BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

ADMINISTRATIVE LAW JUDGE MARIBETH A. BUSHEY, presiding

Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	)	EVIDENTIARY HEARING Rulemaking 11-02-019

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PUBLIC UTILITIES COMMISSION, STATE OF CALIFORNIA
SAN FRANCISCO, CALIFORNIA

I N D E X

STATEMENTS

SAN FRANCISCO, CALIFORNIA

NOVEMBER 18, 2013 - 9:30 A.M.

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ADMINISTRATIVE LAW JUDGE BUSHEY: The Commission will come to order.

This is the time and place set for the evidentiary hearing in order instituting rulemaking on the Commission's own motion to adopt new safety and reliability regulations for natural gas transmission distribution pipelines and related ratemaking mechanisms.

This is Rulemaking 11 -- R.11-02-019. Good morning. I'm Administrative Law Judge Maribeth Bushey, the assigned administrative law judge to this proceeding. Also presiding with me this morning is the assigned commissioner, Commissioner Florio.

We'll begin this morning with opening statements from four parties. And then we will proceed to the cross-examination of PG&E's witness Rosenfeld followed by the panel of witnesses Johnson and Singh and finally by witness Harrison.

Any questions before we begin with opening statements?

(No response)

ALJ BUSHEY: Hearing none, then,

Ms. Paull.

STATEMENT OF MS. PAULL

MS. PAULL: Thank you, your Honor. I'm Karen Paull representing ORA. PG&E's vice-president of gas transmission and maintenance, Mr. Johnson, has testified that in his professional judgment Line 147 is safe to operate at 365 psi, even though PG&E's now requesting 330.

He says it is safe to operate at 365 psi because all of Line 147 has been hydro-tested. And because the tests have confirmed that 365 psi is a safe MAOP -- MAOP for the court reporter is maximum allowable operating pressure -- and hydro-testing is the gold standard for checking the integrity of a pipeline.

So ORA expected PG&E to demonstrate in response to the order to show cause that all segments of Line 147 have been tested, especially since the line has been hydro-tested relatively recently.

Now, ORA's witness, Mr. Roberts, carefully reviewed the evidence PG&E provided up until shortly before this hearing, excluding the information we received just before the hearing. And he found that PG&E has failed to demonstrate that all of

Line 147 has been hydro-tested.

Keep in mind, if you will, that the line that runs through San Bruno exploded when a five-foot long pup failed. Every foot of a pipe counts.

Mr. Roberts' testimony also shows that the hydro-test information for Line 147 that PG&E has provided is internally contradictory with inconsistent start and end points for the same tests and is also inconsistent with other test information provided to the Commission. We cannot tell for sure where PG&E's hydro-tests of Line 147 started and stopped. PG&E doesn't appear to know, either.

Mr. Roberts' concerns are supported by the fact that SED acknowledges in its concurrence that two of the hydro-tests performed for Line 147 resulted in MAOPs of 220 and 236, much lower than the MAOP of 330 that PG&E now says is the corrected MAOP.

SED, however, decided that these low values could not be correct when all the data is considered. And that conclusion is based on engineering judgment.

No one can honestly stand here today and say that Line 147 is safe to operate at an MAOP of 330 psi. PG&E has not provided

evidence that demonstrates that. And this Commission, as you know, is required to make its decisions based on evidence and the applicable law.

The federal pipeline safety regulations provide several permissible ways to determine a line's MAOP. If the different methods produce different results, the operator is required to choose the lowest MAOP.

Two of the methods that apply in this case are based on hydro-test results and the design of the pipe. And when a pipe has been in prior use as defined in the federal regulations, which now appears to be the case for parts of Line 147, the design MAOP is to be calculated using a different formula that uses more conservative values.

In this case, both the design MAOP and the hydro-test MAOP require that Line 147 be operated at an MAOP of 220 psi. The regulations do not allow the MAOP to be set higher based on engineering judgment.

To be clear, this is not about whether Mr. Johnson or Mr. Shori have good judgment. It is a question about what the safety regulations specifically require. Engineering cannot trump those requirements.

In summary, Mr. Roberts' testimony explains how PG&E's evidence of hydro-testing is incomplete and inconsistent. In the interests of public safety, the Commission should not ignore deficiencies in PG&E's showing and should require that the MAOP be properly calculated as required by the safety regulations.

That is why ORA recommends that before the Commission authorizes any MAOP above the 125 psi that it's operating at now, it should require PG&E to show that every foot of Line 147 has been tested consistent with Mr. Johnson's representations and confirm that those test results support PG&E's requested MAOP.

And now I would just like to make a brief comment about process, procedural issues. The testimony ORA offers into the record today addresses the question of whether PG&E has shown that 330 psi is the correct MAOP for Line 147 under the federal regulations.

That narrow focus is consistent with the guidance on scope that you provided, your Honor, at the Prehearing Conference on October 21st. We just discussed this off the record. But I want to make the point on the

record.

Based on that guidance, ORA focused its preparation for today's hearing on Line 147. We prioritized our discovery to make Line 147 the first priority. And we agree that PG&E could respond to our discovery requests on the broader issues raised by the OSC after today's hearing. So we are expecting that at the conclusion of today's hearing, a schedule will be set to address those broader issues.

And, finally, one word about SED's concurrence, which we also discussed off the record. We received it at the end of the day Thursday last week. Also on Thursday and on Friday, PG&E served a series of voluminous files containing documents that PG&E said it had provided to SED previously.

These documents include transcripts of the examinations under oath of PG&E staff that are quoted in the SED concurrence. PG&E provided these transcripts to SED between October 24th and October 29th, nearly three weeks ago. But they were not provided to the other parties until the eve of this hearing.

As we said in our joint motion to revise the schedule for these hearings, which we filed on Friday, there was not enough time

to process this information before the hearing. ORA had to choose. We could prepare for today's hearing on the basis of the information we have gathered over the past two and a half months, or we could spend the entire weekend reviewing the large number of documents received just before the hearing. We chose to prepare for the hearing based on the information we had already sorted through.

And I just want to note for the record that we did not have adequate time to review the information provided on Thursday afternoon and Friday. Thank you.

ALJ BUSHEY: Thank you, Ms. Paull.

Mr. Gruen.

STATEMENT OF MR. GRUEN

MR. GRUEN: Your Honor, I might just echo -- I don't really have a substantive opening statement to say, but I might just echo one or two things in ORA's opening statement. We discussed off the record the focus of the hearings today. And based upon SED's understanding of the PHC of what was discussed at the PHC, SED informed PG&E that in discovery that data responses not pertaining to the operating pressure of Line 147 could be responded to after hearings

today.

So we too would expect that a further hearing be provided to focus on issues not pertaining to Line 147. And SED as well has not -- SED advocacy has not had an opportunity to review the transcripts that were provided on I believe it was Thursday and supported the concurrence report.

ALJ BUSHEY: Thank you, Mr. Gruen.

Ms. Strottman.

STATEMENT OF MS. STROTTMAN

MS. STROTTMAN: Good morning, Judge Bushey. Good morning, Commissioner Florio. Britt Strottman for the City of San Carlos. The City of San Carlos was brought in with the consent of PG&E, who welcomed our constructive contributions to these proceedings.

The City would like to renew its request for more time to conduct fracture testing. This will help our expert, Dr. Stevick with BEAR Laboratories to determine the allowable operating pressure. PG&E did not make an adequate showing of urgency that this line needs to be operated at a higher pressure for the winter months.

Or in the alternative, Judge Bushey, Commissioner Florio, we ask you that you

leave the record open until fracture testing is completed. It seems like this review of Line 147 is rushed, to state the issue simply. The City of San Carlos' interest is that the line is safe. Line 147 runs through the heart of the city and through densely populated neighborhoods. The citizens want to feel safe. The infamous "Are we sitting on a San Bruno situation?" email, the level of attention to this issue has led the citizens to perceive this situation as dangerous, and rightfully so.

We're looking to the Commission to take prompt action that you keep the operating pressure lower until the line is replaced. Specifically, we concur with ORA's recommendation that the line be operated at 125 until we have complete confidence that every foot has been hydro-tested. Thank you.

ALJ BUSHEY: Thank you, Strottman.

Mr. Malkin.

STATEMENT OF MR. MALKIN

MR. MALKIN: Thank you, your Honor, Commissioner Florio. I will be brief. The testimony of the parties who made it last week raised the question that you heard discussed this morning. The evidence that has already been presented to SED and the

parties does in fact demonstrate that every foot of Line 147 has been hydro-tested.

The testimony this morning from Mr. Johnson and Mr. Singh will explain the confusion that Mr. Roberts apparently had in trying to line up the documents and understand how every foot of a line was tested.

SED's concurrence did identify errors in two of the reports on the hydro-tests. Those were corrected. And corrected reports were sent to the parties last week and to SED's representative somewhat prior to that.

So there were discrepancies in the test reports. They have been corrected. Every foot of Line 147 was in fact hydro-tested, as the evidence will show. Every foot was hydro-tested to a pressure sufficient to support an operating pressure of at least 330 psig, which is all that PG&E is asking for today.

And you will hear from Mr. Rosenfeld, the living expert on hydro-testing, about the safety of this line and the hydro-testing. You will hear from Mr. Singh and Mr. Johnson as to the analysis they have gone through and why the

hydro-testing does in fact cover everything.

And, finally, because of the publicity around it, you will hear briefly from Mr. Harrison what he really meant when he wrote that email that's been splashed all over the newspapers.

MS. PAULL: Your Honor --

ALJ BUSHEY: Question?

MS. PAULL: Is Mr. Malkin requesting an opportunity to provide additional direct testimony on behalf of PG&E? That's what it sounded like from his statement just now.

ALJ BUSHEY: Why don't we wait to get a witness on the stand and see what he asks for. And we'll handle it at that time when we have something specific in front of us rather an abstract procedural discussion.

So, Mr. Malkin, are you ready to call your first witness?

MR. MALKIN: We are, your Honor. Consistent with the discussion we had before, our first witness will be Mr. Rosenfeld. My colleague, Mr. Hariston, will be presenting Mr. Rosenfeld.

As he's coming up, I would like to ask how we're going -- never mind.

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We're back on the record.

Mr. Malkin, would you like to call your first witness?

MR. MALKIN: Yes, your Honor. PG&E calls Michael Rosenfeld.

ALJ BUSHEY: Raise your right hand.

MICHAEL ROSENFELD, called as a witness by Pacific Gas and Electric Company, having been sworn, testified as follows:

ALJ BUSHEY: Thank you. Please be seated. State your full name for the record and spell your last name.

THE WITNESS: My full name is Michael Rosenfeld, R-o-s-e-n-f-e-l-d.

ALJ BUSHEY: Thank you. Mr. Malkin, I understand Mr. Hariston will be presenting this witness.

MR. MALKIN: Yes, your Honor.

ALJ BUSHEY: Mr. Hariston.

DIRECT EXAMINATION

BY MR. HARISTON:

Q Good morning, Mr. Rosenfeld.

A Good morning.

Q Thank you for being with us today.

Can you briefly summarize your background qualifications for the record?

A Yes. My background is I'm a mechanical engineer by training. I received

a bachelor's degree in mechanical engineering from the University of Michigan in 1979 and master's degree in mechanical engineer from Carnegie Mellon University in 1981. From 1979 to 1981, I worked at Westinghouse Electric in Pittsburgh performing structural analysis of power plant electrical generators.

From 1981 to 1985, I worked at company called EDS Nuclear, which then changed its name to Impel, I-m-p-e-l. During that time, I performed stress analysis of piping systems and site structures and equipment for nuclear power plants.]

From 1985 to 1991, I worked at Battelle Memorial Institute in Columbus, Ohio, where I performed analyses, design and testing of various types of industrial equipment, including everything from chicken fryers to military equipment.

Also, began getting involved in research and development work related to natural gas pipelines starting around 1987.

From 1991 to the present, I've been employed with Kiefner and Associates in Columbus, Ohio. During the first ten years my position was Senior Structural Engineer. During the second ten years my position was

president of the company. For the last two years, since we've been acquired by another company, my position has been vice president, chief engineer and service line manager for pipeline fitness for service related work.

During my time at Kiefner and Associates, I've been involved in pretty much all of the types of work that we do on behalf of operators of oil and gas pipelines, including numerous pipeline failure investigations, risk assessment, pipeline stress analysis, fitness-for-service assessments, evaluation of the time to failure for conditions such as fatigue, stress corrosion and cracking, corrosion, as well as presenting seminars and training.

I am a member of several -- ASME, that's American Society of Mechanical Engineers -- committees involved in writing standards for pipelines and piping systems. I'm also ASME's designated instructor for their workshop on the ASME B31.8 gas transmission and distribution piping systems workshop.

And I'm a registered professional engineer in the State of Ohio, and have written a few articles about pipelines.

MR. HAIRSTON: Q Thank you,

Mr. Rosenfeld. And have you recently been involved in an occasion with PG&E related to its natural gas transmission pipeline Line 147?

A Yes, I have.

Q And can you briefly describe the objectives of that occasion?

A Yeah. The overall objective was to try and understand whether the hydrostatic test that was performed on sections of Line 147 in 2011 verified the integrity and fitness for service of the pipeline at that time and currently going forward.

MS. PAULL: Objection, Your Honor. This is direct testimony. I thought the purpose of this hearing was to cross-examine PG&E's witnesses.

ALJ BUSHEY: Do you want a foundation or do you just want to move it in?

MS. PAULL: I'm not moving anything in right now. Foundation is --

ALJ BUSHEY: I assume that Mr. Hairston is leading up to moving this into the record. Are you willing to stipulate it into the record and we can go right to cross-examination?

You can't object to him making a foundation to move his testimony in.

MS. PAULL: No, I'm not objecting to his putting his testimony into -- offering his testimony into the record, but I don't -- this hearing should not be allowed to turn into more new direct testimony from PG&E. That's what I'm concerned about because that's what's happened in the past.

MR. HAIRSTON: Your Honor, this is brief foundational testimony.

ALJ BUSHEY: He seems to be reading the first paragraph of his letter from October 18th.

MR. HAIRSTON: And I actually believe, your Honor, that pursuant to stipulation of the parties, the October 18th letter will already be in the record --

ALJ BUSHEY: Right.

MR. HAIRSTON: -- because -- but there was a subsequent letter that I would like to move in and then --

ALJ BUSHEY: Where is the subsequent letter?

MR. HAIRSTON: It was circulated to the parties. It's not in evidence yet, which is why I would like to move it in, and complete some brief foundation. And Mr. Rosenfeld will be available for cross.

ALJ BUSHEY: All right. Do you have

extra copies of that?

MR. HAIRSTON: Yes, we have.

MS. BONE: When was that circulated to the parties?

MR. HAIRSTON: I don't know that off the top of my head.

ALJ BUSHEY: We'll be off the record.

(Off the record.)]

ALJ BUSHEY: We'll be on the record.

While we were off the record, we received a copy of a November 14, 2013 letter from Mr. Rosenfeld to Mr. Singh at PG&E. For the moment we've marked it as Exhibit A.

(Exhibit A was marked for identification.)

ALJ BUSHEY: Ms. Strottman.

MS. STROTTMAN: Yes. Thank you, your Honor. And we are objecting to Exhibit A being entered into evidence. It's 17 pages we justified received I guess at the end of the last week. I'd like to renew my request that this proceeding be continued to a different time.

There are 17 pages of substantive findings in here. This just isn't background information and San Carlos thinks that it's fair for the City to have more time to review all this information.

And I'd also like to note that on Friday afternoon before 5 o'clock, we received all of our responses to our data requests, which we still haven't had time to review.

ALJ BUSHEY: Thank you, Ms. Strottman.

Exhibit A is identified only for the record.

Mr. Hairston.

MR. HAIRSTON: Thank you, your Honor. I think I'll just ask one more foundational question and make Mr. Rosenfeld available.

Q So Mr. Rosenfeld, before we went off the record we were discussing your analysis of Line 147. Do you recall that?

A Yes.

Q And what was your conclusion regarding the safety of Line 147?

A My conclusion is that the hydrostatic test was effective at demonstrating the integrity and fitness for service of Line 147 at that time and current -- there's no reason to believe that that's not still the case, and the pipeline is safe to continue operating.

MR. HAIRSTON: Thank you, Mr. Rosenfeld.

Your Honor, I'm going to ask just

a few more foundational questions before we make Mr. Rosenfeld available.

Q So Mr. Rosenfeld, can you briefly summarize the materials that you relied on to conduct your analysis?

A Yes. I relied on data from the --

MS. PAULL: Objection, your Honor. This again is direct testimony.

ALJ BUSHEY: He's describing what he relied on.

MS. PAULL: But --

ALJ BUSHEY: It cannot possibly be more foundational.

MS. PAULL: Isn't it in the document? Isn't it in the document?

ALJ BUSHEY: It's repetitious? Is that your objection is repetitious?

MS. PAULL: Your Honor, if it's in the document, it's not necessary to take up precious hearing time with direct testimony when the purpose of the hearing is to permit the other parties to cross-examine PG&E's witnesses.

ALJ BUSHEY: Are you willing to stipulate -- well, this is already in the record.

MS. PAULL: Yes.

ALJ BUSHEY: So let's just -- that's

enough. Mr. Hairston, you're done.

MR. HAIRSTON: Okay. Thank you.

ALJ BUSHEY: Cross-examination of the witness, who would like to begin?

MR. GRUEN: Your Honor, we're prepared to cross.

ALJ BUSHEY: Please begin, Mr. Gruen.

CROSS-EXAMINATION

BY MR. GRUEN:

Q Good morning, Mr. Rosenfeld. My name is Darryl Gruen. I'm representing the Safety and Enforcement Division for the California Public Utilities Commission.

Just a couple of questions and just to specifically note for the record I'm only asking questions about the October 18 letter.

Were there any other individuals other than yourself either who you supervised or colleagues who helped you write that letter?

A Well, I wrote all of the letter. However, there's a fair amount of analysis work involved and so I -- there were two other engineers in our office who performed analyses at my direction.

Q Okay. And so the information that came, the results of these analyses from those two other engineers were incorporated

into the October 18 letter; is that right?

A That's correct.

Q Okay. One other question about the letter is, would it be your view if PG&E had -- could conduct an in-line inspection of Line 147, would it be able to pick up cracks on that line?

A Currently, in-line inspection technology for detecting cracks is not very well developed for natural gas pipelines, so --

Q So it would not be able to pick up cracks on Line 147 if it was conducted; is that correct?

A It's conceivable that it may. It's also possible that it may not.

MR. GRUEN: Thank you, your Honor. No further questions.

ALJ BUSHEY: Thank you.

Ms. Paull.

MS. PAULL: I do not have questions.

ALJ BUSHEY: Mr. Long.

MR. LONG: No questions.

ALJ BUSHEY: Ms. Strottman?

MS. STROTTMAN: Thank you. Sorry.

CROSS-EXAMINATION

BY MS. STROTTMAN:

Q Good morning, Mr. Kief- -- I'm

sorry, Mr. Rosenfeld. I'm Britt Strottman with the City of San Carlos.

So, I wanted to you ask a few questions about your October 18 letter.

You stated that there are three limitations to hydrostatic testing and I believe that's on page 5 of your letter. Do you recall that?

A Yes, I do.

Q And I believe the first one is that it doesn't ensure the -- assure the integrity of the line.

Sorry. I'm just trying to find -- oh, I'm sorry.

The first one is that it may only assure integrity for a finite period of time; is that correct?

A That's correct.

Q And what do you mean by that?

A Well, the hydrostatic test, if it's successful and the test pipeline doesn't fail during the test, the hydrostatic test proves that there are no flaws or defects of a size that would fail at the test pressure or at the operating pressure since the operating pressure is much lower than the test pressure. However, there may still be flaws that remain in the pipe that are not

currently a threat to the safe operation of the pipeline.

If there's a mechanism for those flaws to enlarge over time in service whether it's due to corrosion or fatigue or anything else, then essentially the proof of the integrity of the pipeline or its fitness for service eventually is no longer reliable and you have to perform another assessment.

Q So can you give me a list of when you would have to perform another assessment when you have to hydro it, a line it again?

A Well, there are no regulatory requirements. If you're in a designated high consequence area, you have to perform -- under Part 192, you have to perform a reassessment typically every seven to ten years, depending on circumstances. Or if you have a circumstance that you're concerned about, for example, fatigue or something of that nature, then one could perform engineering analyses that evaluate how long it will take for those conditions to become a concern and one would perform a reassessment prior to that time.

Q And a condition that would cause concern, would that -- would a reconditioned pipe be considered a condition that would

cause concern?

A Not if it's successfully undergone a hydrostatic test to a high level above what it's going to operate at.

Q What about the importance of good recordkeeping. Is that a consideration of whether a test should be -- or whether a pipe should be hydrotested?

If you don't know what's in the ground, for example, should a pipe be hydrotested more often?

A No. I don't think that that necessarily ties into how frequently one would hydrotest the pipeline. The main determinant for how frequently one would do that is the ratio of test pressure to operating pressure.

Q Do you think it's important to know what's in the ground, though?

A Important. I'm not quite sure what you mean by "important" and to what end so...

Q Whether a pipeline can be safely operated, do you think it's important that a utility know what's in the ground and have accurate records?

A Certainly it's useful.

There are I think many pipeline systems in the country that are operating

with some degree of uncertainty about exactly what every individual feature in the pipeline is. PG&E is not necessarily unique in this regard. In fact, I know pipeline systems built in the 1990s where there isn't complete correlation between what's on the record and what's in the facility.

Q But you still would agree that it's useful to have that information to know what's in the ground to have accurate records?

A It's useful, but I believe that one can operate a pipeline system safely provided you have performed a hydrostatic test to a high level with a generous margin over and above what you operate at. Beyond that, being a prudent operator means doing things that you're supposed to do in day-to-day operation of -- doing things to prevent corrosion, doing things to prevent damage, and so on. That doesn't necessarily rely on having a great deal of specific data about some things about the pipeline.

Q Now, referring to your October 13th letter -- or I'm sorry, October 18, 2013, letter, did any attorneys review your letter?

A I have no idea.

Q Did you notice any changes in your

letter from your initial draft that I assume you sent over to PG&E and your final draft?

A No. I'm not aware of any changes.

Q And how many contracts do you have with PG&E? And if you can estimate the total income that you've made from your contracts with PG&E.

A Yes. We have other work with PG&E. I think this year we'll probably come close to $200,000.

Q And then how much is your rate per hour?

A My rate is $245 per hour.

MS. STROTTMAN: Your Honor, may I just have one moment.

ALJ BUSHEY: Off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

MR. MEYERS: Thank you, Judge Bushey, Commissioner Florio.

CROSS-EXAMINATION

BY MR. MEYERS:

Q Mr. Rosenfeld, my name is Steven Meyers. I'm representing the City of San Bruno in this proceeding. I just have a few questions for you this morning.

Line 147, a portion of Line 147

consists of what's called AO Smith pipe; is that correct?

A Yes, sir.

Q And do you know the vintage of that pipe; in other words, when was that pipe manufactured?

A It appears to be first generation AO Smith line pipe which would have been made prior to the middle of 1930.

Q All right. Prior to 1930. And do you know whether that pipe was previously used at a PG&E facility or PG&E pipeline system?

A No. I don't know specifically where it might have been used.

Q Do you know whether this pipe is reconditioned pipe as that term is generally used?

A It appears to be, based on some welding and repair features discovered on the pipe.

Q And when was that reconditioned?

A Well, most likely would have been before it was installed in that pipeline.

Q But you don't know specifically?

A No, I don't know specifically.

Q Does PG&E have records showing when it was reconditioned?

A I haven't seen those.
Q Do you know where it reconditioned?
A No, I do not.
Q Does PG&E have records showing where it was reconditioned?
A You'll have to ask PG&E that.
Q And do you know how it was reconditioned, in other words, what did they do to the pipe to recondition it?
A Generically, what is typically done with reconditioned --
Q Sorry. I'm not asking you generically. I'm asking you specifically with respect to that portion of Line 147 existing at Mile Post 2.2.
A It appears that they filled corrosion pits with weld metal.
Q Is that customarily what's done to recondition pipe?
A Well, as I was about to explain with the previous question, yes, that is actual my fairly typical. In fact, there are many pipelines all over the country that contain reconditioned pipe. In fact, I know of one pipeline that has been salvaged and reinstalled in different locations three different times.
So typically, what's involved is

the pipeline is -- the pipe materials are cleaned up so that they can examine the condition inside and outside of the pipe. Any features such as corrosion pits are filled with weld metal to restore the strength. If there are -- if there's damage that can't be properly repaired that way, it's cut off the piece of pipe and the pipe is recoated and reinstalled in a pipeline.

Q Is there CPUC guidance given to utility operators in California on how to recondition pipe?

A I do not know that. I do know that the American Society of Mechanical Engineers' standard for gas transmission and distribution pipeline systems has provisions for using or reusing pipe, and they do require going through exactly the steps that I described before the pipe can be reused.

Q But as an expert for PG&E and as you sit here today, you have no personal knowledge that PG&E went through those steps to recondition this pipe; is that correct?

A Well, it appears that they did do some of those steps because there are corrosion pits that have been repaired with weld metal.

Q How much AO Smith pipe remains in PG&E's system?

A I don't know.

Q Does PG&E have records showing the amount of AO Smith pipe that it has in its system?

A You'll have to ask PG&E that question.

Q How many feet of AO Smith pipe is there in Line 147?

A Off the top of my head, I'm not exactly certain.

Q So if you were building a pipeline today and you were advising the utility they had a choice between 84-year old reconditioned pipe or new pipe, what would you tell them to use?

A Well, I'm not aware of people using -- reusing old line pipe today. This was a practice that was very common in the '40s and '50s because the demand for pipe was much larger than the available supply. It's what people did.

Q So it's not done anymore; is that your testimony?

A It's still allowed but I don't know people who do that anymore.

Q Okay. Well, you're an expert --

A Because --

Q You're an expert in this business. You obviously have extensive qualifications. Are you aware of any recent, recent within the last decade utilities in the United States that have used reconditioned pipe?]

A Within the last decade, installing reconditioned pipe?

Q Yes, sir.

A No.

Q I'm sorry?

A No. But they're certainly using reconditioned pipe that's already in their system.

Q You testified that PG&E hydro-tested the entirety of Line 147 from its connection at Line 132 to its connection at Line 101; is that correct?

A I don't know that I used that word anywhere. I said that they tested their pipeline.

Q Okay. Well, let me ask it a different way. To your personal knowledge, based upon the records that you reviewed produced by PG&E, did PG&E test -- hydro-test Line 147 through its entire length from Line 132 to Line 101 including all the shorts, elbows, miters, joints, valves

associated with that pipeline?

A I did not check that. I didn't view the purpose of my evaluation to be a verification of start and end points or reconciliation of discrepancies in records. We have hydro-test records from 1987 and 1990 pipeline replacements. We have hydro-test records from 2011 showing extensive amounts of hydrostatic testing. And I take that information at face value that line has been hydrostatically tested.

Q I'm not sure I got an answer to my question. Let me try it a different way, Mr. Rosenfeld.

In your testimony, you said that even though records may not exist for a particular pipeline and even though the pipeline that exists in Line 147 in San Carlos that we may not have accurate pipeline features for that, it's okay because PG&E tested that line to a level that was sufficient to maintain a maximum allowable operating pressure of 365 -- in this case, 330 -- and it's okay because they hydro-tested the line.

Are you with me so far?

A Yes, sir.

Q Okay. Did PG&E hydro-test all

aspects of that line from 132 to 101 including the shorts, the valves, the miters, the elbows, the joints, everything else associated with the line?

A I did not verify that.

Q Well, then how can you tell us that the line is fit for service?

A The issue that I was asked to evaluation was whether the hydrostatic test is a good measure of the integrity of the pipeline system. I was not asked to verify that the test extended to every foot of the pipeline.

Q But you testified that the line was fit for service.

A That's correct. And Mr. Singh, I believe, is PG&E's witness for describing the reconciliation of reported various pressure test records with respect to their start and stop end points. And he has told me that he believes that all of those discrepancies are resolvable. So I'm going on the information that I received from PG&E.

Q Okay. So just so the record's clear and I'm clear -- I may be the only one in this room that doesn't quite understand this -- but your opinion is not based upon your own personal analysis of the data. Your

opinion is based to some extent on the statements made by other members of the PG&E staff to you?

A With respect to the reconciliation of discrepancies and start and stop points, yes.

Q Okay. Thank you. What is API 579?

A API 579 is a fitness-for-service standard that's panel recognized in various industries for evaluating the fit for service of pressure vessels in piping systems.

Q Does it have to do with crack growth in pressure vessels?

A One aspect of it does discuss that, yes.

Q And in the literature on API 579, does any of that discuss weld material that dates back to 1929?

A Not specifically, no. It discusses weld material and carbon steels, among other things.

Q Have you ever performed any crack growth test for pipe that dates back to 1929?

A We performed a lot of mechanical testing on line pipe of various vintages. And the 1929 line pipe is basically a very plain carbon steel that is no different than a wide variety of carbon steels that are

adequately represented, in my opinion, by the crack growth rate parameters recommended by API 579.

Q Did you ever examine the cracks that were evident in Line 132, Segment 180, that exploded in San Bruno in 2010?

A I have read the metallurgist's reports and other documents associated with it. I haven't personally examined the pipe.

Q Have you done any study of the crack growth rates in that section of pipe?

A The crack growth rates in that section of pipe have never been tested.

Q And Doctor -- it's Doctor, isn't it?

A No, no.

Q Sorry.

A Sorry. I can't prescribe prescriptions.

Q But after today, you may need to.

If Line 147 were built today by PG&E, would you recommend PG&E use reconditioned A.O. Smith pipe if it was available?

A No, because it's possible to get new line pipe today.

Q Better pipe?

A New pipe.

Q New is generally better, isn't it?
A Not necessarily.
Q What time of seam weld is there on A.O. Smith pipe?
A A.O. Smith Pipe made seam welds using a variety of technologies depending on when the pipe was made. In this particular pipe, it would have been an automated shielded metal arc weld used to fill a groove from the outside of the pipe.
Q And the shielded metal arc weld welds the top of the pipe, but not the inside of the pipe; is that correct?
A No, that's not true. The way A.O. Smith made this pipe was they machined a wide bevel in the ends that would form a U-shaped groove. They then pressed the edges of the pipe together. And the inner portion of the what would be called the land, the bottom of the U-shaped groove, would then deform into what's called a chill bar on the inside of the pipe that would provide for cooling of the weld metal that may come through the gap. And then they would fill up the groove with weld metal.
Q So the weld bead cap extends all the way through the cross-section of the pipe?

A That would be normally the case, yes.

Q And why did they stop doing that in 1930?

A Because it was too slow a process. They couldn't make pipe fast enough using that process. So they went to something that could allow them to make more pipe faster.

Q And in your examination of the section of pipe from Line 147 that was removed by PG&E in August of this year, did you see that there was in fact shielded metal arc welding on that piece of pipe?

A What I saw were photographs. I didn't examine the pipe personally, but I relied on photographs that I believe were in the metallurgist's report.

Q So you didn't examine that pipe yourself?

A I did not examine that pipe personally. But based on a photograph that I saw that was supposed to be of the scene from that pipe, I concluded that it was A.O. Smith pipe of that particular variety.

Q Does steel pipe get brittle as it gets older?

A No. Its properties do not change with time.

Q So 500 years from now, that pipe would still have the same plastic properties?

A It should, yes.

MR. MEYERS: Thank you. I have no further questions.

ALJ BUSHEY: Thank you, Mr. Meyers.

Other parties have further questions?

Commissioner.

COMMISSIONER FLORIO: Thank you, Mr. Rosenfeld. Appreciate you being here today.

EXAMINATION

BY COMMISSIONER FLORIO:

Q At some point in the not too distant future, my colleagues and I, none of whom have a background in metallurgy or welding, are going to be asked to allow the pressure on this line to be restored to at least 330 psi.

In the face of what appears to be some fair degree of public skepticism, what degree of assurance can you provide us that this line is safe to operate? I don't know if you can put percentages on it or. But, you know, this is a big decision. And it's a challenge for us.

A Sure. I understand that. You

know, I looked at it from the standpoint of what do I believe the pressure test shows about the pipe? What didn't it show as well? And what other evidence is there that PG&E understands the various integrity threats affecting the pipe? And are they doing something to manage that? And I think my October letter describes that thought process.

I believe that there's actually a regulatory basis dating back to when Part 192 was first adopted that would support an MAOP of 400 psi, which is greater than pressures that you're talking about right now. And I believe that the current condition of the pipeline does in fact support that as demonstrated by the pressure test.

And, to be honest, I'm aware there are people living around the pipeline. And throughout this process, I've contemplated knowing what I know as a pipeline engineer knowing what I or based on what I can determine or infer from the information available, how would I feel about living next to that pipeline? And I don't see a cause for concern. I mean, the only question I came away with was are the schools any good? So I wouldn't have a concern about it, about

living there.

Q Apparently some concern about whether the entire pipe was tested. I take it you're not in a position to say any more about that than that you're relying on PG&E's representation that it was?

A That is correct. I will point out, though, that it's not unusual for a pipeline operator to have discrepancies in stationing or location information because what happens is that the pipeline does have its length changed at various times. New pipe is added. Other pipe is taken out. Portions can be relocated.

How you establish that, those locations -- you can -- the positional information you get can vary depending on the technique you use, whether it's surveyor's chain in transit or you're using electronic theodolite or you resort to GPS sort of data, every pipeline operator that I know of has to carry forward historic locational data and then try and reconcile that with new or updated data that doesn't tie in. And it's just thing that operators learn to work with.

COMMISSIONER FLORIO: Thank you very much.

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EXAMINATION

BY ALJ BUSHEY:

Q I just have a couple questions for you. I wanted to circle back to your notion that the -- well, I'm sorry. Let's start with a foundational question.

In the pantheon of pressure test experts in the United States, would you place yourself near the top?

A Well, I guess if I didn't, I shouldn't be here. But, you know, I would certainly put Dr. John Kiefner probably at the top of that list. And there are other well known experts in the pipeline industry on hydrostatic testing. And I've tried to make sure I understand exactly what they're doing as well.

Q Okay. So it would be safe to say that you're one of the top experts in the United States on pressure testing of natural gas pipelines?

A I'll accept that, yes.

Q Okay. Thank you. All right. Now, I want you to think about all of the pipelines that you've seen and that you've had experience with in your history.

Of those that are reusing 1940s and 1950s pipeline or reconditioned pipeline,

what share of them do you think of them pressure tested?

A I can't give you a proportion. I do know of plenty of instances where that we've been involved in hydrostatically testing pipe that does contain salvaged or reconditioned pipe, often with visible crack-like features in repair welds not unlike what we've seen here. And in most cases, they do just fine in a hydrostatic test and subsequently.

Q So you've seen this before in pressure test. So that brings us though to the efficacy of pressure tests and how much -- what we can draw from the fact that a pressure test has been conducted. I'd like to put that together with the record-keeping challenges that PG&E seems to experience.

Let me ask you first, based on your experience, what is your assessment of the level of record-keeping challenges that PG&E seems to be facing? Are they above average, average, or below average for the industry?

A Well, I think they're in the category where they're not alone. Other pipeline systems have -- there are many other pipeline systems that are equally old or variegated or complicated. And they also

have -- there other pipeline systems that don't have any significant things to talk about.

So, you know, in terms of challenges, they're probably at the more challenged end of things. But I know of systems where pipeline operators are operating at much higher pressures than this, ten times this pressure, literally. And they actually don't know what the pipe is, so --

Q And has it been pressure tested?

A That's the question.

Q Right. Let's talk a little bit about that, about assuming that we have above average record discrepancy problem at this utility, what the best means for a regulator to address that problem?

A Well, you know, the CPUC did direct PG&E to hydrostatically test pipeline systems where they can't verify a prior test or are lacking information about the pipe. That's an appropriate -- that's an appropriate response because regardless of what's actually in the pipeline, if you tested to this level and you're operating down here, if you tested this level and you have a successful test where the pipe doesn't rupture or, you know, doesn't leak during the

test, you've demonstrated the ability of the pipeline to safely operate here. It's just logical.

Q Okay. Back up to your preparatory statements. Regardless of what's in the pipeline -- explain that.

A It's like a load test, or it's a proof test. You may not know the precise properties of the material or certain other data. But what you've proven is that the pipe can withstand a pressure that's much -- and is therefore stressed that is much higher than what you're intending to operate at.

Now, you're not proving that the pipe is perfect, flawless material. But what you are showing is that there's nothing present in the pipeline today that could threaten the safe operation of the pipeline at this proposed operating level that's well below the test pressure.

Now, you know, the validity of that may decrease over time, if there's a mechanism for whatever remaining flaws that you don't know about, if there's a mechanism for them to worsen over time. But insofar as its current condition and for near-term foreseeable future, you've proven the strength of the system irrespective of what

the specific materials or details of the pipe are.

Q So then really the only practical response that a regulator has is hydro-testing to when there are instances of incomplete or inaccurate records?

A I think it's a good practical response. One might -- actually, I believe PHMSA is contemplating proposed rulemaking right now concerning what's called their IVP or Integrity Verification Process where they are leaving the door open for performing an engineering critical assessment and other measures instead of hydrostatic testing.

So but the onus would be on the operator to demonstrate that the combination of engineering analyses and, say, in-line inspections and institute properties testing and whatever other methods operator may attempt to use will be safe and reliable. And the people who are performing it are capable of doing it consistently and repeatedly, repeatably, and so on. But they are leaving the door open for -- I believe for performing engineering assessment. However, that's not a regulation yet.

Q And it's certainly not a regulation in California?

A No, it's not.

Q Thank you. Just a couple last questions. You stated that the most important thing is the ratio of the test pressure to the operating pressure?

A Yes, it is.

Q Okay. And, in your opinion, the ratio of the test pressure here to the operating pressure here or the proposed operating pressure here is in excess of the ratio that you would recommend?

A Yeah, I think it's plenty adequate for the need. Essentially, I think for a system like this, anything over one and a half is going to provide good assurance. And you're well above that.

ALJ BUSHEY: All right. Thank you.

Redirect, Mr. Hariston?

MR. HARISTON: Yes, briefly.

MR. LONG: Can I just ask a couple of questions based on the questions of you and the commissioner?

ALJ BUSHEY: Recross -- new cross. All right, Mr. Long.

CROSS-EXAMINATION

BY MR. LONG:

Q I'm curious about something, Mr. Rosenfeld. I'm Tom Long with TURN.

A Yes.

Q You're aware that under the federal regulations maximum allowable operating pressure or MAOP is to be determined by the lower of MAOP calculated under various methods; is that right?

A Correct.

Q Okay. And one method is based on hydro-testing. And that's what you've been talking about; is that right?

A Yes.

Q And another is based on the design pressure calculated according to Barlow's Formula; is that right?

A The design pressure is calculated according to a formula that's in 192.105. And that is not precisely Barlow's Formula.

Q Okay. Thank you. So under the federal regulations, if the design pressure is lower than the test pressure MAOP, then the operator's is required to use the design pressure MAOP; is that right?

A Well, what I have to point out is that this pipeline system was already in place and in operation before the federal regulations were enacted in 1970 and in fact before the concept of class location fact was existed as well. So the regulations in 1970

contained provisions for dealing with already existing systems which would have applied to this pipeline.

And 192.619(c) said -- well, I mean, 619 listed some of those various methods of establishing the MAOP. But it also said those requirements notwithstanding, the pipeline operator could continue to operate at the highest pressure that it had experienced during the five years prior to July 1st, 1970. So that would have been 400 pounds in this case.

And so there's a basis there. And in addition to that, there's a paragraph 192.607 which no longer appears in the regulations. That was taken out in like 1993 or '96 or something because it was no longer needed. But that provided for a procedure for the operator for the first establishment of the -- or verification of the MAOP under the new regulation.

And both 619(c) and 607 pointed to meeting the requirements of 192.611. And 192.611 said that in lieu of doing a hydrostatic test, you could -- the pipeline could continue to operate not in excess of what it experienced during the five years prior to 1970. And provided the pipeline was

in good condition, it could operate or its pressure had to be adjusted so that the stress did not exceed what was allowed for the particular location class. So this being a Class 3 area, that would be 50 percent of SMYS.

Now, there was also in 1979 PHMSA or at that time it was called Office of Pipeline Safety issued an interpretation written by acting director, Cesar de Leon. And he said in that interpretation, you do not use the joint efficiency factor in establishing -- in calculating the hoop stress.

So when you piece all these together, what that would indicate is that the prior MAOP of 400 psi is essentially validated going forward from 1970. There's nothing in the regulations that took that away.

Q Okay. I didn't know your answer was going to go that long. I probably should have interrupted. But anyway I appreciate that response.

But I wanted you to focus on just the MAOP. Put aside the grandfathering provision. Put aside one class out. And let's just focus on MAOP based on pressure

test and MAOP based on design pressure. And if you just have those two and put aside these other exceptions, the rules say if the design MAOP is lower than the test pressure MAOP, the operator is to use the design MAOP; is that right?

A Well, no. The regulations say what I just recited earlier.

Q But putting aside those, though, if you have -- I mean, in fact, what's going on here is PG&E is limited from Line 147 by the design pressure; is that right?

A No. I believe PG&E is limited in its pressure based on the chain of what the different paragraphs in 192 permitted both historically and currently.

Q You're aware that PG&E is proposing an MAOP for Line 147 of 330 psi?

A Yes, sir.

Q And is that the MAOP calculated by design pressure?

A That would be the MAOP that you would get by taking the -- yeah, that would be the pressure that you would get using the design pressure for the least favorable pipe. But that is not the MAOP that you would arrive at using all of what the regulations state.

Q The question I'm trying to get to here is do you have an understanding of why the experts who drafted the federal pipeline regulations would say that, notwithstanding your views, that the pressure test is the gold standard, that in instances where the design MAOP is lower than the pressure test MAOP, that the operator should use the design MAOP?

A I'm sorry. I'm going to have to ask you to rephrase or restate the question.

Q Okay. Why does design MAOP trump -- under the regulations, why are the regulations set up so that the design MAOP trumps pressure test MAOP?

A Well, you know, there are a number of different things that for designing and commissioning a new pipeline, which is not what we're talking about here. But if you're building a new pipeline, this is where design enters. So you've got multiple multiple criteria. You can't operate at more than the lowest pressure --

ALJ BUSHEY: Excuse me, Mr. Rosenfeld. I'm sorry to interrupt, but I want to back up for a minute because I think it's important that the record be clear. And I'm not clear on the foundation of Mr. Long's question. So

let's try and get clarity on that. I'm going to split it down into a couple of simple questions.

I'm looking at Subpart J right here.

THE WITNESS: Okay.

ALJ BUSHEY: Is there a subsection of this that says that you compare the results of a pressure test to a calculated MAOP based on pipeline features? Is there regulation that says that?

THE WITNESS: If you go to 192.619, that is where they will list that. So that's not under Subpart J. Subpart J only talks about the requirements for carrying out a pressure test.

ALJ BUSHEY: And why would we use 619?

THE WITNESS: Well, because 619 is the paragraph that talks about operation and maximum allowable operating pressure.

ALJ BUSHEY: Okay.

MR. LONG: Your Honor, I was referencing Section 619(a), Subpart 1. Subpart A says lowest of the following. And then the first one listed is the design pressure calculated according to Subpart C and D. And that is what Mr. Rosenfeld was referring to as 192.105, I believe.

ALJ BUSHEY: Okay. All right. So

that's what we're talking about. Not Subpart J.

THE WITNESS: That's correct.

ALJ BUSHEY: Okay. So it's the operational requirements. Okay.

MR. LONG: How to set the MAOP.

ALJ BUSHEY: Right. Okay. Thank you.

MR. LONG: Q And the regulations, Mr. Rosenfeld, said "lowest of." And one of the listed elements is design pressure.

So my question is -- back to my question, why are the regulations drafted this way -- if you know, why do the regulations require the design pressure to trump a pressure established by hydro-testing, if that design pressure is lower?]

A Well, again, this is for establishing the MAOP of -- essentially of a new pipeline. There were already provisions -- there are other provisions that deal with establishing or verifying the MAOP of an existing pipeline system, and that occurred in 1970. So that would have carried forward to today. So really you have to look at this in the context of what have the regulations always said.

Q Right. But let's -- okay. We'll

talk about an older pipeline, one that's grandfathered, et cetera. But if the design pressure is lower than all of those, then the design pressure is still going to control; isn't that right?

A Well, in 1970, what the language said was "those requirements notwithstanding," meaning, you don't have to abide by those. Alternatively, you can operate at how you operated for -- at the highest pressure during the five years before the regulations and subject to the requirements of 192.611.

Q Let's talk about a post-1970 pipeline, then. Why -- back to my question. Why would the regulations be drafted in such a way that the design pressure trumps the MAOP test pressure -- test pressure MAOP?

MR. HAIRSTON: Your Honor, I object. Mr. Rosenfeld is here to discuss and opine upon the safety of Line 147. He is being asked to describe the original intent of these pipeline safety regulations. I don't know that this is the necessary forum for that or that he's --

MR. LONG: Frankly, I'm trying to understand why Mr. Rosenfeld is relying on the test pressure as the gold standard for

safety -- and that's PG&E's position and Mr. Johnson's statement as well -- when we have the rules that seem to say a different type of pressure is important to getting the right MAOP.

MR. HAIRSTON: Your Honor, I suggest that that's the appropriate question to ask Mr. Rosenfeld, not to ask him to interpret the original intent of the draft regulations.

ALJ BUSHEY: But he seems to be giving us answers that -- there are two other subsections to this particular rule and there is a sub-subsection that talks about if something is unknown, that it's 80 percent of what looks like SMYS. It seems to be a rule that has a lot of different permutations to it.

MR. LONG: It's true, but I think Mr. Rosenfeld has agreed that at least for post-1970 pipeline, that if the design pressure is lower than the MAOP pressure, then we're going -- the operator must use the design pressure as the controlling MAOP.

Q Is that right, Mr. Rosenfeld?

ALJ BUSHEY: Right. And that's a very interesting point, Mr. Long, but Line 147 isn't post-1970.

MR. LONG: We don't follow the

grandfathering rule. And we can have -- there is a debate we can have about one class out, but PG&E's current interpretation is one class out doesn't apply here either.

ALJ BUSHEY: Well, the Subsection 3 seems to follow exactly what he says about the highest operating pressure. So --

MR. LONG: That's the grandfather.

MS. PAULL: That's the grandfather clause.

MS. BONE: That's been eliminated by this Commission.

MR. LONG: We don't follow that. That was your decision.

ALJ BUSHEY: I understand that. But now you've gone perfectly in a circle. Now you're back to pressure testing because that decision said "pressure test."

MR. LONG: I guess I'm happy to ask it the way counsel wanted me to ask it.

Q I would like an answer to the question of why design pressure is important and why the federal regulations seem to think that if design pressure was lower than these other ways of establishing MAOP, that we should use the design pressure.

A Well, disregarding the original language which included the "notwithstanding"

paragraph, it doesn't say what -- what it says is use the lowest of any of about four or five different ways of getting to that pressure.

So it doesn't place a higher priority on the design pressure. It says you use the lowest of several alternatives. If the design pressure is the lowest, then that's the one you use. But there could be other things that are lower than the design pressure.

Q Right. But if the design pressure is lower, then we use that.

A Yes, in the simplest interpretation.

Q And why would that be?

A It's no different than saying -- they're saying use the lowest of several. If that's the lowest, then that's the one you use.

Q And is that for safety?

A Well, the whole regulation is for safety.

Q Okay.

A It says minimum federal safety standards.

MR. LONG: Okay. Thank you.

ALJ BUSHEY: Additional questions?

Ms. Paull?

MS. PAULL: Yes.

CROSS-EXAMINATION

BY MS. PAULL:

Q Mr. Rosenfeld, I'm Karen Paull, for the Office of Ratepayer Advocates.

If you look at Subsection (a) 1 of 192.619 -- do you have the regulation in front of you?

A No, I don't.

Q You don't. Okay. Well, are you aware that it has a provision for pipe being converted under Section 192.14?

A Being converted. So that would be conversion of service from transporting hazardous liquids, I think.

Q Well, here's what it says. "The design" -- this is the section you've been discussing with Mr. Long about the requirement of the regulations at the lowest MAOP be used if the different methods, allowable methods, produce different results.

So Subsection (a) 1 says

"The design pressure of the weakest element in the segment determined in accordance with Subparts C and D," but it says, "however, for steel pipe in pipelines being converted under Section 192.14," and

then it goes on to say there is a different formula that has to be used as a design -- to calculate design MAOP.

Are you aware of that, that aspect of the rule?

A Well, I'm not sure how it's applicable. What's the title of 192.14?

Q That's the section about if a pipe has been used, it's called conversion to service subject to this part.

MR. HAIRSTON: Your Honor, can I ask that Mr. Rosenfeld be provided a copy of the regulations and a chance to look at them if he is going to be questioned on this specific language?

MS. PAULL: May I approach, your Honor?

(Pause in the proceedings.)

THE WITNESS: Well, I'm not sure how this is applicable because the first sentence of 192.14 says "A steel pipeline previously used in service not subject to this part."

So this pipeline already was subject to this part. So whatever it says in there isn't necessarily applicable unless it has identical requirements to parts that are applicable.

MS. PAULL: Q What if you -- if you don't know what the prior use was, prior use

of the pipe? What if you have no way of knowing how it was used before it was put in the ground in Line 147?

A Well, I'm pretty sure PG&E believes that Line 147 has already been a natural gas service.

Q But if it used pipe. There is evidence in the record that PG&E -- at a certain point in the past PG&E put -- relocated pipe from somewhere else and put it into Line 147.

A Well, I believe that --

Q As far as I know, we don't know where that pipe was before and how it was used. So wouldn't this provision be applicable?

A I don't see how. I think that all parts of Line 147 that were in service as of July 1, 1970, were covered by the grandfather rules at that time, irrespective of how it might have been used sometime -- how individual pieces of pipe might have been used sometime in the past.

Q Let me clarify. The grandfather clause is really not applicable to my question.

A I understand.

Q My question is simply: If the

pipe -- some of the pipe was used previously somewhere else -- we don't know where, we don't know how -- isn't it possible that this provision about prior use calculating the MAOP when a pipe has had a prior use and is unknown, isn't it possible that this formula, this provision, applies in that case?

A Well, I think you're overreaching what the language says. I think the fact is the pipeline was already in service when the regulations came into effect in natural gas service. I mean, if you really need an interpretation on this, then you should write to PHMSA.

Q No, I'm not asking you for an interpretation.

I have -- let me just ask you one more question about that. Do you know how the -- the pipe that was previously used somewhere else before it was installed in Line 147, do you know where it was used?

A No, I do not.

Q Do you know how it was used?

A No, I do not.

Q Okay. Thank you. And then just another question about the test, the hydro test records that you looked at. Did you look at any of the -- well, you're aware that

the line was hydro tested at times before 2011; correct? You're aware of that?

A Portions of new pipe were installed in 1987 and 1990. So there is evidence that they were pressure tested, if that's what you're referring to.

Q Yes, it is what I'm referring to.

Did you look at those records?

A I did look at those records, yes.

Q Okay. And did you -- for the 2011 hydro test records that you looked at, which test records did you -- the records for which test did you look at?

A Well, I don't recall all of the test section designations. I think there was a test T 42 and a T 43A and a T 43B. And I think there was one other and I don't remember what it was called.

Q So a total of four?

A I recall four test sections, yes.

MS. PAULL: Thank you. No further questions.

ALJ BUSHEY: Anyone else?

Mr. Meyers.

MR. MEYERS: Your Honor, just a couple of questions for follow up.

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CROSS-EXAMINATION

BY MR. MEYERS:

Q Mr. Rosenfeld, what's a mill test?

A What is a mill test. A mill test is a pressure test of the pipe that the pipe manufacturer performs to a specified level in accordance with either the pipe product specification that the pipe was manufactured to or perhaps by an agreement between the pipe manufacturer and the purchaser of the pipe.

Q And that includes a percentage of the SMYS of that particular steel; is that correct?

A That's correct.

Q And today, as we sit here today, what is the customary mill test pressure as a percentage of the SMYS that a piece of steel would have associated with pipe manufacturing?

A Well, that depends on the pipe product specifications. The API 5L versus some ASTM -- that's the American Society for Testing and Materials -- pipe product specifications which may have requirements that differ from API 5L. And it also depends in 5L on the diameter and the grade of the pipe.

Q Let me just simplify. For purposes of Pacific Gas and Electric Company's acquisition of gas pipeline today, do you know, as you sit here, what the standard mill test pressures would be for that pipe that they acquire?

A Well, as I said, it would depend on the diameter and the specified strength grade for the pipe. But if we're talking about large diameter high-strength pipe, it would be 90 percent of the yield strength.

Q Thank you. And what was the percentage of SMYS that A.O. Smith used in 1929 when they manufactured the pipe that is in Line 147?

A It would have been at least 60 percent.

Q And why has that changed over time?

A Well, it's like anything else, things have -- technology has evolved. So as pipe manufacturers started making larger diameter, higher-strength grades of pipe, the value of testing to higher levels in the mill became recognized. So they could do it.

Q Would it be correct for me to say that this is a margin of safety?

A Well, it can be in lieu of a test in the field. Although, I'm not certain that

the CPUC has necessarily recognized the agreed direct value of a mill test as opposed to a hydro test in the field. But we have sometimes in evaluating other pipelines used the mill test as a basis for judging the integrity of the pipe.

Q And the mill test is information that Pacific Gas and Electric Company would have in its records for its pipelines features list? Is that a correct statement?

A The mill test would be something that one could determine if one knows the specification that the pipe is manufactured to and when.

Q And for the piece of pipe that we're talking about here today in Line 147, do you know what the mill test was?

A Are you talking about the A.O. Smith pipe --

Q Yes, sir?

A -- or all of the various varieties of pipe that are in there?

Q Well, we only know about the A.O. Smith pipe so far. So let's try that.

A Well, actually, we know about other varieties of pipe in there, too. We know there is Grade B and X42 and X52.

Q The A.O. Smith pipe.

A Okay. Yeah, I believe that because of what's known about A.O. Smith's pipe manufacturing processes, I think that we can conclude that those pieces of pipe were tested by the manufacturer to 60 percent of the specified minimum yield strength.

Q I'm sorry. Is that an assumption or is that fact?

A It's informed by knowledge about A.O. Smith's pipe manufacturing processes at the time.

Q So that's an assumption.

A It's an informed assumption.

MR. MEYERS: Very well, Mr. Rosenfeld. Thank you.

ALJ BUSHEY: Anyone else?

MS. STROTTMAN: I'm sorry, your Honor. I have three questions.

ALJ BUSHEY: Okay.

CROSS-EXAMINATION

BY MS. STROTTMAN:

Q Mr. Rosenfeld, you said you had performed many tests on old pipe; is that correct?

A Yes.

Q Any actual crack weld tests on single-sided submerged arc welds with porosity and inclusion like San Bruno?

A No, we have not performed that specific type of test. It's fairly uncommon to do those kinds of test.

Q What about any crack growth tests on pipes similar to Line 147 at issue here, which is A.O. Smith pipe with SSAW?

A No, we have not. But there is test data in the literature for pipe of a variety of grades and vintages, all of which -- and which would have similar -- I mean, at some level steel is steel when we're talking about plain carbon steel materials. And for a wide variety of plain carbon and as well as high strength low alloy structural steels, the crack growth rate behavior falls within a fairly narrow band irrespective of the details of the grade, and they're all bound -- upper bounded by the API 579 rate.

Q And then last question: Did you perform a crack growth analysis for the mitre bend?

A No, we didn't. We did perform a structural or a piping stress analysis for the span including the mitre bend.

MS. STROTTMAN: Okay. Thank you. I have nothing further.

ALJ BUSHEY: Thank you. Redirect, Mr. Hairston?

MR. HAIRSTON: Very brief redirect, your Honor.

REDIRECT EXAMINATION

BY MR. HAIRSTON:

Q Mr. Rosenfeld, you testified earlier I believe in a question from Miss Strottman that Kiefner and Associates' revenue from PG&E would be approximately $200,000; is that correct?

A That's correct.

Q Now, is Kiefner and Associates a stand-alone entity or is it part of a larger group?

A We're now a wholly owned company operating -- a wholly owned company owned by Applus -- that's spelled A-P-P-L-U-S -- and, but we're operating as a separate company called Kiefner and Associates.

Q Could you estimate the percentage of total revenue for Applus that the PG&E engagements represent?

A Well, Kiefner and Associates this year will probably be -- do about $7.3 million. So for our company, it's 200,000 out of 7.3 million. Applus is about a $750 million company.

Q Thank you. Now, you were asked a series of questions earlier about the

potential prejudice of reconditioned and/or A.O. Smith pipe in Line 147.

Do you recall those?

A Yes.

Q Mr. Rosenfeld, does the presence of reconditioned or A.O. Smith pipe on Line 147 change in any way your conclusions about the safety of that line?

A No, it does not.

Q And why not?

A Well, for one, A.O. Smith pipe was pretty good pipe, to start with. In fact, for most of the period -- in fact, as far as I know, as far as I'm concerned, for all of the periods of time in which it was manufacturing pipe, it was probably the best stuff that you could buy.

Secondly, the hydrostatic test establishes the ability of the pipeline to safely operate at significantly lower pressures. You've got a very large margin between the test pressure and the operating pressure. That's a -- provides a minimum immediate factor of safety. And the larger the test margin, the more time you have before there is any -- any other concern arises.

Q And that actually leads to my next

question. You testified in response to Miss Strottman that the hydro test only confirms the safe operation of pipe for a certain period of time.

Do you recall that?

A Yes.

Q And is that in part because of the impact of subsequent pressure cycles on any remaining defects in the pipe?

A Well, in principle, yes. I mean, that's what the -- that's what the NTSB found in the case of San Bruno and that's why we were looking at that particular issue of the effects of pressure cycle crack growth, specifically in this case. It's not commonly an immediate or short-term problem for natural gas pipelines, but it needed to be looked at.

Q So you did in fact analyze the crack growth on Line 147?

A Yes, we performed analyses about that.

Q And what were your conclusions about the remaining fatigue life of that pipe?

A The fatigue crack growth due to operating pressure cycles would not be a problem in this pipeline for many hundreds of

years.

MR. HAIRSTON: Thank you, Mr. Rosenfeld.

One minute, Your Honor.

(Pause in the proceedings.)

No further questions.

ALJ BUSHEY: Thank you, Mr. Hairston.

Final questions for anyone?

(No response.)

ALJ BUSHEY: Hearing none, then the witness is excused. Thank you, Mr. Rosenfeld.

We will take our morning break, then, until 11:20. Off the record.

(Recess taken.)

ALJ BUSHEY: We'll be back on the record.

Mr. Malkin, would you like to call your next witnesses?

MR. MALKIN: Yes, Your Honor. PG&E calls Kirk Johnson and Sumeet Singh.

ALJ BUSHEY: Stand.

MANLY KIRK JOHNSON, called as a witness by Pacific Gas and Electric Company, having been sworn, testified as follows:

SUMEET SINGH, called as a witness by Pacific Gas and Electric Company, having been sworn, testified as follows:

ALJ BUSHEY: Please be seated. State

your full name for the record and spell your last name.

WITNESS JOHNSON: My name is Manly Kirk Johnson, J-O-H-N-S-O-N.

WITNESS SINGH: My name is Sumeet Singh, S-I-N-G-H.

ALJ BUSHEY: Mr. Malkin?

DIRECT EXAMINATION

BY MR. MALKIN:

Q Mr. Johnson and Mr. Singh, you have both changed positions since you last testified.

Mr. Johnson, would you please tell us what your current position is at PG&E.

WITNESS JOHNSON: I am currently the vice president of project management for gas operations responsible for all the transmission and distribution, major projects.

Q And Mr. Singh, what is your current position?

WITNESS SINGH: I am the senior director of integrity management and responsible for providing oversight of the application of risk methodologies to develop integrity management programs, to ensure we're investing in projects to reduce the risk on our system.

Q Thank you. We're going to jump right into the elephant in the room: Hydro testing.

Mr. Johnson, you signed the safety certification for this pressure restoration on Line 147; correct?

WITNESS JOHNSON: I did.

Q And what did you do to satisfy yourself that the line had been hydro tested -- that all of the line had been hydro tested before you signed it?

MS. PAULL: Objection, Your Honor. I would just like to note for the record that we are going -- we are now having new direct testimony from PG&E's witnesses, when we thought the purpose of the hearing was to cross-examine them on their previous testimony that's already in the record.

ALJ BUSHEY: Same response as before. Foundational information.

Please continue, Mr. Malkin.

MS. STROTTMAN: I'm sorry. The City of San Carlos would like to share in ORA's objection.

ALJ BUSHEY: Thank you.

Mr. Malkin?

MR. MALKIN: Q Do you remember the question?

WITNESS JOHNSON: I believe so. So prior to signing my verified statement in the safety certificate, I reviewed the pipeline features list and specifically focused on things that had changed in that features list since our filing approximately two years ago. I went over the MAOP validation exercises, and went through all that activity sitting with Mr. Sumeet Singh and some of his team. I reviewed all of the hydrostatic test reports for the work we did in 2011.

I also looked at all of our pipeline patrols and our pipeline inspection records for the previous three years. I reviewed PG&E's pipeline center line survey information. And, in addition to that, I sat down with Mr. Rosenfeld privately to ensure that I had done my due diligence and to see if he had any questions, any concerns whatsoever with everything he was in the process of reviewing for PG&E.

Q And focusing specifically on hydro testing, what did you do to get comfortable that all of Line 147 had been hydro tested?

A Well, previously, two years ago, we had gone through that same exercise and I had sat down with my engineering team, Ben Campbell and Mark Cabral, and walked through

and made sure they had walked through tie-in piece by tie-in piece and ensured that Line 147 had been hydrostatically tested either with a hydro test in 2011 or a prior hydrostatic test.

In addition, we conducted the same exercises for shorts that operated above 20 percent, as consistent with the CPUC recommendations or requests to uprate the pressure. This time around I again reviewed those records, asked those very same questions, and reviewed one additional document and that was for the leak repair that had taken place at the end of last year.

Q Mr. Singh, you heard described in ORA's opening statement and you read in Mr. Robert's testimony the questions he raises about his inability to line up the mile posts and the stationing on the strength test pressure reports and various other reports, and his uncertainty whether everything in Line 147 has in fact been hydro tested.

Could you, please, explain how one can determine and verify that all of Line 147 has been hydro tested?

MS. STROTTMAN: Your Honor, I would object to that question.]

MS. STROTTMAN: Your Honor, I would object to that question. That is, once again, additional direct.

MS. PAULL: It's essentially rebuttal and PG&E has the opportunity -- PG&E can cross-examine Mr. Roberts if it wishes to do so on his testimony.

ALJ BUSHEY: Is this information in the MAOP records that were presented already?

MR. MALKIN: Well, the information, your Honor, can be derived from the records.

ALJ BUSHEY: Right, but we need someone --

MR. MALKIN: One needs to understand how to do it, and obviously Mr. Roberts doesn't.

And so I understand the parties would like to have the record where they can raise questions and there are never answers.

ALJ BUSHEY: I'll take that as an editorial comment, Mr. Malkin.

MR. MALKIN: Yes, it is.

ALJ BUSHEY: Let's focus on the question I asked you.

So the information is already in the MAOP test records and this witness is just going to tell us where to look for the correct information. Is that an accurate

statement?

MR. MALKIN: I think it is a fundamentally accurate statement. The records consist of strength test pressure reports, reports from RCP, the company that oversaw the strength tests, as-built drawings, and some other drawings the name of which I can't remember, that Mr. Singh can explain. And he can explain why Mr. Roberts couldn't match up mile points and stationing and why the records, in fact, show that a hundred percent of the line, including shorts over 20 percent, has been tested.

ALJ BUSHEY: To the extent that those representations can be made without reliance on documents that are not part of the supporting information, then the witness may proceed.

MR. MALKIN: Okay. Well, there is information beyond that which was specifically submitted that has been provided to all of the parties, namely all of these drawings.

ALJ BUSHEY: But those were the background.

MR. MALKIN: They're not part of the initial supporting information. They were information that was data provided at

a later point.

ALJ BUSHEY: Okay. And was that -- did that data provide the foundation for the MAOP calculations and tests?

MR. MALKIN: Yes. It provides the basis for being able to verify that every foot of pipe has been hydrotested.

MS. PAULL: Your Honor, if those records exist, if there are records that Mr. Roberts should have looked at if he had had them that make that showing, let PG&E distribute those records and add them to the record if they're not already in there.

ALJ BUSHEY: I think he just told me he did that.

MR. MALKIN: Yeah. All the parties have them.

MS. PAULL: When were these documents served that you just referred to, Mr. Malkin?

MR. MALKIN: Would your Honor like me to find that out?

ALJ BUSHEY: No. Let's get going here. Let's get -- let's hear what he has to say and go from there. So let's get the direct on the record.

MS. BONE: Before that happens, ORA renews its objection. If Mr. Johnson is to simply going to tell us which documents we

need to look at, it seems like he should simply say which documents we need to look at and produce them.

Our point is that PG&E hasn't made its showing and it shouldn't be able to supplement its showing today on the stand. We weren't prepared to cross examine.

ALJ BUSHEY: Let's see what they have to offer and we'll go from there.

Mr. Malkin.

MR. MALKIN: I think I had asked a question but let me rephrase it.

Q Can you please explain, Mr. Singh, why Mr. Roberts' inability to match up mile posts and stationing does not undermine the fact that PG&E hydrotested all of Line 147?

MS. BONE: I object. This actually does not go to the issue of whether mis- -- whether PG&E hasn't provided the information. This goes to the inconsistencies within PG&E's data.

So this is a separate issue from the issue of showing that PG&E has actually provided all the documents needed to demonstrate that this line is safe at an MAOP of 330.

It's -- and it's -- again, it's

improper either direct or rebuttal. And to the extent that Mr. Roberts, the inconsistency can be explained away, it should be done through cross-examination of Mr. Roberts, not direct testimony of PG&E.

ALJ BUSHEY: So your objection is relevance?

MS. BONE: Yeah. I mean, you're allowing them --

ALJ BUSHEY: Overruled. Please continue, Mr. Malkin.

MR. MALKIN: Q Mr. Singh, could you please explain how, from the record, the hydrotest records one can see that in fact all of the pipeline has been hydrotested?

WITNESS SINGH: A Based on my review of the testimony submitted by ORA, there was one missing key element of the record that needs to be reviewed which is referenced in the pipeline features list that have been submitted as part of our recertification filing, and they were also referenced in the 2011 filing. And those records are the detailed as-built drawings that clearly show what was the starting location of the test, what was the ending location of the test, and that's what our engineers used,

coupled with the strength test pressure records.

Furthermore, the analysis of converting mile points strictly to footage by multiplying the mile points or miles by 5280 does not get you the associated engineering footage that's referenced in the Pipeline Features List. And the reason is the mile points that are referenced for Line 147 are the historic mile points.

So these were the mile points at the time the line was installed in 1947. Since then, there's been a lot of work that's been done on the lines.

In addition, the engineering station that's referenced in some of the STPRs is a horizontal footage and distance as the crow flies and not the actual footage of the pipeline which is in the Pipeline Features List.

So a simplistic example is if you have a pipeline that goes from point A to point B and you have a pipeline that traverses five feet horizontally, five feet vertically, and another five feet horizontally, that distance, when you measure it as the crow flies on a horizontal plain is ten feet but the actual footage of

the pipeline is 15 feet.

Q And is that the same reasoning, same reason why you can't use the stationing to line up with the actual footage tested?

A That is correct.

Q And based upon the work that you and your team did in developing the Pipeline Features List and looking at all of those hydrotest documents, is there any doubt in your mind that PG&E has in fact hydrotested every foot of Line 147 main line pipe and all of the shorts operating over 20 percent of SMYS?

A Based on the discussions I've had with my team, the work that our records team has done, there's no doubt in any mind.

MR. MALKIN: That concludes my direct, your Honor.

ALJ BUSHEY: Thank you, Mr. Malkin.

Who wants to go first for cross? Mr. Gruen?

MR. GRUEN: Your Honor, may I approach and circulate an exhibit?

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

Mr. Gruen.

MR. GRUEN: Your Honor, may I circulate the next exhibit.

ALJ BUSHEY: Yes, please.

We're not going to mark this as an exhibit. This will just be used for our reference at this point.

While the copies are being distributed, why don't you ask the witnesses the questions so they can start formulating their answers.

MR. GRUEN: Okay.

Q Mr. Singh, the exhibit that's being circulated is in reference to your testimony on -- for hearings on -- that happened on September 6. And this is page 2469 of the September 6 transcripts and it notes, the last line of the testimony right above where Mr. Malkin says "Thank you" on line 19.

It says:

"And we're ... going to continue to be open and transparent.

Do you recall making that statement?

WITNESS SINGH: A It's on the transcript, so I'm certain I made the statement.

Q Okay. What do the terms "open" and "transparent" mean to you?

A Open and transparent to me mean that we're providing understanding of the work that we are doing to all of our stakeholders internal and, to the extent relevant, external stakeholders as well. And it's consistent with what we've done with the MAOP validation project.

Q And would that include the Commission?

A That's correct.

MR. GRUEN: Okay. And if I may circulate one more, another exhibit, your Honor. It's also a transcript so I wouldn't ask that it be entered into the record but just for referencing.

This is a -- also a section of page 2473. It's referenced as 2473 of the September 6 transcripts. And it asks Mr. Johnson:

> I guess I would like a little more [context] -- organizational context. Who do you report to in the organization?

And if I may take latitude, this is a question from Commissioner Ferron that was asked.

And the answer that Mr. Johnson said is:

"I currently report to Jesus Soto, Senior Vice President of Gas Transmission."

"And Mr. Soto reports to?"

And the answer:

"Nick Stavropoulos."

And continuing onto the next page 2474:

"... Mr. Stavropoulos reports to?"

"Chris Johns."

And then the question:

"Your verified statement laid out in some detail the timeline of events surrounding Line 147. When were you informed of the discrepancy relating to that line?"

So this is a line of questions that go to when Mr. Stavropoulos and Mr. Soto were informed of the discrepancy relating to Line 147.

And Mr. Johnson, this is for you. Isn't that accurate?

WITNESS JOHNSON: A As I read through it, the best of my recollection, that's accurate.

Q Okay. And turning on to the next page 2475 of this document, it states:

"Okay. So if I" --

This is line 5, and I believe this is Commissioner Ferron continuing.

"Okay. So if I could [ask you], when you were first informed of that information, who do you inform up the chain of command?"

And the answer is:

"I honestly don't recall exactly who I would have told at that time. That was sometime ago."

Question:

"But presumably it would have been Mr. Soto in the first instance?"

Answer:

"It would have presumably been Mr. Soto."

"And Mr. Stavropoulos?" is the question.

And the answer is: "I don't know."

Do you recall that or does that seem true to you, Mr. Johnson?

A The questions seem true to me, yes.

Q Okay. And Mr. Singh, when those questions were asked, you did not provide an answer to Commissioner Ferron's questions, those particular questions; is that right?

WITNESS SINGH: A To the best of my

recollection, no, I did not.

Q But in fact, you did know the answers to those questions about when Mr. Stavropoulos and Mr. Soto were informed about the discrepancies on Line 147; isn't that true?

A I did not recall at that the point in time.

MR. GRUEN: Your Honor, I'd like to circulate the next exhibit. And this I would ask to be included in the record as a transcript.

I have a copy, an unredacted copy that's available for your viewing, your Honor, and the rest of these circulated exhibits need to be -- are redacted versions.

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

Mr. Gruen.

MR. GRUEN: Q Mr. Singh, I have -- the document I have circulated is an e-mail from you to Mr. Soto and Mr. Stavropoulos, dated November 16. Do you see that at the top of the e-mail?

WITNESS SINGH: A Yes, I do.

Q And do you see on the subject,

the subject area where it says: Forward: Line 147, Mile Post 2.2 Brittan Ave & Rogers Ave, San Carlos -- Pipe Specification Discrepancy. Do you see that?

A I do.

Q And was this an e-mail forwarded by you on November 16th to Mr. Soto and Mr. Stavropoulos?

A Now, that you've provided me with a copy, I can see that.

Q So you are now familiar with the -- in fact, you did inform Mr. Soto and Stavropoulos of pipe discrepancy information on November 16th?

A In terms of the specific date, right.

Q Okay. And also in terms of the specific subject; correct?

A We did. And I did not respond to the question as it was not directly stated to me, but I believe we did state that the discrepancy was communicated to our leadership, executive leadership, and had the exact specifics of the date and time. And I did not recall that at the time until you put this in front of me.

Q So you didn't recall. I see. Okay.

Oh, yes, your Honor. May we have this exhibit marked for identification?

ALJ BUSHEY: It's marked Confidential pursuant to 583.

MR. GRUEN: The version that we provided you is the only version that is not redacted, your Honor.

ALJ BUSHEY: Oh. Okay. Well, then we have a problem because that's what becomes the record.

MR. GRUEN: Yes, your Honor. We can provide you a redacted version as well.

ALJ BUSHEY: All right. We'll mark that for identification as Exhibit B.

(Exhibit B was marked for identification.)

MR. GRUEN: Thank you, your Honor.

The next line of questions --

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

Mr. Gruen.

MR. GRUEN: Q This is also a transcript from September 6 hearings, page 2434. And Mr. Johnson, I believe this is your testimony.

Going to line 11, this is a,

I believe a question from Mr. Malkin. It says:

> In this morning's session, which you were not present for, there were questions raised as to whether the error with respect to Segments 103, 103.1, and 103.6 on Line 147 -- where the MAOP validation report incorrectly listed seamless pipe was the same type of error and raised the same issues as on Segment 180 of Line 132 where the accident took place. It is it the same?

And the answer:

> "No, I don't believe they have anything in common. This particular pipeline has seen a hydrostatic test. It has ... one with a spike on top of it."

So Mr. Johnson, is it your testimony that Line 132 did not have a hydrostatic test?

WITNESS JOHNSON: A I don't believe it had a hydrostatic test or a hydrostatic test with a spike.

MR. GRUEN: Thank you.

Your Honor, I could circulate

the next exhibit.

I'm sorry. This is -- circulate another piece of transcript from --

ALJ BUSHEY: Another transcript?

MR. GRUEN: Yes, your Honor.

ALJ BUSHEY: All right. Mr. Gruen, how many of these do you have you?

MR. GRUEN: I believe that this is -- okay.

Your Honor, may we go off the record for a moment?

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

Mr. Gruen.

MR. GRUEN: Q Mr. Singh, do you recall answering questions about, in your direct testimony on September 6 about the amount of effort that went into the amount of time and effort and resources that went into the MAOP validation effort?

WITNESS SINGH: A I vaguely recall that.

Is there a specific section in the transcript you were going to point me to?

Q I -- no. I just asked for your take on it. Not necessary.

But perhaps you could give a general sense of how many man hours or staff hours, excuse me, it took to complete or to do the MAOP validation effort up to this point?

MR. MALKIN: Your Honor?

ALJ BUSHEY: Relevance, yes.

Mr. Gruen, can we get focused on Line 147?

MR. GRUEN: Okay.

Q Let me ask a hypothetical.

ALJ BUSHEY: And the hypothetical is going to relate to some fact that has some relationship to Line 147?

MR. GRUEN: Line 147, yes, your Honor.

ALJ BUSHEY: Okay, please do.

MR. GRUEN: Q In your opinion, what is a safe maximum allowable operating pressure for a line that contains AO Smith pipe manufactured in 1929 and that PG&E cannot assure the Commission has not been damaged by hydrotesting it?

WITNESS SINGH: A I believe we've already submitted the MAOP validation reports for each and every feature of Line 147 as well as the associated shorts. And in those filings, we have stated at this point 330 psig, which is what we're here talking

about.

Q Let me just ask. Related to -- in the hypothetical if the pipe had been damaged by hydrotesting and it contained AO Smith pipe manufactured in 1929, what would be -- what is, in your opinion, what would a safe MAOP be for a line like that under those circumstances?

MR. MALKIN: I'm going to object to the form of the question. "Damaged by hydrotesting" is incomprehensible.

MR. GRUEN: Your Honor, I believe I can prove that up if I'm given a little bit of latitude.

ALJ BUSHEY: Prove up?

MR. GRUEN: I believe I can show evidence that suggests that PG&E at least has concerns about damage to -- from hydrotest. It's from their own data responses, your Honor.

ALJ BUSHEY: Right, I understand that. But I think the way you've worded your question, it's too vague. What are you talking about "damaged by hydrotesting?" Damaged how? Did a front-end loader hit it? Was it dug out? What happened?

MR. GRUEN: Ah. Thank you, your Honor. I would modify the question to say damage

from overpressurization related to hydrotesting.

ALJ BUSHEY: Well now, what does overpressurization mean?

MR. GRUEN: It would be above a hundred percent SMYS.

ALJ BUSHEY: Okay. That's what your question is about?

MR. GRUEN: Yes.

ALJ BUSHEY: Tests that go above a hundred percent SMYS.

Mr. Singh or Mr. Johnson, have you performed any of those tests, PG&E?

WITNESS JOHNSON: I'm not aware of any tests where we have performed them above a hundred percent SMYS based on the information we have available to us.

ALJ BUSHEY: All right.

WITNESS JOHNSON: And our testing records where we do stress strain curves and yield testing has not indicated any yielding of any pipelines that have been tested under the PSEP program.

ALJ BUSHEY: Thank you.

They don't have any.

MR. GRUEN: Okay.

Q Does PG&E's hydrotesting procedure recognize that damage to the pipe from going

over a hundred percent SMYS being tested may occur if the test is conducted with too high a pressure?

WITNESS JOHNSON: A Are you asking that in theory can it be done, is that your question?

Q No. I'm asking if hydrotesting procedure, PG&E's own procedure recognizes that damage to the pipe being tested may occur if the test goes over a hundred percent SMYS.

A I think I believe PG&E's procedure -- and I don't have it in front of me -- probably references the potential for damage if you go over a hundred percent SMYS.

Q Okay.

A Potentially.

MR. GRUEN: The next exhibit would go to that point, your Honor. May I circulate?

ALJ BUSHEY: Let's back up for a minute. I'm wondering about the relevance here. If they've never done this and their rules say -- where are we going with this?

MR. GRUEN: Your Honor, I believe and I have evidence later that I intend to use on cross with Mr. Harrison that would suggest that in fact they have gone over a hundred percent SMYS on -- for hydrotesting on

Line 147.]

ALJ BUSHEY: Why are you going to wait for Mr. Harrison? These are the experts. And they just made representations that they haven't gone over 100 percent.

MR. GRUEN: Because, well, I have to look back at the email. Mr. Harrison was part of the email. So I was going to use it to lay a foundation with him because I believe he would be familiar with the documents, your Honor.

ALJ BUSHEY: All right. Bring it forward.

MR. GRUEN: And, your Honor, before I circulate this, I provided PG&E with a copy of an excerpt of this and asked whether they had any concerns. It's marked confidential, but it's not redacted. So I would wonder if PG&E has any concerns with circulating it.

ALJ BUSHEY: Why don't we get it circulated so we can see what it is. And we'll go from there.

MR. GRUEN: Yes, your Honor.

ALJ BUSHEY: Mr. Gruen, this just looks like a copy of the regulations.

MR. GRUEN: It is, your Honor. That's my understanding of it as well. This is a copy of PG&E's own requirements, as I

understand it. But I note that it's marked confidential provided pursuant to PU Code Section 583. I didn't see any concerns, but I wanted to be sure that PG&E didn't either from a confidentiality standpoint.

ALJ BUSHEY: Mr. Malkin, do you have any confidentiality objections to this?

MR. MALKIN: We don't have a confidentiality objection to that excerpt. We do believe the witnesses should be shown a full section. This is one page out of a middle of a section of a 41-page procedure.

ALJ BUSHEY: Right. But is there any -- do we have any doubt --

MR. MALKIN: No confidentiality concern about a single page.

ALJ BUSHEY: Do we have any doubt that this is the page -- this is a page of the actual regulations?

MR. MALKIN: We don't dispute that this is a page taken --

ALJ BUSHEY: Good. So they're willing to stipulate to that.

What else do you need from these witnesses?

MR. GRUEN: Just to note the part that identifies caution. It's under the first --

ALJ BUSHEY: Mr. Gruen, you don't need

to read things to us. That's why we put things in the record so that we have them.

MR. GRUEN: Yes, your Honor.

ALJ BUSHEY: So other than reading this to us, is there anything else you want these witnesses to do?

MR. GRUEN: Q So after looking at this, you would agree that PG&E's procedure for hydro-testing prohibits pressures above SMYS values, hydro-test pressures above SMYS values?

WITNESS JOHNSON: A I'm not exactly sure what you're referencing. This is one page of a document, if I look at this correctly, of 3-29-13. I'm not sure if you're trying to back-date this to when the hydro-tests were done, which was 2011.

And, again, without going through the whole document and putting everything in context and you can read it, I do believe at the very end it says the pipeline cannot be established without exceeding the rating pressure of the equipment. Consult the pipeline engineering. So if there's questions about our hydro-test program, you consult the pipeline engineers.

Q And doesn't it say before that that the test pressure for any pipeline must not

be greater than the pressure which produces a hoop stress of 100 percent of SMYS of the pipe regardless of the strength of the valves, regulators, and similar equipment?

Do you see that?

A Yes.

Q Okay.

ALJ BUSHEY: Okay. Now we both read it. That's good. Let's mark this as Exhibit C.

(Exhibit No. C was marked for identification.)

ALJ BUSHEY: Put it in the record, and we'll go from there.

Do you have any substantive questions for these witnesses on this topic?

MR. GRUEN: Yes, your Honor.

Q What's the reason for this prohibition against exceeding SMYS in a hydro-test?

WITNESS JOHNSON: A I didn't write the document. So I can't tell you exactly everything they were thinking of as they went through this. What I believe is -- I don't know how many -- 41 pages. So I didn't write all of it. I can simply state that, in general, we would like to avoid going over the MAOP of SMYS in some specific conditions

so as not to create problems.

Q And would those problems be safety related?

A They could be safety related.

Q Does PG&E recognize that hydro-testing damage to a pipe at too high a pressure for the strength of the pipe can damage and weaken the pipe without causing a complete failure of the pipe during the hydro-test?

A I'm sorry. Can you repeat that question again?

Q Sure. Does PG&E recognize that hydro-testing damage to a pipe again at too high a pressure higher than a hundred percent SMYS for the strength of the pipe can damage and weaken the pipe without causing a complete failure of the pipe during the hydro-test?

A I believe there is a possibility of that occurring in some types of pipe. But Mr. Kiefner -- excuse me -- Mr. Rosenfeld, who was up on the stand earlier, is much more of an expert on that specific issue than I am.

MR. GRUEN: In fact, your Honor, I provided Mr. Malkin with another data response that was marked as confidential.

And I would ask if PG&E has any concerns with circulating this next document. I'm happy to circulate it again if --

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll back on the record.

Mr. Gruen.

MR. GRUEN: Your Honor, there is additional explanation on this that may be valuable for the Commission's and your Honor's understanding of PG&E's precise concerns with going over a hundred percent SMYS.

May I circulate this in for the --

ALJ BUSHEY: We're not here for edification. We're here for cross-examination.

What do you need from this witness that you don't already have on the record?

MR. GRUEN: Okay. I'll ask the next question.

Q Didn't in fact PG&E contend that hydro-testing damage to a pipe at too high a pressure for the strength of the pipe, that in the case of San Bruno, it was damaged but it didn't fail and then it later failed -- isn't that exactly what happened in the case of San Bruno?

MR. MALKIN: I'm got to object on both relevance grounds and also it mis-characterizes Dr. Caligiuri's testimony rather egregiously.

ALJ BUSHEY: Mr. Gruen, what does it -- let's get back to Line 147. I understand that you've got a witness coming that's going to tell us that at some part of the line went over 100 percent. Okay. These witnesses have already admitted that if you go over 100 percent, there could be safety issues.

What more do we need to weave together a story here?

MR. GRUEN: Okay. I believe that that's it. I can move on to the next line of questions, your Honor.

ALJ BUSHEY: Okay. Let's go.

MR. GRUEN: Q Let me ask you about the leak found in the field on Line 147 now.

WITNESS JOHNSON: A I'm sorry. Who are you addressing the question to?

Q I'll ask it, and then maybe we'll see who can answer it.

ALJ BUSHEY: Let me interject. Mr. Johnson, when you present yourselves as a panel, the question is presented to the panel. You can decide amongst yourself who is going to answer, but he doesn't have to

decide who answers. Okay. We're not going to play a guessing game here. Okay. All right.

Mr. Gruen.

MS. BONE: Could you also admonish them to tell the whole truth so that if one person doesn't answer the question and the other person knows the answer, that they should answer the question.

ALJ BUSHEY: I just swore them both in. Okay.

Go, Mr. Gruen.

MS. BONE: Well, that wasn't relevant previously.

MR. GRUEN: Q And just touching back -- actually, maybe this is for Mr. Johnson because it's in your verified statement. It's just confirming that the leak on Line 147 that caused PG&E to file the errata in July of 2013, just for memory, when was that leak discovered again?

WITNESS JOHNSON: A It's in my verified statement. I don't remember the exact date.

Q Just the month is sufficient. Was it October?

A I believe it was October.

Q October of 2012; is that right?

A October of 2012. That's correct.
Q And what was the date of the hydro-testing for the segment of line that PG&E found a leak on?
A Again, I don't have those documents in front of me, but I think we consistently said it was done in 2011.
Q So is it correct that no leak was discovered during hydro-testing?
A Correct. There was no leak seen during hydro-testing of that segment of line.
Q Okay. And PG&E later had third parties test a small section where the leak was observed; isn't that right?
A PG&E had two independent parties do a I would say different testing and root cause analysis on that.
Q I'm just asking about testing. I'm sorry. I'm just asking about testing at this point. I'll get --
A What kind of testing?
Q Testing for a leak.
A Testing for the leak itself?
Q I'm sorry. Field testing.
A I'm not following you at all. I'm sorry. What field testing?
Q PG&E had third parties do field testing of a small section where the leak was

observed; isn't that right?

A I believe what I'm thinking of -- and maybe this isn't what you're thinking of -- but PG&E removed that section of pipe with the leak in it and sent that into two third parties for testing. So I wouldn't consider that field testing.

Q I appreciate the correction. Thank you.

And how long after the hydro-test did PG&E take before sending the section into the lab for testing?

A I don't have the dates when we sent it into the lab, but you could do the math.

Q Could you give an approximation?

A Eighteen months. I don't know.

Q Eighteen months.

A That was my approximation, yes.

WITNESS SINGH: A I actually like to add something here. We removed the section in August of 2013. And it was sent shortly thereafter for testing. Don't have that exact date in front of me. Somewhere in the August, September 2013 time frame.

Q Okay. August 2013, did you say?

A That is correct.

Q Okay. So, again, a significant amount of time after the section where the

leak was actually observed -- after when the leak was actually observed; isn't that right?

A I think you can quantify the exact number.

Q And the two labs that it went to were Anamet and Exponent. Are those the names of the labs?

A That is correct.

Q Okay. And did the lab reports from Anamet or Exponent identify an actual leak on the section tested?

A That wasn't the objective of their analysis. The objective of their analysis was to identify potential root cause of the contributing factor why that potential leak occurred.

Q But isn't it true that you can't do a root cause analysis if you don't know where the leak is?

A Is your question you can't do a root cause analysis if you don't know the source of the leak?

Q Don't you need to know the leak to see the leak before you can do a root cause analysis of what actually caused the leak?

A You don't necessarily need to see the leak. You actually don't see the actual gas molecules.

Q But you need to know that the leak exists. You need to have found the leak. Let me ask it that way.

WITNESS JOHNSON: A If the question is do you need to find the leak, yes, we found the leak. We repaired the leak. We later cut out the section with the leak in it, and we sent it in to these two parties.

Q The question is did these labs find the leak?

A I don't know. PG&E found the leak. We found the leak. We had -- I think in our certified statement we tell you exactly how we found the leak, how we tested for the leak, how we repaired the leak. And then we took that segment, sent it in to the labs to ask them to do root cause analysis.

Q Right. You're saying that -- if I understand your verified statement, it's that PG&E observed the leak through happenstance in the field in October of 2013. And then after observing the leak, took the section of the pipe where it believed the leak was, sent it in to the labs for analysis?

A No. We repaired the leak. Then later on went back and cut out the section that had the leak in it and sent it in to the lab. The leak was repaired.

Q How did you repair the leak?
A We put a PLIDCO cap over the leak.
Q Okay. Can you describe the repair?
A We put a PLIDCO cap, which is simply a cap, over the top of the section that was leaking. We welded it on. We tested it. The leak was gone. And that's how we repaired the leak.
Q Okay. So that PLIDCO cap -- when it was sent in to the lab, wasn't that cap removed? And didn't they then look for the leak in the lab?
A I don't have all the documents in front of me. I think the reports have been turned over, is my understanding.
MR. MALKIN: I would want to object to this line of questioning. If we had an infinite amount of hearing time, we could go on forever. The reports are part --
ALJ BUSHEY: The reports are what they are. So, Mr. Gruen, where are we going with this?
MR. GRUEN: This gets at the actual labs doing root cause analysis. And if the labs can't identify the root cause of the leak, how can PG&E be certain there aren't other problems on the line? If they can't identify the leak, they can't identify the

cause of the leak in the labs, how does PG&E know there aren't problems elsewhere? Perhaps there's a root cause that they need to look at elsewhere on the line that they haven't found yet.

ALJ BUSHEY: So is your point that their vendor labs gave them incomplete or useless analysis?

MR. GRUEN: Not necessarily, your Honor. It's just that I'm clarifying whether they know that the lab reports identify the actual leaks and the lab reports themselves did a root cause analysis.

ALJ BUSHEY: Do we have copies of the lab reports?

MR. GRUEN: I don't have those --

ALJ BUSHEY: But you have them?

MR. GRUEN: I believe they're in the record. One of those is attached to Mr. Singh's declaration, I believe.

ALJ BUSHEY: Okay. All right. So it's in the record. It's there. So what do we need more from these witnesses? The labs did what they did. What else do we need from these witnesses that goes to the ability to operate 147 at 330?

MR. GRUEN: We're good, your Honor. Thank you.

ALJ BUSHEY: Okay. Where are you in your cross-examination? It's time for us to take our lunch break.

MR. GRUEN: I have a bit more to do, but I do have a new line of questioning.

ALJ BUSHEY: And what's your best estimate for how much more time you have? Well, hold that when we go off the record.

We're going to take our lunch break. It's 12:20. We'll resume at 1:20.

We'll be off the record.

(Whereupon, at the hour of 12:20 p.m., a recess was taken until 1:20 p.m.)

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AFTERNOON SESSION - 1:23 P.M.

* * * * *

ALJ BUSHEY: We're back on the record.

SUMEET SINGH and KIRK JOHNSON,

resumed the stand and testified further as follows:

ALJ BUSHEY: Mr. Gruen, would you like to continue cross-examination of the panel?

MR. GRUEN: Yes, your Honor.

MR. MALKIN: Your Honor, may I bring this one thing before Mr. Gruen begins? I don't want to interrupt him.

Mr. Gruen before we broke for lunch estimated another 90 minutes.

ALJ BUSHEY: He just reported to me that he's significantly pared that down. There are no more exhibits. So if we get started, we'll be done sooner.

Let's go, Mr. Gruen.

MR. GRUEN: Yes, your Honor.

MR. MALKIN: I will hold that thought.

MR. GRUEN: That's true. We've pared it down. And we have no other exhibits to circulate for the panel here. That's exactly right.

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CROSS-EXAMINATION (resumed)

BY MR. GRUEN:

Q So good afternoon, Mr. Singh and Mr. Johnson. Just want to ask a question about the -- related to the leak that was discovered in October on Line 147.

Could the gas on the line have been coming from somewhere else on the line other than the leak that verified statement said it discovered?

WITNESS JOHNSON: A We had no reason to believe it was coming from somewhere else. We found the leak. We soak test for leaks. We take the wrap off. You soap test, soap bubbles. We found the bubbles or what are sometimes referred to a bubble or a fizz leak. We identified the location of the leak. We repaired it. And then we recheck. And there was no leak after this. So we're confident we've got the leak.

Q Okay. I want to switch to another topic and ask you in addition to those values identified in the verified statement, what other PFL values have you found in Line 147 that are either missing or wrong?

A Can I just ask what you're representing when you say "those values"? Which page or what section are you --

Q I don't have the verified statement in front of me handy at the moment. But just the reference is to the values on Segment 109, Segments 103 and 103.1, those particular values, particularly with relation to seam types. Let me ask it this way:

What values in the PFL -- what other PFL values on Line 147 related specifically to seam types are either missing or --

A I'm sorry. Are either missing or what?

Q Or incorrect.

A Everything we've given you on Line 147 we believe to be accurate.

Q Okay. Wasn't the A.O. Smith pipe characterized variously as both seamless and DSAW in the PFL?

WITNESS SINGH: A If you're alluding specifically to Segment 109, it was characterized as DSAW when we initially submitted the filing in 2011. And subsequent to that, we discovered it was A.O. Smith when we were performing leak repair in October and November time of 2012. I think that's all stated.

Q Was part of the PFL -- did some of the values in the PFL initially reported on

Line 147 show that that particular segment was -- showed that as being seamless as well?

A If you're specifically alluding to Segment 109 on Line 147?

Q Yes, I am.

A My understanding is what we submitted to the Commission -- is all on record -- initially the October 2011 filing where that segment showed it was DSAW. And subsequent to that, we discovered it was A.O. Smith.

Q Okay. Can PG&E assure the Commission that no other characteristics that affect Line 147 MAOP have been stated in error on the PFL or elsewhere, for that matter?

A The information that we provided is the best available information we have today. We have successfully strength tested the line with a spike test in 2011, as our expert -- the pipeline expert Mr. Rosenfeld testified to previously. To the best of our information that we have today, we have filed all the information that we have regarding Line 147 to the Commission including all the specifications.

MR. GRUEN: Okay. Your Honor, no further questions for the panel at this time.

ALJ BUSHEY: Thank you, Mr. Gruen.

Ms. Paull?

MS. PAULL: Yes, your Honor. May we go off the record for a moment?

ALJ BUSHEY: We're off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

While we were off the record, we identified the following exhibits: Exhibit D is PG&E's data request -- I'm sorry -- PG&E's response to DRA 86-40.

Exhibit E is PG&E's response to DRA's data request 87-45.

Exhibit E (sic) is PG&E's response to DRA's data request 87-39.

Exhibit G is PG&E's response to DRA's data request 87-44.

And Exhibit H is PG&E's response to SED's data request 11-05.

And Exhibit I is PG&E's response to SED's data request 003-06.

(Exhibits Nos. E, E, G, H, and I were marked for identification.)

ALJ BUSHEY: Okay. Ms. Paull, would you like to begin your cross-examination?

MS. PAULL: Thank you, your Honor.

ALJ BUSHEY: Mr. Malkin.

MR. MALKIN: On that last one, we haven't got that.

ALJ BUSHEY: I is 003-06.

Please begin, Ms. Paull.]

CROSS-EXAMINATION

BY MS. PAULL:

Q Good afternoon, Mr. Johnson, Mr. Singh. I'm Karen Paull representing the Office of Ratepayer Advocates today, and I have actually only a few questions for you. Mr. Roberts will have other questions. My questions should take maybe 10 minutes. First, I have a couple --

MR. MALKIN: May I ask a procedural point? In various other proceedings Mr. Long, who I feel a colleague since we're sitting next to each other, has raised the objection to more than one counsel for a party making argument, let alone questioning. I understand Mr. Roberts is not an attorney. And we're fine with that, but we certainly don't want the attorneys ganging up on people.

MS. PAULL: May I respond?

ALJ BUSHEY: I think you can take it, Mr. Malkin.

MS. PAULL: I will assure you it will be much more efficient if Mr. Roberts asks a

series of questions.

ALJ BUSHEY: That's okay. Go.

MS. PAULL: Q So first a few questions about the circumstances under which the leak was discovered, or rather, the leak and the problems with Line 147.

Mr. Johnson, you said in your verified statement of August 30th in paragraph 25 that it was a routine leak survey of Line 147 that led to the discovery of the problems with Line 147, or to a discovery, rather, to a discovery of the leak. Do you recall that?

WITNESS JOHNSON: A I'm looking at my verified statement on line 25 to a routine leak survey. Yes, I see it here now, yeah.

Q Okay. And if you could take a look, please, at the first exhibit I distributed, which is a brief response to a DRA data request.

A Is it Exhibit D?

Q It is.

A 086 Q 40?

Q It is 86, Question 40, yes.

A Okay.

Q And so in this we asked -- ORA asked PG&E why this leak survey was performed at this location. It was performed on

October 15th, correct?

A I believe -- I believe, yes, October 15th, 2012.

Q 2012. And we asked why it was performed at this location. And in the discovery response PG&E responded that a PG&E gas crew leader was performing a standby during a water main repair conducted near our pipeline by the local water utility. And it was while he was standing on standby that he observed the leak.

So my question is, that happened on October 13th, and your discovery responses indicate that the leak surveyor came to inspect the leak the same day, right?

A The leak surveyor returned to the site on the morning of October 15th.

Q And he returned on October 15th. Now, why did he return on October 15th?

A As I recall, he wasn't able to get a good read on the gas leak due to the accumulation of water and mud in the hole.

Q Okay. So the original -- the standby crew was at the location on October 13th because the water utility called PG&E and told PG&E that they were going to be doing some work in that location.

A Any time you work around a gas

transmission line or a critical facility, standby is required to ensure that parties do not damage our line. And this was a gas crew leader who was conducting standby for PG&E.

Q And that sounds like a very good thing. But this sequence of events to me does not sound like a routine leak survey. It sounds like a special circumstance. The water utility was doing some work, called PG&E. PG&E sent a crew. Those were the circumstances, correct?

A So we had a gas crew leader standing by, and then we sent a leak surveyor out after the fact. This is routine leak survey. It's not special. Special refers to in our standards as an earthquake, a landslide, something special and unique. This is routine work. We do it all the time. We stand by our facilities every time they're dug around.

Q So the sequence of events we just went through you consider a routine leak survey?

A I consider it routine work, routine where it looks, yeah, routine leak survey.

Q So you stand by your testimony that it was a routine leak survey that led to the discovery that the pipe in the ground at that

location on Line 147 was different from what was indicated in the pipeline record?

A I'm sorry. I didn't follow your question. If you're asking, do I stand by my statement, my statement as I put in my verified statement is that it was a routine leak survey.

Q That led to the discovery of the --

A Yeah.

Q -- of the pipe in the ground?

A As I -- we either have routine or we have special. Special is for unique, one-off circumstances such as earthquakes, accelerated leak surveys like after San Bruno, landslides. Those are considered special surveys. Everything else is considered routine. Within the routine category there are scheduled surveys, that sort of stuff. This was a routine leak survey --

Q Okay. So --

A -- conducted by our leak surveyor.

Q -- you've clarified. If the water utility calls up and says we're doing work and PG&E sends a crew, you include that, you categorize that as routine?

A We stand by every time they're working around the pipeline. So any time

anybody calls in a USA and is going to dig within the vicinity of our pipeline and we require hand digging within that vicinity, we have a standby personnel there to ensure that nothing happens to our pipeline. It's done every time on a gas transmission system.

Q Sounds like a good thing. If the water utility had not called PG&E to notify PG&E that they were doing work on October 13th would PG&E have sent a crew on October 13th?

A We didn't send a crew. We sent a standby person. If they hadn't called us to let -- you mean if they hadn't conducted a USA, it's hard to know whether or not we would have sent somebody out there. But they -- it's their obligation to call when you're digging around a transmission line. It's everybody's obligation.

Q So it wasn't a survey that PG&E had scheduled independent of the water utility calling them?

A It is not a scheduled survey. It's not a semiannual or annual scheduled survey. It's a routine survey.

Q Okay. Thank you. Let's move on. If you could look at the next three exhibits I distributed. So that E, F, G. They're

short data responses that have to do with the questions about the welding and the leak. And they all are titled something about root causes.

So if you'd look first at Exhibit E, which is PG&E's response to ORA's Data Request 87-45, we asked about the probable cause of the leak. Was it corrosion, cracks, other reasons. And the answer, part of your answer was that those defects were created during the weld deposition process. Do you see that?

WITNESS SINGH: A I see that.

Q Thank you. What's your best estimate of when this weld deposition process was performed?

A We don't have direct supporting information that ties it back to a record of when specifically that was done. Based on all the facts that we have in front of us, one of the likely scenarios is potentially when the line was getting installed back in 1957 as part of the reconditioning process.

Q Okay. So that's the most likely -- what you believe is the most likely estimate, most likely time period?

A That is potentially one of the probable justifications.

Q But you don't know for sure? You don't know for sure when, when this was done?

A So I want to define for sure just so that there's no ambiguity around that. For sure would be having a record that identifies when that specific repair was made. I believe I stated that we do not have that record. The most probable justification is what I just articulated.

Q Thank you. Okay. Now, would you please look at Exhibit G, response to DRA 87-39.

WITNESS JOHNSON: A 87-39 is G? We have it as F.

Q Oh, F.

MR. MALKIN: I thought that was F.

WITNESS JOHNSON: A So is it 87-39 you're looking for?

MS. PAULL: Q It's 87-39. And you are correct. It is F.

WITNESS JOHNSON: A Okay.

Q And if you will -- I'm going to skip over a couple of questions I was going to do because I don't believe they're necessary. We're going to move to my next couple of questions.

Mr. Singh, you participated in an examination under oath that Mr. Shori

conducted; is that right, for purposes of this proceeding?

WITNESS SINGH: A That is correct.

Q And at a certain point Mr. Shori asked you about changes in the safety culture at PG&E within the last three years; is that right? Mr. Shori asked you questions about how things are changing at PG&E with regard to safety culture; is that correct?

A I recall that question.

Q Okay. And did you say that one thing that has changed is that the engineers and the other PG&E employees now have easy access to senior management to bring safety concerns to the attention of senior management? Did you say something like that?

A I recall making a statement that as part of what we're focused on is fostering, and I stated this previously as well, open and transparent communication not just with external stakeholders but also all of our internal employees and internal stakeholders.

Q So do you feel that the engineers, field personnel, other employees, middle management now feel freer to bring their safety concerns to senior management at the company?

A That's a safety culture that we're

fostering. And there has been specific examples that I've been a part of where an e-mail from a crew foreman in the field has gone directly to our Executive Vice President of Gas Operations. I know that because at times those questions are asked of me in terms of what are we doing, some of the questions, or whatever the potential issue may be.

Q And do you personally feel free to bring safety concerns to the attention of management that you report to?

A Without a doubt, absolutely.

Q Including all the way to the top of the management structure?

A If your question is if I feel that I have the access to talk to Mr. Earley, who is our CEO, or Mr. Johns, absolutely I do if there's a safety related issue.

Q Thank you. Okay. Just one more, one more area I'd like to cover. And if you could go to the last exhibit, which I believe is I. It's a data response to data request from SED No. 003, Question 6. And it consists of a page and a half question and answer and then a short table. Do you have that?

A Yes, I do.

Q So one of the questions that was asked in this data request was which pipeline features for Line 147 were not accurate. And in response you said that you -- PG&E re-reviewed all its records for all of Line 147. Was that the case? That's right, isn't it, that PG&E reviewed, re-reviewed all its records for Line 147?

A Yes, we did after we identified the leak. It was as part of our routine root cause analysis work that we do. When there's an issue, we identify what the issue is, learn from it. And in this case we wanted to know as a prudent operator where else could there be a potential discrepancy.

Q So to figure that -- to answer those questions, you did do another review of -- that is, you had completed MAOP validation of Line 147, correct, when this leak was discovered?

A That is correct. We went through and completed the pipeline features list, MAOP validation report that was submitted as part of our October 2011 filing.

Q Okay. So after the leak was discovered, you reviewed all of those records again?

A That is correct.

Q Okay. And then if you could, in response to this question you provided a table showing what information changed when you did your second review. That is, it compares certain values, pipeline feature values that you provided in October 2011 to the Commission. It's on the left side of the page. And on the other side you have the updated specifications. Highlighted in green are the things that changed. Am I reading this correctly?

A That is correct.

Q Okay. And we've got several kinds of things that change, don't we? We've got, looks like there were changes to wall thickness for some segments, correct?

A Correct.

Q And to the type of seam?

A That's what's stated here.

Q And changes to the SMYS, S-M-Y-S, the yield strength?

A The Specified Minimum Yield Strength, yes.

Q Specified Minimum Yield Strength. So there were changes to those, those three features after you reviewed your records in 2012 or 2013; is that right?

A That is correct.

Q So how long is Line 147, approximately?

A Slightly over 4 miles.

Q Okay. And about how many feet or how many miles of pipe had incorrect data, incorrect feature data at one time or another?

A I don't have that number in front of me.

Q Well, if you look at the -- if you look at the length of these various segments, it appears that nearly 25 percent of the length of the line had some kind of incorrect data in what was presented to the Commission in October 2011. Do you agree?

A If you add the lengths and do the calculation, I'm sure you can come up with a percentage to validate that.

Q So approximately 25 percent of the pipe data for Line 147 was incorrect prior to the leak investigation?

A The specification information was different, correct.

Q Different and presumably incorrect?

A To the best available information we had in October 2011, we presented that information. As that information was updated, we presented that. As you can see,

the sections were tested, tested and strength tested to well above what the MAOP was required for that line. And it was tested to establish a MAOP of 400 pounds. And none of that information changed. And we've stated that on several occasions that strength testing, and Mr. Rosenfeld also testified to this this morning, is the industry's trusted safety validation.

Q Thank you, Mr. Singh, but that doesn't really respond to my question. I think you have agreed that this table we were just looking at shows features, pipeline features for the line that were corrected after you reviewed your pipeline records after the leak?

A That's correct. They were updated.

Q That's all I want to know.

A Absolutely they were updated. And it's a record of the continuous improvement process.

Q When you say "updated," is that the same thing as corrected in this case?

A They were updated to reflect what's in the ground.

Q So when PG&E -- PG&E has used this word "updated" quite a lot in its presentations to the Commission. So if I

understand what you just said correctly, when you say "updated to reflect what is in the ground," to me that's the same thing as correcting. If the record did not reflect what was in the ground and you then change it to reflect what was in the ground, isn't that a correction?

A Yes. Could say that is true.

MS. PAULL: Thank you. Those are all my questions. And now we -- if you -- could we go off the record for a moment so that Mr. Roberts can come forward?

ALJ BUSHEY: We'll be off the record.

(Off the record)]

ALJ BUSHEY: We'll be back on the record.

While we were off the record, we identified Exhibit J. It is PG&E's response to DRA Data Request 086-22.

(Exhibit J was marked for identification.)

ALJ BUSHEY: Mr. Roberts is going to ask some questions regarding this document.

Please begin, Mr. Roberts.

MR. ROBERTS: Well, the questions don't begin with questions about this document, but that's in the first line of questions.

ALJ BUSHEY: Okay.

MR. ROBERTS: Okay.

CROSS-EXAMINATION

BY MR. ROBERTS:

Q Good afternoon. I'm Tom Roberts. I'm with ORA.

I'd like you to start by turning to page A-64 of Exhibit A to PG&E's October 11 filing.

WITNESS JOHNSON: A We don't have the documents up here.

ALJ BUSHEY: I don't have one either.

MR. MALKIN: May we be off the record?

ALJ BUSHEY: We'll be off the record.

(Off the record)

ALJ BUSHEY: We'll be back on the record.

Mr. Roberts.

MR. ROBERTS: Thank you.

Q So now if you can turn to page A-64 of Exhibit A.

WITNESS SINGH: A Okay.

Q Under section A, this is determining the maximum allowable pressure for Line 147. This summary report is to determine the MAOP for Line 147 as a whole; is that correct?

A That's correct.

Q Okay. Section A provides three

types of values used to determine the MAOP; is that correct?

I can be specific. It provides a design pressure, a pressure test data point, and a historic operations data point.

A That is correct.

Q Can you explain why the value for historic operation says not -- N/A which I assume means is not applicable?

A I'm sorry. Can you restate your question?

Q Yes. Under the -- so the bottom left of this page, it says Historic Operations and instead of a numeric value, it says N/A, which I assume to be not applicable.

I'd like to understand why that is letters as opposed to numbers.

A On part B?

Q This is part 19 -- no. It's part A.

A Okay.

Q Says part 192.619 A-3 Historic Operations.

A Yes, I see that.

Q It's N/A. So why is there an N/A there as opposed to a number?

A Because as part of the MAOP

validation process, the Commission was clear that we would not be basing the MAOP of our lines on the grandfather clause. And that's what that's referring to.

Q I believe that the decision actually refers to 192.619(c) only. But is it correct then to say that your interpretation that this other section of the code is also influenced by the removal of the grandfather clause?

A Correct. If you actually look at the description, it's very similar -- it's the same description, actually.

Q Okay. Thank you.

Now if we can turn -- and part B of this page doesn't apply because this isn't a distribution system. This is transmission, correct?

A That will be correct.

Q Now for part C, there is a number of 330 given and it's provided as the highest operating pressure considered safe based on operating history. I didn't find that description in the code in either of the sections you cite. Do you know what the source of that language is?

A I show on page A-64.

Q No. This is page 65 now. Part C.

A Okay.

Q It gives a highest operating pressure considered safe based on operating history of 330. And that narrative description isn't consistent with language in either of the two regulations cited above it, so I'm curious what the source of that language is.

A Well, this number references 330 in this case because the line over time has operated at a pressure above this value. And this is what we call our MAOP of record, of what was the actual MAOP of the line when it was put in service. The line was put in service in 1947 and various modifications were made to the line subsequent to that.

Q Thank you. For answering my next question about what the number meant. That still doesn't address -- what I was trying to find out is how to tie this number back to the federal code. And these citations here do not reference the part of the code that I would have expected it to and the language doesn't exactly match. But let me -- maybe I can paraphrase to get around this.

Is this the reference to the CFR that says you can establish that one of the pressures you look at in establishing

MAOP is what the operator considers to be a safe operating pressure, is that what this is referring to?

A This in this case is referring to what has been PG&E's historical pressure of that pipeline. And this is not a form that we developed. We've made a few modifications to it but it comes right out of what's cited off the top of the report on page A-6. It's based on AGA white paper on verification of MAOPs for existing CO transmission pipelines.

And if you pull up that report from the AGA, this specific form comes from the 1998 PHMSA guideline. And it's a form that's taken right out of that reference guideline.

Q So if there's something that's inconsistent between this document and the federal code, it's because the AGA white paper has it wrong?

A That's not what I stated. What I stated is that this document is referenced in the AGA white paper and the origination of that is the 1998 PHMSA guideline on how to establish MAOPs.

Q Correct. But if the language here and the citations are not accurate references to the federal code, then there's something wrong with this page, this certification of

the MAOP of this line. And I'm trying to -- if you're saying you got this form somewhere else, then AGA is the one -- AGA is the one that started this, and we don't need to discuss it any further.

A That's not what I stated. It's referenced in the AGA white paper and PHMSA is the one that developed the form as part of --

Q This line references federal code?

A That's correct.

Q It does not reference applicable federal code to a transmission line in this case.

A Understood.

MR. MALKIN: Your Honor, I'm going to object. This is irrelevant.

ALJ BUSHEY: Argumentive. Not focused. Probably more correctly labeled as discovery.

Mr. Roberts.

MR. ROBERTS: We can move.

ALJ BUSHEY: Yeah, let's.

MR. ROBERTS: I think that it matters that we cited the federal code correctly but --

ALJ BUSHEY: But Mr. Roberts, that's the type of thing you do on discovery, not cross-examination.

MS. PAULL: I think he was trying to clarify whether they relied on the Code of Federal Reg- -- what in the Code of Federal Regulations they were relying on --

ALJ BUSHEY: So he's got his answer where the form came from.

MR. ROBERTS: Yes.

ALJ BUSHEY: So please move on, Mr. Roberts.

MR. ROBERTS: Q When you described what that number was, it sounded like it was based on what you operated at historically, the pressure you operated on historically to determine this number which contradicts that you are not using the grandfathering clause.

So I do want to understand the source of this number.

And the reason I mentioned the code is because what I think is the correct code states that an operator can determine what the minimum operating pressure is. And this seems like the right slot for that number that you operated this line, you know how it operates. It's not that it was operated at a lower pressure or a higher pressure before. You know the line and did determine what's safe.

MR. MALKIN: I'm not sure, your Honor,

who's the witness.

ALJ BUSHEY: Yeah.

WITNESS JOHNSON: What's the question? Your question --

ALJ BUSHEY: You keep asking the same -- do you have a clear answer Mr. Johnson?

WITNESS JOHNSON: No. I'm asking what the question was. I heard a lot of conjecture, but hearing you need to go talk to PHMSA.

MS. PAULL: Based on operating history.

MR. ROBERTS: No. I can do this.

ALJ BUSHEY: Let's back up. The question I hear you asking is you put the number 330 in this column.

MR. ROBERTS: Yes.

ALJ BUSHEY: Where did you get that number from?

MR. ROBERTS: And what does it mean.

ALJ BUSHEY: Let's take it one step at a time.

Where did you get the number from?

WITNESS SINGH: A So the number was based on the fact that the pipeline, ever since it was installed, either operated at that value or higher.

ALJ BUSHEY: So you decided?

WITNESS SINGH: A No. We have a record between 1965 to 1970 that states what the highest operating pressure was of the line, and that's what we've used as the MAOP of record which was 400 psig.

The other aspect --

ALJ BUSHEY: Wait a minute back up. Where did you get the 330 then?

WITNESS SINGH: So 330 in this case was based on the fact that it was limiting MAOP based on the design, based on the strength test, and based on what we have operated the pipeline at. We take a minimum of those three values.

ALJ BUSHEY: Okay. So the historic was 400, the design was 330, and you took the minimum of those two, 330?

WITNESS SINGH: We also take the test pressure established for that respective class, which was 404.

ALJ BUSHEY: 404. Okay. So 404, 400 and 330, and you took 330.

And we know where all three of those numbers came from. Okay.

MR. ROBERTS: Q Actually, the determination of the lowest seems to be the final number where it says choose the lowest. I think that's still unclear.

It seems like you're saying that Part C value of 330 came from historic operating pressures; is that correct?

WITNESS SINGH: A What I'm saying is we've historically operated the baseline up to 400 pounds based on the actual pressure log information we have from 196. And we've at least operated the line at 330 or higher. And that's what you see here is 330.

Q Okay. And so in -- okay. Thank you.

On pages before this summary page, you provide this MAOP data for each feature in the pipeline, is that correct, that we have a more fine resolution breakdown of the MAOP of record for each feature that leads to this summary report for the entire line?

A That is correct.

Q And in that table, you have different values for the MAOP of design for each feature, you have different values for the MAOP of -- per test because there were multiple tests performed. But the MAOP per R is consistent for the entire line. So that's because you operated at 400 psi so you consider, as the operator, you can operate it safely at 330; is that correct?

A That's correct.

Q Okay. Now, if we can go to page A-175. Actually, I'm sorry. It's good to hold that page, but now I do want to turn to Exhibit J.

WITNESS JOHNSON: A Which is what now again?

Q In particular, I'll be asking about PG&E's response to DRA 86 Question 22.

A Okay.

Q And in particular the response to part a) on page 2. The question asked basically if there are repercussions of testing a pipe at too high a pressure if you didn't know what the pipe was made of.

And if I could ask one of you to read the first sentence of your response to part A.

A I can read it.

If the test pressure causes the hoop stress on the pipe to exceed a hundred percent of the specified minimum yield strength (SMYS) of the steel, then the steel can weaken and experience structural damage.

Q Thank you.

A I think it is important to point

out we didn't have any of that on Line 147. As we've already stated, the pipeline was tested. It was hydrotested. There was no yielding of the pipeline. So this discussion on what can happen is simply theoretical. It didn't happen on Line 147.

Q But since -- I understand that. Okay. But what I wanted to get at is there are negative repercussions if you don't have the correct pipe specifications, isn't that correct, in performing the hydrotest?

A If you exceed -- if you go to too high a test pressure, things such as rupture can occur, things such as significant yield could occur if you not do any information whatsoever. That's why you do stress strain curves and that's why you check for yield when we do a hydrotest, to ensure that you don't put yourself in that circumstance.

Q Okay.

A As we've already stated, that didn't happen on Line 147 and we haven't had it happen on any hydrotest we've done.

We've done -- we will have done over 500 miles in the last three years. So we've got a strong record there.

Q So now we can turn to 175, please. Let me know when you are there.

A Okay.

Q This document on this page refers to which test?

A Test 43 B. We're on Exhibit A-175, correct?

Q Correct. Yes.

A Page 1 of 12?

Q Correct.

A It says at the top it's T-43-B.

Q Okay. Do you happen to know if Segment 109 was tested as part of this particular hydrotest?

A My recollection is Segment 109 was part of the Test 43-B.

Q Okay, thank you.

This report was written by it says at the top of the page RCP. What was RCP's role in the hydrotest?

A RCP is an independent third party that oversees our hydrotests and makes sure that things like stress strain and all the relevant features of a hydrotest are conducted properly for in-situ hydrotesting that we're doing under the PSEP program.

MR. MALKIN: Your Honor, if there's going to be questioning about that test report, may we provide the witnesses with a corrected copy that we provided to

the parties last week?

ALJ BUSHEY: Do you have copies, corrected copies?

MR. MALKIN: Well, I know we have one but I don't know --

MS. PAULL: What was the question?

ALJ BUSHEY: We'll be off the record.

(Off the record)]

MICHAEL ROSENFELD

resumed the stand and testified further as follows:

ALJ BUSHEY: We'll be back on the record.

While we were off the record we had an extensive discussion about stress-strain curves and evidence and yielding.

Mr. Rosenfeld has retaken the stand. He remains under oath, and he's going to describe in summary terms what he explained off the record. And he's going to address changes that have been presented by PG&E to their report from RCP regarding pressure test 43 B.

Mr. Rosenfeld.

THE WITNESS: Yes. So the pressure versus volume chart is analogous to a material stress-strain curve because pressure

is -- stress is tied directly to pressure in the pipe. And strain is a measure of deformation which is tied to the volume of -- the volume of the pipe. And so if the material is behaving elastically, meaning it hasn't -- has not yet yielded, you would normally expect a linear portion of the stress-strain curve, and you would expect the pressure volume chart to also be linear in that range.

However, that as far as the pressure versus volume, that assumes that in fact the pipeline has -- is full of water with no bubbles or pockets of air in the pipeline. And when you introduce water into a pipeline that has various elevations and so on, air is going to get trapped in portions, portions of the pipe inevitably.

So what we see here is that if your -- you see on the stress-strain curve which we talked about earlier, the curve does in fact deviate from a straight line, but it's curving and bending to the left and going -- and the slope is increasing as it's doing that. That is not indicative of yielding. If a joint of pipe or several pieces of pipe in the pipeline were in fact yielding, what would happen is that the curve

would bend to the right and it would move farther to the right faster than it goes up. Here instead we see it's rising, and it's essentially showing that the system is in fact stiffening.

So that's occurring as -- my interpretation of this is that that's a result of air being absorbed in the water. When it finally does go straight, it's behaving in an elastic manner. It doesn't necessarily match the slope of what was predicted potentially for a number of reasons. For example, one could be that there's still a pocket of air trapped at the -- say in the header at the end of the test section, and it's continuing to compress kind of like a big spring. And so what you see is an air spring. And the pipe is also elastic, and it's behaving like a steel spring. And the water is elastic, and it behaves like a big hydraulic spring.

So these springs in series are going to have, especially with the air pocket, are going to -- will have a lower elastic slope, which is going to affect the pressure versus volume relationship. However, that does not mean that it didn't get to the pressure. The pressure is pressure, and the pipe doesn't

really know the difference whether it's coming from water or air or a combination of those. So I don't think that this shows yielding.

The earlier version of the report indicates a -- that a yield pressure of 442 pounds, you can see that that's actually not even on this -- that pressure level isn't even shown on this chart. I don't think there's any way that it could have been -- I think the only explanation for that number is a typo. People do make typos. So the second -- the revised version of this shows the -- it indicates a yield pressure at 748. That's simply the maximum pressure that it was taken to during the test. So it very likely would have yielded a -- if it were pressured to the point of yielding, that would have been at a most likely a much higher pressure than that. So that's my interpretation of this information.

ALJ BUSHEY: Thank you, Mr. Rosenfeld.

Any questions for Mr. Rosenfeld? All right then.

CROSS-EXAMINATION

BY MS. BONE:

Q Yes, Mr. Rosenfeld. Which chart are you referring to, on what page of the

report or what's supposed to replace what page of the report?

A I was referring to this chart.

Q Okay. And that's the only one you were referring to?

A Yes.

Q Okay.

A I don't believe that chart changed in the two different versions.

Q For the record, what page is that?

A I see that as page 11 of 14 on the corrected report.

Q The corrected report, the third corrected report?

A The one that --

Q By RCP?

A -- is dated 11/11/2013.

Q Okay. The one we don't have here.

ALJ BUSHEY: Okay. Final questions? Yes, Ms. Strottman.

MS. STROTTMAN: Yes. Thank you.

CROSS-EXAMINATION

BY MS. STROTTMAN:

Q Mr. Rosenfeld, looking at this chart, there's a green line that says predicted, correct?

A Mm-mm.

Q And then you have the -- it's the

actual line --

A Yes.

Q -- there? Okay. And so you testified that there were some, I guess perhaps some air bubbles. Is that between 150 and 200? I was trying to give you a reference. Where are the air bubbles located on the actual line?

A Well, they're -- what I would interpret as absorption of air in the water is indicated by the fact that the curve is as it goes up it's curving to the left and the slope of it is increasing. So what that indicates is that the overall stiffness of water plus air plus steel all being elastic under pressure is increasing. So that's the opposite of yielding.

Q So then why didn't the estimated level go back to the predicted level?

A Well, because it has -- it has absorbed -- it's taken additional water to arrive at that pressure. So what happens is if you have the whole system having a -- behaving with a lower stiffness or lower compliance, it will take more water to arrive at a particular pressure. It's affecting the pressure versus volume relationship because portions of -- essentially what's happening

is you're collapsing pockets of air or something of that nature. So it's behaving with a lower -- lower overall compliance. But you can see that it eventually does become elastic. In other words, you've got a straight line as you're coming to the completion of the test.

Q But it's still not behaving as predicted?

A No. That's because you can't predict the quantity of air that might be trapped somewhere in the pipeline.

Q And was any one -- was any one at the leak site when this pressure test was conducted? Do you know?

A At the leak site.

Q Yes.

A You mean the place that leaked a year later?

Q Yes.

A I couldn't tell you that, but it would surprise me if they were.

MS. STROTTMAN: Thank you.

ALJ BUSHEY: Mr. Meyers.

MR. MEYERS: One question, your Honor.

CROSS-EXAMINATION

BY MR. MEYERS:

Q Mr. Rosenfeld, referring to excerpt

from PG&E response to DRA Data Request 86, Question 2, Attachment 4, this chart.

A Yes.

Q When is the first time you saw this?

A I saw this when I was reviewing the data back in October.

Q And this was part of your conclusions then when you evaluated the hydrostatic test?

A You know, I wasn't especially focused on this chart. I was actually more interested, to tell you the truth, in this chart. And this shows --

Q Sir, can you identify for the record what chart you're holding up?

A That is on page 10 of 14 on the 11/11 report, but it also appears in the earlier reports as well. It's in both. It's the page before the pressure versus volume chart. And what this shows is, I was concerned about were there changes in pressure during the whole period that would have indicated a leak. And if there were changes in pressure, would they be tied to a leak or would they be tied to changes in temperature of the pipeline because a long column of water is a pretty sensitive

temperature transducer.

And what I see is that the pressures held steady. The pressures on the chart match the pressures that were in the test notes. And so this to me, this was the chart that I felt was most important in terms of understanding the outcome of the test.

Q Is the predicted path of this chart in the spike pressure test, is that an arithmetic calculation or is that someone's opinion?

A Well, you would have to really ask RCP about that. All of these spreadsheets and worksheets are their work products. But they have indicated to me in conversations that it was based on their information about the lengths of various segments of the pipeline having different diameters and wall thicknesses.

Q So would it also be affected by the hydraulic head of the section being tested? In other words, the fact that the spike line runs up downhill?

A I don't think it would be significantly affected by that.

Q And so you asked the experts how they arrived at the calculations that led to the expected yield. And did you have any

concerns with respect to the analysis that they gave you as justification for the predicted calculation here?

A I'm not sure I answered your ques -- understand your question.

Q Were you satisfied in your discussions with the retained consultant by PG&E that the information or assumptions or calculations that they were using to come up with the expected yield as shown on this graph was in fact accurate and would be consistent with what you would do if you were in the same position as the world's expert on hydrotesting?

A Their description of what they did made sense to me.

Q Thank you.

CROSS-EXAMINATION

BY MS. BONE:

Q One more clarification. Mr. Rosenfeld, Mr. Meyers just asked you when you reviewed this report. And you mentioned I think October of this year. So the report you reviewed, was it the one dated March 15th, 2012, or was it the current one, the 11/11/2013 report that's now been corrected?

A Well, since I was reviewing it in October, it couldn't have been the one dated

11/11.

Q Right. So the report you reviewed for Test T 43 B showed the 236 psig on that, on page -- what is that, I can't see -- 10 of the 12.

A Right. And I -- I was somewhat baffled by that number. But I was more concerned with things like the actual written pressure and stroke counts and the chart that I just showed you a minute ago showing pressure over time and temperature over time. And so that was -- that was what I focused on.

Q So the 11/11 version, when did you first see that version of the report?

A I think yesterday.

Q Okay. And can you rule out for us that Line 147 was not damaged by this test?

A Yeah, I think I can. First of all, there's no evidence that yielding took place, and to be perfectly honest, yielding does not necessarily mean that the pipe -- pipe is damaged. A lot of pipe is actually manufactured by expanding it to a final diameter to get -- get strength. So you know, yielding is -- all pipe is yielded in some form in turning it from a flat plate to a circular cylinder.

I think the -- without going out on a limb here, I suspect that you're concerned about the possibility of some kind of damage during the test from some kind of tearing or crack growth, kind of like what the NTSB reported observing in the pipe that failed at San Bruno. And you know, you actually can't rule that out with any test. Even in brand new pipe that's always a possibility.

The issue is, can it be so bad that it -- the creation of or the occurrence of tearing, small amount of tearing at the root of a flaw that may have been present before the test, if that reduces the strength of the pipe such that it affects the reliability or the integrity of the pipe at its operating pressure. And the -- so long as you've got a significant, a reasonable or significant margin between what you test to and what you operate at the answer is no, it's not going to do that.

Now, in fact, this isn't supposed to be a discussion about -- I mean this whole thing isn't about San Bruno. It's about this particular pipe, but San Bruno is sort of the reference for everything that we're talking about in a way. And so tearing did occur there. That pipe was tested to only -- to a

relatively small margin over what it operates at. And yet it was in fact able to tolerate that condition for quite a few decades. And that's with a relatively small test margin.

Now, this pipe has been tested with, effectively, that was a test of 1.25 times what it operated. In this case the spike test level was double what the pipe is proposed to operate at. So that's essentially four times the margin of what we saw with the San Bruno pipe. So even if a small amount of tearing did occur, it will take a long, long time for that to ever affect the pipe.

The other thing that people worry about is the so-called pressure reversal phenomenon where the tearing is actually significant enough to lower the failure -- lower the failure pressure after achieving a successful test. And you know, this is something that's been observed with some old varieties of old low frequency ERW pipe, for example, or occasionally with something like mechanical damage which is where the pipe has been hit by a backhoe.

And the vast majority of observed incidences of that have been on the order of 5 or 10 percent of -- a reduction in failure

pressure of 5 to 10 percent of what the test pressure is. In fact, that's why you use that 5 to 10 percent bump up for the spike test. All right. It's the same issue there.

So I don't think that there have ever been so-called pressure reversals that lower, immediately lower the strength of the pipe after a successful test by more than about 25 percent. So something like here where you've tested to double what you're going to operate at. I'm not worried about that affecting this pipe.

Q Okay. Thank you. One other clarification. I thought PG&E witnesses testified this morning that there was no hydrotest on the San Bruno line?

A You know, there's -- there was a metallurgist, Bob Caligiuri with Exponent, who examined those fracture surfaces. And I think he has gone on the record as saying, well, there's ductile tearing. There's -- you think about what are the opportunities where that could have occurred. It didn't occur where at wherever whoever made that -- wherever that piece of pipe was made, whoever made it we don't know because the material was -- the weld was so weak and the material was so low in strength there's no way that it

was -- you can't even call it pipe. It's cylindrical, but it's not pipe. And so it wasn't made the way pipe is supposed to be made or even was supposed to be made at that time. It didn't occur then.

There was no evidence of the pipe -- pipeline operating at excessively high pressures, at least not in past -- the past ten years of pressure records. So it didn't occur then. And so, you know, I have been -- I'm given to understand that there was a sworn witness who claimed that they did see a pressure test at 1.25 times the MAOP at that time. So given the choice between something that a sworn witness has said versus something for which I have no evidence, I'm going with there probably was a pressure test to 1.25.

And you know, the occurrence of a possible pressure test for a short time is not -- and then a failure about 50 years later is not inconsistent with what we know about the behavior of pipelines that have been pressure tested. 1.25 is great for a pipeline operating at very high stress because 1.25 times a high stress is a very high stress. And only very small flaws could withstand that. Whereas 1.25 times a low

stress is -- or a low or moderate stress isn't a very high stress. And very large flaws can potentially survive that. And large flaws grow faster all -- grow faster than small flaws all other things being equal.

And in fact, we did, just to satisfy ourselves that we understood what might have been going on, we used the NTSB's metallurgical report to make our own calculations in using the pressure data that we had from Line 132 to make our own estimates of the time to failure. And we calculated a time to failure that was about 49 years. It went 56. So I think it all ties together.

But in this case you've tested to a very large margin over -- or PG&E has tested to a very large margin over what the pipes can operate at. And consequently, I don't have concerns about pressure reversals that would affect this pipeline as a result of the phenomenon that we were talking about. And that ties directly to the long predicted times to failure from pressure cycle fatigue.

Q Thank you.

ALJ BUSHEY: Mr. Gruen.

MR. GRUEN: May I ask a follow up, your

Honor.

CROSS-EXAMINATION

BY MR. GRUEN:

Q Mr. Rosenfeld, does it factor into your thinking, assuming that Line 147 was hydrotested above 100 percent SMYS, if that fact is true, can you still rule out the possibility of damage to the pipe from the hydrotest?

A I don't consider yielding to be necessarily a no man's land in terms of what that does to -- what that does to the pipe. There are situations where it's -- where you actually have to test to above a hundred percent of the Specified Minimum Yield Strength of the pipe to deal with particular situations. There are other situations where that's not a good idea, mainly if you have pipe with seams that have shown a sensitivity to extremely high -- to trying to be tested or a sensitivity to being tested to higher than the pressures that it may have seen historically or at the pipe mill.

So that would be some low-frequency ERW seam pipe that has had seam ruptures in the past, or it could be lap-welded pipe, for example, which has a -- tends to fail spontaneously at a historically high test

pressure. You couldn't take some of those to above a hundred percent SMYS. I don't think this pipe went that high, but if it did, I wouldn't necessarily be -- consider that it was irreparably damaged.

Q Would you think it's a good idea if there were unknown values in the pipe and that there could in fact be reconditioned pipe on Line 147, what about then, would it be a concern for you?

A No. No, it wouldn't. I mean if it was a problem for the pipe, it would have failed during the test. And if this was pipe that was susceptible to pressure reversals after being tested that high, the next attempt to test would probably have resulted in a failure as well, probably at a lower pressure. In fact, where you have subsequent -- where you have test failures at lower pressures than the prior occurrence, that's when you know that you're damaging your pipe. There's no evidence that that occurred here. There were no failures. I don't think it did yield.

MR. GRUEN: No further questions, your Honor.

ALJ BUSHEY: Thank you. Final questions for the witness?

(No response)

ALJ BUSHEY: Thank you again, Mr. Rosenfeld.

THE WITNESS: Thank you.

ALJ BUSHEY: We will let Mr. Singh and Mr. Johnson resume the stand then and return to Mr. Roberts' cross-examination.

SUMEET SINGH and KIRK JOHNSON resumed the stand and testified further as follows:

ALJ BUSHEY: Mr. Roberts.

CROSS-EXAMINATION

BY MR. ROBERTS:

Q Thank you. I'd like to start with an exhibit that I circulated initially. It hasn't gotten an exhibit number yet, but it says, "Pipe features with assumed data on Line 147 DRA sort of PG&E spreadsheet."

ALJ BUSHEY: This will be Exhibit K.

(Exhibit No. K was marked for identification.)

WITNESS JOHNSON: What document was it again? There are documents everywhere here.

WITNESS SINGH: Was it titled "Pipeline features with assumed data"?

MR. ROBERTS: Q Yes. Let me know when you're there.

WITNESS SINGH: A Okay.

Q You may recognize that this is data that was taken from the spreadsheet that PG&E provided, which was an Excel version of the MAOP report that was included in Exhibit A, PG&E's October 11, 2013 filing. Does that look familiar and correct to you?

WITNESS SINGH: A There's no specific date on this report. So I'll take your word for it. This is a MAOP validation report.

Q What this is, I sorted -- so first of all, if you look at the first page of that attachment, you'll see that in the very far right column are either a 3 or a 1.]

Do you see that?

A I do.

Q The legend's a little bit blurred, but can you tell me what a value of 3 means relative to the adjacent SMYS to the left of that?

Let me rephrase that.

Does that indicate that this is a federal minimum standard?

A The 24 -- are you alluding to a specific feature and number?

Q No. I'm referring to the Footnote 3 that -- if we were to go back to Exhibit A, the footnote's clear and it

says federal minimum is what that footnote means. And so I'm asking, does that mean that the 24,000 SMYS is a federal minimum number?

A Yes. That's cited in the federal code.

Q Okay. And then short of the manufacturing bends at the top of this list, we then go to a number 1 and the values start at 30,000 for SMYS; is that correct?

A That's what's included here, correct.

Q Okay. And that footnote 1 says historical procurement practices sound engineer analysis. Is that the same thing as your PRUPF document used to determine assumed data?

A Yes. The Pipeline Resolution for Unknown Pipe Features, PRUPF for short.

Q Okay. Now, just so we have an idea of the scope of this assumed data, I sorted on features that have assumed data and summed the footage on the final page of this exhibit. So it shows both total footage and assumed length. And that number indicates that 10 percent of the pipeline 147 currently as updated by PG&E through this OSC has assumed data. Does that sound correct to

your knowledge about the line?

A That's what this analysis states. Without looking at this in more detail, I'll take your word for it.

Q Okay, thank you.

Okay. So we have 10 percent assumed data. So if you look through this exhibit, other than the values that are indicated with the 3, is it correct that this lowest SMYS value in this table is 30,000 meaning 30,000 psi?

A That's what this data shows.

Q Okay. Now, if I can turn your attention to Exhibit A to the October 11 filing page A-60 about halfway down the page.

A I'm sorry. I'm not there yet.

Q Sure.

A Okay.

Q And if you can look at any piece of data with the seam type that says AO Smith SMAW and with an MAOP per design of 330, there are a few of them right in the middle of that page.

Let me know when you find that.

A I'm there.

Q Okay. For any of those lines, is the SMYS value shown 33,000?

A Yes, it is.

Q If that SMYS value were lower than 33,000, what would happen to the MAOP of design that's shown for that feature, would it go higher or lower?

A It would be lower.

Q And from the safety perspective of say the City of San Carlos, would the use of a SMYS for a piece of pipe where you don't know everything about it, would an MAOP that is higher be more conservative or less conservative than an MAOP of design using a lower SMYS?

Want me to rephrase?

A Yes, please.

Q Is a lower MAOP more or less conservative than a higher MAOP whether that MAOP is based on an assumed SMYS?

A Well, it depends. It's relative to the design factors for that respective class location. And again, the values that we're looking at here, and I believe Mr. Rosenfeld addressed this earlier, the MAOP of design is for pipelines installed in 1970 and going forward. And what we've done is we've actually been conservative in our methodology and we've retroactively applied section 192.105 as part of the MAOP validation process.

Mr. Rosenfeld also stated there's a difference in the code between the design and the operations section of the code. And he made a reference to hoop strengths to ensure if the hoop stress is operating within the respective class which does not use a joint efficiency factor. So in essence --

Q Excuse me. I'm sorry. This was a very general question.

MR. MALKIN: Your Honor, I'm going to object to the witness being interrupted. I mean, I understand we're not really searching for truth but --

ALJ BUSHEY: At least we want some.

MR. MALKIN: The witness ought to be allowed to complete the question. We've got one engineer asking another engineer and --

ALJ BUSHEY: At a minimum, this will inconvenience the court reporter. So for the convenience of the court reporter, Mr. Roberts, let's let the witness answer.

MR. ROBERTS: My apologies.

ALJ BUSHEY: So Mr. Singh, do you have anything you wish to add?

THE WITNESS: I've stated what I needed to state.

ALJ BUSHEY: Thank you.

Mr. Roberts.

MR. ROBERTS: Q MAOP of design is something that's required by federal standards for determining the MAOP for a line; is that correct?

A For pipelines installed in 1970 and going forward.

Q Is it a coincidence here that the MAOP of design of 330 happens to correspond to the hoop per R a few columns to the right.

A Well, there's no coincidence. The -- what I stated earlier was the MAOP of R is the MAOP of record. And this value is the value that PG&E operated the line to prior to the MAOP validation effort as well as the strength test effort and the actual MAOP of record that we have is 400 psig. The reason why we're showing 330 here is because that's what the limiting factor is based on our current interpretation of the regulatory code.

Q This whole Order to Show Cause is taking place because PG&E has to adjust the MAOP for this line down to 330; is that correct?

A That is correct, but there's several factors that brought us to the place of where we are today from the starting

point.

Q Is one of those factors the changed assumed data for line segment 109?

A One of the factors is the fact that we identified at the time the leak was done a AO Smith section of pipe which we take on a conservative basis the value of .8. We do an efficiency factor. And that's what reduced the MAOP of design. There's also another key contributing factor and that was the application of a repealed section of the code which was 192.607 and in our current interpretation it states, which is counterintuitive to engineering, that you can't use a more recent strength test to operate one class out. And had this pipeline been tested between '71 and '74 which was the then-applicable section of that code, we would be able to operate one class out. So those two inputs taken together end up reducing the MAOP on the design basis.

Q When was section 607 repealed?

A My understanding is it was repealed in 1996, maybe earlier, subject to check.

Q Okay. Let me try this one other way. Going back to the exhibit that we started on, you have assumed SMYS values in this table which are used to calculate

the MAOP of design which is included in, for whatever reason, you have included it in your MAOP certification report and it does show in the summary and it just so happens that the value that you want to run this line at corresponds to the MAOP of design of the segment that that had revised characteristics.

The SMYS value that's used there is 33,000, which is higher than the federal minimum; is that correct?

A That is correct. And that is also consistent with -- I'll point you to a document that we submitted on the record, was I believe a public document March 21 of 2011, and that clearly articulated to the Commission our methodology that we're going to use for the MAOP validation effort. The specifications and the MAOP of design is not a substitute for strength testing. We do not use it as such. It's an interim safety measure.

And in that March 21, 2011, document, we also clearly stated that we don't have traceable, verifiable, complete specifications with a hundred percent perfect chain of custody for every single specification given that some of these

records are 60, 70, 80 years old. And in those cases, we would use conservative assumptions based on PG&E's historical procurement practices.

Q Okay. So that's what PG&E said it wanted to use, correct, and it submitted that to the Commission for approval?

A That was filed March 21 of 2011, correct.

Q So there's a federal standard, 192.107 which says if you don't know what kind of pipe is in the ground, the default value unless you've done tensile testing is 24,000 psi; is that correct?

A That is correct. But it also states what you just read that you don't know anything about that pipe, which is not true in some of these cases. And that's the basis for the conservative assumptions being based on historical procurement practices because we do know something about those lines, i.e., the diameter of the line, i.e., when was that particular line installed, the fact that it was engineered and constructed under PG&E's standards. So those, that serves as additional information that we use to make and base our engineering analysis on.

In those circumstances where we

have acquired pipe from third-party operators and we didn't have that information, absolutely we use the federal minimum standard.

Q So in other words, according to PG&E's discretion in their document where they design -- where they define their assumption criteria, it allows you to establish, according to what we see in this line, a value no lower than 30,000 psi for a SMYS where you know limited information about the pipe, which is higher than the federal minimum standard of 24,000.

So in essence, what it seems that you're saying is that if PG&E feels it knows more about the pipe than nothing, it's justified in coming up with a SMYS for that unknown pipe where you don't know where the pipe came from, let's say you don't know where it was purchased, you don't know when it was purchased, which is the case with 109, that you can use a SMYS value which is higher than the federal minimum which results in an MAOP that is higher than would be calculated using the federal minimum SMYS; is that correct?

A That the basis of our analysis and conservative assumptions is exactly as

I've stated. And what we do is, if you actually follow the PRUPF, that there's certain specifications associated with diameters of lines and when they were purchased and when they were installed and we use the actual minimum of those values.

So our specifications didn't state just 30,000. They stated 30,000, 35,000, 42,000, 52,000. But we use the minimum of our procurement standards and material specifications consistent with the methodology that we submitted.

MR. ROBERTS: Your Honor, I can finish this line of argument if I could refer directly to the PRUPF, which I did include as a attachment but it is confidential because it's considered proprietary, it sounds like.

ALJ BUSHEY: Well, first of all, it's not a line of argument. It's a line of questioning.

Second of all, what is it that you want to ask him about? And is it possible to take just a couple sentences out of that and just read that to him?

MR. ROBERTS: I can refer to a specific table and ask a question about that.

ALJ BUSHEY: Okay. Why don't you do that without saying what's in the table.

And for clarity of the record, if you could call it by something other than its acronym, that would be helpful.

MR. ROBERTS: I will try.

Q So you have a document called Procedure for the Resolution of Unknown Pipe Features, correct, that defines how you populate MAOP calculations where there's limited information; is that correct?

WITNESS SINGH: A That is correct.

Q And since we're limited in what we can discuss about that, there is a table in that procedure which specifically relates to the diameter of pipe that we have in Line 109 which we know is not confidential. It's 20-inch diameter. I can tell you it's on page 80 of the document.

Just let me know when you're there.

A It's page 80 of 89?

Q 80 of 89, yes.

A Is that page --

Q You're there?

A I'm there.

Q Okay. Is there a value in this table that is as low as the federal minimum standard of 24,000 psi?

A No, there's not.

Q So PG&E's Procedure for Resolution

of Unknown Pipe Features does not allow the assignment of a SMYS at the federal minimum for pipe with certain unknown pieces of data?

I'm sorry. I could be clearer if I could refer directly to this, but my hands are a little bit tied.

A If you actually review the rest of this document, it makes a distinction between, as I just articulated previously, those pipelines that were engineered by PG&E and constructed at PG&E's oversight versus those pipelines that were acquired by third party operators. In the instances where PG&E's standards do not cover third-party acquisitions, we absolutely defer to the minimums in the federal standard.

Q So in the case of 109 where you had reconditioned pipe brought in to use on that line in 1956, if I recall from the record correctly, we don't have verifiable, traceable procurement records for that pipe so we don't really know where it came from, wouldn't it be more appropriate to assign a SMYS of 24,000 to that the same way you would have if it was owned by a third party?

A Not in this instance because we have a specification associated with AO Smith

which identified that the minimum yield strength that we purchased or specified for AO Smith pipe would be 33,000.

And in the specific instance that was actually validated that our assumption of 33,000 is more conservative, there's a metallurgical report that we submitted from Anamet in addition to the root cause analysis.

We're just looking at the material properties and those material properties conclude two things. First, the actual SMYS of the base metal which we are assuming here of 33,000. It was greater than that number. Subject to check, if my memory serves me right, that was 39,300. And the second piece it validated was we also tested the strength of the base metal versus the strength of the weld. And what it showed was the weld had a greater strength and that actually gives an indication of your joint efficiency factor. It continued and continued to use .8. But for that specific location, we validated through destructive testing and laboratory testing. We did not have to derate a joint efficiency factor nor did we have to derate a yield strength at that specific location. But we will continue to

use .8 and 33,000 as a conservative assumption.]

Q You say that it's conservative, but you're using a value that is less conservative than the federal minimum standard when it comes to establishing the MAOP; is that correct?

WITNESS SINGH: A But lower than the actual value of the validated as part of the destructive examination in the laboratory.

Q So then what you're saying it sounds like is that rather than using the default per 192.109, you're establishing a SMYS based on the existence of a tensile test in accordance with Section 2-D of Appendix B.

Is that a correct statement?

A I'm not following what you just --

Q Well, the federal standard says you can use 24,000 or do tensile testing. And that seems to make sense. What I haven't seen is a test report that says a single sample on one portion of Line 109 allows you to make an assumption about all A.O. Smith pipe that was reconditioned and is used in Line 147 throughout the MAOP validation process.

So I guess my question is do you have a report that says you have established

the SMYS for these segments with assumed values per Section 2-D of Appendix B of Section 192.109?

A I believe everything that I've stated is consistent with the MAOP validation methodology that we put forward prior to commencing this work. And we have stated that in those instances where we do not have the specifications for some of the features, that we would base it off PG&E's historical procurement practices. And that's exactly what we've done. Our specifications for A.O. Smith pipe have always been a minimum yield strength of 33,000.

And one other aspect I just wanted to clarify is that the MAOP -- and the Commission's been very clear about this -- is only established through strength testing. And that's been done in this instance as well.

Q The Commission is a state regulatory body, correct? The CPUC is a state regulatory body?

MR. MALKIN: I think we're getting a little --

ALJ BUSHEY: Mr. Roberts, at a minimum, that's argumentative.

MS. BONE: Well, it's actually leading

to a very important point that he wants to make.

ALJ BUSHEY: Can we do that in a nonargumentative respectful way? Mr. Singh knows that we're the California Public Utilities Commission, okay?

MR. ROBERTS: What seems confusing is that Mr. Singh's response is saying that because we said we're going to do it this way, we did it this way, while it is less conservative than what the federal standard says they should do. And so because the CPUC has approved their request to do it that way, there seems to an argument that it's okay to do something less conservative than the federal minimum standards because they said this is what they were going to do. So that's what I'm trying to clarify.

ALJ BUSHEY: That seems to be an accurate summary of Mr. Singh's testimony.

MR. ROBERTS: Okay. Q Going back to Exhibit A -- this is the last question -- once again, Exhibit A, page 60. And one of those examples with A.O. Smith pipe with a design MAOP of 330.

Do you see that?

WITNESS SINGH: A I do.

Q If instead of using the 33,000 from

the procedure for Unknown Pipeline Features document, if instead of using that value, you used the federal minimum of 24,000 psi, would you agree that the MAOP of design would be lower and in fact it would be 241 psi?

A If that was a pipe we were installing in 1970, that will be correct. Given the fact that it was a pipeline that was installed in 1957 and if we want to be consistent with the federal regulations, we should go back to Mr. Rosenfeld's statement which was when we're actually calculating the hoop stress of the line, you use Barlow's equation, which was clarified by PHMSA themselves, the acting director at that point in time in 1979, that you would not use joint efficiency factor of 0.8, that you would continue to use the joint efficiency factor of 1.0. That's a clarification that Mr. Rosenfeld cited this morning.

Q So with that clarification -- and this is strictly an arithmetic question, not a question of policy or regulations -- if you were to use a SMYS of 2400 in your calculation of design MAOP, would the MAOP of design -- would it be lower?

You have a formula. And it's got an input variable. That input variable can

be higher or lower. And I'm asking what the output of that equation would be. It seems like an easy yes/no.

A So I believe in the question you stated 2400. I just want to clarify and validate did you mean to say 24,000?

Q No. If we used a SMYS of 24,000, we would have an MAOP of design significantly less than 330 psi?

A For pipeline installed in 1970 or thereafter, you would be correct because the code has to be applied to the relevant time frame that it exists.

Q Does the equation change depending on when the pipe was installed? because I'm asking a question about an equation, how you got from one column to another. And I wasn't aware that the calculation -- the Barlow's equation had changed.

A So I believe Mr. Rosenfeld clarified this earlier as well. Barlow's equation actually does not include the joint efficiency factors. The design equation referenced in 192.105 does. And that pertains to pipelines installed in 1970 and going forward.

And in our conservative methodology, we applied that same design

equation retroactively. So we've in essence treated any pipeline that's ever been installed in PG&E's system as a new pipeline. That's how we've done our methodology. And that's conservative methodology.

MS. BONE: Your Honor, could you please direct the witness to answer the question? It was a very simple question about if you used 24,000 psi in the calculation, would you have an MAOP of lower than 330? It's an arithmetic calculation.

ALJ BUSHEY: Arithmetic doesn't change. And we don't need this witness to do arithmetic for us. If it's simply arithmetic, then the answer is what it is. Okay.

So, yes, Mr. Malkin. Nothing.

Okay. Do we have further questions for these witnesses? We have a little bit of -- Mr. Roberts, are you done?

MR. ROBERTS: No.

ALJ BUSHEY: No, you're not done?

MR. ROBERTS: No. I have no more questions.

ALJ BUSHEY: Okay. Ms. Bone, do you have some questions?

MS. BONE: No, I do not.

ALJ BUSHEY: Okay. Ms. Paull,

questions?

MS. PAULL: No.

ALJ BUSHEY: Okay. We've got a little bit of time. Does somebody have a short series of questions that they'd like to get started with? No one has any questions for these witnesses?

MR. MEYERS: We have questions.

MS. STROTTMAN: We have questions. Do you want me to start?

ALJ BUSHEY: Yeah, we have got 15 or 20 minutes. Is there something that we can get taken care of? We don't want to waste one moment.

MR. MEYERS: Before we get to that, your Honor, if I can ask, what's the resolution of this issue of coming back in a workshop context? Are we likely to come back here to finish our questions tomorrow morning?

ALJ BUSHEY: Or we can -- we'll be off the record.

(Off the record)]

ALJ BUSHEY: We'll be back on the record.

While we were off the record we discussed the schedule for the remaining cross-examination. We have decided that we

will reconvene for evidentiary hearings, cross-examination of these witnesses and an additional witness at 9:00 a.m. on Wednesday, November 20th.

In addition, PG&E's witnesses will arrange for a clarification session with DRA and any other party that's interested in participating regarding the issues raised in DRA's testimony tomorrow.

So is there anything further to come before the Commission at this time?

(No response)

ALJ BUSHEY: Hearing none, then this evidentiary hearing is continued to November 20th at 9:00 a.m., and the Commission is adjourned. Thank you.

(Whereupon, at the hour of 4:35 p.m., this matter having been continued to 9:00 a.m., November 20, 2013, at San Francisco, California, the Commission then adjourned.)

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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	Rulemaking 11-02-019

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I, Alejandrina E. Shori, Certified Shorthand Reporter No. 8856, in and for the State of California do hereby certify that the pages of this transcript prepared by me comprise a full, true and correct transcript of the testimony and proceedings held in the above-captioned matter on November 18, 2013.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 18th day of November, 2013.

_____
Alejandrina E. Shori
CSR No. 8856

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	Rulemaking 11-02-019

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EXECUTED this 18th day of November, 2013.

_____
Thomas C. Brenneman
CSR No. 9554

BEFORE THE PUBLIC UTILITIES COMMISSION

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STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	Rulemaking 11-02-019

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Michael J. Shintaku
CSR No. 8251

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

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Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	Rulemaking 11-02-019

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CSR No. 11406