulation and window envelope performance requirements of the 2009 IECC. It requires your water heating provisions and some of those mandatory requirements, and we're going to discuss those.

So what are the requirements that we are talking about, mandatory requirements? Those are listed in 406.2 – R406.2 of the IECC. You must meet 2015 requirements that are listed in R401.2, and that includes your requirements for air leakage testing, Climate Zones 1 and 2. That means that you must meet an air leakage rate of five or less air changes per hour at 50 Pascal. Climate zones 3 to 8, you must –

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meet your three air changes or less at your 50 Pascal. In addition, you must meet your control requirement, which require at least one programmable thermostat. You must meet your air handler filter boxes requirement for being sealed. You must do your duct testing, unless of course your ducts are in conditioned space. You must meet your hot water pipe insulation on R3. Those are the mandatory requirements under Section 403. And then 404, electrical power and lighting system requirements. And the details for your hot water piping, by the way, are in 403.5.3. Then you would meet your building envelope requirements as –

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required in the 2009 IECC building requirement – building envelope requirements section, which is in Tables 402.1.2 or 402.1.4 for your efficiency and solar heat gain.

So basically, what is an ERI rating index? The ERI value is defined as a numerical score where 100 is equal to the 2006 IECC and 0 is equivalent to a net-zero home. Now, each value of this scale represent a 1 percent change in your total energy use of my rated design – and that's the design we just talked about – my rated design and my proposed house relative to the total energy –

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use of my reference design. So when we do modeling, we over the years, our numbers are going to get lower. That's what we can't change the 2006 – that's when they started – because we want the numbers to be consistent over time. A house built in 2009 that's rated at a 65 will have the same performance as a house built in 2010, 2012 to a 65. Now, a rated design, that's the numbers – the

work both let's talk about those. Rated design is a description of my proposed building use to determine my energy rating index, and my ERI reference is the design that meets these minimum requirements we just talked about for the 2009.

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So when we look at energy smart home scale, this is on also the U.S. DOE, Department of Energy, web site. This is a home that was rated in 2008, so the numbers were, for this home, very good even in comparison to today's rate. But you can see for energy down to 150. The 100 is – and then it goes better down to 0, which is the best. The scale is based on this 100 index. As I said again, 0 is the best net energy home, and then the code now requires in the 50s and 60s, which would be along in this area here to be a target score. So let's look at the target scores.

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By climate zones, the more stringent is Climate Zone 3, which is required to be at 51. Climate Zone 5 is the highest score allowed by the 2015, and that will be in Climate Zone 5. So the Climate Zones 1 through 8 all fall between 51 and 55. This is the number that you want to meet or beat, let us say, with your analysis. So what you will – what we'll do is then verify compliance by an approved third party. This is using an approved rating tool.

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The IBC says that – the International Building Code – that records should be kept of all inspections and should be provided to the building official upon request. So the third party verifier will need to provide documentation as required by the local jurisdiction – building official and jurisdiction having authority.

Now, what do I do about compliance? There's rating tools. The code requires in 406 that we provide documentation, and the documentation to determine that ERI and the parameters for residential building in accordance with Sections 406.6.1 through 406.6.3 require that you use some compliance software tools, that you complete a compliance report, and that possibly you may need to submit additional documentation.

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So when we look at 406.6.1, it requires that we have

documentation that verify the methods and accuracy of the compliance software tools conform to the provisions and are provided to the code official. To be able to do that, we need to look at these sections, and we'll go into more detail at 406.7 about calculation software tools, their minimum capabilities, specific approval and their input values. Currently, this compliance software calculation is in a standard – an ANSI-approved, ANSI/RESNET/ ICC Standard 301, and we will talk about that a little bit later in the presentation.

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So these compliance reports must generate a report that documents the ERI of the rated design and that it complies. It needs to include – the documentation needs to include address and other identification of the residence if there's no – not an address assigned yet, and there may not be in new construction; inspection checklist documenting the building component characteristics of the rated design, and you need to show both your ERI reference design to the 2009 code and your rated design and document all inputs entered by the user so that the results could be reproduced accurately. Who completed the compliance report, that individual, the software tool's name and version, and –

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there's one exception and that regards – is in regards to orientation.

So there are, in regards to that, in 406.6.2, there is a documentation exception for multiple orientations wherein otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance orientation requirements in each of the four cardinal orientations: north, south, east and west. So one of the software tools – approved rating software tools is defined in the ASHRAE/RESNET/ICC 301 2014, which is not currently referenced in the –

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ICC, or the IECC, the 2015. But it is currently the only standard out there that addresses energy rating index, and this is an energy rating index standard, and it will generate reports. It says that the tools that you use, the program you use must generate reports and have the following information on those reports. Let's go into some of those in a little bit more detail a little bit later, but they need to

have your standard information, a lot of which is on this documentation here – address, my – who to contact about this, when was it done, what tool did you use and who – to determine the rating.

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So document the ERI reference. The certificate then that it produces must be signed by the builder providing the rated design component characteristics and then documentation of this design actual values used in the calculations so that it, once again, can be reproduced. Here is a sample of a possible result report package, a report package. Here is the – in the background, you see the 2015 energy rating index report that shows the index from 0 to 100 and where this house falls on that index, the target index that it has and what – the score it got.

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It has an EnergyStar home report along with that about the energy usage of the home, and then here is this certificate, home energy rating certificate with its annual energy costs, the general information, mechanical feature, building shell features, so that this would be presented to the homeowner and then the two reports would be presented to the city.

So when I look at the ANSI Standard 301, calculation for – to inducting a home – an energy rating index for a home to get their energy rating, then there's the – here's the procedures. First, I need to determine my energy rating index, and with that –

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I'm going to do the calculation using a software. Currently there are softwares being developed, and there – by the end of this year, I'm sure there will be many more. It takes a little bit of a lag time when we introduce something new into the code to get it, but there are some energy rating index softwares that you'll find out there. The energy rating reference home and rated home configuration, so what does the home look like, where are the windows and basically how's this being built. My operating condition assumptions because with any software, there are some assumptions that must be made. What are my minimum rated features? In this standard, there's also an existing home retrofit savings. This is not relevant to code compliance, –

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but it is addressed in the ANSI/RESNET/ICC standard. Economic cost effectiveness. Also there are requirements there for certification and labeling. What rating – are the rating requirements? Do you have any innovative design requests? And then the labeling. When it comes to labeling, there are things that you need to include in the label for it to be – this certification and label for it to be accurate. What's the real property physical address? What is your ERI index score? What's your projected annual site energy use by fuel type? So if you have a dual-fuel home with electric and either natural gas or propane, then I need to use my energy use type both fuels. What's my annual energy cost?

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Who was the rating provider, name and address, and the date of this rating, the date that the rating was completed?

So when I do a calculation, these specifications are not specifically defined in the IECC. But to do an ERI calculation, I'm gonna need a value, and U factors, R values and details on the home to get an accurate rating. So I need to know. A lot of this is the same, by the way, for a performance package. What about my above-grade wall? What – do I have a conditioned basement? What are the R values on the walls? Floors over unconditioned space or outdoor environment or do I have a slab on grade?

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Ceilings, roofs, attics, where's my insulation located, what is its R value? Foundations, crawlspaces, if I'm not doing floors over unconditioned spaces, do I have a foundation, a slab on grade? Doors, glazing, skylights, do I have a thermally isolated sunroom? What's my air exchange rate? Do I have whole house mechanical ventilation? What are my internal gains and internal mass and structural mass? Then when it comes to my heating and cooling system, what's my equipment efficiency and sizing, my air and ground source heat pumps or am I using them if I'm using an all-electric home? Do I have solid fuel combustion? Then my service water heating systems, what's my energy factor, my thermal distribution systems, what's my duct leakage?

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The thermostat, you know I'm required one programmable. Do I

have more than one zone? Do I have other thermostats? Then my lighting, and here's one – here's where we get into a little difference from performance, strictly performance section, in that in ERI calculations, I need my lighting load, my appliance and miscellaneous loads. So I'll need to define all of those so that I can get an accurate ERI calculation.

Additional things I need to consider is component heat transfer characteristics, internal gains. There are tables for default values, solar absorbance for various roofing materials. This is the – based on the solar absorbance, which is –

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my solar reflectance and my solar radiation are taken into various roofing surface to get my total absorption of that various roofing materials, and that's going to give me a factor that I'm going to use. Also there's defaults for framing for fractions of enclosure elements. There's an insulation assessment. This is what grade is it, Grade 1, Grade 2.

So when I do an ERI compliance path and go through the rating process, this provides me an independent third-party analysis and a review of the energy using features of the house. And this total process that we're talking about, compliance pass process, is the initial analysis and energy rating of the proposed home.

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That's the calculation compliance application that you will submit to your authority having jurisdiction. Then they're gonna review that for compliance with the energy code, including the mandatory things that we talk about plus the items listed in your analysis. Then they will do inspection and testing of these energy features so that we know that they perform, and then there will complete a final energy rating of the home once the inspection and testing is completed. A home that complies – demonstrates an ERI path is a total process that goes through submittal, the initial analysis, and then the final energy rating. Your rating for – typically when you submit through a –

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performance path, you say this is gonna be at the performance above code. This one, though, it's a rating and it includes a lot more detail into this testing determination before you get your

final.

So when we talk about these software tools that can do ERI per the section we talked earlier in Section 406.3, there are no tools referenced in the 2015 IECC for compliance. The authority to accept or reject software tools or ERI compliance rests with the authority having jurisdiction. There are several tools out there – software tools, as I said, being developed but ANSI 301 is the only standard.

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It's the standard for calculation and labeling of the energy performance of low-rise residential buildings using an energy rating index, but you must include that Addendum A-2015. This is the one that includes all of the ERI requirements, and currently this is the only standard developed. There may be other standards that come along. There will probably be several softwares based on Standard 301 that are developed. There's a lot of them under development currently. And there may be many more developed under this standard or under another standard once it gets developed. But currently in this existing standard software rating, it's the standard to help create rating software programs.

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They must generate – these programs must generate reports, and these reports must have the following information: the property location, including city, state, ZIP Code, street address, community name, lost number, plan name for the rated home so that you know exactly this is what this house at this specific location; name and contact information, including phone number and e-mail address of the certified rater conducting the rating; the name and mailing address and telephone number of the approved rating quality assurance provider under whose office the rater is certified; the date the rating was conducted; the name of the approved software rating tool, including the version number to determine the rating; and then it must say this – must provide this disclosure that this home energy rating standard disclosure for this home is available from the rating provider.

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So we've talked about raters, so who might be approved as an ERI rater? Currently RESNET certifies raters. Now, RESNET certifying a rater for a home energy rater certification or a rating

field inspector certification is similar to ICC providing certification for building official, mechanical plan reviewers, special inspector. ICC currently provides around 31 different certifications for building department personnel. RESNET currently certifies ERI raters, and they have two certifications. One is the home energy rater certification –

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and the second one is this rating field inspector certification. The inspector cannot provide ratings. They can only do the actual inspections. The raters must be experienced and educated in conducting, supervising and evaluating an ERI rating.

So those qualifications for certification is found in the mortgage industry national home energy rating system standard. And so the certification that they must meet is not developed by RESNET itself; they just provide the certification and the testing of that, but the qualifications and testing is based on the standard by the mortgage industry national home energy rating standard.

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In addition, a rater should also demonstrate their knowledge of the residential provisions of the International Energy Conservation Code by holding either – by holding the ICC – IECC residential energy inspector plan reviewer status certification. And the rater must also have knowledge of any state or local amendments to the IECC for the area in which this home is being built that they are doing the rating or inspection for.

What this certification does is – and the whole ERI rating process does is it reduces the need for jurisdictions to do full plan review and specific inspections that are related to the energy rating index. They can then just review the paperwork that's been –

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submitted and the documentation to ensure that it was done correctly and done by certified personnel.

So ICC and RESNET have – and the DOE have undertaken an education effort to educate code officials on the ERI index option and its benefits. There are several other organizations that are also doing education on this ERI option. So some of the mandatory requirements is that we provide documentation to the building

official to demonstrate that these mandatory requirements contained in the 2015 IECC have been met wherein it comes to the HVAC, to the water –

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heating, to the lighting requirements and also that documentation that the building envelope meets the minimum insulation and glazing requirements of the 2009 IECC.

So to help with this process, there are a lot of – there's a lot of information being developed and a lot of information out there that will, in addition to this webinar, that will help you answer questions regarding this ERI performance. RESNET has six informational fact sheets. One is the overview of the ERI performance path in the 2015. One is what are the benefits of the energy rating index score.

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They have one for frequently asked questions for users, inspectors, raters to RESNET. They have a cost effectiveness of using the ERI to comply with the 2015. There's implementation guidelines that will help local building officials and builders on how to get this done. They have performance paths for alternatives. And then in addition to those information fact sheets, they also have some case studies on how you – how incorporating the HERS index, which is – HERS is Home Energy Rating Score – is one way to do an ERI. And they have some case studies because the HERS actually predated the ERI in private industry and there's some case studies to look at.

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So their fact sheets are found on their web site, and they basically look like this. This is the one for performance – to look at the performance path and comparison of the ERI to the performance path. And that can help show where the differences are between the two and between the typical performance and the ERI index. In addition, there are several other resources that are very useful. One is the Building America Solution Center. The Building America center provides expert – access to expert information on hundreds of high-performance construction topics, including air sealing and insulation, HVAC components, –

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windows, indoor air quality and much more. The U.S. Department of Energy's Building America program strives to reduce energy use and peak energy loads in existing and new homes. The whole building system approach also seeks to improve quality, comfort, safety, durability and a healthy living environment. It was – Building America's Solution Center was designed to offer fast online expert – access to expert guidance on hundreds of high-performance construction topics and give you – there's the tools to customized skill kits to take information to the job site. So you can look under building components; you can look under guides, and we'll go into that a little bit further; EnergyStar certified homes; zero energy ready home; EPA indoor plus.

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There's sales tools, there's some case studies, videos, some optimized climate solutions so that where do you wanna look. Do I need program checklists? Do I need building components? Do I need climate package? Do I wanna take it mobilly? There's code briefs, and just a wealth of information on the DOE's Building America site.

So one, for example, is this continuous rigid insulation sheeting and siding. And this is part of the solution center guide – it's a guide under the solution center. It has an overview of the specific measure. It has including – it's got a full description, tips for insulation, climate considerations, training images, presentations and videos.

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It has code and performance compliance plus other external information related to the topic. So with a few exceptions, each guide is organized into these eight tabs, and it's a fairly new tool, so not all information is fully populated. As new research is completed and users provide additional content, then they're constantly updated. So if you have content on one of these guides, Building America would love to have your input. The intent of code briefs, the one circled there – the second one circled at the bottom is to provide code-related information about Building America's research, their best practices and new innovations. This will help ensure that the measures will be accepted as being compliant with the code. Providing notes for code officials on how to plan, review and conduct field –

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inspections, and this can help builders or remodelers with proposed designs and provide jurisdictional officials with the information necessary for acceptance. If we provide the same information to all parties, then the expected – this is expected to result in increased compliance and fewer innovations being questioned at the time a plan review or field inspection because the building official will understand that it has been accepted and it's been tried and tested – tested and tried.

Now, the building energy code compliance – building energy codes program includes another great set of resources for use. We have compliance software. This is where you get your RES check and your COM check –

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both for your desk use and the web. They have technical support. You met Pam earlier on the phone. She's great with online help for answering energy code compliance questions. Code notes, specific guidance in topics with code reference publications. There's resource guides, as you can see several at the bottom here, the air leakage guide, insulation requirements for residential buildings. There's a resource guide for building energy codes, for policymakers, guide to training materials and includes complete sets on the IECC residential commercial code requirements, full training material for you to go through.

So at this point, I believe –

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I'm going to turn it back over to Miss Pam for any questions that we may have received.

Pam Cole: Thank you, Shirley. That was really informative going over the requirements of ERI. As you can see, she's provided a lot of additional resources, definitely resources that are not in the 2015 IECC, but they are there for you to go out and get additional information, and she's providing you the overview of resources on the links there on the page. So you have IECC, RESNET, the Building America, and of course the Building Energy Codes Program brought to you by Department of Energy.

So thank you again for participating in today's webinar brought to you by the Building Energy Codes Program, and we are going to start into our question and answers period. Shirley, we have received lots of questions today, so we will try to get through as many of these that we can as time permits.

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And I'm gonna go ahead and just address the questions, Shirley, and let you go ahead and answer, and we can tag-team it too. That's not a problem. So let's start out with a couple of these.

What constitutes an approved – and quoted approved because that's a definition in the 2015 IECC – third party for verification?

Shirley Ellis: Okay, the approved is – lies in the building official, according to the definition of the code, and that says if they have conducted tests – if you'll remember, they've conducted tests themselves or it's tested by a nationally recognized – wait – investigation or test conducted by him, reason of accepted principles are test by nationally recognized organization.

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Currently RESNET is the organization that is testing raters, and they must have either the home energy rating certification or, if they're just going to do the inspections, the inspection rating certification. So I would say, yeah, according to the code, they're the ones – they're the nationally recognized organization that's doing that testing.

Pam Cole: Great. So another question that's came in is – and this is kinda taking it off the path, but question – this has come up a couple times. Are there approved software tools that are available right now that can determine the ERI calculations such as REM rate, RES check or energy gauge? Can you expand upon that a little bit, Shirley?

Shirley Ellis: Well, because the software is being developed –

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at varying rates, the RESNET is the one who's certified. Currently they certify performance software and they will also be certifying the energy rating index software. I know A&M, for example, we have a software for use in Texas, and our software is currently

approved for the energy code. It's RESNET certified. Our ERI is still under development and under testing and we have not gotten that portion certified at this time. So the best place to go, because that could change at any moment, the best place to go is to go to RESNET, whether you're looking for an energy rating index software or performance software to see if they have been through the RESNET certification process.

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Pam Cole: That's great. So that takes it to another question that came in a little later, ties right into that is one that asks which states allow this ERI pathway to be performed.

Shirley Ellis: Any one that's adopted the 2015 International Energy Conservation Code that has not specifically amended it out.

Pam Cole: So the best place to go look to see what codes are adopted in what states would be back out on the EnergyCodes.gov web site. And if you click on adoption and status of state codes, there's some maps there, and there's also links to every state page that DOE has posted, and it will tell you exactly what their current energy code is that they have adopted within that state at the state level. There are also home rule states, so there is adoption at the local level, so you really have to pay attention to where you're building your building to understand what code is being enforced and if there are any amendments to that code and work with that local jurisdiction as to what they allow as far as construction –

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specifications, whether they allow an ERI rating and so forth. So you have to do a little bit of homework on this one to make sure that the ERI pathway is an acceptable path of compliance when you get ready to build your building.

All right, so the other one is you had – it came up as far as orientation. Is there any orientation that is like the "worst case orientation?" You talk a little bit about that little exception that's in the 2015 about orientation. Can you expand upon that, Shirley?

Shirley Ellis: Okay, so when I have – let's say I have Plan Number A1, and so I'm going to be building Plan 1 in several different sites, so I would then model it and north, the east, the west and the south facing directions, and the one that has the highest ERI score –

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'cause remember, higher is not necessarily better when we're looking at ERI – then that's the one I would submit because I know the other three orientations are going to be a lower score and therefore a better ERI score.

Pam Cole: Okay. Next –

Shirley Ellis: That's what the exception is referring to.

Pam Cole: Next question. So do you need an energy stat report to meet the ERI compliance alternative pathway? I'm not sure I know what an energy stat report is, but –

Shirley Ellis: No, I'm not sure exactly what they're – I need more details before I answer that one and can answer it accurately.

Pam Cole: Next one. Is there a parallel to the ERI for commercial construction?

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Shirley Ellis: Not currently.

Pam Cole: Okay. Is the ANSI/RESNET/ICC 301 referenced in the 2015 IECC?

Shirley Ellis: No, it is not.

Pam Cole: Okay, so that's a very important point that she's making here. Even though she's provided this guidance to the ICC 301 standard, this is not referenced in the 2015 IECC. It's only provided as guidance, as one of the references, as a resource to provide additional information on meeting ERI rating specification. So this is not in the 2015. This is only as a resource that she's provided today.

Shirley Ellis: One of the best things to help understand how that works is, for years, we've had a reference that you should – a requirement in the –

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IECC that you should do testing – air leakage testing on your home. The only standard for testing doing those tests was the ASTM standard for E779 for blower door tests. The standard was

not referenced directly in the code until here recently, but it provided instructions and directions to help you do the test. It's similar – what we're talking about here is similar to that.

Pam Cole: Great. So I'm gonna touch back on the commercial one a little bit more. So – 'cause this question's came up more than once about is there something similar in commercial, and actually there is. And the performance cost index recently –

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was approved and released by ASHRAE 90.1. Using Appendix G is the parallel for commercial, and the baseline for that is ASRAE 90.1 2004. So if we have anyone who is commercial builders that are online today, there actually is a reference, and again, as I'm saying, it's ASHRAE 90.1 using Appendix G, and that's parallel for the commercial of this rating index, but it is to the baseline of 90.1 2004 version.

Shirley Ellis: Right, and it doesn't quite give a score. It's not as defined as – with a score, but yes.

Pam Cole: Okay. Can you explain more about the testing and inspection of the ERI? Does it happen in one visit or is it in critical stages of construction? And who does the testing and inspection?

Shirley Ellis: Okay, so very –

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seldom can they do it like in – they can do it in one visit for the testing. Usually it's not. They usually test it as a stepping stone at one visit and then do the whole house at another, but there could be opportunities when I guess that could happen at the same time. But it's – the inspection is not because there's – it's just like inspecting the house for the energy code. Some things get covered up, so there may be several inspections. There may be testing at a time of one inspection or not. It could actually be two different people doing the – conducting one, maybe is able to do the inspection because they're certified as an inspector but they're not certified to do the testing through the certification required by the equipment –

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you know, the provider for the testing equipment. Also there may be some mandatory requirements for the ICC, so therefore they

would have to be an ICC-certified inspector, so it could be multiple inspections on a visit. It may not. It could be all one person, it could be multiples. Real hard to answer. That's more by case-by-case.

Pam Cole: All right. So we've also gotten a lot of questions about third party, and this comes up quite a bit in a lot of trainings as far as what does that mean, what are the requirements, what does the IECC say, and I just wanna stress that there is nothing in the 2015 that defines the third party. What it does specify is that the code official has the final approval of what they would approve. So there is wording in the IECC that you would have to go to where –

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it is the code official that makes the approval. So if you are having questions about third party, I would highly advise that you work with your local jurisdiction to get the additional information when you are going down this path of compliance and get all the details that they have as far as what you need to submit for construction specifications. Your ratings, does someone need to be certified, does it have to be third party? That code official has the final approval as far as what they are enforcing, implementing, who does the inspections.

So I highly suggest if you wanna use the ERI path, purchase the 2015 IECC, look at these other resources that Shirley has provided because they're just additional resources. These are not listed in the IECC. And then get with your local building inspector or your plan reviewer and work through the details. This is a new path. This is the first time it's been published in the IECC is 2015, this compliance path.

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That's why we're kinda discussing it today. Not a lot of information, not a lot of details in it, but I think as the next published codes come out, you're probably gonna see more information get added to this section. However, what Shirley provided today is just the section numbers, what's in the code, and then all these other resources. A lot of these questions that have come in are questions related to what's really not in the code, things that we can't truly address because it's not in the 2015. So I highly suggest you go out, get the code book if you don't have it, and work with your local building department if you want to use this ERI path.

Shirley Ellis: And let me add to that. If you are the local building department, then your next level of resources is your local ICC chapter, your fellow building officials and your area, your state chapter for building officials, the – and they can help you with how they handle –

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this in their city and what they're doing and what they've learned, and a lot of times they can answer your questions that are more local than we can on a national level.

Pam Cole: Great. Great. So again, we've got a couple more questions that have come in, Shirley, about do states allow this compliance path, and I can't stress more enough that states that have even adopted the 2015, and there's only a handful of 'em that have, some of 'em have amended that code. You need to go look to see if they have and get with your local authority because this again is new in the 2015, and you gotta do a little homework on this one and make sure that you have – are providing the right documentation, right certifications and you're meeting all of the enforcement materials that they expect you to submit when you're building to this alternative compliance path.

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So I can't stress it enough today.

So let me look at some other questions here. Okay, Shirley, you mentioned this mortgage home energy rater on the one slide, and there was a couple other ones that you mentioned, and it was a bunch of fact sheets, and the question came up is that referenced in the IECC? So I'll let you answer that.

Shirley Ellis: No.

Pam Cole: Okay.

Shirley Ellis: The IECC is silent on a lot of questions that we have. So what I referenced is a lot of resources that are out there by recognized associations that can help us provide some of the answers in a uniform – where we're at least getting them from a reliable source and a dependable source. Whether we use them, it's kinda like –

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when you look at the IECC building code and you don't understand a code section, so what do you do, you go to the IECC commentary on that code, so that you can say, okay, here's some additional information from a reliable source that can provide me more details. They are not referenced in this – the code is a page and a half. It's very vague, does not give you a lot of details, and so we've gotta go to – instead of just making it up ourselves, I try to provide a lotta resources where we can go get some information to help us understand better.

Pam Cole: Okay, great. And it was asked as far as where can they go to learn more about 301? Was there a link that was provided so they can get this information on 301?

Shirley Ellis: 301 is produced by RESNET and ICC.

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So when you look on the RESNET web site, which they will be able to provide the book – where you can go get the book. You can also get it through ICC and could answer more questions. The ICC staff may have someone online who can answer questions about that and also the RESNET staff. And I wanna stress, I think there's some confusion that RESNET is HERS. That's like saying that, you know, they do other things in addition to that. That's just – HERS is where it started, but that's not their only thing. So they can help answer some questions.

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Pam Cole: So let's get back to two more main important details of the ERI. And the question came in is can you – what is it? What's the purpose of getting the rating for the reference design? Is it in compliance based on the rated design? So there were two definitions in the 2015 under this section 304 that had a reference design and a rated design. Can you define those definitions for us again, Shirley? 'Cause they're very critical. They're very critical, I think, that –

Shirley Ellis: They're very critical. When you – and we're all familiar with doing the performance path, and when we do the performance path, we have our standard reference home and we have our proposed home. It's the same thing. When we look at this, we have our

standard ERI reference home. This is the one that if we built it exactly to what the code required, it would use this much energy.

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And then our rated home is the home I'm building, and I wanna rate this home and I wanna see how does it compare back to that one, the one built to the code. And that's gonna give me my number. So rated is the one I'm getting the rating on; reference is the one built to the references that are required in the code. So 2009.

Pam Cole: Okay, perfect. Thank you for clarifying that a little bit more. So a question came in about balconies and canopies. So are there any requirements to treat the major thermal bridging such as these balcony slabs and canopy beams, et cetera, in order to meet the envelope code requirements or must be these treated in the envelope modeling?

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Shirley Ellis: The code currently requires only conditioned space. So if they are part of the conditioned space, they would be inside the building envelope, and then your floor is gonna be treated as it would over unconditioned space or open air.

Pam Cole: So basically I think what you're saying is that building thermal envelope that is the determining factor that you use to run your takeoffs to run the energy counts for the modeling to meet your energy index. So if you had about –

Shirley Ellis: No difference than any other path in the code.

Pam Cole: There's a balcony slab that's not part of that conditioned space, then it wouldn't be part of that building thermal envelope, right. Got it.

So now the next question that came in, without looking at the codes, the air leakage section of the 2015 IECC and the envelope and the blower door section –

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and the requirements of the 2009, so we're muddling some stuff up here. We have some mandatory requirements for air leakage testing, we have mandatory requirements on blower door in the

2015. We have a backstop of the 2009 to this ERI path. Can you provide the details on what are – and if there – are there any conflicts or contradictions between the air leakage testing and the blower door testing? Which one's required? If I'm gonna go down this ERI path, are these mandatory requirements that I still have to meet, the air leakage and the blower door that are in the 2015, or are they not?

Shirley Ellis: Well, what the code says is that you will meet the mandatory requirements and the building thermal envelope shall meet the 2009. So the testing, the rating for your blower door test and all that, air leakage, is a mandatory requirement –

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and it's not a part of your thermal building envelope. It's not your U factor or your R value, so you have to meet the 2015 requirements for that mandatory air testing level.

Pam Cole: So what you're saying is that when you go to this – when you grab the 2015, and Shirley had a slide that listed the actual specific sections that were the mandatory requirements that you still have to abide by.

Shirley Ellis: Right.

Pam Cole: So those are the ones that she has stressed, and the 2009 is only the backstop to the minimum provisions of insulation and fenestration requirements. So you need to be very careful about when you're looking at going down this compliance path that what are the mandatory requirements that you still must meet that are in the 2015 versus only this minimum baseline –

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backstop to doing your ERI rating calculation to your energy rating index. So keep that in mind as far as when you're looking at these, that just because you're going down this path doesn't mean that you still don't have to meet other measures that are in that 2015 IECC.

So what about an existing building? Is there a way to do a calculation to an existing building if you wanted to know what maybe the ERI score was, Shirley?

Shirley Ellis: There – and I mentioned that when I went through what's in the Standard 301. It's not referenced in the code, and the code doesn't

use ERI on an existing building. A Standard 301does address that somewhat. Not sure how much detail it goes into exactly. I can't tell you off the top of my head what the requirements are. That's been a while since I read that, but they do have –

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some for ERI for existing buildings in that standard. So if someone was wanting to do it not for code compliance but just for their own benefit, then that Standard 301 is where I would go.

Pam Cole: Okay. So if I'm a plan reviewer, what certifications – are there any in the IECC? Let's just stress this first. If I'm a plan reviewer, are there any certifications that I need to be certified to do anything with this ERI path, and then if I'm a plan reviewer, is there anything in the IECC that specifies anything that I need to be certified to be a plan reviewer? Can you address that, Shirley?

Shirley Ellis: The IECC – none of the I-codes have any requirements that you have to be IECC or any other certification to do that. That's a local jurisdiction requirement. And this does not say – and this says the verification.

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Everything on this is all on what the authority having jurisdiction approves, whether that be the third party verification by – if your city says you bring your documentation and they say we're gonna let you do that, that's what the local building official's authority has. The local jurisdiction has the authority to say what they're gonna require in the way of certifications and approval for the people who do their plan review and their inspections. Some states have requirements. State of Texas has requirements if you're gonna do energy that you have to be ICC certified. They may come back and say at some point, if you're going to be doing this, you have to – but it's all on a local or a state level, not on the code level for certifications, and whether it be plan review, inspection, –

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third party approval, testing agencies, that's all on the local jurisdiction having – the authority having jurisdiction.

Pam Cole: Okay. So a lot more questions that I'm kinda just grabbing 'em and trying to figure out how I can make one question come out 'cause there've been question on HERS and RESNET, and I'm just gonna

go ahead and answer this one because there's been questions as far as, well what's the difference between HERS and this ERI, and I'm confused. Well, you have every reason to be confused because this has brought in a little bit of confusion, but I will stress HERS is not in the code. HERS is not in the 2015 IECC. We are not talking about HERS today. HERS is a different rating, and if you want more information on HERS and you need to go to the resource that has all that additional information on the HERS.

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So with that also said, let's talk a little bit more about these existing homes versus new construction. Existing homes in the 2015 IECC, if you're touching it, that means if you're gonna replace windows or you're adding an addition to an existing home, there's a new chapter in the 2015. It's Chapter 5. You need to go to that chapter and look at the provisions for an existing home that you might be altering adding an addition to. Has nothing to do with this ERI path. The ERI path is for new construction only. It is not for an existing home. Now, would you wanna see if you meet some energy rating index score, you could try, but that's where it gets really hard to do in an existing home when you don't know what the specs are for certain provisions of that building thermal envelope, meaning if you don't have the specs on your fenestration, your U factor and solar heat gain, you don't know what the insulation levels are in that ceiling or in those existing walls, it could get a little tedious and so you might not wanna consider doing that.

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But I wanna stress that this compliance pathway we're talking about today is for new construction. New construction only. You have an existing home, you go to Chapter 5 in the 2015 if this is the code that you're having to show compliance to.

Question came up again is about the states and who allows this compliance path, and I'll stress again that if you go out to DOE's web site, you can go to the status of state codes and look at what state has adopted these codes and who's adopted the 2015, but you gotta pay attention to any amendments they might have adopted as well. And then work with your local building official.

Now, this ERI rating, this – there are trainings that are taking place on this. This isn't the only training that there's been available. EEBA has a conference coming up you might wanna take a look at

– you could Google EEBA. I'm not gonna provide the URL. It's kinda long. But they're having a training on ERI ratings, and so if you're interested in that, and you might be able to even find more information if you just went out to –

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ICC 'cause they offer trainings as well. Or RESNET, we talked about RESNET a little bit today, but there are other opportunities, I think, that you could get additional information if you're interested in learning more about this energy rating index 'cause there are some trainings that are available throughout the U.S. on this.

So with that said, we're gonna finish just a little bit early I think. Is there anything more, Shirley, that you maybe wanna reiterate or add on to the end of your question and answers that you've been answering for us and doing a great job?

Shirley Ellis: Well, thank you. One I wanna just say thank you for the opportunity. This is a new area for a lot of jurisdictions. It's been an outside the code or above the code program to do ratings for a while and now it's in the code. This is the first time it's in the code. There is a lotta confusion about it, and the next code edition will probably have a –

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lot of clarification about it and a lot more detail. We're all learning. We find out new things all the time about it. There will be a lot more discussion on the area, and so stay tuned. I don't think this topic is over yet. Thanks again.

Pam Cole: Well, thank you, Shirley, and thank you everyone for participating in today's webinar brought to you by the U.S. Department of Energy's Building Energy Codes Program.

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