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with Southern California Edison Company
DVD 2/4

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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AUGMENTED INSPECTION TEAM EXIT MEETING WITH SOUTHERN CALIFORNIA EDISON COMPANY

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MONDAY

JUNE 18, 2012

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SAN JUAN CAPISTRANO, CALIFORNIA

DVD 2/4

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The meeting convened in the Community Hall at the San Juan Capistrano Community Center at 25925 Camino Del Avion, San Juan Capistrano, California, at 6:00 p.m., Richard Daniel, presiding.

NRC STAFF PRESENT:

RICHARD DANIEL, Facilitator

THOMAS BLOUNT

ELMO COLLINS

GEORGE CRAVER

EMMETT MURPHY

JOHN REYNOSO

JOEL RIVERA-ORTIZ

GREGORY WARNICK

PRESENT: (CONTINUED)

GREGORY WERNER

ALSO PRESENT:

PETER DIETRICH, Southern California Edison Co.

DOUGLAS BAUDER, Southern California Edison Co.

THOMAS PALMISANO, Southern California Edison Co.

P-R-O-C-E-E-D-I-N-G-S

(11:20 a.m.)

FACILITATOR DANIEL: (Joins during progress) ready for the question and comment period, what you all have come for. For those of you that may not have been here for the first two-thirds, my name is Rick Daniel. I will be the facilitator here.

And this is the way we are going to try to work this tonight, folks. The job, my job is to try to provide -- be fair and balanced. I'm going to be moving about. I am going to be approaching folks that have questions.

If you have a question, you raise your hand. I will come to you. Not yet. I will come to you. If you can make your way to the aisle, you cane make your comment, ask your question and the appropriate NRC person will address you.

We have our first question. Just a minute. Folks, we will limit questions and comments to two minutes. Okay. I'll be right with you.

Keep in mind what I said earlier about our focus. It's about the steam tubes on the steam generators. I hope we can stick to that. If we can't, I'll help refocus us. Keep in mind, you always have

the option of filling out the NRC form out there on the table. Okay.

So we have our first question. Just a minute. Thank you. Folks, we're going to limit the questions and comments to two minutes, okay? I'll be right with you. Go ahead.

Why don't you give us your name, if you like, and go ahead.

MR. STONE: I'm Gene Stone from Residents Organized for a Safe Environment. On April 6, I had a personal meeting with Chairman Jaczko, as many of our local coalition did, and he promised us, as much as he could, that this meeting would be open for people to speak because at the last April meeting in San Juan Capistrano, the lights were turned off at 8:30 and we had to leave.

Now I understand, and I agree, that the steam generator issue is very important, and we should talk about this issue, and I agree with that for that tonight.

I would officially ask Elmo for the next meeting to be a category 3 meeting so that we can actually discuss everything that the public wants to discuss with no limited time on that meeting.

(Applause)

MR. STONE: If Elmo can tell me how to do that legally, publicly, or whatever it takes to get that done with the NRC, I'll leave you my email.

So my question is how is it that 39 design changes did not trigger a complete review by the NRC and complete public hearings as is required by law? Has the law been broken by either California Edison, Mitsubishi or the NRC? Thank you.

FACILITATOR DANIEL: Thank you, Gene. Greg?

MR. WERNER: Well, the 50.59 process is the regulation and by regulation, they were -- they were allowed to do what they did. Now, to say that it wasn't reviewed, portions were reviewed by the NRC. Actually, there were two changes that did require License Amendments that were reviewed by the NRC.

The NRC did do reviews of part of the design before the change integers were installed were, as well as the Augmented Inspection Team also looked at the design.

As I said earlier, we are continuing our review, and we did identify those two issues for -- I mean the one issue, with the 50.59, associated with the two changes to the code of record that was used, as follow-up plans we have to look at.

FACILITATOR DANIELS: Elmo.

MR. COLLINS: I'd like to add to that, to that response to your question. It's an outstanding question. It's one we have got ourselves. Because of what was in the plant while the plant was operating, we had to be absolutely clear, you know, what happened here, and how did these steam generators get in the plant, what were the NRC's review processes, what are our regulations, to make sure that this went the way that we wanted.

And we are still looking at that. We haven't reached our final conclusion. But we had that question, as well. And so we indicated in the presentation -- and this is part of the augmented team inspection procedure -- that we would look for these conditions, look at ourselves, ask ourselves what else do we need to do. And so that's a question we are trying to answer, as well. I think your question is right on the money.

With respect to the category 3 meetings, I have got to tell you, we have been knocking our brains out, you know, how to do these meetings as best we could.

And on this one, we really, we would have preferred to have gone that route. We just didn't quite, couldn't quite get to it with the information

we wanted to present to you.

But that is actually a question for our next meetings or the series of meetings, which one of those would be appropriate. And we want to have those meetings so we can have a better, I think, exchange of information, a better dialogue with you here in California. So, thanks for raising that.

MR. STONE: Respectfully, we demand that type of meeting.

MR. COLLINS: All right, thank you.

FACILITATOR DANIEL: Thank you, gentlemen. I'm going to come to this lady over here. Excuse me. Give us your name.

MS. BECKER: Rochelle Becker, Executive Director of the Alliance for Nuclear Responsibility. I have two questions, and I thought I saw Mr. Craver here earlier. Is he here?

MR. CRAVER: Yes, I am.

MS. BECKER: Okay. Hello, Mr. Craver. I have a question for you. Could you just stand up, because I think the whole audience would like to hear the answer.

My question is, is there a number, is there an amount of money -- we know that there is no amount

of safety before you reopen -- but is there an amount of money before you reopen? How much money do you expect your ratepayers to pay before this plant re-operates? Is there a break-off point in which Edison decides this is just too much?

FACILITATOR DANIEL: Coming right to you. I'll get back to you.

MR. CRAVER: At this point all of our focus has been on trying to understand the technical aspects and what exactly is taking place here, what the mechanism of wear is, what the causes of wear are and how we are going to actually address those.

As we get through the final evaluation of what the final fixes are, what those will look like, are those the same fixes for the near term as they are for the long term, then I think we will have a better idea of what those cost components are.

But I think it is actually really important for us not to get the financial piece into this at this point, for us to just focus primarily on the safety issues and primarily on what we are going to be able to do to fix it.

FACILITATOR DANIEL: Thank you. Hang on, folks. Hang on. We are going to try to keep the questions oriented towards the steam tubes. Is this

a question on the steam tubes?

MS. BECKER: Okay. This is to the NRC. We have just been told that you spent 1300 man-hours or 1500 man-hours, or whatever, for this review. However, you didn't spend this amount of time before you approved it and the State of California invested in these steam generators.

Is the federal government going to help in any way with the ratepayer cost of this, or are we supposed to pay for your mistakes, as well as Edison's mistakes? Thank you.

(Applause)

FACILITATOR DANIEL: Okay.

MR. BLOUNT: The agency had -- and you are asking for us -- how are we going to handle our regulatory responsibilities. We have an obligation to review the safety of these facilities and how they are operated. We will do that as we are mandated to do.

When situations arise, that's why we have reactive inspections, and so we address those as they come up. I guess I'm not sure how I would address that much beyond that. Please.

MR. COLLINS: Thanks, Rochelle. Good to see you hear tonight. It's been a while. I think we have already indicated we need to go back and look.

You know, wid we follow the -- did NRC follow our processes, which are implementing our regulations, and was the right implementation of inspection programs that were put in place to look at this very thing.

And our accountability, I think, goes to the oversight committees we answer to in Congress ultimately -- and we have some representatives here - that hold us to that, to make sure we follow our processes.

I mean, that's all I can do is follow my process from the regional office. And we are doing our best to make that happen. So, if we're not, we want to be the first to fix it.

But also, we are going to take a look at these processes and see if they need to be improved because of what's going on here.

This is a very difficult, technical issue, and to be quite honest with you, it has not been seen before. That doesn't give anyone any comfort. But we need to be smarter, up-front about these types of changes in nuclear power plants. I'll acknowledge that.

FACILITATOR DANIEL: Thank you, Elmo. This gentleman, you have a question. Can you stand up, please.

MR. CUMMINGS: My name is Jim Cummings

(phonetic), retired Southern California Edison employee, Unit 1. I have a question in regards to why the design was changed on the steam generators from the initial construction to where we fabricated something out of the -- maybe different from what the final engineering report would have had you do. That seems like there's been a major deviation right there as far as the steam generator design.

MR. WERNER: Yes, I'll take that question. Of course the steam generators were different than what was originally put in because the original steam generators had to be replaced. So they had issues with the original generators across the industry, and from a lessons learned standpoint, with the numerous changes that have been incorporated in the new generators.

FACILITATOR DANIEL: We'll get to you. Steam tube generators.

MR. HOLTZMAN: Staying on focus -- Joe Holtzman, Mission Viejo -- my question is one question. I would like to direct it to the NRC, Greg, perhaps you can take it and maybe Mr. Dietrich could take it.

Was there a failure mode effect analysis done on these designs before construction was started?

(Pause)

MR. HOLTZMAN: The silence is deafening.

MR. WARNICK: Like Greg said, as part of the inspection process, we have a procedure that we implement for replacement of steam generators. We reviewed in part the 50.59s associated with the replacement steam generators.

We did not review it to the level of detail to determine if the failure mode analysis was done. Beyond that, Edison, if they choose to reply, they can shed some light on that.

MR. DIETRICH: Thank you. The steam generators were replaced using an engineering design change package which does look at potential modes of failure of the steam generators and it looks for understood or anticipated modes of failure.

Included in our technical specification changes were two License Amendments to change the plugging limits on the new steam generators compared to the old steam generators, to move to a lower percentage of through-wall wear to plug the steam generator tube.

So we did look at and analyze the potential for wear affecting our steam generators. That was documented in our engineering change package. A failure modes and effects analysis is traditionally done in our business associated with looking at a new

occurring problem.

So specifically to answer your question, there was not an FMEA, a failure modes effect analysis done per se. We are working through that as part of our solution set and problem-solving situation.

FACILITATOR DANIEL: Thank you. I'll get back to you. Okay?

PARTICIPANT: (Name inaudible). Why is it that Mitsubishi is not present at this meeting and the same for AREVA and Westinghouse?

MR. BLOUNT: In this particular case for this meeting, this meeting, the Augmented Inspection Team results, it was as the NRC providing our response to the licensee on what we have found.

Mitsubishi, AREVA, others, are vendors to that licensee. They are not the ones that we look to for responsibility associated with that facility. So if they were here, they would be here in an advisory capacity to the licensee.

FACILITATOR DANIEL: Thank you, Tom. Steam tubes.

MS. RUSCH: My name is Emily. I am a concerned citizen and the director of the California Public Interest Research Group, a statewide consumer advocacy group, and like Rochelle, I am concerned first

and foremost about safety, but I am also concerned about cost to ratepayers who are already paying for the steam generators that are now not operating.

And I'm wondering if Southern California Edison can commit to not asking ratepayers to pay for those steam generators again, should they need to be replaced.

MR. COLLINS: I'll start. I appreciate your question. We all know this is, on the face of it a costly -- the plant has been shut down, not generating, for a number of months.

Just from the NRC's perspective, we are primarily interested in safety. And so I know I can't put myself in your shoes as a California ratepayer, so I really don't understand how you're feeling, but I would ask you to look at us and say we are going to take a look at safety first and see where it goes.

And now I'm going to see if you want to -- if Pete might add to that answer for you, since they do think about cost.

MR. DIETRICH: Yes, thank you. You know tonight we came out to talk about specifically the augmentation team results and to talk specifically about what our learnings are up to this point.

I will share with you the concerns of our

stakeholders, the concerns of our customers are very important to us and we are mindful of that as we go forward.

All of our discussions regarding costs or cost issues are ahead of us types of discussions. We will have opportunities to continue to discuss that and it will play out very openly in front of the California Public Utility Commission.

So, we are committed to providing that visibility to the situation going forward. But I think tonight it's important to talk about the technical situation and how we move forward over the next few months. Thank you.

FACILITATOR DANIEL: I'm just going to move over here. I'm coming, folks.

MR. COLLINS: I hope some of you have questions. I've got a technical team sitting here in the front row. They're just dying to answer your questions.

MR. LUTZ: Okay, Okay. Ray Lutz with Citizens Oversight. Now you mentioned that the unexpected tube-to-tube wear was due to excessive steam velocity. The question is -- and you said your simulation simulated it to be three to four times higher than the other simulation.

And my first question is, did you actually measure the velocity of the steam to find out if either of those simulations is any good? Did you measure the velocity in the actual steam generator? Number 1.

And number 2, why is the steam at a higher velocity? That is not the root cause. You need to jump back and say why is it going faster? Is it because Southern California Edison modified these steam generators by adding 370 additional tubes and subtracting the certain supports and so fourth? Is that the reason?

Is it -- what is the reason? Because you guys came in here saying you came to the cause of this and you gave us no cause. This is not the cause.

So I want to know the answer. What is the cause of the excessive steam velocity? If you tell me it is because of something that happened somewhere else, then you have to ask why did that happen?

And you're stopping just after one thing -- oh, excessive tube-to-tube wear, that's why the leak started. Why did that happen, excessive steam velocity, why did that happen?

So, please go down that trail. And I want to know, did you measure the steam velocity?

MR. WERNER: Actually, that question is

outstanding. We have to understand and SONGS owes us that answer as far as what specifically in the design change in the steam generator causing the higher than expected velocity, and as they talked about steam void fractions.

So they still owe us that. That's been something that we've discussed since we have been on site. I'm sorry. What was the other question?

Oh, they do not measure steam flows within the steam generators. There is not that capability. The modeling is done based upon experimental data, as well as empirical data.

FACILITATOR DANIEL: Okay. Another question about steam tubes. Yes, ma'am.

MS. STONE: Karen Stone from Laguna Hills. I wanted to know just how much radiation was released from 3 having its problem. You are saying it's minimal, but how much was it? We need to know.

FACILITATOR DANIEL: Thank you, Karen.

MR. WARNICK: Thank you for the question. As I told you before, I was on site. I responded to the event. Full time, when I'm on the site, I wear a radiation badge that measures my radiation. So I'm monitored.

We independently verified and quantified

how much release there was. The amount was 5.2 E to the minus 5 millirem.

Now, what that means, essentially is it was more than 10,000 times below what you would receive from, say, an x-ray of the arm or what each of us receives daily from naturally occurring background radiation, which is about one millirem. So, it was 10,000 times below that amount.

FACILITATOR DANIEL: Okay. Thank you.

MR. WARNICK: Essentially, on my radiation badge that I wear every day, that measures my radiation, it was negligible. It wasn't picked up at all.

FACILITATOR DANIEL: Thank you. Okay. Question to Gary Headrick.

MR. HEADRICK: My name is Gary Headrick, representing San Clemente Green, about 1500 citizens. And I'd like to share a more general observation that will cover the steam generator issue indirectly. But if you would please indulge me while I read.

This is an intervention. The people that you are sworn to protect, the ones that you ultimately serve, are speaking up in a strong and forceful way because you are blindly following a path that has become a habitual routine.

Unfortunately, it eventually will lead to

the destruction of everyone and everything for miles around if allowed to continue indefinitely. We can't simply let this situation continue any longer. We have been extremely lucky so far.

The reckless behavior of Edison that has been exhibiting over the years has got to stop. Edison's insatiable appetite for gambling continues to escalate, when losing, it is virtually impossible thanks to the Price-Anderson Act, and winning is practically guaranteed simply by staying in the game.

This situation would be an irresistible temptation for even the most timid gambler. Having never lost, the obsession becomes even stronger. Yet the longer one goes on a winning streak, the more likely it is that luck will run out.

The Nuclear Regulatory Commission is equally responsible for this situation reaching such an intolerable condition. Your good intentions aiming to make sure that the power we need is delivered in a safe manner has an inherent conflict of interest that can't be avoided.

You either have to put safety first or follow your loyalty to the industry from which you came. You have become the enabler in this relationship, a codependent partner torn between what is best for those

you work closely with and the public at large.

It is with concern for the good of all that we must step in as interveners, reminding you that you must act responsibly and remember your original obligations to the people and the environment.

FACILITATOR DANIEL: All right, Gary. Hang on a second. Is this going to result in a question about the steam tubes? Another minute.

MR. HEADRICK: It's for a lot of people. The plain truth is that we don't need to gamble our families and our possessions in order to get the power we need for the comfortable lifestyles we are accustomed to. The last four months have been living proof of that fact.

The cost of continuing to support this aging nuclear power plant is not necessary. All of the consternation over evacuation routes and sheltering in place to escape radiation has vanished with this recent revelation.

The only responsible action to take is for Edison to transition to truly sustainable and safe alternatives before the competition gets too far ahead, and for the NRC to recognize that it is time to retire this old racehorse and deal with the extremely toxic waste that has been piling up in the stall for more than

30 years now.

FACILITATOR DANIEL: All right, Gary. Okay. Thank you. Thank you.

(Applause)

FACILITATOR DANIEL: We'll get back to you, Gary. We'll get back to you.

MR. WERNER: Yes, I'd like to respond to that. I think it's important to understand that at the NRC safety is first. We do not have a schedule for restart. No decision has been made.

And again, the units are not running because currently it is not safe to restart, until they go ahead and do actions to prevent tube degradation due to vibration.

The NRC does not rely on luck, nor does the nuclear industry. The steam generators of the reactor itself, the design, actually incorporated looking at a steam generator tube rupture. So that was part of the design that the plant could respond to.

As Greg Warnick indicated earlier, they have detection equipment that rapidly detects small leaks. Operators are trained. They go to training, extensive training. They are able to respond to the leak, isolate it, minimizes the leak, as well as multiple ***11:45:21 (inaudible) in place.

So again, the plant design, the training and the construction of the plant are specifically designed to combat accidents, including steam generator tube rupture. So there is no luck involved with that.

MR. HEADRICK: Can I finish one paragraph?

FACILITATOR DANIEL: Gary, Gary, I'll tell you what, as time permits, we will get back to you for the last paragraph. Okay. We're not going to forget you. Okay? I promise. We're going to get back to you. Sir.

MR. WEISS: My name is Rick Weiss and I have two questions I think are germane to this issue. They concern the tubes. And I wanted to know a little bit more about the details of the tubes. I understand that they're three-quarter of an inch diameter. I want to know what they are made of, how thick the walls are and how they have been tested to withstand -- we have been talking about vibrations -- how they have been tested to withstand the earthquakes that we have around here. That's a concern for me.

And the other question is, in the event that they need to be replaced or something, what happens to them? I mean, where did they go, what plans do you have to dispose of them or store them. Or actually, what are your plans to -- that was a good question about the

nuclear waste piling up, for the past 30 years it has been piling up and we have been looking for solutions, waiting for solutions. And are there any new solutions that you have for that?

FACILITATOR DANIEL: Thank you, Rick.

MR. WERNER: I'm going to let Emmett answer the question about the steam generator tubes, right there in front. He's part of the Augmented Inspection Team, 30 plus years' experience looking at team generators. Go ahead, Emmett.

MR. MURPHY: Okay, I believe one of the questions was what are the tubes made of. They are made out of INCONEL 690, a thermally treated nickel-chromium-iron alloy, very corrosion, stress corrosion, crack resistant, compared to the INCONEL 600 tubing used in the original steam generators. I'm sure I'm missing part of your question.

FACILITATOR DANIEL: The seismic -- the seismic --

MR. MURPHY: The diameter -- the diameter of these tubes is three-quarters inch. The thickness -- the wall thickness is 0.043 inches, 43 mils. The steam generators were designed for seismic conditions to stay within stress limits required by the code, the ASME, or American Society of Mechanical

Engineering, section 3, code stress limits.

(Off-mic question)

MR. MURPHY: The tubes? Each of the tubes is welded at the tube ends to the tube sheet and in addition, they are hydraulically expanded for the full thickness of the tube sheet.

FACILITATOR DANIEL: Okay. Thank you.

MR. WARNICK: I can't answer how far apart each tube is. Maybe you can get that information from Emmett and we can add that additionally.

MR. MURPHY: The tube pitch is one-quarter inch. In other words, the closest nominal dimension between the tubes is 0.25 inches.

FACILITATOR DANIEL: Thanks, Emmett.

MR. WARNICK: Your second question is what do they do with these steam generators when you replace them. That was actually part of our inspection, when they replaced the old steam generators with the new steam generators.

The old steam generators are essentially decontaminated best they can. The cleaned portion is cut up and you know Edison, whatever they choose -- I think they sold most of the metal that they had for scrap, that was clean.

There is a portion that is radioactive on

the primary side in the tubes, and that's shipped to low level waste facilities that are located throughout the country.

As far as the bigger waste question, as you're probably aware, that's something that is being debated in Congress now. There was a Blue Ribbon Commission that gave a report recently and that's something that's being determined at the energy policy level.

MR. MURPHY: Just one brief -- a correction to what I said -- that the minimum gap between the tubes is one-quarter inch. The pitch is one inch, plus diameter equals pitch.

FACILITATOR DANIEL: Thank you, Emmett.

(Off-mic question)

FACILITATOR DANIEL: That was answered by Emmett. All right. Ma'am, do you have a question?

PARTICIPANT: Specifically what are the low level -- where is the low level waste being -- places around the country?

FACILITATOR DANIEL: Well, you know, that's outside the scope of this meeting. That's something for another meeting. But you can put it on the feedback form and submit it and somebody will try to answer it for you. We are going to focus on the steam

generators and the tubes, have questions about the tubes. Utah.

MR. WARNICK: Utah.

PARTICIPANT: Yes. I know that the nuclear regulatory agency has a lot of channel at its disposal. I assume also that there is independence. I would like to know, as there is among really trained professionals, if there is a minority report.

I know that that's considered to be a little difficult. The NRC has been under criticism because of the fact that there has been dissent and it's led to people saying well, you're not playing the game right. And we've had a recent hearing before Congress about all of this.

We want independent professional opinion, if there is a majority view and if there is a minority view, about the safety of this, because safety is supposedly your number 1 concern and for that safety, you are responsible to us.

FACILITATOR DANIEL: All right. Thank you. Your question is, is there a minority report related to the steam tubes?

PARTICIPANT: Other than just the line that has been given to us here, as universal opinions.

FACILITATOR DANIEL: Okay. Do you

understand that question?

MR. COLLINS: Yes. First of all, I want to say I couldn't agree with you more in your comment and even to put a finer point on that, when you do have opposing views or differing views, that drives us to even a better conclusion when they're considered evaluated, understood.

My definition of objectivity is I understand the opposing view. I might not agree with it, but I need to understand it when I make a decision. That's when I can look at myself and say I'm close to making an objective decision.

I've been watching this team work for a number of months now, and I mean, if there is a minority report or non-concurrence, it will be documented in writing and it will available in publicly.

But I have got to tell you right now, I am not hearing any. So far the team is fairly well consistent and it converged on what you've heard here tonight. So I think what -- this is really a team view. So --

MR. BLOUNT: If I can just add to that discussion slightly. One of the things that we were concerned with is that we would develop a mindset that said we're headed down this path and that was the answer

and we'd put blinders on to this particular issue.

So we took the opportunity to bring two separate individuals that are outside the agency as experts to look at what it was that it was that this team was putting together, and we handled them as separate and distinct, much like a challenge board, to look at what the team did and what their findings were and how they went about doing their business to make sure that we got the best insight that we could.

With that, then, we were -- we did make the determination that the team did do the inspection that we expected of them and we did reach the appropriate identification of issues.

FACILITATOR DANIEL: So in answer to this gentleman's question, Tom?

MR. BLOUNT: At the end of the day, we will, once the report is crafted, once we have finalized the report, it will be a publicly available document and it will be available on the NRC website.

MR. COLLINS: Just to be clear. That's two reports. There's this team's report and then there's this report that was prepared by the other engineers that we brought in to challenge us on our conclusions. So --

FACILITATOR DANIEL: Okay. Steam tubes.

Steam tubes.

MS. STEMKE: My name is Janesa Stemke and I live in Riverside. The last I heard before tonight about the radiation leaks, I heard, "We don't have statistics on that. We need time. We want to take accurate measurements and these things take time."

That was the last I heard and that was back in February or something. We need timely and accurate radiation reports, released and made available to the public immediately. And if that cannot be provided, then you did not have the right to operate a nuclear power plant in this vicinity or any vicinity because the public needs to know this information.

And is there a radiation monitoring system made available to the public for this purpose and if not, it makes me wonder if the Nuclear Regulatory Commission is actually paid on commission to keep nuclear power plants operating. Thank you.

FACILITATOR DANIEL: Thank you.

MR. WERNER: Actually, the NRC does get information, an annual effluent report is published. But it is important to note that the utility did measure the amount of radiation, as Greg Warnick said. They have detectors on the secondary side, the steam side, so they picked up the amount of radioactivity and they

analyzed that and came up with the release phase. A couple of weeks after we actually had a radiation detection team from the Region 4 office out here. They actually looked at it and looked at the values and confirmed the numbers.

MR. COLLINS: Yes, this is Elmo. I'd like to add to that response. Actually I really appreciate the question. Actually, I heard three questions in there.

One was what about the specific event on January 31st. I think we've talked about. There are actual measurements and a computation was made.

Then I heard about the NRC's annual report that by regulation Edison has to publish. The question with that is that doesn't seem very timely. What good is that? Every year, how is that being done?

I do think we're in the process of taking a look at that to see as an agency if there is anything we can do to speed that up. I don't want to speak and say more than I know. But I believe we haven't had that question before, and I appreciate it.

The last point is on maybe some radiation detectors off-site. I tell you one of the -- and I have been with the NRC almost 25 years -- one of the hardest things we have to do is -- one of the hardest things

I have to do was stand in front of you and tell you that there is little to no radiation being released from San Onofre, because how are you going to believe me? You can't feel it. You can't taste it. You can't touch it. Right? There is no way you can intuitively tell whether or not you can believe what I'm saying. I understand that.

And so one answer to that might be -- and I don't know how we would get there -- but to have detectors off-site so that they can be available for you.

(Applause)

MR. COLLINS: I understand why you want that. The regulations don't require it, but there may be something, you know, a solution there.

FACILITATOR DANIEL: All right. Thank you, Elmo.

MR. MARLOWE: Rick Marlowe (phonetic), out of Ramona, California. A couple of things. Realtime reporting over the internet, the emissions would be greatly appreciated by, I'm sure, by most of the people in this room.

My concerns about the tubes are Mitsubishi has been making these stem generators for quite a long time. They have been putting all kinds of plants across

the United States and there may be some design changes, but the basic geometry and flow in and flow out are probably pretty consistent amongst all these generators.

I can't imagine that their simulations are three to four times off, and if so, how can that be? And if they are that far off, how come we haven't had these problems in other places and why is it showing up now?

FACILITATOR DANIEL: All right. Thank you, Rick. Greg?

MR. WERNER: Yes. And actually, Mitsubishi has only had two generators that are currently designed and operating in the United States. One is -- well, both the units that are at SONGS and at Fort Calhoun located outside Omaha, Nebraska.

Those steam generators are similar designed, but they are much, much smaller. And actually we had the same concern with the wider thermal hydraulic model, underpredicted the flows. And again, that's another area that we were asking what caused -- what was it in their model that caused those thermal hydraulic conditions to be underpredicted.

So we have already asked for that also.

FACILITATOR DANIEL: No. I told you, we'll

try to get back to you. No. No. We will try to get back to you Gary. Just a minute.

PARTICIPANT: So you guys want timely information. Go to the internet. We have our own sources. If you would like them, you can come and see me later.

Show of hands, how many people here are here because they do not want any nuclear power?

We're here on a post mortem. So why are these things not reviewed upon delivery? I was listening to the earlier part of it and there were accelerometers that had been put off and showed that there could be damage to these things.

Now, if I was a clerk at Ralph's and I accepted a shipment like that, I would -- it would come out of my paycheck. So why is it not going to come out of your paycheck?

How many of these -- oh, you actually answered this question. The models were off by three to four times. The confidence interval there is straight off the normal curve.

So, here is one about how long has an investigation of this sort had to have -- how many -- how long has it taken for an investigation of this sort to have come to a conclusion in the past?

FACILITATOR DANIEL: All right, Zeke. Thank you. Greg?

MR. WERNER: Well, to answer the question about accelerometers, they were actually evaluated by SONGS. We just had a concern as we looked at them to make sure they were properly evaluated.

So, they just weren't blown off. They were actually reviewed. We wanted to make sure that we understood, to make sure they were actually evaluated in accordance with their procedures.

So, the other thing, again, about the model, again, we feel the same way as far as being underpredicted. I mean, we don't understand it and that's the kind of situation we're in right now.

FACILITATOR DANIEL: All right. Who had some question about steam tubes. Stand up please and come on out here.

MR. HARRIS: Harris, (phonetic) building contractor, North San Diego County. I have got a question for Greg. These steam tubes, did I hear you right? Because the statistic were flying so fast. 128 tubes were tested, pressure tested?

MR. WERNER: 129.

MR. HARRIS: 129. Eight of them failed?

MR. WERNER: Yes.

MR. HARRIS: Were they randomly tested throughout the entire amount of tubes?

MR. WERNER: No. Actually, if you go back, all approximately 40,000 tubes had inspections completed on them, and then numerous tubes were reinspected beyond what was required.

The tubes that were selected for in situ pressure testing were actually based upon the ones that had the extensive tube wear.

MR. HARRIS: So there was no random test of the entire 19,450 tubes in Unit 3?

MR. WERNER: That is correct, as far as the in situ pressure testing.

MR. HARRIS: With a failure rate of 0.06 percent, you might have 1,167 bad tubes.

MR. WERNER: I'll let Emmett help me out on this also. But the way the tubes are selected, again, we're looking once the 80 current testings have identified those tubes that would be susceptible to failure, they go in and test them, because they don't have information to analytically say they're okay.

So the idea is to go in and physically test them to make sure they will or will not hold. And of course, those eight tubes did not hold, and we suspected that a number of tubes would fail. That was not beyond

what we did not expect to happen.

So, we expected a number of tubes. Actually, I was surprised more didn't fail.

PARTICIPANT: But they only tested 148?

FACILITATOR DANIEL: Hang on.

MR. COLLINS: We need some explanation here. There is a misunderstanding of what we know about the tubes. So, Emmett.

MR. MURPHY: Okay. Every time a plant conducts a steam generator inspection, one of the purposes is such to find tubes that are -- that are damaged beyond accepted limits and those tubes are removed from service.

The second question a steam generator inspection is intended to address, is whether or not the plant or the utility was successful in maintaining adequate safety margins in all of the tubes during the last cycle of operation since the last inspection.

Normally, that assessment is performed through analysis of the inspection or any current test data of each of the tubes. They measure the depth and length of the cracks.

They take into account measurement error. They utilize standard equations for predicting girth strength of the tubing as a function of the length and

depth of the flaw.

And then they, based on all that information, they determine whether or not they have maintained factors of safety against failure consistent with the requirement.

These analyses tend to be very conservative because a lot of the input parameters have a lot of uncertainty, and so sometimes you predict through these analyses that tubes don't have sufficient strength. But it is a very conservative analysis.

So, in situ pressure tests, then, are a way to then more realistically establish the amount of safety margin or confirm that you have the appropriate safety margin.

So based on your earlier analyses done by Southern California, the eddy current inspection data, they identified a significant number of tubes where their analyses indicated they didn't have the appropriate margin.

But these were conservative analyses. That's why we did the pressure tests to determine for sure whether or not they had the appropriate margins. The rest of the tubes that were not tested, it was very clear, upon the eddy current inspection data, that they had the appropriate safety margins.

So, it's just the ones -- they just test the ones where there was some question as to whether or not they had appropriate the safety margin. Thank you.

MR. WERNER: I'd like to add to that also, even before the steam generators were brought here to site, that each steam generator, at least one time, if not multiple times, was pressurized, the entire steam generator, to 125 percent of design pressure.

So every steam generator tube was pressurized to 125 percent of design pressure.

(Off-mic question)

MR. WERNER: No, the -- again, you go in from the primary side, so we'll go approximately 2000 pounds, so add another, you know, 2500 pounds, and add another 500 pounds. So they're all pressurized to 2500 pounds, the entire steam generators. It just wasn't the tubes. It was entire structure.

MR. COLLINS: I want to make sure we -- this is a very important point that's made by the gentleman, understand, what's been done at the steam generators and what the condition of the tubes are today. I need the team to tell me. I wasn't on the team, so I could have a misunderstanding.

One hundred percent of the tubes, almost

20,000 of them, had the tube thickness measured, I think, for the full length, right? So we know the thickness and have data on every tube, almost 20,000 on the steam generator, and it was only those that I think Emmett, as Emmett described, that had the most wear that received the in situ pressure testing. So, we know what's out there with these tubes.

MR. WERNER: It's also important to understand that the tubes will wear during the normal operation. So, as part of the inspection program, they go and look at them to make sure even if they don't have a leak, they inspect so many tubes as required by tech specs. Again, the first outage they inspect 100 percent of all the tubes.

FACILITATOR DANIEL: Okay. Steam tubes.

MR. TEASLEY: Hi, I'm Russ Teasley, local resident, with the Earth/Ocean Society. My question is did the NRC or any of the investigators involved do specific analysis of the presence or absence of the stay cylinder, the primary stabilization element of the steam generator?

MR. WERNER: I'm going to let Joel answer that question. Joel Rivera-Ortiz was on the team. He actually looked at the design changes associated with the --

MR. RIVERA: This is Joe Rivera, NRC, Region 2. As part of the AIT, we looked at many of the design changes that were made from the regional to the new steam generators, and we looked at how the stay cylinder was changed from the regional to the new steam generator.

We reviewed the design basis of the steam generators and how the regional steam generators rely on the stay cylinder to perform their function, which formed the basis for operating licensing, operating license of the facility.

And we determined that the final safety analysis report of the facility did not rely specifically on the stay cylinder for the safety functions of the steam generator.

FACILITATOR DANIEL: Thank you, Joel. All right. I've got to go to this lady in the green shirt before her arm falls off. You had a question about steam tubes? Right? Okay.

PARTICIPANT: Thank you so much. This event that happened on January 31st, correct? Okay. What would the tubes' strength be on January 30th if we had had a serious seismic challenge to that plant? What would it take?

They certainly were damaged the day before,

but they only broke on the 31st. Now maybe they were damaged on the 20th or the 21st. What do we know about how strong these were prior to? Aren't we just gambling here? Aren't we just taking our chances? We are not a test facility here, a nuclear test facility. We are families. We are a community. And we deserve better.

(Applause)

MR. WERNER: Thank you. I'd like to answer that question. Of course, the steam generators, the design, take into consideration the seismic. As part of the in situ pressure testing, again, they selected those 129 tubes, as Emmett described.

Now, all those tubes were pressurized -- attempted to pressurize up to 5200 psi, which is, again, essentially almost three times higher than normal pressure.

So three of the tubes failed around what we call the main steam line pressure, which was -- I think the test was 3300 psi. And those are the tubes that we were concerned with from a safety standpoint, because they failed at the lower pressure and then the other tubes failed almost at or near the 5200 psi. The rest of the tubes maintained the pressure and they had full strength and showed the integrity that they needed.

FACILITATOR DANIEL: Okay. Go ahead, Elmo.

MR. COLLINS: Let me re-ask that question. Do we think the tube degradation, the as-found conditions of the tubes, had a significant impact on the ability of the steam generators to withstand the seismic event? That might have been one of the questions I heard there.

FACILITATOR DANIEL: That's right.

MR. COLLINS: What -- and did we look at that? Do we have an assessment? And do we think seismic qualification was significantly impacted? hate to put my team on the spot, but that was the question we got, I think.

FACILITATOR DANIEL: Go ahead, Emmett.

MR. MURPHY: Well --

MR. COLLINS: Okay, we had the team leader. Now we need the expert to speak, so --

MR. MURPHY: The pressure tests -- the test procedure calls for considering not only the differential pressures that are at work during normal operation and during the accident conditions, the safety margin, but for the section that you're testing, section of the tube that you're testing, you must adjust the test pressure to the extent that loading from a seismic event or a local rarefaction wave or some other hypothetical event, if that could affect the pressure

capability of the tube, that should be reflected in the test pressure that the in situ pressure test was conducted.

It was my understanding during discussions that I had with personnel during the time that the tests were done that at the sections that they were testing that no -- that the loading conditions for size differential pressure did not impact the failure pressures.

MR. WERNER: Thank you, Emmett. That's why I have people like him on the team. A lot smarter than I am.

FACILITATOR DANIEL: Well, what does that mean? Okay. Clarification.

MR. COLLINS: Let me restate it. Emmett, you check me to make sure that I say this in plain language accurately.

(Off-mic question)

MR. COLLINS: It would be the ground acceleration for the design basis earthquake at San Onofre, point 6 gs. But I think I heard Emmett say -- I'm looking at him carefully -- is that based on those stresses alone, the tubes would have retained their structure. Is that what you said? No? Emmett is going to clarify.

MR. COLLINS: The test pressure, test pressures at which the in situ test was conducted should reflect any seismic that is occurring.

I think maybe the point of confusion was, you know, is how much does seismic affect the failure pressure for the conditions that we had at San Onofre. It affected it -- it affected it in a negligible manner. In other words, it was differential pressure that controlled the structural margins for this situation.

(Off-mic question)

MR. MURPHY: Whatever magnitude they were required to consider. I don't know that -- that's not -- I don't know the answer to your question.

FACILITATOR DANIEL: All right. Thank you, Emmett.

MR. COLLINS: I think we all understand that it's not the magnitude. It's the magnitude and how close it is to the plant. So, what the plant has to be built to is what is the maximum ground acceleration at the site, and then it's doubled.

Then that acceleration is doubled. And for San Onofre that's 0.67 gs that constitutes the design. That's the ground acceleration at the site that the plant has to withstand.

(Off-mic question)

FACILITATOR DANIEL: Is that horizontal and vertical?

MR. WARNICK: There are components, horizontal and vertical. I don't know the numbers of exactly the horizontal and vertical, but yes that is considered.

FACILITATOR DANIEL: Okay. We have a gentleman here who has a question about steam generators.

MR. STEINMETZ: Thank you. My name is Jeff Steinmetz. I've got concerns concerning some of the changes regarding the generators and steam tubes. Previously, you stated that you did not -- that you only considered two changes to be under the 50.90 rule.

This I'm confused by because it's my understanding that you guys removed the stay cylinder. This should have fallen under the 50.90 rule. The changed tube sheet, the thickness of the -- excuse me -- the change tube sheet was changed. This should have fallen under the 50.90 rule. The tube alloy change. This was the only, as I understand it, thing that was clear to the NRC that was changed that SCE notified you guys of.

The additional tubes, 370 tubes per generator, this should have fallen under the 50.59 rule.

The changed tube supports should have fallen --

(Whereupon, at 12:18 p.m., DVD 2 ended)