

**DEPARTMENT OF VETERANS AFFAIRS
ADVISORY COMMITTEE ON STRUCTURAL SAFETY OF VA FACILITIES
Minutes of June 15, 2007 Meeting,
811 Vermont Avenue, NW, Washington, DC 20420**

PARTICIPANTS:

Committee Members:

Mr. Chris D. Poland, SE, **Chair**
Mr. B. Todd Gritch, FAIA, CBO, FACHA
Mr. William E. Koffel, PE
Dr. Lelio H. Mejia, PE
Dr. Sharon L. Wood, PE

VA Staff:

Lloyd H. Siegel, FAIA
Krishna Banga, PE
David Klein, PE
Kurt D. Knight, PE
Fred Lau, PE
Satish Sehgal, PE

Guests:

Mr. Richard Kuchnicki, International Code Council
Dr. William S. Leith, United States Geological Survey
Ms. Nancy McNabb, National Fire Protection Association

PROCEEDINGS

1. Chairman's Introducing Remarks

MR. POLAND: I'd like to call the meeting of the Advisory Committee on Structural Safety for VA Facilities to order. This is our annual meeting.

I appreciate you all being here. I'd like to go around the table for a round of introductions.

At which time everyone present introduced themselves.

MR. POLAND: Okay, good. Thank you very much. I'd like to remind you that while this is an open meeting and we're pleased to have guests with us today. The discussion needs to be limited to members of the committee and to the staff of the VA that are here. But, when we're voting, just the members of the committee will be voting. If our guests have any questions or comments, they could please write those down and hand them to Kris Banga. We can deal with those in a proper manner.

2. Minutes of June 20, 2006 Meeting

MR. POLAND: I'd like to move forward with the next item on the agenda. That has to do with the minutes of the June 20th 2006 meeting. We have reviewed them, and have agreed that they are correct. So I'm going to sign the minutes.

We'll move on to the issues that we raised in our June 2006 meeting. The first one is the VA Program Guide PG 18-3 updates.

3. VA Program Guide PG 18-3.Update

MR. SEHGAL: We have a VHA Program Guide PG-18-3, titled, "Design and Construction Procedures." They are posted on VA web site. This particular topic of importance is Topic 1: Codes, Standards and Executive Orders that we follow at VA. I'll read through quickly the purpose and general statement so that everyone can understand it .

The Public Buildings Amendment Act of 1988, Public Law 100-678 requires federal agencies to follow national recognized model Building Codes. The "Federal Participation in the Development and Use of Voluntary Standards," Office of Management and Budget, OMB Circular A-119, requires all executive agencies to rely on voluntary standards, both domestic and international, whenever feasible, and to participate in voluntary standards bodies.

Generally speaking, VA has adopted the latest edition of the following codes, which we will discuss, which have modifications shown today, and standards there as a minimum for all projects performed in the modernization, alteration, addition, or improvement of its

real property and the construction of new structures. VA Design Manuals and Master Specifications specify other codes and standards that VA follows on its projects.

Bullet No.1: VA Directives, Design Manuals, Master Specifications, VA National CAD Standard Application Guide and other Guidance on the Technical Information Library is posted at (<http://www.va.gov/facmgt/standard/>). And you can access all these standards there. First of all is that we follow the International Building Code, IBC, and that we have made several changes to our references to NFPA 101 and the other NFPA standards . And this is a result of a recently completed study, comparing IBC 2006 and NFPA 101 2006, and these are the recommendations of the consultant, which we have accepted. Basically, we're saying follow NFPA 101 code, and we have put a note in the next page which describes the qualifications of this. NFPA 101 primarily addresses life safety and fire protection features, while the IBC addresses a wide range of considerations, including, but not limited to, structural strength, stability, sanitation, adequate light and ventilation, and energy conservation. VA buildings must meet the requirements of NFPA 101 and documents referenced by NFPA 101 in order to comply with the accreditation requirements of the Joint Commission. Therefore, designs shall comply with the requirements of the latest edition of NFPA 101 and documents referenced therein. Design features not addressed by NFPA 101 or documents referenced therein shall comply with the requirements of the latest edition of the IBC, or as otherwise addressed above in this program guide. For design features that are addressed by both IBC as well as NFPA 101, or a document referenced by NFPA 101, the requirements of NFPA 101, or the document referenced by NFPA 101 shall be used exclusively. That means they follow NFPA 101 as the primary document. That is the gist of all this. Any time we have conflicts between VA requirements and VA accepted nationally recognized codes and standards, it should be brought up to the attention of VA. And the resolution of the conflicts shall be made by the authority having jurisdiction for VA to ensure consistency system-wide. In other words, we'll make the final decision. This is a change we have made. Rather than making a statement like we used to have in NFPA 101, we have qualified this NFPA 101 and that has to be supported by IBC where NFPA 101 is silent or does not address some of the issues.

MR. KNIGHT: Now, at this point in time, this is a proposed draft. It has not yet been implemented.

MR. SEHGAL: About two years ago. we did a study which compared NFPA 5000 with IBC. And we determined that we're going to follow IBC and the National Fire Protection Association codes, with the exception of NFPA 5000 and NFPA 900. NFPA 900 addresses energy issues. Regarding Energy issues, I will take you to the next page. It's shown in green where we are making changes -- there are four mandates, federal mandates, which VA must comply with. One is the Energy Policy Act of 2005. And then DOE has issued an interim final rule, energy conservation standards for new federal commercial multi-family high-rise, residential business and new low-rise (inaudible) building, then CFR part 433, 434, 435. What that is, the view is the interpretation of how to follow -- what things we should follow from the Energy Policy Act, which factor into energy conservation.

Then VA, along with the other 18 government agencies, have signed a memorandum of understanding, and it's called "Federal Leadership in High Performance and Sustainable Buildings. VA is required to abide by that document. In addition just recently; there was an Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management." This overrides the previously issued Executive Orders on the same issues of energy and green buildings. So those are four mandates which we have included. That's a major change.

MR. POLAND: Satish, I don't quite understand. In my version those all look like they've been struck out and have been deleted.

MR. SEHGAL: It is confusing. I should have clarified the proposed changes. When and we inserted sections the word processing program showed these strike lines on the inserted sections. I could not remove them. Deleted text is shown on the right side, in boxes.

MS. WOOD: But we're talking about the colored text that seems to be inserted, but it also is indicated by strikeout. It really is inserted; right? The colored text is inserted.

MR. SEHGAL: These are inserted. The colors are inserts, blues and greens.

DR. WOOD: So it's just an insert.

MR. KLEIN: Anything that is in color is an insert.

MR. POLAND: And even though it's struck out, it's --

MR. SEHGAL: Anything in color is a new addition.

MR. POLAND: In our meeting last year, we had recommended to you that you delete -- it says here in our recommendations to leave National Fire Protection Association -- NFPA -- Codes with the exception of NFPA 5000 and substitute (inaudible). Is that what we've done?

MR. KNIGHT: Yes, that was accomplished. In the current version on our web site is the modified version as the --

MR. POLAND: So this bullet point that's here, the second bullet point, is in fact what we asked to have done. So we've done that and we've made these other additions.

MR. SEHGAL: That is correct.

MR. KNIGHT: Again, this document that Satish was discussing is a proposed draft. It's not yet been adopted by VA.

MR. GRITCH: Mr. Chair! I have a question. I see that we're calling out a plumbing code, an International Building Code and a plumbing code. Are we intending when we see "International Building Code" that you're adopting the entire family of codes, or it's just the building code there? Because in the comments, we talk about the IBC addressing a variety of issues, and it looks -- and we talk about energy and we're talking about ventilation and some of those things. I'm wondering, are we looking at the mechanical codes? Are we looking at all the family of codes that's inherent in the international code family?

MR. SEHGAL: That is correct.

MR. GRITCH: So it's not just the building code. It's the entire family of codes, with the exception where we provide a different code, like the Plumbing Code.

MR. SEHGAL: That is correct.

MR. GRITCH: And then the Energy Code, which would be the -- so we don't need to say which ones of those we're not adopting?

MR. KNIGHT: We haven't at this point in time.

MR. GRITCH: We might want to look at that before we issue that, take a look and see exactly where we have other codes that we're substituting, and then say we're not adopting those of the international code family.

MR. KOFFEL: I'm not sure our motion two years ago was for the entire family of international codes. And the only reason that I'm a little concerned about that, and I think some of these other issues like energy were part of it, but then that means you have two fire codes too. Because you have NFPA 101, and you have the International Fire Code. I'd have to look at the minutes, but I thought the action two years ago was the International Building Code, and then the references from the building code where it refers to a specific section in the mechanical code or something would be picked up, but not the entire code.

MR. GRITCH: Right now, I'm not sure, from what I see.

MR. KNIGHT: Well, we'll review that, but it was our intention to adopt the IBC and mechanical code, et cetera. Now, the fire code, I'll have -- you know, as you point out, maybe we should identify those that we don't intend to adopt of the IBC.

MR. GRITCH: Yeah, I think because there is a whole family of codes, we need to identify specifically which ones were the intent, and then let us take a look at where we may have conflicts in that and see where one -- you know, what the other ones, how they relate to it.

MR. KOFFEL: Why would we have the National Standard Plumbing Code if we're using the International Plumbing Code?

MR. POLAND: Why don't we allow them to answer some questions here? We're asking them questions and not giving them time. You want to tackle that one first?

MR. KNIGHT: Specifically, you're asking the question on what was this, the National Standard Plumbing Code versus the --

MR. KOFFEL: Yeah. Again, I think it's just the example that we have duplicate codes if we're adopting the international codes. I'm not trying to make the argument to adopt the international codes or not at this point in time. What I'm saying, if that's what we did or plan to do, we need to look at the fact that we would have two fire codes, we would have two plumbing codes.

MR. KNIGHT: Right, and that falls in line with your recommendation to review the request or review the adoption of the IBC and specifically identify those other codes that we don't intend to adopt the portions of the IBC that we will not adopt.

MR. GRITCH: Yeah. Since this is a draft, I think that we have the opportunity to go back and we're fine-tuning it --

MR. KNIGHT: We will clarify those portions of the IBC code we do not intend to adopt, which is basically your recommendation.

MR. GRITCH: Yeah, so that we have a comprehensive list. You know, we've everything covered and we don't have our duplications, as we intended it to be, and then we can take a look at that.

MR. KNIGHT: Now, this is a proposed draft. I mean, the recommendations from last year's meeting, we have included in our version that's on the web site now.

MR. MEJIA: Right. My recollection was, and I admit I have not looked at the minutes until just now, that we would adopt an International Building Code but retain the NFPA Fire Code -- that was our intent. And so I note a slight difference in the language that we recommended for adoption versus the language that is actually included as a bullet in this list.

MR. SEHGAL: Okay. I wanted to bring up one other important aspect is this JCAH joint commission only follows NFPA 101. They don't follow IBC.

DR. MEJIA: If I may continue. If you look at the bullet that we recommended be inserted in our motion, it reads as follows: "NFPA national" -- which is redundant -- "fire codes with the exception of NFPA 5000 and NFPA 900," while the bullet currently reads, "National Fire Protection Association (NFPA) Codes," and does not make the distinction between fire codes.

MR. KLEIN: What page in the minutes was that?

MR. KOFFEL: Page 2, bold 6.

MR. POLAND: Page 2 of the minutes, down at the bottom.

MR. KLEIN: So you would say insert the word "fire" after the parenthetical "NFPA?"

DR. MEJIA: That's what we recommended.

MR. POLAND: That was our motion last year.

DR. MEJIA: That was our motion last year. It was my recollection that we intended to keep the fire code from NFPA as a ruling standard and IBC for other aspects of design.

MR. KLEIN: Okay.

MR. GRITCH: A point of clarification. I don't know that it's -- I think it is properly stated when it says "NFPA National Fire Codes." That's an entire body of work. It's NFPA being National Fire Protection Association is the name of the organization, but the National Fire Codes is a very large grouping of the NFPA standards. There's a multitude of standards that fall under what's called "the National Fire Codes." So you're adopting the entire NFPA packet at this point with this language.

MR. POLAND: With the exception of NFPA 5000 and 900.

MR. GRITCH: Yes, that would be the way we would be looking at it is, we're adopting all of the NFPA standards except for 5000 and 900, which we have specifically excluded.

MR. POLAND: So Lelio's point is on this fourth bullet, and we didn't have discussion about this last year, it needs to say "fire codes," not just "codes."

MR. GRITCH: NFPA 101 is only one of many when we adopt the National Fire Codes.

MR. SEHGAL: Yes.

MR. POLAND: So are there NFPA codes that are not fire codes?

MR. GRITCH: Tons.

MR. POLAND: So that's what we were trying to do. We were trying to first point at the volume of fire codes and say we're going to adopt those, not all of the NFPA codes, except for these 5000 and 900.

MR. GRITCH: Yeah, I think that what we're looking at is we have a lot of things that will cover all kinds of things that maybe we don't really -- are interested in covering. There are things about firefighter equipment in there, you know, the standards for firefighter equipment, for firefighter -- could we ask if they're --

MR. GRITCH: No. Anyway, I think we need to go back and look specifically at what is encompassed by -- when we say the national -- the fire codes.

MR. POLAND: Well, it's very common to cite codes that cover lots of things that don't apply to particular applications. That's not a problem.

MR. GRITCH: I would say there's probably like 250 standards that we've just adopted with this if we say that.

MR. KOFFEL: Yeah. I think going back to the question, when you say "National Fire Codes," that is everything that NFPA produces that gets published in this multi-volume set and it includes codes and standards, and our language is such that we are adopting all of it. Now, there's a good percentage that will have absolutely nothing to do with a VA facility. And yes, we could go back and clean it up and take some of those out if we want. So I don't really have a problem with that language, at least for now.

MR. KNIGHT: With what language?

MR. KOFFEL: What was moved at the meeting last year.

MR. KNIGHT: Okay.

MR. KOFFEL: My issue is more when I heard that the International Building Code inferred all international codes, and I'm not sure that was our motion two years ago. And it's the same issue, the International Building Code is 1 of 10 -- I'm not sure, I'm guessing -- publications.

MR. POLAND: I want to get control of the meeting again because I don't know what's going on right now. Last year, we had a discussion and we made recommendations. And now they've come through and told us that they've done a recommendation and they've done some other things here. So could you help me focus on what the issue is, and where we need to go from here?

MR. KOFFEL: Well, if you want it in the form of a motion --

MR. POLAND: No, I just want you to tell us first.

MR. KOFFEL: It is that the fourth bullet that should be consistent with what is in the minutes -- Item 2 from the June 20, 2006 meeting.

MR. POLAND: That's where you need to add the word "fire" in front of "codes." What's the other issue we have here with these other changes?

MR. KOFFEL: I think that's the issue. We've had some other discussion, but I think that's the issue on the table right now.

MR. POLAND: Is there a problem with citing the International Building Code as one body of codes there in the first bullet?

MR. KOFFEL: The International Building Code does not get you the international codes. The International Building Code gets you a particular document.

MR. MEJIA: Right, which I think was our intent at our last meeting. So that would follow the intent as discussed in our last meeting.

MR. POLAND: Okay. Is there any other discussion or comment about the other changes that have been made to this?

DR. WOOD: I have just one editorial comment. And that is, in the general statement, you say that the VA has adopted the latest edition of the following codes. When I get down to the last one on the first page, the ACI Building Code, the reference numbers are incorrect. ACI 318 is the document number, and the "02" is referring to the edition. And so because you said you want to use the most current codes, it should just be ACI 318 and ACI 318R.

MR. KNIGHT: That will be corrected.

MR. KLEIN: Yes. Just to carry on with the topic of the NFPA family of codes, the VA does utilize many of the codes that don't necessarily have to do specifically with fire. In fact, the VA has 22 fire departments, and so we do make use of the codes that you referenced. So I agree with the comments that the NFPA Fire Codes refer to the entire family of codes, which we have traditionally used for construction.

MR. KNIGHT: We also reference in our specification many other NFPA codes for mechanical systems, sprinkler systems, et cetera. They reference specific NFPA codes in a number of specification sections. I think that's where the -- possibly we just used the National Fire Protection Association Codes because we adopt many of those codes throughout our other standards -- not just the fire codes I think is what we're trying to say.

MR. KLEIN: We adopt the whole family of codes for construction unless there's a specific exception.

MR. KNIGHT: And this was a specific exception of NFPA 5000 and NFPA 900. So I think that's why it was done that way, because we are adopting in other documents many other NFPA codes.

DR. MEJIA: Not just the fire codes.

MR. POLAND: So are you suggesting that this motion that we made last year is incorrect in referencing the fire codes here?

MR. KNIGHT: Well, it's not incorrect. I'm suggesting that there maybe a better way of stating it, because we have adopted in addition to the fire codes additional NFPA codes. The only one we did not want to adopt was the exception identified here.

DR. MEJIA: Question, Kurt. And so if we have language like this, is there a conflict between adoption of the National Fire Protection Association Codes as a body of codes and the International Building Code? The reason I ask that is because that was one of the issues that was identified last year that led to the study that was performed, and that led to the recommendations and adoption of the International Building Code as the overall standard and the NFPA --

DR. WOOD: But, the NFPA 5000 is the equivalent to the IBC, the International Building Code, and so that's why they're accepting the NFPA Code complete with the exception of 5000.

DR. MEJIA: I'm just asking the question as to whether there are other conflicts.

MR. KNIGHT: There are other conflicts. You're asking the question is there other conflicts between IBC's entire family of codes versus NFPA. I would say probably there are some. I mean, there's a vast body of information there, so there are conflicts. We're not aware of any major conflicts at this time. It is our intent to adopt the International Building Code in its entirety including mechanical, plumbing, etc.. however, at this point in time, I think we need to clarify other referenced codes that we accept with the adoption of the International Building Code. I think that's a good point and needs to be clarified. However, as far as mechanical and other IBC codes, it is our intent to adopt those too. We need to obviously review and clarify of which parts of which codes we're going to accept or exempt and be more specific. We also need to review code conflicts with our VA standards.

MR. SIEGEL: In addition, naturally we can only speak about today's latest codes, but it's always possible that in the future, one or the other of the codes will generate conflicts, which is why we mention the Authority Having Jurisdiction making the decision. We're also aware that NFPA and IBC are engaged in conversations trying to eliminate conflicts.

MR. KOFFEL: Yeah, again, I just want to clarify because I think there's still some confusion. Saying "NFPA National Fire Codes" is not limiting you to only the fire-related documents within NFPA. National Fire Codes is a known entity.

It's the entire volume of codes and standards and guides that are produced by NFPA, and it includes the National Electrical Code and the Fuel Gas Code and all of those

documents, whether we think of those as fire codes or not. So the National Fire Codes covers everything that NFPA produces and publishes in that multi-volume set.

MR. SIEGEL: So are you suggesting we change our wording?

MR. KOFFEL: I am suggesting the language from the last meeting is the correct language.

MR. KNIGHT: And that includes all the other referenced codes, or a majority. know you don't have everything we referenced, but --

MR. KOFFEL: If it has "NFPA" in front of it, it's included in that referenced National Fire Codes.

MR. KNIGHT: So it's the use of whether we say "the NFPA Codes" versus "the NFPA Fire Codes." And the preference of the committee is "the NFPA Fire Codes,

MR. KOFFEL: National Fire Codes. NFPA National Fire Codes. That is that series of multi-volume documents.

MR. SIEGEL: With the exceptions we have mentioned.

MR. POLAND: I've heard three modifications. I just want to summarize to see if I'm in the right place. There are three topics going on here simultaneously. One is we're trying to figure out for bullet no. 4 exactly what that needs to say so that we get the right reference to the body of codes that we're talking about. Second is we've been talking about potential conflicts that exist between the variety of codes that we have cited, codes and standards. And there's a paragraph here about how those conflicts get dealt with. And the third thing is we have a lot of new information here that we haven't seen before that you've added to fill in other areas that need to be dealt with. That's the green areas on page 2.

MR. KLEIN: I have a question for Bill and anybody else who wants to comment. Would it clarify the issue to say "the NFPA family of codes," or would that just confuse the issue?

MR. KOFFEL: I have always seen it referenced as the National Fire Codes, and it's a registered -- you know, put the little R after it. It's the whole set of documents.

MR. KLEIN: It's clear then.

DR. WOOD: May I ask a question? Does that then conflict with specifying the National Electrical Code and the National Standard Plumbing Code? Does NFPA have Electrical and Plumbing codes that --

MR. GRITCH: That one is, that one's not. This one already is in there, and that one's not.

MR. KOFFEL: The documents won't show which ones you're pointing to. The National Electrical Code is part of the National Fire Codes. The National Standard Plumbing Code is produced by an organization other than NFPA. That is not an NFPA document.

MS. WOOD: So does NFPA have a Plumbing Code?

MR. KOFFEL: Not in the National Fire Codes. They have a plumbing code that they affiliate with, but it's not part of the National Fire Codes.

DR. WOOD: So given that the National Electrical Code is part of the NFPA suite of National Fire Codes, are we being redundant by listing it?

MR. KOFFEL: It is redundant, but I'm not sure the redundancy is bad in this instance because it is a major document. No different than the third bullet says the Life Safety Code. That is part of the National Fire Codes.

MR. SEHGAL: I think it stands out for clarification to deal with electrical issues.

MR. POLAND: We're going to need to move on. I'd like to ask Bill, I guess we're going we need a motion to clarify our recommendation of this discussion. The first thing is what the fourth bullet should read, and you wanted to insert the words "National Fire" between the parentheses NFPA and "Codes," I believe.

MR. KOFFEL: I will make that motion, or it's just a clarification that we stand by our motion from the last meeting.

MR. POLAND: That's fine. So the second thing is, is there any issue about the potential conflicts between these codes and how they'll be resolved, or is that taken care of in the language?

MR. KOFFEL: I think we have set up a methodology to identify the conflicts and try to resolve the conflicts. And it's my understanding that there is ongoing effort by staff to address these maybe more specifically in the future.

DR. WOOD: When I read the first note, it seems as if the entire suite of International Code Council codes is being adopted, because it talks about sanitation, adequate light and ventilation, energy conservation. I don't think those topics are actually covered in the International Building Code. It's the ICC suite, and I think that's part of the reason why I got confused in this discussion.

MR. POLAND: Kurt, is that correct? Is the International Building Code really much broader than what we normally think about it being?

MR. KNIGHT: It's a family of codes.

DR. WOOD: But that's the International Code Council family of codes.

MR. KLEIN: Can I address that? I'm the one who wrote that note, and I took that verbiage out of the IBC. If that's wrong, then we can easily correct it, but I just pulled it right out of the IBC.

MR. KOFFEL: In some instances, there is specific language in the IBC to address it. In some instances, it refers to another document that would address it.

MR. POLAND: It sounds like we're satisfied with the language we have related to conflicts works. Are there any concerns about the new material that's been added? So if we're standing by our motion, Bill, it sounds like we don't need another motion. We just need to have a little clarification here and move forward.

MR. POLAND: Satish, thank you. We've had some more people join us. We'd like some introductions. Lloyd, would you like to introduce yourself?

MR. SIEGEL: I'm Lloyd Siegel, Director of the Strategic Management Office of the newly reorganized Office of Construction and Facilities Management of the Office of the Secretary.

DR. LEITH: I'm Bill Leith from the U.S. Geological Survey. I'm currently the Manager of the Earthquake Hazard Program there.

MR. KUCHNICKI: I'm Dick Kuchnicki with the International Code Council.

4. Report on VA involvement with ICC and NFPA Processes

MR. KLEIN: We had Mr. Kuchnicki come out and give us a talk during the past year about the benefits of membership, and I believe it's the intent of the VA to establish a corporate membership with the ICC -- I think that's what they call it -- under which several of the architects and engineers in the VA would become members. At the present time, I don't believe we have anyone actually participating in ICC committee activity, although we do plan to go in that direction in the future. Regarding NFPA Code activities, we do have a number of people who participate in NFPA technical committees, and I have a list of these people, which I'll pass out as soon as I find it.

MR. KNIGHT: And note we are planning to attend as observers the next ICC annual educational conference scheduled for September 30th through October 4th of 2007.

MR. POLAND: So in our motion to you last year, we had suggested that your membership include reviewing proposals and comments, submitting proposals to revise codes and standards, and addressing conflicts and concerns identified by the VA, and as deemed necessary, participate in hearings and committee meetings where those proposals and comments are addressed. So is that how you intend to do it?

MR. KNIGHT: Yes.

MR. POLAND: Any comments or questions for David on the participation in ICC and NFPA? Thank you, that's good.

5. Seismic Safety in Operability of Equipment and Materials

MR. KNIGHT: The motion last year was to conduct a study and develop guidance to ensure the seismic safety of furniture, moveable equipment, and supplies, and report back to the committee. We have not had an opportunity to complete that study this last year. We have, however, had meetings with our emergency management staff and some preliminary discussions on how to accomplish or -- the bracing of other moveable equipment. We do have a specification, Section 13-08-1, Seismic Restraint Requirements for Non-Structural Components that required the bracing of a wide variety of equipment in a hospital that is under construction, and that the construction contractor is required to have a structural engineer review the bracing details to ensure that they're adequately done. That other equipment purchased outside of a construction contract I think was the major thrust of the request from the motion of last year. And we will need to continue to review this process and look at other procurement vehicles within VA, and the procurement service in VA, to ensure that some requirements to structurally brace or seismically brace equipment that is purchased by the VA and installed by either a contractor or VA, but not part of a major or minor construction project. I think that's the area that we need to pursue in accomplishing and in trying to address the motion to develop guidance to ensure the seismic safety of furniture, et cetera. We did have a meeting yesterday. The committee was invited to attend the emergency preparedness meeting that is held weekly in VA to give the committee an overview of VA's emergency response process, how the VA accomplished that. And that was, I think, very useful. And we will continue to work with the emergency management response staff to try to better address some of the issues identified and intended as part of this motion.

MR. POLAND: Questions or comments?

DR. WOOD: Kurt, I have a general comment about this Section 13-08-1, and that is, you have a number of standards and specifications identified in this document, and the years that each are given. But most of these documents are updated on a regular cycle ranging from every one to six years, and many of the documents are currently out of date. So I would like to recommend that you either update the references every year or, as in the document that Satish just showed us, state specifically that the most current versions should be used.

MR. KNIGHT: We will certainly take that into consideration. Our current program is to update our specifications every three years, no older than three years. You have pointed out that some of these references are updating every year, so that does pose a problem. We have discussed in the past this issue of using the verbiage, the latest version of the standards as trying to reference the particular year of updates, so we will

certainly take a very hard look at that and determine it. It affects not only this specification section, but many of our specifications sections.

Dr. WOOD: For example, the ASTM standards are now updated every year. And I know that from my participation in the ACI Building Code, it's actually very difficult to keep everything up to date and in sequence because things are changing so rapidly.

MR. KNIGHT: Yes, it has been increasingly a problem, and the latest issues associated with that are the complete revision of the numbering of VA specifications to comply with the CSI Master format 2004. We're currently in the process of updating our current specifications.

MR. POLAND: I'd just like to point out that these are master specifications that the design professionals take and build the project specifications out of them.. So they have to make sure that what they're specifying is what they want. Sometimes you don't want to specify the most current edition because you're dealing with a project that may have started earlier, and it's under a set of criteria that may not be the most current because it's taken a while to get the design done. The other thing is when the project is completed you want to have it in the record a set of specifications that clearly states which of the criteria you used. And so it's really important that the design professional fill that thing out and get it correct for what he wants. So I would not suggest that our master specs try to take that part of the job over, but we need to make it clear that that's what's supposed to be going on.

MR. SIEGEL: You're quite right. There are two sides to the coin. One side is everything should be as updated as possible. And the other side is if you're doing a contract with a general contractor or subcontractor or whomever, he's bidding on a particular set of documents at a certain date and time with references to a certain date. So if there are any claims, litigation, or anything else like that, you must tie it back to the contract documents of a specific date. However, the Master Guide Specifications really should state the most recent date or without saying the date, state the most recent edition.

DR. WOOD: Or there should be something that says that the specifications applicable at the time of the initiation of the design should be used throughout the project. And then, as Chris says, the construction professionals --

MR. SIEGEL: I wouldn't tie it that way, because there might be a specific case why you would want to use something else rather than the original one; as long as when the drawings are issued for bid, they are tied to certain specific dates.

MR. POLAND: I agree with that. I think the instructions need to be to the specification writer about indicating to make sure they have the right dates down for those specifications that they're citing, as opposed to having them written in the master specs.

DR. WOOD: Right. I think it could cause problems if they were written in the master specification

DR. MEJIA: We thought we might provide some clarification to the motion we made last year, because in reading the motion, we saw that there might be some ambiguity as to what we were trying to recommend. And we thought that it'd be important to highlight that in recommending a guidance for ensuring seismic safety of moveable equipment and supplies and so on, it'd be important to clarify that this is equipment, furniture, and other things that are installed after construction, since the specifications for construction cover all equipment to be installed at the time of construction. So, that would be one clarification we thought would be worth making. And the other one was to clarify and identify seismic safety as meant to include operability of equipment and furniture after an earthquake. And so our thinking was that we could clarify the motion with those notes.

MR. SIEGEL: You're saying "should" rather than "shall," right?

DR. MEJIA: In the motion of last year, we said "shall," I believe.

MR. POLAND: That's right. "We shall conduct a study."

MR. SIEGEL: "We shall conduct a study". That's fine.

MR. POLAND: That's what we said last year. One of the things that we noticed when we visited the Emergency Operations Center and listened to the discussion is the intention to shelter in place as much as possible, not move patients, to be able to continue to operate the hospital if at all possible. And our concern about the availability of the equipment that's purchased after the construction relates to the large pieces of equipment like X-ray machines, MRIs, that sort of thing, and have that secured so they are available to use immediately after an earthquake. And as we had the discussions, as Lelio said, there was some confusion about whether we were talking about what would be installed during construction and what was happening afterwards, and you mentioned that in your report. So Lelio, why don't you go ahead and read the motion to try to clarify what we're talking about?

DR. MEJIA: Okay. The motion would read as follows:

"VA shall prepare a report outlining VA's plans to ensure the seismic safety and post-earthquake operability, by bracing or other means, of furniture, moveable equipment, and supplies installed after construction at essential facilities."

The motion seconded by Dr. Wood was unanimously carried.

6. Modifications of H-18-8

MR. BANGA: Last year there were two motions made at the meeting with four items to modify H-18-8. The first part of the motion mainly to make some language changes, which we did in-house. And for the second part, we retained the services of S.K. Ghosh & Associates to review the entire revised version of H-18-8. The consultant concurred with the updated version, and recommended a few additional changes, including the complete revision of Table 4, "Spectral Response Accelerations at VA Facilities". Basically, we added the reference of the AISC 341, refined Seismicity Table in section 1.12, and added a clarification in section 2.6, and refined language of Sections 3.0, 3.4, 3.54, and 5.1.

DR. WOOD: We had a fairly thorough discussion of this yesterday, and we have some additional changes that we'd like you to implement before the 2007 edition of H-18-8 is published. There are four specific comments I'm going to make.

The following motion applies to the 2007 edition of H-18-8. There are four parts:

- a) Revise Section 3.5 (a) to read, "Special steel moment resisting frame systems shall be compliance with Section 9 of AISC 341." All the existing text in this section should be deleted.***
- b) ASCE 41 is now available in print. Therefore, replace all references to FEMA 356 with ASCE 41.***
- c) The spectral accelerations listed in Table 4: S_s and S_1 should be consistent with the design maps in ASCE 7-05. The VA should ascertain with the consultant who provided the updated information to confirm that it is true.***
- d) The notes in Table 4 should be as follows:***
 - I. Delete existing note 1; and***
 - II. Change existing note 2 to, "Values of S_s and S_1 were obtained from the design maps in Chapter 22 of ASCE 7-05."***

The motion seconded by Dr. Mejia was unanimously carried.

7. Report on Inspection of Facades.

MR. LAU: Thank you, Chris. The funding for the facade inspection program of VA facilities became available in April. Currently, VA is under contract to conduct facade inspections of eight facilities in VISN 1. Six more VISNs are in the planning stage to have the facade inspections conducted in FY '07 or FY '08. Once the buildings' facades are inspected, the re-inspection will occur in six years, which will be in line with the facility condition assessments cycle.

MR. KNIGHT: I'd like to note that as a result of this inclusion in the facility condition assessment, it is part of our VA process. It'll be a regular part of a normal update process. The funding that comes with that is generally available and part of this process. It has in essence been included in VA's facility condition assessment regular process, and I think that's a significant accomplishment. We greatly appreciate the committee's continued support of this effort. It's been ongoing for several years to get to this point, but it's a great success from the committee. We thank the committee for its persistence and support.

MR. BANGA: Should we send some of this information to Dr. Susan Niculescu, who basically initiated this issue?

MR. SIEGEL: That's an excellent idea.

MR. POLAND: Thank you very much. The other thing is, I hope that we can continue to have this on our agenda so we can hear the reports for the next few years, because Susan raised a question that we really would like to know if we do have issues out there.

8. Report on the ANSS Seismic Instrumentation in VA Buildings

MR. BANGA: As of now, new digital instruments have been installed in 42 VA buildings by USGS under the ANSS program. Three additional buildings have been selected under the same program for the installation of multi-channel instruments. We have also discussed with the emergency preparedness unit of VA how we can develop and incorporate the second recommendation. And third is that VA staff had several meetings with the USGS representative and the ANSS program staff, and we are continuing to work towards accomplishing the above. In fact, we have Dr. Leith, in-charge for the USGS ANSS program here today, who will make a presentation on ShakeCast.

MR. POLAND: That's Item E on our agenda under New Business, but we're going to move that up. Before we have Dr. Leith present the information on ShakeCast, do we have any questions for Kris related to the ANSS instrumentation program?

MR. BANGA: Yesterday, I was asked about the medical centers, "How many of them are in high and very high seismicity?" We've have ascertained that there are at the present 27 such locations.

DR. WOOD: But that's the instrument in the basement, right?

MR. BANGA: Not necessarily. Some of them are in the basement, and many are at the roof.

DR. WOOD: But there's just one instrument.

MR. BANGA: Generally that is correct. At some places there may be two or more instruments. Out of those 27 locations, 26 do have a digital instrument. For some reason, Roseburg got left out, so we'll work on that with USGS.

MR. POLAND: Are all those instruments in buildings, or are some of them free field sites?

MR. BANGA: There are a few locations where an instrument is on free field.

MR. POLAND: Are they all connected into the ANSS system?

MR. BANGA: They all have a dedicated telephone, and they are monitored centrally at Menlo Park, CA.

MR. POLAND: And so once there's information available it'll just naturally go into the ANSS data archive. Is that right, Sharon?

MR. BANGA: During the meetings we have had with USGS, we were given the following task: That USGS will provide VA a computer program, which is ShakeCast, which will be talked today for accessing the magnitude earthquake shake. USGS will also provide details on how historic data of earthquake movement in buildings can be archived.

DR. WOOD: I think the answer to your question, Chris, is that all available data, once it comes into USGS, is used in the generation of the ShakeMaps. And so the data from the VA buildings will be used.

MR. POLAND: But will it go into, for instance, the engineering database, or someplace so that you can actually pull the records up and look at them?

DR. WOOD: Yes, with SMIP, the California Strong Motion Instrumentation Program, USGS is developing an engineering database that has all the engineer structural records.

MR. POLAND: So will we be able to know which ones are our VA buildings?

DR. WOOD: Yes, that is my understanding. And it would also then be possible if you were doing a renovation of an existing building and there were records, you would have access to those records to help you with your analyses.

MR. POLAND: You said the historic records are there now or they're not there?

MR. BANGA: No, we are working on that. USGS schedule was at the end of July 2007, we should have them.

MR. POLAND: So our historic records will end up in the engineering database; is that correct?

DR. WOOD: That's my understanding, yes.

MR. POLAND: There are some great records, as I recall, from some of our sites have very important records, like in Sepulveda and Palo Alto.

MR. BANGA: We have hard copies of many of them.

MR. SIEGEL: Will you be introducing a resolution concerning material we've been discussing in the workshop?

MR. POLAND: Yes, we will do that after Bill's presentation.

9. ShakeCast

DR. LEITH: My name's Bill Leith. I'm with the USGS, as I mentioned before. The USGS, in the Earthquake Hazard Program, operates the National Seismic Monitoring System. It conducts national, regional, and facility-specific earthquake hazard assessments. And more recently, we're trying to work on loss estimation with our other federal and state partners, and earthquake risk. That hazard assessment part includes the national seismic hazard maps, which are the basis for the building codes that you've been talking about this morning, in particular the IBC. The most recent version of the hazard maps has been completed now and is about to go out for public review. And then finally, we conduct applied research on things like earthquake physics, earthquake effects, historical seismicity information, and so on. Our connection to the VA is through what I started with here -- monitoring, what we call monitoring. And Kris mentioned this just a minute ago in his summary of the instrumentation that the USGS has installed and operates in the Veterans Administration. We operate sensors in VA hospitals across the U.S. Those sites are shown with the blue dots on this map. The current plans are for instrumentation, as Chris mentioned just a minute ago, of two VA hospitals in Southern California and one in Seattle. And we're in the process of developing final proposals and then instrumentation plans. And the Southern California sites will be completed this year and the Seattle site next year. These are from more extensive instrumentation than is typical of the VA hospitals. This instrumentation is being funded by USGS as part of the modernization of our system called the Advanced National Seismic System, which includes plans for up to 9,000 channels of strong motion data recorded in buildings and in other structures. The new business that I'm going to describe to you came, as I understand it, as a result of a recommendation from this committee for the VA to look into a service that the USGS provides, which is to get rapid estimates of the facility-specific shaking from the earthquakes -- within minutes. So that's facility-specific shaking, and in fact, damage probabilities. And that's what I'm going to describe to you today, not the instrumentation program. A test implementation of that system is in place now. I'll describe that, but I think that I need to first give you a little primer on what happens in the first few minutes after an earthquake. There's a handout, a one-page

handout that I threw together. It's approximate and idealized. It's based on our best instrumented areas, which are in the State of California. And with the earthquake, beginning at 0 minutes, as soon as a station detects the earthquake, many stations are set up to provide alarms. So we don't know actually where the earthquake is, but a station says, oh, my motion is over a certain value, I need to report, and it sends out an alarm. This is typically done within seconds. An earthquake in California will typically be located in less than a minute, often less than 30 seconds. The location for the San Simeon earthquake in 2003 was identified in 25 seconds. The sensor network determines the epicenter essentially the origin point of the earthquake, usually within 30 seconds or so in California. The magnitude calculation is done soon thereafter. That's typically out within a minute. So the combination of the location, the depth, which is also computed at the same time as the physical coordinates, and the magnitude, are the basis for the generation of a model of the earthquake. So that model is very simplistic when it first comes out, and it says that essentially the point above the earthquake is the most strongly shaken, and the shaking decreases away from that point. That generates, within about two minutes, something called the ShakeMap. On the right here is an example of a ShakeMap from an earthquake that occurred in March in Northern California. It's called the Lafayette earthquake. It was a magnitude 4.2. And the star is the location of the earthquake and the shading, the color shading on the bottom is the intensity from Intensity 1 in the cool colors to Intensity 10 in the warm colors. So this initial -- the other thing that happens as soon as the location and magnitude are determined, is that the system automatically goes out to all of the strong motion stations that collect records. So these will include the stations at the VA hospitals, for example. It's what we call a dial-up system -- through a telephone line, it goes to the station, retrieves the record, and then that data gets incorporated. Initially, the first thing that comes out is a model. Then as the data are retrieved, that builds the precise ground motions into the model, the model's revised, and what you'll see here in minutes two, three, four, five, and so on is that model is updated every minute as new data come into the system.

MR. SIEGEL: Do I gather that it shows six as the highest in that map?

DR. LEITH: Yes. Yeah, it's more like five or six. So that initial ShakeMap is distributed to users. Some users are, for example, the FEMA emergency local, California state regional office. FEMA takes that initial map of shaking, plugs it into a program they have called HAZUS; it starts to calculate the loss estimates from that earthquake. This all happens, again, within a few minutes of the distribution of that ShakeMap. Within a few minutes, a seismologist usually reviews the event. The event is then distributed on a notification system. So this is called ENS, the Earthquake Notification System. We send out over 100,000 text messages, pager messages, and e-mails for an earthquake based on a user's particular preference. WE have 110,000 subscribers. So a whole suite of computer servers starts to distribute that information to users, and then the ShakeMap is updated. The map on the left here are reports by people. People go, after they've felt an earthquake, to the Internet and start to report their experiences. Those are statistically averaged by ZIP Code. They provide data points in places where we don't have sensors, and they are then incorporated into the Shake Map, and the

ShakeMap is updated. People -- it turns out statistically, average people are very good seismometers. You wouldn't think so, but there's a wonderful paper just published about how good it is, and what we've learned from people's responses. 23,000 people responded. This is a magnitude 4 earthquake. If you were in Washington a few years ago, I think that was in December of 2003, there was an earthquake in Virginia. It was about a magnitude 4 earthquake. Fourteen thousand people responded and they provide data that's statistically averaged, and you see the similarity of these maps. People make good seismometers, not any individual, but statistically averaged. So the next --

MR. SIEGEL: What kind of comments do you get from people?

DR. LEITH: They'll say, for example -- well, one of the classic ones is it was hard to stand up. "It was hard to stand up" indicates a certain level of acceleration underground. Or the windows rattled -- and these have all been developed over actually decades of reporting after earthquakes and developed these connections between that value of the intensity on the bottom, the Roman numeral value, and people's experiences. Then we're getting to this thing called ShakeCast. The ShakeMap can be used then, you have all your data points from the sensors and then you have the model which fits all the data points together, and that provides a prediction then of the shaking at any point. That shaking at any point can be calculated. And this program ShakeCast, which stands for ShakeMap broadcast, goes to usually specific users and calculates the shaking at their location. USGS automatically operates this ShakeCast for cities. We take a sample of a city and we calculate exposure in that city and that allows us to prioritize information going out of the cities. But as I'll show you in a minute, we have many users who take this data for their specific facilities: Nuclear power plants, dams, and transportation/roadways. So let me run through that. This was that earthquake, that magnitude 4.2. It was in Lafayette, California. And this is an example of this ShakeCast output to the California Department of Water Resources. This is a suite of seven dams in the East Bay area of San Francisco that were within an area that was designated for minimum recording by that organization, and indicates a damage level of possibility based on an intensity of over 5 for that earthquake for these seven facilities. So then what the Department of Water Resources wants to do is go out and inspect those dams for possible damage.

MR. POLAND: What's the exceedance ratio?

DR. LEITH: The exceedance ratio is the amount of -- this will be important and I will come right back to it. For -- that level possible is based on an analysis of what you might call the fragility or vulnerability of the dam. And the engineers work to determine when is it that we're going to say "possible" here. And below that, it's "unlikely", and then your sheet shows the same earthquake I'll show you in a minute. So, engineers determined that for these dams if the intensity exceeded 5, that there was possible damage and that it would show up this way in the display. That's a customizable feature of the software. So that value is an intensity value to the nearest 100, and the exceedance ratio is how much over that minimum damage level did the intensity reach. Here's a second

example. I mentioned that we calculate for cities, for Mammoth Lakes region of eastern California, and these are city values. These values are for cities in the epicenter region of the earthquake. And also, besides an exceedance ratio, we can calculate particular quantitative values of the shaking, such as the peak ground accelerations, the peak ground velocities. And the last three over there, PSA 03, 10, and 30, that's the peak spectral acceleration at 0.3 sec., 1 sec., and 3.0 sec., which would be then correspond to short buildings, medium-height buildings and tall buildings. Those would be the things that an engineer would be interested in knowing. For that Lafayette earthquake, in our test implementation of this software for the VA, we are running ShakeCast for the VA hospitals in which we have sensors. In the San Francisco area, there are four. And in the handout which I gave you here, the ShakeCast output for the magnitude 4 intensity earthquake in March for those four VA hospitals, the damage level is listed as unlikely. The intensity values were low, all below three. And the exceedance ratio in this case is above a minimum value. You can also with this system do scenarios. ShakeMap can be built for hypothetical earthquakes and then we can look at the then vulnerability of either cities, urbanized areas, or specific facilities based on a scenario ShakeCast. This is an example of the earthquake in Charleston that occurred in the 19th century, and this is for exposure at nuclear power plants in the Southeastern U.S. What you see here is then a list of these are the top 10 exposed nuclear power plants in that region and then calculated again intensity, peak ground acceleration and velocities and spectral accelerations and velocities for those. This is an earthquake of about magnitude 8. And you see in line 10 there, or maybe you can read it better in your handout, you'll see the intensities of 6, spectral accelerations of about 26. That's a little bit over one-quarter of the acceleration of gravity. So these can be done -- use both in the post-earthquake response mode or they can be used in an analytical mode for a future earthquake. Again, here's the VA hospital in Charleston for that specific earthquake, and what's shown there is the predicted intensity. This VA hospital would be sitting right above the epicenter of this hypothetical earthquake. It would receive an intensity of approaching 9 and acceleration of over 1g. That's 114 cm/sec of gravity. A velocity of 65 cm/sec and then the spectral accelerations at three different periods are listed below that the peak ground velocity. Then the remainder of what's in your handout, I'm not going to go through. This is about the interface to the data, which is a customizable interface that any specific user -- whether it's CALTRANS or the Department of Water Resources or Veterans Affairs -- can adapt to it to have it show exactly what they'd like to know. The last page of your handout is a write-up of what's been done in the California Department of Transportation. It's our most extensive cooperation. They have -- what is it? Anyway, I just would recommend that you read through that sometime. It's very understandable, and it shows how they've chosen to implement it. If you look on the back of that page, you'll see a ShakeCast output. And you'll see that their choice for getting a sense of what's going on is just simply red, yellow, and green. So which of the overpasses and bridges in California need to be inspected right away? Which of them are the next priority and then which of them can wait until later? In summary, we are currently running this test system for those hospitals which are instrumented. We're working to expand to the entire inventory of VA hospitals. That's the next step. Beyond that, I look at three needs to extend this. The first is to improve the accuracy. What we would like to do is define the likely damage criteria using the contractor data on

fragilities that your contractors at the VA have put together for the facilities in earthquake-prone regions. So right now in this example, this exceedance ratio does not have a lot of meaning, because the actual information about the building is not in there. So take that to that next step. The second would be to incorporate the data from the instrumented buildings. So then you get a data point right at your building. You know exactly what the ground motion was. And then the third action would be then to expand the instrumentation itself so that you have an instrument in every one of your vulnerable sites. And then customize it to get this information to the right people within VA, the people who would be doing emergency response and need to know this within a few minutes of an earthquake, to provide the most useful outputs -- whether it's spectral acceleration or red, green, yellow -- and then finally, as it operates now, in the Nuclear Regulatory Commission or the Department of Water and Power or the California State Department of Transportation, it operates in their facility instead of in our facility. Right now it's operating in our facility and these messages are coming out. This is just an e-mail to me because I asked to be included. So we need to know to whom the messages need to go. So that's what I have.

MR. POLAND: Questions?

MR. KNIGHT: I have a question. Are the current instruments that VA has adequate to support this ShakeMap reporting system?

DR. LEITH: As long as the instruments have a dial-up capability or a real-time capability, they are automatically incorporated into the ShakeMaps.

MR. BANGA: All of VA instruments do have dedicated lines.

MR. SIEGEL: But what we have in most cases, the instruments in only one location. So is it a good idea, important, and imperative, where is it to have multi-channels sensors at different locations?

DR. LEITH: For a building -- I think the engineers can answer that as well, but it's pretty important to also have an instrument on the roof so that you know what the acceleration was at the top of the building. And so a typical layout would be a ground sensor, a basement sensor, somewhere in the middle, and somewhere on the roof would be a minimum layout. And, for example, in the San Simeon earthquake, there was a hospital. In which highest acceleration in a hospital was recorded on the roof. If you looked at the ground acceleration, you wouldn't think much about that, but there was more than 1g of acceleration on the roof of that hospital.

MR. SIEGEL: We saw the same thing at our last Palo Alto hospital, which was replaced, but I think the acceleration on the roof there was something like 1.2g.

DR. MEJIA: I have a follow-up question related to that. In those cases where you have multiple recordings within a building or a bridge, the assessment of damage level is done how?

DR. LEITH: I'm not an engineer, but an engineering analysis is done of a building and a prediction would be made of at what level of acceleration and velocity one would be concerned about damage and that's programmed into the system and that's usually from a ground sensor.

DR. MEJIA: And so the system hasn't been I guess developed to consider all of the sensors in the building and what they mean as far as the performance of the building is concerned.

DR. WOOD: I think, Lelio, that there are not that many heavily instrumented buildings that the U.S. has invested in USGS has not done what you're suggesting right now.

DR. MEJIA: What about bridges?

DR. WOOD: I think from my discussions with the people, it's pretty much the same. Everything now is based on the ground motion. And that was what we were discussing yesterday as potential for expansion is to take the measured structural response and what we know from the evaluations of the existing buildings, and incorporate that to get much better information about our structures very soon after the earthquake. And I think that ties in really well with the shelter-in-place initiative that we heard discussed yesterday. Because you are suggesting taking archival information about how the engineer expected the structure to perform, comparing it with the measured response, and it's my understanding talking with Bill that that capability could be built into these types of maps.

DR. MEJIA: That was going to be my next question to you, Bill. How feasible would it be to implement a more sophisticated system that considers multiple sensors and attempts to assess the performance of a structure, from not just the ground recording, but the recordings at the ground, the recording at another level, and at third level?

DR. LEITH: That's a perfect question, because that's exactly what we're trying to do as a research project now in Southern California, where we have several fairly heavily instrumented buildings. There's a building on the UCLA campus has 72 sensors and three ground sensors. Our recent effort was to actually put a global positioning satellite receiver, real-time receiver, on the roof of that building to determine the -- to be able to determine if drift occurs. So if there's a motion between stories that isn't recovered, that will result in a permanent displacement of the roof relative to the ground, and that would be a good indication of significant damage. So that's a project that we're working on now. And then a lot of our extensive instrumentation projects are to learn how buildings of different construction types respond: Buildings, bridges, pipelines, how they respond, in order to do just what you're saying.

DR. WOOD: And one of the requirements when a building is selected for instrumentation as part of ANSS, which, as Kris mentioned, three of the VA hospitals have been selected. One thing that's suggested in that selection process is to have these analyses already done, and that allows you to select your sensor locations that

are most appropriate. But it also then could help you relate the sensor readings back to the structural response.

MR. POLAND: Will ShakeCast be able to accept specific information from the VA about the buildings?

DR. LEITH: Yes.

MR. POLAND: Can we ask them to hire a contractor to go out and determine the thresholds and where the instruments need to be located and then contract with USGS to update that? In our conversations with the emergency management personnel yesterday and with the Deputy Secretary, there was a lot of interest in installing this capability and refining this as much as we can so we have the best information possible. So is there a timeline that that could be accomplished, or is that something that's way out in the future?

DR. LEITH: No. California State, I think as you know, does a very large number of building instrumentations, but at a minimal level. Where we're trying to position the USGS effort is in extensive instrumentation, and complete what we call 'metadata' - complete information about the building construction and its analysis before the earthquake happens -- so that we can take advantage of the sensor data when the earthquake happens.

MR. POLAND: So I guess what I'm trying to ask is -- I see this more as an operational application as opposed to a research application.

DR. WOOD: I think the question Chris is asking is, if the VA were to have consultants develop either thresholds for each sensor in a building or fragility curves for the building, how difficult would it be to implement that specific information into the ShakeCast so that their indication of damage is much more refined?

DR. LEITH: I'll have to take that back to the ShakeCast group and say, you know, what's the next step for buildings? Right now, it's based on a single threshold for any particular site, whether it's a nuclear power plant or a dam or whatever. And it seems that it would be possible to make that as sophisticated as the user wanted.

MR. POLAND: The Deputy Secretary told us yesterday that he was interested in hearing about what this program could look like, because he has a special appropriation of funds that have come out of all that's going on right now related to the war. And he thought that this might be something he'd be interested in investing in, so we were talking about what that would look like. We've got our list of sites. We've got a list of buildings. We need to develop the thresholds. We need to get them built into the system so when ShakeCast comes to the VA, it talks to them about their buildings with as much accuracy as we have information now about our buildings. That's what we're trying to achieve is to have it be very specific to the construction type. Does USGS see themselves in this business for agencies and for the public at large?

DR. LEITH: Yes, it does. ANSS, the broad system, is trying to cover a lot of bases and is trying to look at public safety on the one hand. But on the other hand, right there in the mission of this system is to collect critically needed data on the motion of structures and the motion of the ground for research purposes. And what you're talking about is operationalizing it. And that's happening more and more.

DR. WOOD: Bill, I think you said that, for example, CALTRANS runs the ShakeCast software on their computers. And so, you know, we saw the VA emergency management -- or situation room yesterday. Conceivably, the VA could be running it on their computers. Then they would have all their fragility information there and they could just integrate the two.

MR. POLAND: Because we want to make sure we make as clear a recommendation to the VA as we can. And if the recommendation is that they need to get ShakeCast, install it on their own systems, get the information -- you know, build it themselves like CALTRANS has, then we need to say that. Or if they can depend on USGS to do that and send them the e-mails, then we can go that direction. And maybe we don't know yet. I don't know.

DR. WOOD: My impression is that USGS developed all the software that CALTRANS is running. It's just that you no longer have responsibility for evaluating the entire inventory of bridges; CALTRANS does that.

DR. LEITH: They develop their fragilities and their criteria and their damage levels. That's their job.

DR. WOOD: But they can easily embed that into your program. The VA would not be responsible for programming anything, per se. You would do that type of development work if it's needed.

MR. POLAND: So does CALTRANS receive the earthquake information and process it themselves on their computers, or do you guys process it and send them information?

DR. LEITH: Yes, they receive the ShakeMap and all the subsequent updates of the Shake Map. And then each time that's updated, they generate their own facility exposure information. And part of that has to do with firewalls. We want it to run on their side of the firewall, for security reasons.

MR. POLAND: So this test program that you're doing for VA right now, this is running on your servers? Is the intention that it'll eventually be shifted over to the VA?

DR. LEITH: Yeah. We think that's the right path to go, and mainly because of the second thing I mentioned at the end there. You know, the first thing was let's get more accuracy into the system by getting more information about the buildings built in, and the other is getting to the right people and giving them exactly what they want.

What will they act on? What do they need to know? And so that -- and that means customizing the interface. And when we do take that step, we ought to put it on the inside here.

MR. POLAND: And so ShakeCast can accept a site-specific record and process based on that instead of based on ShakeMap or does it -- can only use ShakeMap?

DR. WOOD: The record at the site would be incorporated into the ShakeMap.

MR. POLAND: Yeah, but it can get smoothed away or thrown out.

DR. WOOD: No, but if it's recorded, it doesn't get smoothed away.

DR. LEITH: The ShakeMap averages the data within the grid cell.

MR. POLAND: That's not what I understand, but that could be clarified.

DR. LEITH: I'll look.

DR. WOOD: The example was the earthquake around in December a couple years ago where the nuclear plant is at San Simeon. And so because it took a while for some of the stations to report in, it was completely calculated to start with. And then when they started getting the measured results, it showed the direction of the earthquake much more clearly. It showed that they didn't have to worry about doing anything to Diablo Canyon. They could proceed with their normal procedures. They didn't have to shut it down. And so the measured information tends to override the calculated.

MR. POLAND: But if you have a strong motion record at Diablo Canyon, why would you wait for ShakeMap to figure out what's going on? Why wouldn't you just use that record?

DR. LEITH: That's a good question.

DR. WOOD: I don't think they did, though.

MR. POLAND: Well, they may not have. But what I'm saying is, what we're headed toward is we want a ground station at our medical center, we want to know what the shaking is, and we want to put that into ShakeCast and have ShakeCast tell us what it thinks the condition of the buildings are. So the question was, does ShakeCast know how to do that, or is it really set up to just keep track of the ShakeMap that's coming along?

DR. LEITH: I don't know the answer and I'll find out the answer to that. I do know that, like for the VA, we have sites, recording sites, on bridges and overpasses in California. And you have a good question: Is that smoothed when the ShakeCast or ShakeMap is built, or does that incorporate that data point precisely? And I'll find that out.

MR. SIEGEL: To a layman's view, what you're saying, Chris, seems to make a lot of sense. In effect, if you have all of the instrumentations at your site, why do you even need a ShakeCast?

MR. POLAND: Yes, you need the part of the ShakeCast that offers an opinion about the condition of the buildings, that portion of it. You still need this table.

MR. SIEGEL: Yes, but the map and all the rest

MR. POLAND: You don't need it.

MR. SIEGEL: Which is beautiful eyewash, but do you really need it? I don't think so, if you have all the instrumentation at your site.

DR. WOOD: Well, it was my understanding that you have some fairly large campuses with multiple buildings.

MR. SIEGEL: That's right.

DR. WOOD: And so we might have one ground motion instrument and possibly one building instrument, but there could be other buildings that we want to get information about; we have to interpolate. And so that's one of the reasons why you would use this is that it puts it in a larger -- the whole epicentral region is in that interpolation scheme.

MR. SIEGEL: But our sites aren't that large. It would almost seem you could interpolate from the large building on the site, which is where all the instrumentation is.

MR. POLAND: We're going to have to move on. I think our motion as we prepared it, or it is pretty much a recommendation.

MR. MEJIA: The motion is as follows:

"VA should expand the strong motion instrumentation plan to include site-specific measurement of free-field earthquake motions and of structural response by instrumentation of the main hospital building at all medical centers in high and very high seismicity regions. The plan should include development of ShakeCast-type reports considering the building instrumentation and previous seismic studies by the VA of building vulnerability."

MR. SIEGEL: May I ask a question? Is there a reason you didn't talk about multiple sensors, as almost all of these facilities, already have instruments? Are you not interested, or do you not feel it's necessary to have multiple sensors? If you do, perhaps you might consider putting some language about that in your resolution.

DR. MEJIA: The answer is that we are interested, and I can clarify that by adding the words "multiple sensors." Because that was what we actually meant by "instrumentation."

MR. POLAND: We talked about instrumenting the main hospital that requires multiple sensors, so he can add those words in there.

DR. MEJIA: Yeah, let me just –

MR. POLAND: It's just kind of buried behind that term.

MR. SIEGEL: Because, for the laymen, they may feel we already have a sensor.

MR. POLAND: Does that sound okay, Sharon?

DR. WOOD: Yes, I second the motion.

MR. POLAND: Okay. We think we have 27 medical centers. Twenty-six have some instrumentation at them now. We believe that the cost of the instrumentation is on the order of \$100,000 per building, maybe up to \$150,000 per medical center the way we're talking about it. And so to figure out what the cost of the whole program would be you'd have to take that \$150,000, give consideration to the instruments that are already there, times the 27 medical centers, plus whatever additional costs would be necessary to get the ShakeCast system oriented and get it tailored to what we're trying to do. The other thing is, and maybe we want to add it to the motion, or maybe we want to leave it open, is whether this tries to run at USGS and be delivered or whether we're going to incorporate it into the IT network that the VA has for their emergency management.

MR. KNIGHT: I think we should leave that open. VA's IT system is quite complex, and we would need to coordinate with them as whether one or the other is the most practical for us.

MR. POLAND: The observation that I would make -- that's fine. I think that's fine. We can just leave it out of our motion for now. But after being down at the operations center yesterday and seeing what they have the ability to do, it would be wonderful to see this information sitting there live. And certainly their 24/7 capability, once they get it built into their system, can make that happen with high reliability.

MR. SIEGEL: And because of the firewall that was mentioned by Bill, it might be easier for VA to do it on its own system rather than importing it.

MR. KNIGHT: Right. But even bringing a new system into VA behind its firewall is complex in that there's a whole series of things that'll have to happen before you can bring a new electronic software program in behind VA's firewall, and that's time-consuming. And so it's complicated and it would need to be looked at carefully one way or the other, and we would certainly need their cooperation and coordination to accomplish it.

MR. POLAND: So in order to get all that to happen, is there something else we need to add to our motion, or are you content that the fact that we've asked this to be done gives you the kind of recommendation you need to go forward?

DR. WOOD: Let me ask another question is that when we spoke with the Deputy Secretary yesterday, it sounded as if it was a fairly short time frame. Do you need USGS or us to write more than just this simple motion that will give you the ammunition that you need to move forward? It sounds as if it is an opportunity that we should try to take advantage.

MR. SIEGEL: Could you reread the motion, please?

DR. MEJIA: Yes, absolutely. And I've added the "multiple sensors" words. It reads as follows:

"VA should expand the strong motion instrumentation plan to include site-specific measurement of free-field earthquake motions and of structural response by multiple sensor instrumentation of the main hospital building at all medical centers in high and very high seismicity regions. The plan should include development of ShakeCast-type reports considering the building instrumentation and previous seismic studies by the VA of building vulnerability."

MR. SIEGEL: May I suggest you consider at the very beginning "the program" rather than "plan?"

DR. WOOD: I would also think we'd want to add something to talk about -- for appropriate emergency response immediately after an earthquake.

MR. SIEGEL: That's a very good idea.

DR. WOOD: And to support the shelter-in-place initiative within the VA, to show that it's not something that you'll be using two months after the earthquake, but it's something you can be using in the half-hour after the earthquake.

MR. SIEGEL: Rather than "shelter in place" would you consider something like "continued operation?" Because it's not just the shelter, it's continuing an operation. Do you have a phrase you'd like to add there? And you do consider the word "program" rather than "plan" at the beginning?

DR. MEJIA: Yeah, let the minutes reflect that we would substitute the word "plan" with "program." And why don't you give me a minute and --

DR. WOOD: Could we say, "In support of VA's post-event emergency management planning?"

MR. MEJIA: I would simply add a sentence that says the intent of the motion is to support VA's emergency response capability and maximize continued operation of the medical centers after an earthquake.

DR. WOOD: I would put that as the first sentence.

MR. MEJIA: Let the minutes reflect that that will be the first sentence.

MR. POLAND: Why don't you go ahead and work on that a little bit and we'll come back to it?

DR. MEJIA: Okay.

MR. SIEGEL: It's a very good idea to do that, because we can take this resolution and work with it. As we all know, it takes a few months before the minutes come out, and we would like to work with this right away.

MR. POLAND: I think what I'd like to do is to table this discussion and move down to Item D, because it doesn't require Lelio to think too hard about what we'll talk about. He's got to rewrite his motion. So David, could you please give us your report on fire safety issues under New Business?

10. Report on Fire Safety Issues

MR. KLEIN: I'll mention the activities that have happened since the last meeting. The sprinkler master spec and the Fire Protection Design Manual were both updated to reflect an issue that was identified by the field in that we have required all our sprinklers to be FM approved. At the present time, there are no institutional sprinklers that are FM approved. Institutional sprinklers refer to the suicide-resistant type of sprinklers. So we revised our spec and the Fire Protection Design Manual to allow institutional sprinklers that are UL listed or FM approved. In addition, we updated our Fire Safety Guide Book. The guide book is a general operational guide intended for facility field staff, as opposed to the design manual, which is intended for AEs. And lastly, as you may know, the 2006 edition of the Life Safety Code requires retroactively that all buildings that contain a nursing home must be sprinkler protected. And the VA contracts with a number of privately owned nursing homes out in the field under our geriatrics program, many of which are not sprinkler protected. So the Deputy Under Secretary for Operations and Management issued memo, which states the intent of the VA that all contract nursing homes will be sprinkler protected and essentially sets out a process for making this happen. Homes that agree to retrofit sprinklers will be given three years to provide sprinkler protection with a relief valve that, under extraordinary circumstances, they could have two additional years, for a total of five years. And for homes that choose not to provide sprinklers at this time, the VA would have one year to take our patients out of those homes, with a relief valve of another year for a total of two years. So we are now ahead of CMS on this issue because CMS is still considering what they want to do concerning the retroactive sprinkler issue, and we are moving forward.

MR. POLAND: So comments?

MR. KOFFEL: No, I don't think so.

MR. POLAND: You're happy with that timeline?

MR. KOFFEL: Yes.

MR. POLAND: Is that consistent or ahead of schedule? VA likes to be ahead of the game, likes to worry a lot about taking care of our veterans.

MR. KOFFEL: Well, yes, I think it's ahead of where a lot of others are going to be in the sense of -- one, we've already recognized the '06 code and taken steps to meet that requirement, where a lot of people aren't even at that point yet.

MR. GRITCH: No, I'm good with it. We discussed it in subcommittee yesterday and I felt it was appropriate.

MR. POLAND: That's very good. Okay, Lloyd, I'd like to switch over to you and have your discussion on the reorganization of facility management.

11. Reorganization of FM to CFM

MR. SIEGEL: As you all are aware, the Secretary formed a committee under the Federal Advisory Committee Act to study the organization of VA's operations concerning design, construction, renovation and maintenance of its facilities. The Secretary appointed a number of individuals to a committee similar to yours, which looked at this subject and came up with recommendations to him. Following that, Congress passed a law which followed the major recommendations of this committee. Subsequent to that, the Office of Facilities Management, which was part of the Veterans Health Administration, was moved together with some other functions from the Veterans Health Administration to report to the Secretary through the Deputy Secretary. As part of this reorganization, the group of people you normally work with, the Strategic Management Office became the new Strategic Management Office, with no name change, within the new Office of Construction and Facilities Management, as the Office of Facilities Management was renamed. In addition, because of the extraordinary increase in workload which was discussed yesterday, the Office of Construction and Facilities Management was enabled to hire a great deal of additional staff, mainly in the field, to support construction management and resident engineering personell needed for these new projects. We hope that within the near future, we will all be properly staffed to execute excellently and speedily this program. One of the other things that affect the Strategic Management Office is that we now have two staffs within the Strategic Management Office. One is the Facilities Quality Service, which Kurt heads, and the other is the Cost Estimating & AE Evaluation Service. There's currently a position being advertised, which I believe just closed yesterday or is closing today, to select the chief of that new service.

Small Break

MR. POLAND: I'd like now to switch back to our discussion we were having about building monitoring and incorporating the Emergency Management System. Lelio, you want to restate your motion?

DR. MEJIA: So considering the discussion we just had and the comments we had, I have redrafted the motion to read as follows:

"To support VA's emergency response capability and enhance continued operation of VA's medical centers after earthquakes, the committee recommends as follows: VA should expand the strong motion instrumentation program to include site-specific measurement of free-field earthquake motions and of structural response by multiple sensor instrumentation of the main hospital building at all medical centers in high and very high seismicity regions. The program should include development of ShakeCast-type reports considering the building instrumentation and previous seismic studies by the VA of building vulnerability."

The motion seconded by Dr. Wood was unanimously carried.

MR. POLAND: I know that we'll be very happy to assist you with any additional written material or program definition that you might need.

DR. WOOD: I did come up with two reasons of why not relying just on your own instruments would help. The first is, as Bill mentioned, the strong motion instruments that are part of ANSS, they're the ones that trigger and go back to Menlo Park automatically, so that identifies the earthquake. And then they would contact your building to download, so there's going to be a time lag. So to get information as quickly as possible, you'd want to use the calculated values. In addition, you have many other facilities that are not going to be instrumented. They're not these -- your hospitals, but you'd also want to know what's happening to them. And so the ShakeCast would give you an interpolated value at your other facilities in the epicentral area.

MR. SIEGEL: How will these values that we get after the earthquake relate to the physical structure of the buildings you're interested in? In other words, we may have sensors which show certain characteristics at the ground level, at the mid-level, at the roof, and perhaps various wings, but how will that relate to the specific information about whether you don't have any problems except in the east wing?

MR. POLAND: What's being done now is that the instrumentation that's available in the building is converted to an estimate of how much displacement is occurring. And then consideration is given to the structural system and its vulnerability to that displacement, and when those thresholds are exceeded, then it reports out the information.

And based on how specific and how distributed the instrumentation is, you can determine whether there are particular areas of the building you're concerned about, and whether you should flag a concern for the building.

DR. WOOD: I think it might be dependent -- you have to remember you're going to need someone to design the instrumentation plan. And so if all your operating rooms are in one wing of the building, you might have more instruments there -- which would give you more detailed information about that. But there has to be a link between the evaluation and the analyses of the building and the instruments, and someone's going to have to provide that.

MR. SIEGEL: That's exactly what I was trying to point out. In addition to the instrumentation, as I understand the ShakeMap, there has to be another module, so to speak, and the module is the interpretation of the results. Where would that module sit?

MR. POLAND: It's inside of ShakeCast.

DR. WOOD: I think that's where the development at USGS would be required. And working with a consultant, the VA could identify the thresholds that they think are important, that they'd like to have flagged. And you might have specific thresholds for each building.

MR. SIEGEL: So in other words, with the ShakeCast information, it will automatically tell VA Medical Center X you have a problem in the east wing?

MR. POLAND: I think the message would more realistically be one of the following: there's no problem, you don't have to worry about inspecting, there's a potential problem, you can continue to use the building, but you need to have it inspected or it looks like there is a serious problem and you need to evacuate the building until an inspection can be done. I think that's similar to CALTRANS' green, yellow, and red flags that they put up. I just want to say one more thing. What I see is that after an earthquake, each medical center that's affected would come up on the reporting screen and all their buildings would be listed along with an opinion about what the state of the building is so the central office and the center could tell immediately what they needed to do.

MR. GRITCH: And this is just a theoretical probability of conditions that it's establishing. It doesn't know in real-time if there's actually anything happened to the building. Therefore, you know, you have a theoretical probability that you have an issue.

MR. POLAND: Engineers still need to come and look at it if you're above a certain threshold. What we learned in the past two earthquakes that I was involved in the inspection of is that people, because of the violence of the shaking even at low levels, overreact. And so you think there's something wrong with your building when there's really nothing that could be wrong with it because the shaking's not strong enough.

MR. SIEGEL: That's why I was surprised when Bill's map showing public response was so close to the real situation, because I felt that it would be much higher.

DR. WOOD: But see, when you go online, you answer specific questions. Did the windows rattle? Did the light fixtures move? And then they're the ones who tie your answers back to the MODIFIED MERCALLY INTENSITY ratings. And if you're just saying, oh, it was a huge earthquake, they're not asking you to estimate the acceleration. They're just saying what did you observe about your surroundings and then they relate it back to the levels.

MR. SIEGEL: Okay.

MR. POLAND: I was sitting at the epicenter of that earthquake at the time it occurred because I live right there, less than a mile away. And the interesting thing is, you can't tell when you experience that if you've just felt a little local earthquake or if it's a big distant earthquake. You have some notion. And I did log on and within three minutes, got the ShakeMap to see what it was, so it's really quite remarkable what you can get.

MR. SIEGEL: Was this the Northridge?

MR. POLAND: It was the 4.2 magnitude earthquake in Lafayette that he talked about because it was a small earthquake, but it was still a good rattle earthquake. It reminded me how much I didn't like earthquakes.

MR. POLAND: Okay, let's move on.

12. Retrofitting of Seismically Deficient Existing Two Story Building

MR. POLAND: Because this is a particular project in the VA system and the contractual relationships that our firm has with the VA on this project, I'm going to have to reclude myself from this discussion and Sharon's going to take over.

MR. BANGA: This building is in San Diego. It's Spinal Chord Injury (SCI) building. It has two stories above the ground with a basement. It's a steel building and does have seismic restraints, achieved by concentric brace frames in both directions of the building. It was built one story and another floor was added in the year 2000. Currently the entire second floor is empty. It does have interstitial space too. Recently the VA medical center (VAMC) has received funds to do renovation under minor program. Minor programs generally are \$7 million or less. The plan is to renovate the second floor, and make it more like a medical facility. During the last year, we got a seismic study done of the building, and it was found deficient with the existing system. So, when the VAMC does the renovation, it will also do the seismic hardening. But the VAMC does not have enough funds to do the complete task, and has requested us, "Can we renovate with seismic retrofit of just the upper floor and come back later to ask for funding for the retrofit of the first floor?" My question here to the committee is, "Is it a

reasonable approach or we stick to the normal way of hardening, i. e. go from bottom up?

DR. WOOD: Well, we did discuss this situation yesterday at length in our workshop, and I believe, Lelio, you have a recommendation from the committee?

DR. MEJIA: Well, let me ask a question here before I do that. What are the options to proceed forward in this situation?

MR. BANGA: Well, the possible options are not to do anything, just do the renovation work. That's the simplest option for the medical center with the least amount of funding. But they know that building is deficient, and right now it is excellent situation that it is empty, and they can do the required seismic hardening of the second floor. The recommendations are to strengthen the existing braces and use stronger braces and strengthen the connections. Since it's an open space at the 2nd floor, this can be accomplished very easily. Once the space is occupied, you have a problem of vacating the people, retaining a vacant space, and moving the people. So what exactly are your feelings of doing the seismic hardening of the upper floor only at present, and then later on come back and do the lower floor?

DR. MEJIA: Sharon mentioned that we discussed this at some length yesterday, and the committee's feelings and beliefs are that it'd be best to, of course, to undertake the entire retrofit at once, in one project, so to speak. However, if that option were not to be available or possible for whatever constraints, possibly economic constraints, then we thought that a staged retrofit of the building would be possible, provided that the guidelines in FEMA 396 were satisfied. And so we've drafted a motion to that effect basically stating that position.

DR. WOOD: FEMA 396 deals with incremental seismic rehabilitation of hospital buildings. So it is in our preference from a structural perspective to do everything at once. But given the limitations you outlined, we feel as long as you satisfy that FEMA document that the safety of the occupants would not be compromised.

MR. BANGA: We'll look into FEMA 396 and report back to you whether FEMA 396 does allow the incremental seismic hardening of upper floor first, and then the lower floor or you do need to do lower floor first and then the upper floor.

DR. WOOD: Okay. So you want an official motion on this?

MR. BANGA: Yeah. Please go ahead.

MR. MEJIA: Okay, then the motion is as follows:

The committee considers that the best option from a structural safety perspective is to retrofit the entire building at once or in a single project. However, if this option is not possible due to economic or operational constraints, the committee supports staged retrofit of the building provided that the guidelines in FEMA 396, 'Incremental Seismic Rehabilitation of Hospital Buildings,' are satisfied.

The Committee also recommends adding a reference to FEMA 396 in Section 2.3 of H-18-8.

MR. KOFFEL: Do we need to put a timeline on this? Because I guess conceivably, we could say that the ability to do the total facility would be possible at some point in time. It might be 10 years from now or something. And so I think what you're saying is we should not delay the incremental rehab if funding is not available in a timely manner. That's the intent, right?

DR. MEJIA: Well, as I understand it, the funding is available to do the work on the upper floor only, but not to do an entire retrofit.

MR. KOFFEL: We would support doing the incremental upgrade with the funding that's currently available.

MR. SIEGEL: May I ask a question, because I'm not familiar with the details of the project, Kris! Will they have to move the spinal cord injury activity out of the building to do the work on the second floor?

MR. BANGA: I have not heard of that scenario.

MR. SIEGEL: Because it's an interstitial space building, they shouldn't have to make any move.

MR. BANGA: That is correct, especially because it has eccentric brace frames, which typically do not go into the floor. So they can do all the work in the interstitial space.

DR. WOOD: But I think to address your comment, the whole purpose of the FEMA document is to make sure that you don't do something that makes the structure worse, or less safe for the period until you can complete that upgrade.
All those in favor, please say aye.

The motion seconded by Mr. Koffel was unanimously approved.

MR. POLAND: Okay, thank you. We discussed the issue of incremental strengthening a couple of years ago when the FEMA document was under development, and we thought that it would be a good idea once the document became available that we look

if it was something we wanted to put into H-18-8 and adopt. I think that as we move forward, especially as we move forward with the minor seismic strengthening projects, that there is a very good opportunity, as long as it's appropriate, to put some seismic strengthening into each one. Because in the long term, we end up with buildings that are taken care of and you really do save a tremendous amount of money. It's almost free to put braces into a building that is shelled compared to going in and going it when it's completely finished. So I think we'd like to make a recommendation.

DR. WOOD: I think we would like to make a recommendation. Lelio, may I have that back for a second that you consider adding a reference to 396 in Section 2.3 of H-18-8.

13. Physical Security Progress Status

MR. KNIGHT: The Physical Security Design Manual is nearly complete. It's gone through several review processes. I believe the committee was provided an earlier version of it. It has not changed substantially from that from a structural perspective. It was mainly editorial and clarification, et cetera, comments. We have a final version that we received about two weeks ago. Basically, the manual identifies new requirements -- or requirements for physical security for new buildings and existing, and our mission-critical new buildings and existing, and life safety protected new buildings and existing buildings. It identifies a series of requirements that vary depending on the type of building, but for mission-critical buildings, it requires the protection from progressive collapse, blast resistance, ballistic protection in some areas, emergency power for the entire operation of the facility, and redundant utilities, among a number of other requirements. We are providing it to consultants at this point in time. It is still a final draft. It will have to go through a VA concurrence process. There was a VA evaluation group that has been involved in the development of it and the review of it, which included VBA, NCA, and VHA, and some other organizations within VA, Emergency Management included, and security and law enforcement also were included in that. But nevertheless, we'll have to go through a formal approval process through VA, which may take several months. But in the meantime, we're providing copies now to consultants designing buildings, major projects, and proceeding ahead with the implementation of it. It's quite extensive. It adds some significant cost to VA structures, estimated now at about 5 percent. Monies have been added to project budgets to address the physical security requirements. It's a major step forward for protecting VA facilities from a wide range of risks, and we think it's going to be quite useful to VA.

We'll probably -- I think we're going to put it on the web site as a draft in this earlier version. But at any rate, it is being used now and we're getting input from AEs on some of our larger projects who have started to review it and looking at it and see how they can implement it in their particular projects. So we would expect to be continually looking at and reviewing it as we get input from consultants actually using it for a project. But the preliminary results have been very good. Some of our newer projects that have been adopting it or requiring -- or trying to meet some -- many of the requirements, including the 50-foot setback for mission-critical facilities, which is difficult to achieve. But generally, we have been achieving those goals, and we will proceed ahead. The document itself will not be controlled. The only part of the document that is

for government use -- for official use only would be the blast loadings. And that is separated from the document and is in a separate document, and we'll request that consultants receiving that sign a confidentiality certificate that they will take appropriate care, and only those people who've signed the certificate will have access to those blast loads.

MR. SIEGEL: We have purposefully incorporated some of the recommendations of the Interagency Security Committee into the document, because the standards promoted by the interagency Security Committee are listed as "For Official Use Only," which means it can't be distributed openly. And it's very difficult to work with standards that can't be distributed.

MR. KNIGHT: It's got extensive enhancements in intrusion detection and CCT camera systems that are much more than we currently have standards for.

MR. SIEGEL: With integration of them. One of the things that was pointed out in our physical security assessments of over 40 of our most critical facilities is that many of them had the correct kind of equipment, but because they weren't integrated, they were not working efficiently.

MR. KNIGHT: This document implements a series of physical security strategies that were identified in a report development for us through NIBS and approved by the Secretary on April 18, 2006.

MR. POLAND: Any questions or comments? It's very well done.

MR. SIEGEL: If you all have any comments, please let us know, because we always are interested in updating our standards.

MR. KNIGHT: It does require the hiring of a blast consultant on VA projects to assess the blast issues, because we felt that was kind of a specialty and that was one of the recommendations of the NIBS group study. And also, a security consultant shall develop the security systems integration, especially integrating within an existing medical center or one that's being built on an existing site. Both of those are specialties which we felt were important to be able to properly design this into a newer major renovation building.

MR. POLAND: Kurt, if your A/E had in-house capability that met the criteria, would that be satisfactory?

MR. KNIGHT: Right now, we're requesting a separate security consultant. We could re-evaluate that, but most A/Es, in our opinion, don't have the appropriate staff.

DR. MEJIA: Does this consider security during emergency response, that is in the event of an emergency?

MR. KNIGHT: No, this is mainly aimed at construction, new projects. It has minimal operational components. There's a slight overlap into operations, but we tried to keep the operational aspects of VA hospitals out of the document. We have requirements in the manual for existing facilities. Budget constraints will delay full implementation of the physical security upgrades for existing facilities. We are also in the initial stages trying to develop an educational process to make sure our own staff from the field and our own construction staff understands the documents, understands how to implement it, and the impacts on projects as they proceed through design.

MR. SIEGEL: It does have operational impact, naturally. For one easy example is redundancy. It requires redundancy of certain utilities, utility entries into the building, control areas, emergency control areas, security, et cetera. And they all have operational impact. In addition, we tried whenever we could possibly do it, and I think we accommodated it in almost every place, the potential for various operational methodologies and provided space for it. For instance, one thing we provided space for electromagnetic equipment etc. for the inspection of people coming into the building, but not yet requiring it. That would probably not happen except in certain specific areas, or sites, I should say, for various operational reasons.

MR. GRITCH: I was looking at this document. It's pretty impressive and extensive, and I wasn't paying as much attention as I think I should have been. I just wanted to make sure that what we have here is what's on the web site and that there's nothing -- you said something about restricted blast loading. That's not in here, right?

MR. SIEGEL: That is correct

MR. GRITCH: So we don't have to worry about -- we can just share this with other people if we want to.

MR. KNIGHT: Yes. It's not on our web site as of yet. We expect to get it up there in the next month or so, but it is being distributed to consultants designing projects.

MR. SIEGEL: It is, however, not "official". It's final draft because it hasn't gone through the concurrence process.

MR. KNIGHT: But the specific blast loads, and that's a one or two-page Document and that will be specifically provided to individuals who have a "need to know" that information for the design.

MR. SIEGEL: The concurrence process should not create any problems, because this fulfills, as Kurt said, the strategies that were concurred on and approved by the Secretary.

MR. KNIGHT: Back to the issue of a mandatory requirement for a blast consultant. There is a requirement in the manual now, but we intend to review this requirement based on our experience with ongoing projects. .

MR. POLAND: I think you're going to see that more and more of the A/Es are picking up this capability, so that the need for a consultant -- you definitely need to have somebody on staff, on the project, as an expert in that. Under the structural systems, I notice that there are no requirements for doing physical modifications to existing facilities for progressive collapse, column protection, or priority protection. That kind of surprises me a little bit. You know, we've got the seismic program, which is dealing with existing facilities straight up and their structural systems. What was the thinking behind not having that for blast protection?

MR. SIEGEL: The seismic program only allows seismic updating and mitigation when it's funded. Similarly, it seemed that facilities that would require this kind of progressive collapse retrofitting might probably be facilities that would either be replaced or would get the funding as part of other projects. And when there is a major renovation, the project has to follow new building requirements.

MR. KNIGHT: And I think from a risk analysis standpoint, progressive collapse is different from seismic. Seismic events are known and we can predict they're going to happen in general areas. A blast is a much more nebulous thing and there's much less specific information on, VA as a target. The expenditure required to upgrade a facility for blast protection is quite significant, especially in an existing structure. And based on that, we made the determination that existing facilities would be treated differently than new facilities.

MR. SIEGEL: Which doesn't mean it won't be revised.

MR. POLAND: I just was wondering why it was.

MR. SIEGEL: We have had threats and bomb problems at some of our facilities. Nothing to do with what one thinks as normal terrorism -- "normal terrorism," what a terrible phrase, but caused by patients who may not have yet been as mentally healthy as they might become. But that could happen anywhere.

MR. POLAND: Well, I had two thoughts. One is -- and we don't do it very often, but when there's going to be a wholesale rehabilitation of a facility --

MR. SIEGEL: Then it would have to be done because it's a new -- would fall under new facilities.

MR. POLAND: Well, it seems like Chapter 7 ought to say that. The other thing is that FEMA has conducted two studies and shown that when you do significant seismic strengthening, if you pay attention to the seismic strengthening and you keep blast and progressive collapse in mind, you can get almost two for the price of one. And that seems to me that it's something else that ought to be mentioned or thought of or paid attention to. Now, all of our EHR buildings have been identified for seismic risk and the detailed studies are underway. I don't know if there's time to deal with that or not, but maybe it'll all be dealt with anyway. But that's another thought since we do have

buildings we're going to go into and spend a lot of money working on. And since FEMA has shown anecdotally for two different cases that you might be able to gain a lot of progressive collapse protection, it's something we ought to pay attention to.

MR. GRITCH: That might be covered in administrative and enforcement, where it says that the provisions of these standards shall apply --1.8, to all VA mission-critical construction projects which is begun after the date. And it says, "These standards apply to new construction and all additions, alterations, and modernization." So that would take care of your concerns, wouldn't it, Chris?

MR. POLAND: It seems like it. Then I think that there ought to be another couple words added to page 7-2 and 7-3, where it says, "existing facility blast resistance, progressive collapse, column protection," and it says "no additional physical security requirements." So I just -- it seems like that conflicts with what it says in 1.8. It's just something that needs to be picked up.

MR. KNIGHT: We'll certainly look into that, we're very open to comments. The refinement of the Physical Security Design Manual will be an ongoing effort.

MR. SIEGEL: The structural consultant to us on this project was Weidlinger.

MR. POLAND: Great consultants.

MR. SIEGEL: We've had lots of conversations with Bob and Mohamed, whom I'm sure you know.

MR. POLAND: I'm sure that what they've written here is excellent. My concern is really more of a policy -- my question is more policy questions. It's a very remarkable document. I add my congratulations to Todd's on getting this done. I think you're way out in front of everybody on this one.

MR. SIEGEL: And Mohamed shared his studies on multiple uses of blast, seismic, and wind.

MR. KLEIN: I have a question for Kurt. How does this relate to the Handbook, 0730 Security Handbook?

MR. KNIGHT: It adopts it and it's referenced in it and it should be in line with it. Keith Frost is the one that's managing the "new" 0730, and he has been heavily involved in this and is reviewing it for compliance and coordination with that document.

MR. KLEIN: So there could be things that overlap between the two documents.

MR. KNIGHT: Could be but we have tried to avoid that. But yes, 0730 is referenced in here as one of the key documents. For the committee, 0730 is a Security And Law

Enforcement policy document that really deals more specifically with security and law enforcement-type issues.

MR. SIEGEL: And many members of staff were very much involved with this.

MR. KNIGHT: We're continuing to maintain a very close coordination with Security and Law Enforcement Office. . On some of our larger projects in Denver and Orlando, where our new hospitals are being planned, they're part of the very early initial review team. For example, in Denver, we had specific committees set up to deal with physical security and trying to apply the manual requirements to that facility. Keith Frost has been a part of that process. He's the security and law enforcement coordinator person, along with the medical center and the police chief at the medical center. There were complaints about the 50-foot setback and the fencing, but we've generally been -- achieving this goal. I won't say we'll achieve it in every project, for example, Denver's a very tight site. It's only got approximately 40 acres,, and there's a road running through the middle of it and there are other medical facilities in surrounding areas. So it's a difficult design challenge to achieve these requirements.

MR. GRITCH: Well, I'd like to say as, at some point, a possible user of this document, that the Appendix -- I'm happy to see those. That's great.

MR. KNIGHT: There was a lot of discussion on the appendix. To be quite honest with you, in the equipment and door hardware schedules is a work in progress for example trying to coordinate all the different types of doors, intrusion detection systems and other door hardware.

MR. GRITCH: That's about one of the hardest things to coordinate on any project even without adding the security to it.

MR. KNIGHT: Yes, it is. We've had numerous problems along that line, you're absolutely correct.

MR. GRITCH: But the clearer it can be, the easier it is, so that's great.

MR. Poland: Okay, moving along, we're down to Item 4F, though I need to tell you that Earl Kennett wasn't able to join us today, so we're going to have to put off a report on the pilot testing of FEMA 452 until our next meeting. So we'll move on to Item 4G.

14. Report on HAZUS

MR. POLAND: The last item on the agenda, Kris asked me to report out about HAZUS. And what it doesn't say there is HAZUS and how it's relating to the California Seismic Mitigation Program for Hospitals. HAZUS is a program that was written by -- or sponsored by FEMA, written by NIBS. It's in continuous development, and it was written with the particular aim in allowing FEMA to very quickly assess the amount of damage

that occurred in a disaster. It was first written for application in earthquakes, and it's been expanded to applications for other hazards.

Basically what it does is it assesses the extent of the hazard, and in the case of earthquake, it uses ShakeMap. It takes the ShakeMap information and it combines it with inventory information that it has for the area. And if it's a whole city or a community or a set of counties, the inventory information can either be based on specific information that has been gathered, which is not very available, or it's based on standard inventory information that's built in the system. It's based on statistical averages or what kind of construction there is, the age of construction, et cetera -- and a series of fragility curves that are written for a variety of types of construction. So that if you have an idea about what the distribution and number of buildings are and you know what their fragility is and you have a ShakeMap that tells you how strong the shaking is, you can gather up or make an estimation of how much damage there would be.

So that's what the program really was originally written for, and that's what it's most often used for. It has other uses. Let me first say, though, that the level of damage is important because it determines if the President will declare a state of emergency, and that's based on the amount of loss that's estimated. Once he declares a state of emergency, then there are a number of special provisions that kick in and resources that are available for the emergency response and reconstruction.

So HAZUS was set up to do that. It has, since its initiation, been expanded to be able to do a couple more levels of evaluation. That evaluation I just talked about was based on the general inventory information for buildings. There's a second level that can be used for individual buildings where you can take a single building and, given a dozen parameters about that building -- its age, style of construction, particular deficiencies, et cetera -- you can use the HAZUS program to consider what the loss potential is for a variety of earthquakes, or what the exceedance potential might be for a 500-year earthquake or a 2,500-year earthquake or for a (inaudible) shakedown. So you can use HAZUS to determine what the loss would be in a particular building.

And what it reports out is what the expected repair cost is going to be in terms of a percentage of the value of the building. So it'd be a 20 percent loss, 50 percent loss. And it also reports out the number of casualties that are expected. Now, number of casualties is based on the probability of collapse of a particular building. So if you have a building or a series of buildings, there's a probability of collapse that can be determined based on the characteristics of the building. We would consider those buildings to be HER buildings. Okay, that's HAZUS. It's a tool.

I want to talk now for a minute about California's Seismic Mitigation Program for Hospitals. This was passed in, I believe, 1996. It's Senate Bill 1953. It set out a 35-year program for California's hospitals to be evaluated and retrofitted or replaced, so that by 2030, all of California's acute care hospitals would be capable of operating after a major earthquake. So it would bring them all up to the current hospital standard in California.

So it's a 35-year program, with that target of 2030. There were two significant intermediate milestones, or three, I should say.

By the year 2000, all of California's hospitals had to evaluate their facilities, inventory their buildings, and report back to the state the condition of their buildings both from a structural standpoint and from a non-structural standpoint, so the state could determine what the functionality of those buildings would be. Now, the states that you had to report back had to do with whether the building had a significant probability of collapsing in an earthquake -- and the words they used "would impose a significant risk of collapse in an earthquake" -- or whether it would be seriously damaged or whether there was a potential it could be operational. And they used a five-state rating system. SPC 1 for structural performance category are the buildings that they felt could collapse. SPC 2 were the ones that were safe to be in. You could get out, but they would be closed. And then SPC 3, 4, and 5 were various states of damage based on the age of construction, about how usable the building would be.

SB 1953 had similar non-structural categories. NPC 1 buildings were buildings that had no consideration given to the seismic resistance of their non-structural elements and equipment that is, nothing is anchored or braced. NPC 2 related to the buildings and the non-structural elements that were required for emergency evacuation. Included were the oxygen tank, the communications systems, and those things that are necessary to be able to get the building evacuated. If those things were taken care of, the building would comply with NPC 2.

NPC 3 considers all the non-structural elements in the building that were required to take care of patients under emergency conditions. It's interesting that research has been done about what actually goes on in hospitals after major earthquakes and what kind of care needs to be taken care of, because you don't do any elective surgery. You only have to take care of your intensive care patients. You tend to release all the patients you possibly can and get them out that don't need to be in the hospital for any longer than necessary. And then the kind of things that you see is mostly trauma, either serious cuts and bruises and crush injuries and that sort of thing. There aren't a lot of major surgeries that are necessary after earthquakes. There's more a need for emergency care. And so the NPC 3 categories were aimed directly at making sure that the hospital could function under emergency conditions, recognizing that it didn't need all of its services.

So in 2000, the hospitals reported back to the state of California, to the Office of Hospitals. They reported back the condition of their buildings and they reported that there were 975 buildings in California that were rated SPC 1 or had a significant risk of collapse. That's what they reported. And that reporting was based on three different styles of study. One was that hospitals could self-declare that their building was an SPC 1. Secondly, they could do a rapid evaluation, which was just a quick screening to do that determination. And the third was to do a detailed evaluation.

That 975 buildings reported out as SPC 1, all needed to be taken out of service or replaced or rehabilitated to a life-safe level by 2008. And this was first reported in 2000. 2008, of course, is next year, so we're getting right to that point. There was provision in the law that would allow hospitals to apply for an extension, which most of them have, so that 2008 deadline is really now set as 2013. So where the program is right now is that you had to report in 2000. You have to get your SPC 1 or your collapsible buildings out of service or replaced by 2013. And you have to have all of your hospital buildings capable of operating after an earthquake in 2030. As far as the non-structural goes, you had to take care of your NPC 2 work or make sure you could evacuate the building by 2002. You have to do your NPC 3 work by 2013, and then you had to be fully compliant by 2030.

DR. WOOD: You mentioned 975 buildings, what was the total population?

MR. POLAND: Twenty-eight hundred. So it was 40 percent of the buildings to wrap up on the SB 1953 program. The federal government, the VA, is not required to comply with any state programs, though when we build new buildings -- and if I say something wrong here, correct me -- I understand as we build new buildings, we have to make sure that we build to the local requirements if they're more stringent.

We believe -- and I've talked to Kris and to Lloyd before about this, we believe that the Veterans Administration would do well just to understand where they stand in California with their buildings compared to this legislation and these mandatory requirements of SB 1953. The VA, in participating in the federal building survey and the report to Congress, which actually was never delivered, but fully written -- in 2000, really did what California's hospitals had to do by 2000. So we know the condition of our buildings. Our EHR buildings are really the SPC 1 buildings, so we know which buildings need to be dealt with. Under the California program, those EHR buildings would all have to be strengthened or taken out of service by 2013. And we heard yesterday that 75 percent of them -- and I'm not sure what the number is in California. Was it 75 percent in California? There is some large number of EHR buildings.

MR. BANGA: 50 percent.

MR. POLAND: Fifty percent of our hospitals in California that are EHR have programs now to bring them up to our standards, which would meet the deadlines. So we need to recognize that there's another 50 percent that may or may not make that 2013 deadline. And again, it's just something we need to know, not something that we need to act on today. The other thing, of course, is we have no program to say that all of our acute care hospital buildings in California will be upgraded to a fully operational level by 2030, because I don't think we've ever talked about a program like that.

Now, that's SB 1953. Within the last couple of years, because we've been moving toward the 2008/2013 deadline, the hospital industry in California has been seeking a delay from the legislature, an extension in the deadlines because it's so expensive. The original thought was that California's hospitals could meet these requirements for about

\$3 billion total cost. The price tag has now gone over \$100 billion. And the issue I think that everybody came to realize was that when you actually go in and look at a hospital and you have to do a significant seismic strengthening to bring it up either to a safe level or to an operational level, it makes more sense to replace the building, because they're old and all the reasons that we know these buildings ought to be replaced. And so all of a sudden the price tag for SB 1953 was not the price tag to add the seismic strengthening that was necessary. It was really the price tag to give California a whole network of brand new hospitals, and that's why it's gone to \$100 billion. And so the question is, do we really need to get all this done by 2008/2013 or can we have more time? So the legislature turned back to OSHPD. OSHPD looked and recognized that in 15 years that had passed.

There is new design and analysis techniques and we have HAZUS. So my long story is starting to come together. We have HAZUS available to us to offer another opinion about whether buildings are hazardous enough to pose a significant risk of collapse. So of the 975 buildings, the idea was could we use HAZUS to restudy the 975 buildings and get that number down? Preliminary estimates -- and as always, there's lots of arguing about this, but preliminary estimates are that somewhere between 50 and 90 percent of the 975 buildings don't need to be strengthened because they really don't pose a significant risk of collapse. And it's another whole conversation why there's so many, but there is. And so the HAZUS program is being adapted to California's hospitals and the information that we have available. And that is going on right now. I believe the final report is being presented to OSHPD this week. And the expectation is that OSHPD will then take the information that they have on the 975 buildings, do the HAZUS run, which considers the ground motion on a site-specific basis using the 2,500 -- well, it actually uses the 500-year maps because that's what the hospital program is based on. It uses standard fragility curves based on the information that they have about the 975 buildings, and it calculates a probability of collapse, which HAZUS knows how to do because it knows how to calculate casualties.

The thing that they've been working on for the last year is to figure out what the acceptable level is. What's the acceptable probability of collapse to say that it's okay? And it's interesting because what they've been doing is they've been looking at all the reports that they have received on buildings that meet the standard for life safety, SPC 2, and they've been calculating, using the HAZUS program, what the probability of collapse of those buildings is given a 500-year earthquake. And what they found out -- they reported about two months ago, was that there's about a half a percent probability of collapse given a 500-year earthquake for a building that, using the techniques we use, is judged to be life safe. So that becomes kind of a threshold. So it's a very small probability, but that's good. Now they can apply that to all the other buildings. And, of course, if we have a hospital building that's sitting down in Fresno, which is the lowest seismic region of California, it doesn't matter too much how fragile it is because there's almost not seismicity. You can judge given that very poor fragility and very low seismicity whether it really needs to be taken care of or not. So that process is all going ahead. It seems to me that since we want to make sure that we understand where our VA hospitals stand in comparison to California's mandatory program, that it would be

wise, once they get this application of HAZUS settled, that we take our VA hospitals in California and analyze them using HAZUS, because it's a very simple routine to do. It's not like what we usually do with evaluation -- and be able to report out to our leadership about where we stand in terms of these thresholds, these deadlines that California has in 2013 and 2030.

MR. GRITCH: Chris, would it make sense to look at hospitals in other high-hazard areas outside of California and run the same analysis?

MR. POLAND: You sure could, because the analysis is not specific to California. The information is available nationwide, sure.

MR. BANGA: In practical terms, the question is has HAZUS been used already by consultants?

MR. POLAND: Yes, HAZUS is being used. HAZUS is being used by FEMA all the time whenever there's a disaster, to estimate losses. And as I understand it, it did a pretty good job at estimating the losses in Katrina. HAZUS has been used by a variety of consultants to estimate the potential for losses in communities. For the commemoration of the 1906 earthquake, the 100th anniversary commemoration, EERI commissioned a team to use HAZUS to estimate what the losses for the 19 Bay Area counties would be given a repeat of the 1906 earthquake, and it was a very successful study. So it's been used and its information is continually being calibrated, but I believe it's credible.

MR. BANGA: Not as a chairman, but as Chris Poland, the CEO, have you done any?

MR. POLAND: We've hired consultants to do some for us. I haven't personally done any.

MR. BANGA: What's the time frame on that? Like what kind of fee is expected to do one building, average building, a four-or five-story building?

MR. POLAND: Let me answer it this way because I was involved in the 100th anniversary study. We spent -- I think it was about \$50,000 to do a HAZUS run to estimate the losses for all the buildings and estimate the casualties and the damage levels in the 19 Bay Area counties that represented the --

MR. BANGA: What approximate number of buildings?

DR. MEJIA: Thousands or maybe even tens of thousands.

MR. POLAND: No, it was millions, millions of buildings. Because it's all -- it uses default parameters. I would guess to do a medical center, it might be 5- or \$10,000. The program is extremely complex, but it's pretty simple to do once you get settled. The key thing for us, you can get HAZUS to calculate the probability of collapse. You can do that. The key thing is what's the threshold? Where do you draw the line?

MR. SIEGEL: There's another very important element as far as we're concerned. We don't just want our buildings not to collapse; we want our buildings to remain in operation.

MR. POLAND: HAZUS can offer an opinion about that, also. And so actually that's another thing. Looking at it nationwide is one additional part. And the second part would be to use it to offer an opinion about whether those buildings are going to be usable or not.

MR. SIEGEL: I feel it would seem to be an appropriate thing for us to do for all of our high and extremely high. We have many historical buildings which we need to preserve, in addition to maintaining operations.

MR. POLAND: HAZUS has the ability to recognize the difference between new buildings and old buildings. And it also has a third level of analysis that you can do for buildings that are not typical where you actually calculate the fragility curve instead of using the default fragility curve. You actually calculate a fragility curve based on detailed analysis and then you can do the evaluation that way.

MR. BANGA: So that 50 percent number which you indicated off the 975, that's based on collapse?

MR. POLAND: Yes. Because that whole thing was, we're coming up against this first deadline where these collapsible buildings have to be taken out of service, and way too many of them were signaled as being collapsible.

DR. MEJIA: Is that based on the application of HAZUS to those buildings?

MR. POLAND: Yes, that's correct.

DR. MEJIA: So the buildings classified as SPC 1, using the procedures for conventional assessment, so to speak, and then we re-evaluated using HAZUS. And HAZUS determined that 50 percent of those had a significant probability of collapse. Is that correct?

MR. POLAND: Yes, they haven't actually done the final run yet, so I don't know what that percentage is. And I don't know that we're ever going to really know, because of the 975 buildings that were declared to be SPC 1, about half of them were self-declared. And I know from our own clients that sometimes they self-declared because they decided to get rid of the building anyway and they didn't want to study it or even talk about it. It could have been a good building, but they just were going to get rid of it or they didn't want to pay to have the evaluation done. They didn't want to disclose any information to the state about the campus, and so they declared them as SPC 1. The third thing is there was some medical centers that thought that this whole thing would go away and that the law would be changed and they'd never have to do anything. And so it was kind of their way of stonewalling the process to just declare

their buildings as SPC 1. And, of course, that's kind of backfired right now because, starting next year, they've got to take these things out of service or they've got to submit the documentation of proof, because it didn't go away.

DR. MEJIA: Is an accepted procedure to see if the building is classified as SPC 1 or otherwise to use HAZUS for that building?

MR. POLAND: It will be, yes. That will be an accepted procedure. In fact, if -- the timeline right now is that the committee that's working on this for the state is, I think, validating the whole process this week. It'll be validated by their advisory board next week, and it's going to the Building Standards Commission in July under emergency regulations to be adopted into the California Building Code. So this will be an acceptable procedure to meet the requirements of SB 1953. And since they've been working on this for two years and there have been a lot of people involved, I have a hunch it's going to march through. And honestly, the biggest thing they're going to accomplish is being able to consider the actual expected probabilistic ground motions at a site, which we've never been able to consider before. All that initial assessment was really done more Zone 2, Zone 3, and Zone 4 kind of study instead of actually recognizing what the hazard level was.

DR. MEJIA: I just have one more question. In determining whether a building complies with the provisions of SB 1953, is it necessary to know the probabilities of collapse or loss of functionality? Or those provisions do not consider that specifically?

MR. POLAND: You need to know that and you know it by using the default fragility curves, which are based on -- I think 15 parameters of the building, or you do a building-specific study and determine a building-specific fragility curve. So there are a whole host of them. And the thing that they've been working on for so long is if you have like a concrete shear wall building and it has a weak story, that weak story -- because right now the fragility curves in HAZUS treat all concrete shear wall buildings the same. And what they're trying to do is go in and look at the various deficiencies that we like to talk about -- soft story, weak story, irregularity, lack of detailing, you know, the various things like: adjust the fragility curve so they get a better estimate than that. So Lloyd said he's interested. We're interested. Do we have a motion?

DR. MEJIA: Yes, actually, we have a motion with a recommendation to VA to consider this. And the motion is as follows:

"The committee recommends that VA undertake a HAZUS-type assessment of VA buildings in California to determine if VA medical centers will comply with State Senate Bill SB 1953 deadlines."

MR. KNIGHT: The only question, at least based on Lloyd's comments, do we want to expand that to say all of our -- not just California, but other VA hospitals in other states?

MR. POLAND: In high and very high regions.

DR. MEJIA: Yeah, we can do that. The reason we didn't do it from the start is that the idea is to see how you would fare against SB 1953, which of course is California-specific.

MR. POLAND: So what we can say is to do it for all buildings in high and very high and see how they would compare to the California deadlines. I mean, it doesn't matter that they're not in California.

DR. MEJIA: That's okay with me.

MR. POLAND: I think it's a good idea myself, because I think it would be good to know how we stack up. The Deputy Secretary yesterday told us what we've heard for years and years: The VA likes to pay attention and be in front, be proactive in what's going on so we'd know.

DR. MEJIA: Just to clarify things, we could recommend that all -- right now it reads as all buildings in California would be evaluated. But then we would add to that recommendation that all buildings in very high and high seismicity regions be assessed as well.

MR. GRITCH: Excuse me, Lelio. Do we want to say "all buildings" or "essential facilities" or "medical centers?" Do we want to say "all buildings?"

MR. POLAND: We call them "Mission-critical" and "essential," right?

MR. GRITCH: Yeah, there's probably something specific there that it should be "hospital buildings?"

MR. POLAND: You want to just do "hospital buildings?"

MR. BANGA: As a start.

MR. POLAND: What do we call them? We call them "acute care hospital buildings."

MR. KNIGHT: We use the same terminology that is in H-18-8. It's Critical and Essential facilities in High and Very High seismic areas.

At this point some discussion took place took place on critical and essential buildings in California and other high seismic areas to be included in the motion..

MR. MEJIA: So the motion would read as follows:

"The committee recommends that VA undertake a HAZUS type assessment of VA critical buildings in California and in other high and very high seismicity regions, to determine if those VA buildings will comply with California State Senate Bill SB 1953 deadlines."

I didn't add the piece about the specifics of exactly how you would do that, with the idea that that can be worked out as they comply with this.

The motion seconded by Dr. Wood was unanimously carried.

15. Assignment of new activities.

MR. POLAND: We don't have any new activities to assign.

MR. BANGA: We will go through the motions and will take care of the assigned tasks on them

MR. POLAND: Well, as always, if there's anything you want to send to us and ask for, it seems to me you may like or if this is something that we could approach this year and you need some help in getting the scope of work written, we'd be glad to help out with that and anything else you want to send over.

MR. KLEIN: And we would appreciate any comments you have on the Physical Security Design Manual final draft.

MR. POLAND: Okay. And then, of course, there's the ongoing monitoring program and its possible expansion. And of course, we're pretty excited about what the Deputy Secretary said yesterday, with the expectation that maybe we can get something significant to happen in the short term, so we're very happy to jump in and help with that if we can.

16. Date of next meeting

MR. POLAND: We need to set the date of our next meeting. I assume it'll be a year from now. So if you look at your calendars.

MR. BANGA: Typically the Thursday-Friday meetings work out much better.

MR. POLAND: Okay. They certainly work out well for me. So it looks like the Thursday and Fridays are June 12th/13th or June 19/20. Is there any preference on those? I guess I would probably lean toward the 19th myself, say 19/20?

All Committee members agreed to have the next meeting June 19 and 20, 2008.

ADJOURNE MEETING

MR. POLAND: Okay, then I'll declare the meeting adjourned. Thank you very much. Whereupon, at approximately 11:54 a.m., the MEETING was adjourned

Chris D. Poland, Chairman

6-27-08