ROUGH DRAFT

# NRC INTERVIEW OF MR. E. E. KENT

INTERVIEW DATE: 10/15/82 LOCATION: Dana Point, CA

ATTENDEES:
E. E. Kent
O. C. Shackleton - NRC/Office of Investigations
P. V. Joukoff - NRC/Office of Investigations
D. F. Kirsch - NRC/Region V

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ROUGH DRAFT

E. Earl Kent

Mr. Shackleton: Mr. Kent is being interviewed in Room 101 at the Marina Inn at Data Point, California. Present from the United States Nuclear Regulatory Commission to conduct this interview of Mr. Kent is Mr. Dennis Kirsch. Mr. Kirsch is a Section Chief in the Construction Branch of the U.S. Nuclear Regulatory Commission assigned to Region V. Present from the Office of Investigations, the San Francisco Field Office, is Mr. Philip V. Joukoff, an investigator and as moderator of this interview, my name is Owen C. Shackleton. I am the Acting Director for the Office of Investigations for the San Francisco Field Office. This interview on tape is beginning at approximately eight minutes after ten in the morning of October 15, 1982. Prior to this interview, I discussed with Mr. Kent the laws that apply to persons giving testimony under oath and he voluntarily gave his permission to be placed under oath and this was so done prior to going on tape.

Mr. Shackleton: At this time Mr. Kent I have I'm conducting this interview on tape, is this being conducted with your knowledge and permission?

Mr. Kent: Yes sir, it is.

Mr. Shackleton: Alright, thank you. And a Mr. Kent would you please for the record give your home address and telephone number.

Mr. Kent: My telephone number is area code My address is

Mr. Shackleton: Thank you. At this time Mr. Kent, a what we would like to do in order to take as small amount of your time as possible and get right to our point which are our concerns with the information you have to provide us with the San Onofre Nuclear Generating Station. And I understand you have information relating to Units 1, 2 and 3. Is that correct?

Mr. Kent: Yes, I I a have knowledge of them. I don't have it right here on my fingertips.

Mr. Shackleton: Well that's all right. So at this time what I'd like to do, I will turn our discussion over to Mr. Kirsch because Dennis wants to go back over information that you have provided to us by telephone and make certain that he has everything correct to the best of your recall so that when our engineers proceed on their inspection over your concerns we won't a possibly miss anything that you a have identified. So Dennis why don't you go ahead.

Mr. Kirsch: Earl I talked to you October 6, 1982 about 1:30 p.m. and a this was by telephone. I have written down a number of the concerns as I understood them and I want to read back what I have written to verify that this is indeed your concern.

Mr. Kent: Of some of my concerns?

Mr. Kirsch: Of some of them, yes. Number one - outfitters use used pipe cutters to place scribe marks on socket weld fitup measurements. The alleger stated that the pipe cutter used caused deep grooves in both stainless and

carbon steels pipe carbon steel pipes from about 1 inch back from the weld area. The concern is that these grooves caused stress risers

Mr. Kent: Raisers, I'm sorry, it is ~~stretch~~ stress raisers not risers.

Mr. Kirsch: Okay.

Mr. Kent: There's a difference.

Mr. Kirsch: He stated that these conditions exist all over Units 2 and 3 socket welds. Is that a true statement?

Mr. Kent: To the best of my knowledge, yes it is.

Mr. Kirsch: Okay.

Mr. Kent: Now at random I do not know exactly where they are. But I would suggest that you ask the welders a

Mr. Kirsch: I have seen a number of them.

Mr. Kent: Okay okay you know them. All right.

Mr. Kirsch: Number 2 - Bechtel Designers use only fillet welds on web-to-web connections of beams and pipe supports and tray hangers and do not weld all around to restrain forces in all directions.

Mr. Kent: In in some areas I have seen this in some of Bechtel's work but not at all areas. I'm not saying that every design is like that. There is a lot of different designs.

Mr. Kirsch: Okay. In a clarification to number 2, I have a seen a number of pipe support details where all around welding on a fillet is not required by the detail which have been app duly approved by engineering. Do you have any problem with those details?

Mr. Kent: I have a number of reservations about the the detail that do not develop the strength of the joint. When they load up the joint and cause the weld to be the weak link in the chain so to speak and you have a a necking down of the stavus stress flume lines and you create stress raisers, you can have a magnitude of a 3 to possibly even 4 times the theoretical true stress in that joints.

Mr. Kirsch: Okay. At point is though your, as I under.tand it, your problem is with the philosophical in a philosophical sense with not requiring the engineer not requiring an all around weld. My question is, in a technical sense, if the engineer has performed sufficient computation or calculation or if the engineer has data empirical or actual test data

Mr. Kent: Empirical not theoretical

Mr. Shackleton: that the weld as conducted even though it was not all around in and placed in that location would be satisfactory for service based on

computer stress levels under seismic conditions, thermal deadload deadweight conditions, thermal conditions. Do you have any problem with that?

Mr. Kent: As seismic conditions as well as

Mr. Kirsch: I said seismic.

Mr. Kent: Yeah all right. Uh I I do have a many reservations on that because a in a areas where the interturns are lacking you can initiate cracking much easier than if you did have an end returns.

Mr. Kirsch: I'm talking about all around. I'm not talking about welding end returns right now. I'm talking

Mr. Kent: Alright then your concerned with all around and whether installed to full strength. Once this full strength were rejoined and development at full strength to the members on either side of the joint we'll see if the permeable

Mr. Kirsch: Okay, are you saying then that you believe the engineer to be wrong in his specification, failure to specify in all cases all around welding? Is that what you are telling me?

Mr. Kent: I will tell you that in my opinion in a seismic zone like San Onofre is located that it is prudent to develop the strength of the joint and if he can develop the strength of the joint in lieu of all around and really prove that the joint is full strength like a 90° elbow, I have no real fight

with that as long as he develops the full strength joint without welding all around.

Mr. Kirsch: Uh huh.

Mr. Kent: And that is possible in some areas.

Mr. Kirsch: Are you a seismic engineer?

Mr. Kent: No, sir. But I have

Mr. Kirsch: or do you have any seismic qualifications?

Mr. Kent: I have a diploma in structural engineering.

Mr. Kirsch: Okay.

Mr. Shackleton: I'm sorry I didn't get that in the a original. Which university is that then?

Mr. Kent: This is from the ICS.

Mr. Shackleton: I beg your pardon.

Mr. Kent: This is from the ICS, the International Correspondence School of Scranton, Pennsylvania. I did receive a diploma in structural engineering from the ICS in Scranton, Pennsylvania.

Mr. Shackel:on: International

Mr. Kent: Correspondence School

Mr. Shackleton: Correspondence School

Mr. Kent: Yes.

Mr. Shackleton: And what wha what degrees did did they give? Bachelor of Science?

Mr. Kent: (Mr. Kirsch and Mr. Kent both speaking, unable to understand either) equivalent to $1700 of study and it is a diploma and a a different people have different opinions on this.

Mr. Kirsch: So a a degree should at least be called be called a diploma of Bachelor of Science degree and a Associate of a Science degree.

Mr. Kent: ICS didn't call it that. They called it a diploma.

Mr. Kirsch: They did call it a diploma?

Mr. Kent: The diploma in structural engineering. I'm sorry Dennis, go ahead.

Mr. Kirsch: Okay, no problem.

Mr. Kent: I am familiar with the requirements for seismic design in this, the locality.

Mr. Kirsch: Okay.

Mr. Kent: I know they have changed a a-the requirements under the base codes for different loading for a period of years because they have learned that for instance at the epicenter you can have twice the a original load they expected, things of this nature. I know that a lot of their original theoretical data was not as it should have been.

Mr. Kirsch: Wha what theoretical data was not as it should have been?

Mr. Kent: Well if you research seismic loading calculations and so forth and you can go on back, you will realize that they have certain values under the code today that establish as horizontal loading altitude a dead load of the members and in one code for instance is .3 times the dead load or horizontal load or an overturned overturning moment _____ OTM in calculations. A if you look at the original a data and the evolution of formulas for seismic rating, you will find some years back they did find that the epicenter at the epicenter of a seismic event you can have twice the a a theoretical loading at that point and time. So they did change the code and a

Mr. Kirsch: The code has been changed?

Mr. Kent: Absolutely correct. A number of times.

Mr. Kirsch: Oh good. Okay. That's good.

Mr. Kent: A number of times.

Mr. Kirsch: Those years are are important too.

Mr. Kent: Incidentally very important when the codes did change.

Mr. Kirsch: When did the codes change?

Mr. Kent: Different years. I mean the code's constantly evolving just like the ASME code is changed every year.

Mr. Kirsch: Uh huh.

Mr. Kent: You've got the _____ code changed every year now.

Mr. Kirsch: Uh huh.

Mr. Kent: But I want to bring to your attention that a there were major theoretical points that they did assume at first. They did not check out later and they did change the code to be more in conformance with empirical data.

Mr. Kirsch: The okay. It's going good. A so then regarding number or item number 2, my views

Mr. Kent: My concern with item number 2 is that you are loading up the welds in many many many configurations and unfortunately the welds are to take far more stress than the theoretical average. The true stress is not a true representation as the calculations normally give an average across the weld. You can have concentrated stresses in the weld that's on the order of three maybe even four times the magnitude of the theoretical. This is when you come into stavus (strain?) stress flow lines and the stress raisers and the abrupt changes from thicker members down to a thinner weld and then back into a thicker member.

Mr. Kirsch: Uh huh.

Mr. Kent: You have a concentration of stresses. And when you have a necking down of the stavus (strain?) stress flow lines, you can have a stress raiser or in essence an invisible metallurgical launch.

Mr. Kirsch: It it a Then I don't think that we have really established one way or the other. My que the question is: are you telling me, I need to know if you're telling me that the Bechtel engineer who professional engineer who has designed that joint

Mr. Kent: All right.

Mr. Kirsch: based on either computation, empirical data, or analysis by test, you feel

Mr. Kent: Now when you say by test you mean a a test (Mr. Kent and Mr. Kirsch both speaking, unable to understand either) by back braking. A test from years back on other pieces of material that did not directly a germane to this particular piece of material but this was done years if not decades prior to that on some of the pieces of material, mall sealer so forth and did break tests in (noise on tape, unable to understand speaker) in tensile testing machine in a laboratory and then extrapolated that data as being adequate for something else. No time (Mr. Kirsch interrupts, but Mr. Kent continues) did I ever see anything of the prototype tested at Santa Nuclea on the actual hangers for instance (electrical tray hangers). At no time did I see them actually test any of the square or rectangular tubes or the welds to them and the junction of any structural girder or anything of that nature to see that it would survive a horizontal loading like you would realize under seismic loading.

Mr. Kirsch: Are you saying ~~that the fa or are you merely saying~~ that you did not observe those tests?

Mr. Kent: I did not know of any tests.

Mr. Kirsch: You don't know of any tests that was conducted?

Mr. Kent: To the best of my knowledge they they never conducted any actual, empirical a prototype test to prove out the actual breaking point of the ~~wells~~ welds at the junction between the electrical tray hangers for instance and the girders or beams that support them. Now ideally

Mr. Kirsch: Let me hold on hold on please. Let me let I I cannot write nearly so fast as what you're talking.

Mr. Kent: I'm sorry.

Mr. Kirsch: Okay.

Mr. Kent: You did read a John Odell's a LA Times article didn't you where a he says that Moss Davis, a technical representative of a AWS of Magniforia said that in in essence he wouldn't trust Bechtel to design an outhouse.

Mr. Kirsch: I read the article. I don't think indeed I don't it said that he wouldn't trust Bechtel to design an outhouse.

Mr. Kent: Well that's in essence that's in essence.

Mr. Kirsch: I would not want that placed into the record.

Mr. Kent: Well that's in essence what he said. According to the Times article (clearing throat - pardon me) the first one that came out that John O'dell a had on the first a front page of the Los Angeles Times Marsh County Edition.

Mr. Kirsch: Okay, I made a note on item number 2 and it says basically that you feel that no tests were conducted to verify the adequacy of electrical tray hanger, slants of tube steel welds on actual material used at San Onofre.

Mr. Kent: As a an item there are other items like pipe hangers and things of this nature, pipe supports uh so forth and etc. right on through. What I am saying what I am saying it does warrant it does warrant an actual prototype, an actual fillet weld size or whatever, actual horizontal loading is in essence equivalent to a seismic loading, the impact value versus time a

Mr. Kirsch: You a

Mr. Kent: the quantity. Pardon.

Mr. Kirsch: Okay. Can you a you feel that it warrants it. Can you justify that feeling

Mr. Kent: I'll give you an example by

Mr. Kirsch: No, what I'm asking is can you justify that feeling by reference to an actual code requirement that dictates that tests be conducted on actual material and not use extrapolated data from other materials tests? Is that in the code as a requirement that it be done?

Mr. Kent: I know of no place where a it actually required under the ASME code because there are many many places in the ASME code that it does not fully address the things that a really should be there in my opinion.

Mr. Kirsch: I wish to I wish to go back again to our previous comments. My point here is not to take issue with the adquacy or the inadquacy of the code because since the NRC does not has not written the code, we the NRC strictly

use the codes as an industry standard. I do not I cannot take issue with the adequacy of the code. That is outside of my bounds of jursidiction.

Mr. Kent: All right. In in the real world in the real world they are saying that theoretically these electrical tray hangers and pipe supports and so forth will survive a seismic event of the magnitude that a they will have in the future undoubtedly.

Mr. Kirsch: Well you know that that's coming?

Mr. Kent: Well I believe (Mr. Kirsch interrupts) I believe that it will be coming, just like I believe the sun the will rise tomorrow and I believe the sun will set tomorrow evening. I believe that someday it will rain here again.

Mr. Kirsch: Okay.

Mr. Shackleton: Are you aware of what a ground acceleration g's San Onofre's 2 and 3 are designed to?

Mr. Kent: It is my understanding they a are upgrading a unit 2 one not now to a higher seismic loading standard.

Mr. Shackleton: Do you know what it is?

Mr. Kent: I have not a seen a copy (noise on tape, unable to understand) I would a be very happy to a review the calculations even in a cursory manner.

A I would certainly think in this area anything of this magnitude a should be realistic. I would suggest that they a consider a a magnitude of 8.0 for instance.

Mr. Shackleton: You know what that converts to into g acceleration, which is the basis of the calculations.

Mr. Kent: Well this has changed (several speaking at once) This has changed over a period of years. This has changed over a period of years.

Mr. Shackleton: I realize that.

Mr. Kent: This is probably since I a a had gone into the formulas that existed then. You're talking about things that I had a been subject to many years ago.

Mr. Kirsch: Okay. No no problem. A the failure to weld all around (my comment) the one thing that I've got written here is it says the alleger feels that this is a code violation. Do you know of any place in the code that specifically requires weld all around on all joints?

Mr. Kent: No, the burden is on the design. The _____ is on the designer to make sure that it is adquate.

Mr. Kirsch: Okay.

Mr. Kent: Normally it will all around to a certain fillet size for instance, if you are going to use fillets _____ group whatever. And consequently if you can develop the strength of the joint and it is as I understand a background joint. There have been structural failures as you well know in Unit 1 on pipe hangers. They did last for years before they failed. In my opinion they should have lasted full service life of the anticipated a let's say 25 or 35 or 40 years.

Mr. Kirsch: Okay, instead of the alleger feels that this is a code violation, what I'm going to put in here is that the alleger feels that the failure to weld all around is a generic problem.

Mr. Kent: It could be a generic problem.

Mr. Kirsch: Okay.

Mr. Kent: Could be.

Mr. Kirsch: But however, that the code does not specifically require all around welding

Mr. Kent: It does not demand. In the ASME code it does not demand all around welding. Same in the AWS Structural

Mr. Kirsch: Uh huh.

Mr. Kent: Welding Code D1.1 ~~STQB 1.1~~. It does not demand all around welding. The onus, the burden is on the designer to make sure that it is adequate. In many many cases the designer is wrong. In many many cases the engineer is wrong. There have been many many structural failures as you are well aware as well

Mr. Kirsch: You say you tell me the designer is wrong. Do you know of any instances at San Onofre on a welds when the designer's specification of a weld joint has been wrong, based not upon on your feeling but based upon your examination of the engineer's calculations or your independent calculations.

Mr. Kent: Well I will tell you right here that the AWS Structural Code D1.1 ~~Encode B1.1~~, Revision 2 in 1974 on page 81, paragraph 8.8.6 does demand end return fillet welds and these were lacking at thousands of places.

Mr. Kirsch: Okay, let me write that down. This is AISC.

Mr. Kent: Now this is a note in the AISC book and this is also a very very similar note in the AWS code and has been there for many many years, not decades.

Mr. Kirsch: Okay. What is the a edition of this?

Mr. Kent: Pardon.

Mr. Kirsch: What edition is this AISC?

Mr. Kent: This this one right here.

Mr. Kirsch: That's the sixth edition. Okay. Good.

Mr. Kent: Yes, they have a seventh edition revision 0 and also 1. And if you will look at Figure 19 on the fatigue in a ~~a~~ the appendix you will find that a they did add fillet welds there a in revision 1, where they do not exist in revision 0. And I was a very successful in bringing this out and a having them a add the fillet welds in there in order to get it welding integrity. It did not exist there before. I petitioned Jim Marsh, ASC, a in Los Angeles. And he petitions Satina, President of ASC to add these fillet welds in to give it structural integrity. You can check the difference between a

Mr. Kirsch: Okay.

Mr. Kent: the conditions on that one, beween 0 and 1.

Mr. Kirsch: These are basically the same words that come out (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: They're basically the same and if you notice here for instance as an example AWS D1.1, Revision 2 of '74 for instance on page 81.

Mr. Kirsch: Yeah, paragraph

Mr. Kent. paragraph 8.8.6, as an example,

Mr. Kirsch: Uh huh.

Mr. Kent: and has been in there for many many years of not for decades. Okay? And has been in the ASC for many many years not for decades. Okay? And it's in other codes.

Mr. Kirsch: Uh huh.

Mr. Kent: Okay? And yet I saw thousands of places they did not exist. In my honest opinion, they should exist to give you adequate welding integrity, structural integrity, to eliminate the possibility of cracking at the termination of the crater of the well. For instance, in a critical plane when you're terminating the well with a seat bracket and you start at the bottom and the code demands that you roll upward not downward.

Mr. Kirsch: Uh huh.

Mr. Kent: On the AWS. The AWS (Mr. Kent and Mr. Kirsch both speaking, unable to understand either)

Mr. Kirsch: Tell me what code at San Onofre plant is applied to structural steel welding? Do you is it the ~~ISC~~ AISC or the

Mr. Kent: The ISC B1.1, in certain applications and a ASME

Mr. Kirsch: (unable to understand) B.1.

Mr. Kent: Didn't I say AWS ~~B1-1~~ D1.1?

Mr. Kirsch: No, AISC ISC.

Mr. Kent: I'm sorry. I beg your pardon, cause I have the AISC ISC in front of me here. The AWS D1.1 Structural Encode Steel is applicable in many areas at San Onofre as well as the ASME code is applicable in other areas.

Mr. Kirsch: Okay.

Mr. Kent: Basically a structural supports for pipes are of the AWS D1.1 and the electrical _____ supports are under AWS D1.1 Structural Encode.

Mr. Kirsch: A I don't think that's quite right there sir. I think that

Mr. Kent: I said the supports. I didn't say the piping.

Mr. Kirsch: The pipe supports if they are a code ASME code piping, Class 1, 2 or 3, a, b, c, d whatever you want to call it. If it's code class piping define the class code piping by the engineer. The applicable code for supports is the sec section 3, subsection NF.

Mr. Kent: Just on on that area. But read Bechtel's specs of the best of my memory, a there are places in Bechtel's specs that does call out a supports and so forth to be under AWS D1.1 as well.

Mr. Kirsch: These are for piping systems that have not been built to the ASME code, Section 3

Mr. Kent: Nuclear.

Mr. Kirsch: Nuclear. Okay. Now if they're built to B311, yes.

Mr. Kent: Does not call up there in in to the best of my knowledge

Mr. Kirsch: Yes, if they are both B311 then the AWS code applies. However, nuclear piping safety grade piping at San Onofre is not built to B311. It is built to the ASME Boiler Pressure Vessel Code, Section 3, Division 1, NB, NC, ND. Is that true?

Mr. Kent: Yes.

Mr. Kirsch: Okay.

Mr. Kent: To the best of my knowledge. All right now we're talking about the code as its exists back in 1971 and '72, '73 and in that area or what? (Both Mr. Kent and Mr. Kirsch speaki .g, unable to understand)

Mr. Kirsch: The code that they a are that's applicable to San Onofre is a. I have to think about that. I think it's the I think they've upgraded to the 1974 code through summer of '75 addendum.

Mr. Kent: I think you're right.

Mr. Kirsch: I think in the beginning they had the 1972 code, however there are very small differences between as I remember between '72 code and the '74

code. Basically the biggest differences come into play with subsection NF, it which didn't exist in 1972.

Mr. Kent: I think you're right again.

Mr. Kirsch: Okay.

Mr. Kent: But that was code application in the year back when I did a review the ASME code as well as the AWS code and other codes. Okay.

Mr. Kirsch: Okay. So I guess we got that one. Number three here and I'll read, the alleger stated that the ASME requires adequate root penetration of fillet welds and states that "vender supplied material did not always conform to this requirement."

Mr. Kent: Now are you aware that the this has been in the ASME code for many years?

Mr. Kirsch: Oh yes.

Mr. Kent: In given areas, not just one area.

Mr. Kirsch: I understand that.

Mr. Kent: Number of areas.

Mr. Kirsch: A I have also written here that you could not provide specifics as to vendor and location in the plant. Do you now remember any specifics as to which vendor failed to perform adequate route penetration on his fillet welds and

Mr. Kent: And where it's located?

Mr. Kirsch: where these fillet weld where these welds are located?

Mr. Shackleton: Gentlemen can we just take a pause here. The time now is about 10:34 while I switch our tape.

All right.

Mr. Shackleton: This is the continuation of the interview of Mr. Kent. And we just changed the tape and the time is now 10:35 a.m. on October 15, 1982. Please continue.

Mr. Kirsch: Okay, can you provide me specifics because I'm sure that you would appreciate the fact that there are several vendors that apply that a ship structural steel members, pre pre-fabricated structural steel members to San Onofre using fillet welds. Can and can to we do not have the people or the manpower, the resources necessary to go and examine every single piece of vendor supplied material. Can you provide me with specifics as to which vendor failed to do this and where those pieces are located?

Mr. Kent: To the best of my memory a one of the vendors was Zack. And

Mr. Kirsch: Zack?

Mr. Kent: Zack. To the best of my memory one of the vendors was Zack.

Mr. Kirsch: Uh huh.

Mr. Kent: And to the best of my memory I remember one that required additional welding in the vertical plane at a junction to a some of their mechanical equipment. If if I recall correctly now it was an _____ to a support in the vertical plane and the vertical welding was not quite as it should have been and a

Mr. Kirsch: Do you remember where this is at Mr. Kent?

Mr. Kent: No, I do not. It was

Mr. Kirsch: Well then

Mr. Kent: It was either Unit 2 or 3. I don't I don't recall which unit it was in.

Mr. Kirsch: What does Zack supply?

Mr. Kent: They a supplied the some of the a heating and ventilating a equipment a as well as other equipment a to the best of my knowledge. And a I

do not know the extent of their mechanical equipment that they supplied. But a it my understanding that Zack has supplied thi a in one particular instance I recall, additional welding was required on this vendor's equipment and the equipment at that point and time was installed and the well had to be deposited in the vertical plane.

Mr. Kirsch: Did they fix that one then that you had identified, that you're talking about? Was that fixed? Or does it still exist in the plant?

Mr. Kent: No, this particular item a did have additional welding. I was just trying to recall more about the specifics on it. I do know that there was a that the the welding was deemed to be inadequate at a certain point and a it did

Mr. Kirsch: How was this determined?

Mr. Kent: It did have additional wall metal added and I was trying to recall

Mr. Kirsch: How was this determined though? How did a was it determined that the weld was inadequate at that certain point?

Mr. Kent: To the best of my recollection a someone notice that the the weld did not meet the blueprint in

Mr. Kirsch: Was the Bechtel inspector that that identified that?

Mr. Kent: One of the people there did bring this forth and I don't recall his name and I don't recall exactly his function. But I do know on this particular item I'm thinking about, they did additional repair welding in the vertical plane with stick electrode, the a shield metal arc one process, formerly MMA (Magna Metal Arc). And I helieve the electrode used was 5/32 east diameter. I recall the welding of this vendor's

Mr. Kirsch: So basically, in another words what you're telling me is that one instance was fixed. It was found and fixed. Right?

Mr. Kent: Yes, an example.

Mr. Kirsch: Okay. Do you know of any instances since this one instance was fixed, do you know of any instances that have that were when this condition existed and was not identified by either faulty control, belonging to either Bechtel or Southern California Edison or yourself. And where in this the deficient condition was allowed to exist and was installed in the plant.

Mr. Kent: I can't recall exactly a specific case giving the specific location and the specific item. But I have seen areas that I believe do not meet the depth of weld as as deposited and appeared that well was not conforming to code.

Mr. Kirsch: You say that you believe that it doesn't meet it. A based on what? Is

Mr. Kent: Like like the ASME codes demands. The ASME code says that a penetration shall be in the ~~roof~~ vent. I have seen some cases in in some areas especially in vendor-supplied equipment, that I believe this to be the case that it did not

Mr. Kirsch: You believe

Mr. Kent: into the ~~roof~~ vent.

Mr. Kirsch: You believe this to be the case. Can you tell me on how this what you're belief is based upon? Is it based upon direct observation? Both Mr. Kirsch and Mr. Kent speaking, unable to understand) this was not the case? It is on could you say that you looked inside of the fillet well and a

Mr. Kent: No no, I did not break the fillet apart. I did not cut it apart.

Mr. Kirsch: Okay, you looked at both ends of the fillet weld and then you determined there then with that you determined there was not full penetration on the interior of the fillet weld? How did you do this?

Mr. Kent: When you when you visually look at a fillet weld and you see the way that it starts with the arc, the cold adhesion starting point and the amount of metal as it is deposited if it's not equal legged. For instance, where you have an inscribers isosceles triangle and you look at the termination of the _____ which is the crater portion. Visually it gives you an idea of what has occurred there. The only true way is to go out and cut the weld apart and take a look and this is why I do suggest is that at random on

members that are not critical where you can actually take a representative sample, actually cut one apart with a hacksaw, not a torch, but with a hacksaw. And check the depth of penetration or lack of depth of penetration at the route.

Mr. Kirsch: Do you have, again I'll pose the question. Do you have any knowledge right now of any wells that do not meet the route penetration criteria?

Mr. Kent: I have reason to believe that they exist in many many places.

Mr. Kirsch: Based upon what?

Mr. Kent: From visual a nondestructive examination and visual examination is a very very important branch of NDE. A personal knowledge of _____ as a welding instructor, as a welding engineer, as a welding author even. I would like and I would suggest I would suggest that we go out _____ and take a hacksaw and cut through several of these and see the lack of penetration at the route or if penetration exists at the route, I would certainly would like to see it.

Mr. Kirsch: Mr. Kent I feel that this _____ is a request is outside of our purview here. The reason that I feel that is unless you can actually point to or tell me about a weld that does not you feel does not meet that criteria and unless you can show me, show us and Southern California Edison that that does that sort of situation does exist, we have no basis to even request them to go tear that plant apart and at random

Mr. Kent: No, I didn't say tear the plant apart. I said random samples random samples. Because I have seen in my experience places where the weld has started and at that the cold beginning of the deposition of the molten metal, you will not have complete cohesion at that instance that you begin especially in a sheet of metal or crawling stick electrodes. I have seen cases where you have adhesion for at least the first one-quarter of an inch under the well and no penetration of the roof for the first beginning of the wells.

Mr. Kirsch: I'm at a loss in my own mind as to how I can go verify this in the plant on a nondestructive means. Can you tell how that I may verify the validity of your concern using nondestructive means

Mr. Kent: If you can find any place that has been cut with a saw or hacksaw, anyplace where the weld is actually a visible in cross-section. It would give you a very good idea. But in lieu of that you may not be able to do that unless you actually cut the walls transversally and take a look on the inside of the well.

Mr. Kirsch: Now for example

Mr. Kent: I have I have here a sketch. Okay. The one on the left shows the penetration at the ~~route~~ root.

Mr. Kirsch: Yes sir, I understand what ~~route~~ root penetration means.

Mr. Kent: And the one on the right does not.

Mr. Kirsch: Yes, I understand fully what root penetration means. A the other question: Do you feel that Zack was the lender that supplied this and they supplied HVAC this weld that you are familiar with, where they had to go in and perform a weld repair. That one was fixed. You do not know of any other instance at that plant. Is this true that you don't know of any other instance at that plant wherein this condition, failure to give route penetration to members supplied by Zach were not corrected and subsequently were installed in the plant in

Mr. Kent: You said supplied by Zach?

Mr. Kirsch: You told Zach was the vendor.

Mr. Kent: I said Zach was one of the vendors.

Mr. Kirsch: What other vendor was there that that did this sort of thing.

Mr. Kent: I did not get involved in all the vendors that supplied material to the San Onofre Nuclear Generating Plant. I do not know the names of all the vendors. I was only involved in certain areas and I was basically involved in pipe welding and related areas.

Mr. Kirsch: Okay. So you have no personal knowledge of any vendor, any other vendor that has supplied material for installation San Onofre Nuclear Generating Station wherein failure to provide route penetration on fillet welds, was not detected and was subsequently installed in the plant. Is that true?

Mr. Kent: There are many there are many hangers, pipe hangers included where the wells that I have seen on those hangers as it first started, the first instant that ~~welling~~ welding began. It appeared to me that there was inadequate penetration at the route at that point of initiation of the arc. I do not know who supplied them. I would be happy to point some of them out to you even with the paint over them. In fact I'd like to take you out a there if it's possible and a show you a very very ropey welding, very uneven and irregular welds. I'd like to show you where some of the ripples are four inches per linear inch, spaced almost a quarter inch quarter inch crest to crest to the ripples.

Mr. Kirsch: Does the code address the spacing on ripples?

Mr. Kent: Unfortunately, it does not and either the AWS or the ASME code is used. This problem should be addressed in my opinion in the ASME code. Like you said earlier, I'm aware that the ASME code does not address everything to our satisfaction and so forth and a they have not addressed numerous things that does relate to welding and metals and so forth. In my opinion they should address like intergranular stress corrosion and things of this nature, that they haven't adequately addressed in my opinion.

Mr. Kirsch: You understand the deficiencies that you feel exist in the AS ASME code or the AWS code are outside of my purview?

Mr. Kent: Yes, as you said earlier, I understand this.

Mr. Kirsch: Okay.

Mr. Kent: In other words, your hands are tied to a go only by the ASME and the A'S code where its applicable and nothing else as it did read under the contract 1974.

Mr. Kirsch: Yes sir. Okay.

Mr. Kent: In 1974 edition and I do believe that was a summer '75 edition that they did use.

Mr. Kirsch: Okay. The statement then that a you could not provide specifics as to vendor and location within the plant but stated only that the way to check this would be cut out some of the filled welded sections and examine them

Mr. Kent: Yes.

Mr. Kirsch: is indeed a true statement?

Mr. Kent: Representative representative a samples. Not just one sample but a number of samples where you get a real idea.

Mr. Kirsch: What what would be a representative sample in your opinion?

Mr. Kent: I I would certainly like to be the one that selects the the samples at random.

Mr. Kirsch: I'm afraid that would be quite impossible.

Mr. Kent: Why is that?

Mr. Kirsch: A we the NRC are the regulatory body in this matter and a the licensee, Southern California Edison is the owner of the plant. We have no legal authority to bring any other individual other than ourselves onboard the site onto the site and to by using our authority then to dictate destructive examination of portions of that site.

Mr. Kent: I didn't know that.

Mr. Kirsch: There is no legal there is no legal basis that we have.

Mr. Kent: I didn't know this. Okay, this is news to me.

Mr. Kirsch: Okay. Item number four: the alleger stated that a spacer was placed between a Unit 1 hydrogen line on trip for steam generator.

Mr. Kent: Now you've got a spacer. Wait a second.

Mr. Kirsch: Between a Unit 1 hydrogen line on trip for ste steam generator.

Mr. Kent: I don't think the word spacer is applicable there.

Mr. Kirsch: Okay, what what word would you say would be more applicable?

Mr. Kent: They told me that they would develop a steel bracket to maintain the line away from the other line to which it was chapping by wearing one

Mr. Kirsch: Okay steel bracket instead of spacer.

Mr. Kent: They told me that they would. I do not know that they actually did.

Mr. Kirsch: Uh huh.

Mr. Kent: They told me that they would have one designed and would have one installed to permanently separate. What they told me was the hydrogen line that was wearing against another steel line and I do not know the contents flowing through the other steel pipe.

Mr. Kirsch: Uh huh.

Mr. Kent: But the smaller pipe was worn extensively on the surface of the smaller pipe by a actual threading or movement in a fatigue a applications and vibration. One was vibrating against the other and wearing away.

Mr. Kirsch: Uh huh. Okay.

Mr. Kent: They called it erosion, external erosion not internal erosion.

Mr. Kirsch: Okay, I have that written down here. This was done because the hydrogen line had worn thin due to rubbing with another line.

Mr. Kent: Yes.

Mr. Kirsch: The alleger stated that maintenance people at the site during the period when damage due to the Unit 1 steam generator fire was being corrected, would remember and be able to locate the design change and spacer.

Mr. Kent: They should be able to because they they drew it. If they designed the bracket they should have a drawing on it with a control number. And that control number would have a date on it and then a you should be able to track down the people who installed it. And if it is actually installed there, I'd certainly like to see it.

Mr. Kirsch: The alleger could not provide any specific locations specifics and could only state that this, that no equipment was in the vicinity of this line.

Mr. Kent: Not within 10 feet.

Mr. Kirsch: Okay. He could not remember

Mr. Kent: Wait a seond, wait a second. When you say equipment, let's back up there a second and define the word equipment, okay?

Mr. Kirsch: I'm talking about nuclear my concern here is nuclear safety-related equipment.

Mr. Kent: Okay, SR equipment. There were to the best of my knowledge, now wait a second I'll back up there a second too. I do not know for sure that

there was no SR equipment in there cause there may have been some safety-related equipment and there may not. I do not know.

Mr. Kirsch: Okay. You could remember if this location was in a room containing nuclear safety-related equipment. What areas on Unit 1 did you work in?

Mr. Kent: I worked basically on the a repair of the a diesel generator and the emergency diesel generator room there that had the a fire.

Mr. Kirsch: Are there any hydrogen lines in that diesel generator room?

Mr. Kent: No, not in to the best of my knowledge. See this was another portion of Unit 1 that they told me was a hydrogen line.

Mr. Kirsch: Can you tell me what portion of Unit 1 where

Mr. Kent: I would like to take you out there and stand in the same spot where I saw it and point it out to you.

Mr. Kirsch: Okay. I have I do have a little bit of clarification on that matter for you Earl. There is no such thing as a hydrogen line on trip for a steam generator.

Mr. Kent: This is what the man told me.

Mr. Kirsch: as nearly as we were been able to determine, what you were talking about was the hydrogen line that goes to the main generator, the main electrical generator, out in the turbine area.

Mr. Kent: Th's to the best of recollection, this is what the fellow told me.

Mr. Kirsch: Yeah.

Mr. Kent: As I recall it.

Mr. Kirsch: Okay. A we have done some work in that area and a

Mr. Kent: It was a hydrogen line though.

Mr. Kirsch: There were hydrogen lines. These are all non-safety non-nuclear safety-related. They are not safety-related. They we do not, we from the NRC's point of view do not care if that hydrogen line broke or anything there.

Mr. Kent: Well I would certainly care. I would certainly care if it broke, because you can have a fatalities if you have

Mr. Kirsch: Oh, listen we're concerned strictly with nuclear with the with nuclear safety as it relates to the health and welfare of the public, okay.

Mr. Kent: Well aren't you concerned with a man's life or a other men's life a

Mr. Kirsch: Well of course we are.

Mr. Kent: in an environment, a in an industrial environment of things of this nature were you could have repercussions that could cause the loss of other lives

Mr. Kirsch: Of course we are (both Mr. Kirsch and Mr. Kent speaking, unable to understand either of them) Wait a minute, we are not charged with the enforcement of the OSHA regulations.

Mr. Kent: I understand that. But where you have other possibilities of even the fire trucks coming in to an area like this, aren't you concerned with the other ramifications that could exist.

Mr. Kirsch: Oh surely. But regulatory authority is one thing and concern being another. Do you understand the difference between them?

Mr. Kent: Well I have concern for human life. I have concern for for human life a either within or without the domains of the documents a

Mr. Kirsch: Please don't misunderstand me. I think you are misunderstanding me. My I have de just as deep a concern for human life as you do. However, from a nuclear safety-related standpoint that line going to the electrical generator has no effect whatsoever on the ability to shutdown that reactor, to cool it down and maintain it in a shutdown condition.

Mr. Kent: Well I never said that it did.

Mr. Kirsch: Okay. Therefore we have established that a that line that you were talking of was in was a line to the main generator, electrical generator of the station in the turbine area and was a non-nuclear safety-related line. And did not affect the ability of the reactor to be shutdown and maintain the new shutdown condition.

Mr. Kent: Could I ask the pressure of the hydrogen in the line? What prompters range gauge?

Mr. Kirsch: I am not too sure what the pressure is

Mr. Kent: Or the range?

Mr. Kirsch: It really makes not a whole lot of difference to me. It's a it is mainly for generator generator cooling; not the steam generator but the main electrical generator. And the fact that they use in the reactor to generate electricity is purely ancillary to the question of nuclear safety.

Mr. Kent: Let me ask you a question. If you a didn't have a rupture of the hydrogen line and you did have a hydrogen burn, isn't it possible to burn other cables and a burn other equipment a

Mr. Kirsch: We have likewise established that in that area there are no nuclear safety-related cables.

Mr. Kent: Well I do not know that they were or were not and a

Mr. Kirsch: We have established that there were no nuclear there is no nuclear safety-related equipment in that area.

Mr. Kent: Do you know the exact area where this occurred?

Mr. Kirsch: Yes we believe that we do.

Mr. Kent: Have you gone there? Have you looked at it?

Mr. Kirsch: I had one of my people go out and walk the total hydrogen line.

Mr. Kent: Did he say that did he say the bracket did exist there and

Mr. Kirsch: The bracket does exist now. It was it was installed and separates permanent supply of (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them) for the line.

Mr. Kent: What occurred to the line? A was the line repaired for the a wearing away on the outside of the line a

Mr. Kirsch: The line is a one-eigth is a one-inch line. The line based on my inspectors reports to me indicate that the amount of wear and fretting was not sufficient to cause any significant erosion of the metal and could not have in his opinion caused a reduction of the wall thickness of that pipe to less than minimum cooled allowable being roughly 12½%.

Mr. Kent: Did he or did he not take actual wall measurements with ultrasonic equipment like a

Mr. Kirsch: It is he did not and it is not. I don't we don't really feel that it's necessary.

Mr. Kent: Isn't the burden on him to make sure that this is not extremely thin wall, that he does have adequate thickness there to make sure that the that the wall is sufficient.

Mr. Kirsch: No sir.

Mr. Kent: by the minimum wall?

Mr. Kirsch: No sir, it is not his burden. It is his burden to establish whether or not in that area given a failure of that line that the there were there was no safety nuclear safety-related equipment in that area that could have been damaged by the failure of that line.

Mr. Kent: I would I would have anticipated they would have to remove that section of the line that was extensively worn and replace it to make sure that the wall was the original thickness of the wall.

Mr. Kirsch: I repeat Mr. Kent, the line based upon his examination (visual examination of it) was not extensively worn such that minimum code wall thickness would have been violated.

Mr. Kent: Well I saw the particular wear myself and in my opinion it it did warrant replacement from the wear that I saw on it.

Mr. Kirsch: He has established by visual examination (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) that minimum code wall thickness was not (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: I would certainly like to to see the rationale there just to look at a _____ and tell the thickness of the wall left.

Mr. Kirsch: Okay, the reason and I'll explain this one once. The reason that he did not take a UT thickness gauge with him and measure that wall thickness is because it is not a nuclear safety-related pipe. We do not have any regulatory authority over that pipe.

Mr. Kent: You do not at all?

Mr. Kirsch: It is not nuclear safety-related.

Mr. Kent: And you don't have any authority

Mr. Kirsch: It is not a quality class

Mr. Kent: over any (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) material whatsoever?

Mr. Kirsch: It is not a quality class system. It is not under the auspices of 10 CFR Part 50 Appendix B, the Quality Assurance Program Requirements for Nuclear Power Plants.

Mr. Kent: Even though it's considered to to be a satellite type a

Mr. Kirsch: That is true sir.

Mr. Kent: item.

Mr. Kirsch: That is true.

Mr. Kent: That's very unfortunate because in the future you can have a possibility of a rupture of of that hydrogen line at that point. And if fatalities do occur at least we are on record that that this line does still exist with a worn condition in this Nuclear 1.

Mr. Kirsch: Okay, let us let it also be on record then, that our examination of our line indicated that it was not probable that the minimum wall thickness requirements of the code were violated.

Mr. Kent: Not probable in whose opinion? You're saying?

Mr. Kirsch: He's a professional also Mr. Kent.

Mr. Kent: Okay. A that's all I wanted to establish, I say, in his individual opinion.

Mr. Kirsch: He's a professional also. We all are.

Mr. Kent: Is he the only one? Right. Is he the only one that saw it to the best of your knowledge?

Mr. Kirsch: Yeah.

Mr. Kent: No one else?

Mr. Kirsch: Yes.

Mr. Kent: No one to give a secondary opinion on it that you know? I'd certainly a

Mr. Kirsch: Okay.

Mr. Kent: I'd certainly like to see a secondary opinion on it.

Mr. Kirsch: Hm, I I don't know that that is really necessary. That would be questioning the integrity (Both Mr. Kirsch and Mr. Kent speaking, unable to understand either of them) of my

Mr. Kent: I would certainly suggest that we have photos taken of the worn line and UT examination to to determine the actual condition of the

Mr. Shackleton: Tape number 2 and the time is approximately 11:02 a.m., October 15, 1982. Please resume.

Mr. Kirsch: Okay Mr. Kent.

Mr. Kent: I would suggest that a you actually go out have someone take ultrasonic thickness measurements to determine what the actual wall is at that point of wear. And then with that knowledge determine whether or not the line truly will survive the pressure that it's internal within that line, or will the rest of the certified anticipated for that Unit 1. I in my opinion believe that it warrants not only photographs but actual ultrasonic

Mr. Kirsch: What will the photograph tell one in individual more than one of visual examination has already told him?

Mr. Kent: Well a a photograph is a permanent record and just a fleeting glance or a fleeting look at something like this a there is no where near the value of a photograph.

Mr. Shackleton: I don't think that we've established that it was a fleeting glance. I think that we've established that we had an NRC inspector went out and examined it. A I don't think we've established

Mr. Kent: When you say examined, when you examined, a lot of people take issue there at the the extent of examination.

Mr. Kirsch: We've conducted a visual examination

Mr. Kent: Yes.

Mr. Kirsch: of that area

Mr. Kent: Yes, but it was a just a cursory examination or whether it was in-depth a actual a a close looking, a very very close inspection. I personally saw it and I and in my honest opinion believe that it does warrant ultrasonic thickness examination to determine the actual wall remaining in that line of _____ hydrogen and determine the pressure that is in that line and in the ruptured pressure that it will take to rupture the remaining portion of that worn line and then see if theoretically you don't have a condition here that should be thicker in the wall. And if it should be thicker by all means it should be removed from that portion and a new portion added. I would suggest that an independent test lab with no axe to grind be the ones' to take those ultrasonic thickness measures.

Mr. Kirsch: Why do we need why do we need an independent test lab? We have UT people. We have an ultrasonic thickness gauge in our office that can be used.

Mr. Kent: I wouldn't want anyone to take the UT readings there as _____. I would want someone totally outside of _____ to come in and take the readings.

Mr. Kirsch: I'm afraid that would be quite impossible. We can't

Mr. Kent: Why why would it be impossible?

Mr. Kirsch: We could not pay _____. We couldn't justify that. We have people that are fully capable

Mr. Kent: Even though you have people there a

Mr. Kirsch: stages.

Mr. Kent: Even though you have people there, I would a I would suggest in in fact request that outside a testing lab be brought in. Because in my mind, they would be more objective than subjective. In my mind the people there at locally would be a with the tendency to be more subjective than objective.

Mr. Kirsch: Even if we did it ourselves?

Mr. Kent: Even if you did it yourselves.

Mr. Kirsch: You question our integrity.

Mr. Kent: Your people. I'm not questioning your integrity I say your people. I'm talking about your people there now that it is is responsible for NDE MVE work, okay; including ultrasonic and so forth that are onsite now; not you gentlemen personally or anything like that. I'm talking about the people doing the actual nondestructive examination and testing.

Mr. Kirsch: For whom?

Mr. Kent: On the job site (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them) Southern California Edison Company.

Mr. Kirsch : I would not have them do it.

Mr. Kent: Exactly.

Mr. Kirsch: I would not have them do it. I would not have them do it.

Mr. Kent: Exactly exactly. That's my point.

Mr. Kirsch: We have people capable of doing that within our own organization.

Mr. Kent: Well (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them) I'm sorry I didn't I didn't understand you correctly then. I didn't know that you had people available that could do that (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent).

Mr. Kirsch: Oh sure.

Mr. Kent: why when the people their locally

Mr. Kirsch: On no. (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them.

Mr. Kent: I beg your pardon because I was under the impression that I was under the impression when you said, "we would do it" that you had access to

the people that will go out, that are currently there, and have done examinations there and have them do it.

Mr. Kent: Okay, now we've expounded and expanded on a this particular subject and a understand each other better. When you said "we", I didn't know the extent of a people involved.

Mr. Kirsch: We means the NRC when I talk of "we".

Mr. Kent: I'm sorry. I'm sorry.

Mr. Kirsch: We are not including in that "we" the licensee or any of his

Mr. Kent: Okay.

M. Kirsch: contractors.

Mr. Kent: All right. Very good point. Well taken.

Mr. Kirsch: Hey I will not commit to you that this going to be done. I am going to I'll consider it, based on the fact that it was in this area, a non-safety related piece of equipment. It may not be done because of our lack of regulatory authority over that.

Mr. Kent: Let me ask you a question then. If in the future, years downstream, it does rupture and there are fatalities, would the NRC be involved in a liability?

Mr. Kirsch: No.

Mr. Kent: None whatsoever?

Mr. Kirsch: None whatsoever.

Mr. Kent: Bechtel would or Southern California Edison would?

Mr. Kirsch: I don't know.

Mr. Kent: Okay.

Mr. Kirsch: That's of no concern to me. I personally will not be liable and nor will the agency that I work for.

Mr. Kent: I understand. Okay. At this point and time

Mr. Kirsch: Number five

Mr. Kent: you can a avoid the death of a some human being. I think by all means it should be avoided. Because downstream I a have reason to believe that if that line is left in there for many years, that most likely eventually it will rupture if it's very very thin wall, another higher pressure hydrogen.

Mr. Kirsch: What pressure would you consider to be high?

Mr. Kent: Well, as they define high anything as in excess of 55 per square inches defined as being high pressure.

Mr. Kirsch: Number item number 5: The alleger complained about several instances that he believed to be code ASME and AWS errors and inconsistencies. I informed you that the NRC only enforces licensee commitments to the codes and does not write the codes. Do you understand that position?

Mr. Kent: Yes, we went over it before.

Mr. Kirsch: Okay. Item number 6: The alleger provided details on end return requirements and stated "that end returns are not specified on Bechtel Power Corporation detail drawings in violation of AWS Section D1.1, paragraphs 886, 8861, and 8862." He stated that these conditions exist on details in any structural application and

Mr. Kent: Now you said any structural application? Did I ever use the word any?

Mr. Kirsch: Okay. You stated that these conditions exist on details in any structural application and that a two page Bechetel Power Corporation table establishes that certain pipe supports must conform to AWS B11 requests.

Mr. Kent: To the best of memory I have never seen them call out on any of the Bechtel drawings anywhere.

Mr. Kirsch: Okay. To the best your knowledge, they do not call out any requirement for end returns on any Bechtel drawings.

Mr. Kent: To the best of my knowledge I have never seen them on the drawings.

Mr. Kirsch: Okay. That's what that statement is saying.

Mr. Kent: Okay, and do you do you or do you not agree that it says that end returns shall be indicated on the design and detail drawings?

Mr. Kirsch: That's in the ~~ISC~~ AISC.

Mr. Kent: In essence it means the same thing in the AWS D1.1 if you will get that and read it.

Mr. Kirsch: Uh huh.

Mr. Kent: and and the code that we're talking about know in 1974 so forth, when they were using ASME code (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them)

Mr. Kirsch: AWS D1.1 1972

Mr. Kent: All right. Then get the 1972 edition and most likely the 1972 edition will tell you the same thing this says here. Most likely 1972 edition will say under a separate paragraph, "End returns shall be indicated on the design and detailed drawings."

Mr. Kirsch: Yes I've read that portion.

Mr. Kent: Okay.

Mr. Kirsch: Okay.

Mr. Kent: Why isn't it on the drawings?

Mr. Kirsch: That is a matter of the investigational (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: local mission?

Mr. Kirsch: No no. Wait a minute now. I'm tell I don't I'm not going to answer the question because we have not conducted an investigation of this area. That is coming next week. We will find out why they are not entered on the drawings. There may be, there may not be a reason for it. We do not know.

Mr. Kent: But yet

Mr. Kirsch: All we have right here is your statement of concern that we will again followup on in our investigatory process.

Mr. Kent: All right but isn't the burden on them to make sure that they do conform to the requirements of the code AWS D1.1 where it is applicable?

Mr. Kirsch: Where it is applicable?

Mr. Kent: Yes.

Mr. Kirsch: Where it's applicable.

Mr. Kent: And a I would certainly be glad to show you many many cases where end returns do not exist.

Mr. Kirsch: Yes, I know that. As I said before we have no regulatory authority to allow that to happen. We could make requests of the licensee to do that sort of thing.

Mr. Kent: That's possible.

Mr. Kirsch: But we have no authority to force the licensee

Mr. Kent: That's unfortunate.

Mr. Kirsch: to allow you onto the site.

Mr. Kent: That's unfortunate. I would certainly like to

Mr. Kirsch: Okay, but is this the correct statement of your concern?

Mr. Kent: Now when you use the word any, did I use the word any at that point? And

Mr. Kirsch: Yes you did. On any structural application - you have the details on any structural application. In other words, what I'm saying is: the detailed drawing for any structural application, you could not remember where they had any end return required on that drawing.

Mr. Kent: No I have to the best of my memory never seen end returns required on drawings.

Mr. Kirsch: Okay, that's what this is saying. (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: In essence.

Mr. Kirsch: Okay.

Mr. Kent: But I don't want you to read words into something that I did not say.

Mr. Kirsch: Yeah.

Mr. Kent: I want the exact words, exact quote unquote, you know as

Mr. Kirsch: Okay, this but okay I be it quote unquote. All I am trying to establish is whether or not this statement as I have written it

Mr. Kent: Essentially conforms.

Mr. Kirsch: essentially conforms to your concern.

Mr. Kent: Essentially yes.

Mr. Kirsch: Very well. Item number 7:

Mr. Kent: What about 6?

Mr. Kirsch: I just did that.

Mr. Kent: Was 6 end returns?

Mr. Kirsch: Yeah, six was the end returns.

Mr. Kent: You're probably well aware that the ~~quote~~ code does demand that it be two times the well size minimum net or the (Mr. Kent and Mr. Kirsch, unable to understand Mr. Kent)

Mr. Kirsch: the weld

Mr. Kent: wrap-around.

Mr. Kirsch: Right.

Mr. Kent: Wrap-around. For instance if you're using quarter inch wall size that the minimum is one-half inch net length not gross length. That's net exclusive of the crater.

Mr. Kirsch: Yeah, that does _____ how the well sizes

Mr. Kent: That's pool size.

Mr. Kirsch: We're talking about as I understand it also by the code is the throat.

Mr. Kent: Yes, the _____ throat of the inscribed isosceles triangle.

Mr. Kirsch: Yeah. Okay. Okay, item number 7: And these were in the a inspection report. And let me read from that inspection report to establish whether or not these are essentially your concerns.

Mr. Kent: They're some of my concerns. I have many other concerns that I've never had the time (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: We'll get to those. We'll get to those. But I just want to get what I know of right now

Mr. Kent: Okay. Right.

Mr. Kirsch: established. Oh excuse me.

Mr. Kent: That's all right.

Mr. Kirsch: Number 1: And I'm reading from NRC inspection report 822750-3618227, paragraph 6.

Mr. Kent: Who's the author of this?

Mr. Kirsch: Me.

Mr. Kent: Okay.

Mr. Kirsch: Number 1: The welding requirements of AWS D1.1 B11 regarding end returns were not being complied with on pipe hangers, electrical struts, and structural steel.

Mr. Kent: Electrical tray hangers. Okay. You say struts. Struts normally

Mr. Kirsch: Struts tray hangers or whatever

Mr. Kent: Normally a strut is something that sticks out this way or this way or so forth.

Mr. Kirsch: Yeah, Yeah.

Mr. Kent: But a truly you know most electrical a tray hangers are are hung off vertical members you know.

Mr. Kirsch: Yes sir.

Mr. Kent: Okay.

Mr. Kirsch: In addition it was alleged that end return reqirements were not shown on design and detail drawings. (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) We have previously covered that as item number 6

Mr. Kent: Yeah, Yes.

Mr. Kirsch: previously. Okay? Number 2: A spacer plate was believed by the alleger to be missing on the upper inside door hinge of the Unit 2 containment personnel hatch.

Mr. Kent: Mr. Don Martin was taken up there by me and shown where I could almost put my hand in the place where the space plate belonged.

Mr. Kirsch: Uh huh.

Mr. Kent: In fact, I took my green binder notebook, which is on the order of 1/4" thick and was able to slip it in the spacer

Mr. Kirsch: Uh huh.

Mr. Kent: area that the belonged in.

Mr. Kirsch: Uh huh.

Mr. Kent: And Mr. Don Martin did concur that there was a spacer plate missing at that point and time and should have been there in the original fabrication by Chicago Bridge & Iron and it should've never been accepted by Bechtel in the incoming material control.

Mr. Kirsch: Okay, a as I say this is another thing that we're going to have to investigate. We will establish whether or not the drawing required a spacer plate, (2) whether or not, if the drawing did not require a spacer plate, what were the fitup requirements for the weld

Mr. Kent: Very good.

Mr. Kirsch: or (3) if the drawing did not require the spacer plate and fitup requirements were violated

Mr. Kent: Okay

Mr. Kirsch: whether or not that condition that exists would if it does exist at present out there, whether or not it compromises the integrity of the containment.

Mr. Kent: Well I'll draw you a picture if you like then of the cross-section as I recall it. From one plate to another plate, this is a plate coming across this way and this is a cross-section of the plate. And I'm cutting it theoretically and looking at the cross-section as it would exist. The portion coming across this is the opening we'll say coming on down through here to another plate and the the weld. There is another plate that does exist something

of this order here coming on down here. I'll cross-hatch it the other way. And there is a weld that does exist, you'll find a weld that does exist in the best of my memory in the best of memory it is connected between this plate and this plate. But there is a gap here and then consequently you are not talking about (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them) on the upper hinge of the the door.

Mr. Kirsch: Were is the gap at now?

Mr. Kent: Right here in this cross-section right here.

Mr. Kirsch: Oh at that cross-section is missing.

Mr. Kent: Yeah, this is the one that I said I could take the ring binder

Mr. Kirsch: Oh okay.

Mr. Kent: the ring binder

Mr. Kirsch: I understand.

Mr. Kent: and put it

Mr. Kirsch: Okay.

Mr. Kent: this way and the ring binder was in the vertical plane. Okay? And I was able to introduce the ring binder back in the gap where the spacer plate

belonged. I showed this to Don Martin and he did concur that a spacer plate was missing.

Mr. Kirsch: Uh huh.

Mr. Kent: in this transition between this plate and this this plate here, you will find a weld across here. But if you will check this weld here does not have the size and actuality as required here from the view on the outside where you believe this surface to be this size. The true size is this inscribed isosceles triangle from here to here and the theoretical throw from here to here. Not the theoretical throw from here to here. Follow?

Mr. Kirsch: Okay, I understand.

Mr. Kent: Okay.

Mr. Kirsch: A here's what a that I told you before what we are going to be doing about that. And a the method that our investigation is going to be taken. Did you said Mr. Martin did agree that a spacer plate did belong in there.

Mr. Kent: Yes.

Mr. Kirsch: Was that agreement of Mr. Martin, do you remember if Mr. Martin looked at a detailed drawing in order to make make his conclusion that a spacer plate belonged there or did he just look at the piece, the welded piece as it sat in the field and based on what he thought would be required,

establish that a spacer plate belonged there. Was it required by another words by the designer or Mr. Martin's opinion that it would be there?

Mr. Kent: I do not know that it was strictly Mr. Martin's opinion because he had access to the drawings including reduced size drawings on that particular door from Chicago Bridge and Iron and could retract the drawing to see if a spacer plate was demanded at that point.

Mr. Kirsch: Did do you have knowledge of him taking the drawing out, reviewing the drawing to establish whether or not the design detail required a spacer plate in that area?

Mr. Kent: I do not know if he did this or not. I do know that I was told that Chicago Bridge and Iron did furnish drawings on the doors and consequently they should be able to take the blueprints and go out there and verify that a spacer plate was missing. Visually and physically a he did concur that the spacer plate was missing in that transition across the top hinge. And that it should be there and that it was an error in allowing

Mr. Kirsch: In other words

Mr. Kent: to come in without being found this way.

Mr. Kirsch: In other words what you are telling me is that Mr. Martin's statement tht a spacer plate was necessary in that area was based upon personal opinion and not a review of the design drawings to your knowledge?

Mr. Kent: To my knowledge Mr. Martin is of such a caliber that he should visually be able to see in a transition whether or not a spacer plate was intended in the design and was left out by one of the workmen in the fabrication by Chicago Bridge and Iron that built the door.

Mr. Kirsch: You're telling me now that it was his opinion. You believe it was his opinion and not based upon a review of the design detailed drawing?

Mr. Kent: I do not know that he did actually review the design detailed drawings or the amount of time if he reviewed them there would be required to determine this. I do know that it was stated that a Chicago Bridge and Iron did furnish drawings. Were at the job site on these doors and we should be able to get the drawing and retract the drawing and then have a drawing study the drawing and determine what thickness of plate actually belonged there. But I did suggest that they take photographs of this void if you would were the filler plate belonged and send it back to Chicago Bridge and Iron and give them the option of sending one of their technical representatives out and introducing the spacer plate there and welding it in solidly as Mr. Martin did concur. It should be welded in solidly.

Mr. Kirsch: Was Mr. Martin an engineer?

Mr. Kent: Mr. Martin was my boss.

Mr. Kirsch: Was he an engineer?

Mr. Kent: I I never saw his credentials as an engineer.

Mr. Kirsch: Oh okay. So then what you're telling me is basically your opinion of what Mr. Martin's capability or qualification. You see I'm trying to

Mr. Kent: He seemed to be knowledgeable.

Mr. Kirsch: He seemed knowledgeable.

Mr. Kent: He seemed to be knowledgeable in welding. Okay?

Mr. Kirsch: Okay. The other thing is did you ever review the design detailed drawing yourself to establish whether or not that design detail required a spacer plate installed at that point?

Mr. Kent: I do not remember having the actual drawing an actual drawing number to see what thickness of plate belonged there and with and the length and other conditions of the plate, the type of steel and so forth. As undoubted they would have called the grade of steel under the ASTM number like A7 or A36 or whatever. You know 8242 high stream low alloy steel. A whether they've done an assay, I would have imagined that they would have done a _____ low alloy steel though. But I do not know the alloy that they did select in that door.

Mr. Kirsch: Okay. Do you you identified this fact and a as I understand every quality assurance or quality control program, whenever an inspector identifies what he believes to be a deficiency in workmanship or quality of

the plant, that is incumbent upon that individual to bring that to the attention of his

Mr. Kent: Superiors (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them)

Mr. Kirsch: superiors. Let me call it supervision by means of by the established means of a nonconformance report or a deficiency report.

Mr. Kent: I did verbally communicate with by boss Mr. Don Martin and asked him to go out and visually look at. And I was successful in having him go out and take a look at it. Consequently I believed that he was of the honest opinion that a spacer plate was missing. The transition plate if you would was missing. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Did you write up a did you formally write a deficiency report or nonconformance report?

Mr. Kent: I execute I executed my burden when I told my boss, who was Don Martin about it. And a and as far as I was concerned I discharged my duties at that point a upon his shoulders for him to carry the ball and consequently write an NCR and a make sure that Chicago Bridge and Iron knew of this and the other people a knew of it and that they did have a an adequate procedure for welding it for the specific alloys involved. They would have to make sure that the filler material was compatible with the plates that did exist there.

Mr. Kirsch: Why didn't you write an NCR on that Earl?

Mr. Kent: I was relatively new on the job site then. And a being relatively new I was of the opinion I had discharged my duties when I brought my boss, Mr. Don Martin, out there and showed it to him. That was my honest opinion that I had carried the ball as far as I could carry it. And then had put the burden on his back to carry the ball the rest of the way.

Mr. Kirsch: Okay. Let's drop that one. Number 4:

Mr. Kent: I didn't want to get into an argument I didn't want to get into an argument with my boss and tell him, hey you know a this and that and the other thing. No point in a arguing with your boss as far as I am concerned if you want to remain on the job a you cooperate with your boss or not argue with him unless it's something

Mr. Kirsch: Were you told by anybody out there that a if you saw something that was wrong that you were not supposed to write an NCR or (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: Not that you were not supposed to not that you were not supposed to write an NCR. I do realize that the non-compulsory reports as such are normally generated by someone. A sometimes it was thrown up in the air as to who would write the report. If four people saw the item sometimes we'd throw up in the air and said, whose gonna write these NCR report and the fella said I've got that other inspection. Or the other fellow says well I have a little time so I'll write it you know and so forth. And a fellow might even voluntar volunteer

to write it. Other fellows would say no, I'm busy right now. I haven't the time to write an NCR.

Mr. Kirsch: Were you ever told that a you could not write NCR's?

Mr. Kent: No I was never told that I could not that it was against the law.

Mr. Kirsch: Were you ever told you that a you should write NCR's for deficient conditions that (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: I was never told I should when I did not. If my boss told me that I should write an NCR on a specific item, I did write the NCR. And I've written numerous NCR's. And when he tells me that I should write an NCR I certainly did it.

Mr. Kirsch: Okay. Okay let's draw up that one. Number 4: Your concern is and I'm going to state it as I've written it as my understanding of your concern is: based upon numerous spelling errors in nondestructive testing reports, the alleger believed that the quality of nondestructive examinations performed by Peabody Testing personnel may be questionable.

Mr. Kent: It may be questionable is an understatement.

Mr. Kirsch: Do you what are [illegible] the relationship in a the technical relationship

Mr. Kent: Oh a

Mr. Kirsch: between the individual's capability to spell and an individual's capability in the nondestructive testing area. As this individual was surely qualified by conformance to practical and written examinations in accordance with ASNTTC1A.

Mr. Kent: He may have been qualified to certain items but when the fellow has such an academic a lack that he will spell words as simple as a weld as wel and fillet as filet and they are documented things of this nature, a it makes you wonder if a he is allowed to sign his check with an X or not.

Mr. Kirsch: I've known a number of individuals that graduated from college, Earl, that had difficulty spelling.

Mr. Kent: I've seen many of them.

Mr. Kirsch: And several of them have been damn good engineers.

Mr. Kent: This is open in contention in many areas because a if a fellow is truly knowledgeable, the ability to read and the ability to understand and the ability to communicate and so forth be extremely important. If a fellow cannot understand the directions or things like this. If he can't really read how can he understand extensive directions or extensive procedures when he doesn't understand the meaning of many words that he will see in the procedures. Does he just gloss over 'em and say well that a means something I don't understand and a go right on his merry way with partial understanding.

In my opinion, people doing nondestructive examinations should be of such a caliber that they could at at least spell common words

Mr. Kirsch: This is based upon your opinion Earl. Does does that have any your does your opinion have any basis in code requirements or industry standard, written in industry standard

Mr. Kent: The code the code does not demand that that fellow be proficient in spelling in order to use the code.

Mr. Kirsch: Okay. We'll leave that there. I right now in my own mind do not

Mr. Kent: Let me

Mr. Kirsch: see a relationship between the inability (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: All right. What about the relationships what about the relationship having monkeys what about the relationship of thinking about having monkeys go out there and do the a _____ testing. Would you agree that it is possible?

Mr. Kirsch: If you trained them.

Mr. Kent: That's what I mean.

Mr. Kirsch: If they qualify.

Mr. Kent: That's what I mean. Training monkeys and qualified monkeys to go out and a do the _____ testing and nuclear applications. Train monkeys to do it.

Mr. Kirsch: I think I think

Mr. Kent: Would you be happy with that?

Mr. Kirsch: I think that this is I don't see the point of that conver of discussing that one Earl. It's a everybody knows that noone in his right mind is going to go train a monkey or an ape to go do _____ testing. This

Mr. Kent: They have had and trained to work in laboratories though, as you well know.

Mr. Kirsch: I that's totally outside of my realm Earl. No one in his right mind is going to do that.

Mr. Kent: Well people have trained monkeys. I don't I don't suggest it at all. What I am saying is that a if we're going to talk about ridiculous things á this is a point down the line that's even more ridiculous than á the people reading the procedures and can't understand the meaning of the words very often, common words that you don't really have an in-depth understanding of what they mean. I can't expect the fellow to a a correctly spell every single word that he uses in his lifetime. No one is perfect and á I'm

certainly not perfect. And I don't see anyone in the world that is perfect. But by the same token there has to be a certain minimum level

Mr. Shackleton: Earl

Mr. Kent: seen seen in writing.

Mr. Shackleton: Excuse me a

Mr. Kent: Sure.

Mr. Shackleton: Going back to Peabody Testing Lab. Wha what were they doing when you were working at the plant? Were they doing nondestructive testing of welds?

Mr. Kent: Yes yes they were like _____ testing a colored for x-ray welds and things of this nature.

Mr. Shackleton: Do you have any a did you make any observations or have any documentation or any evidence that their work was unsatisfactory?

Mr. Kent: In my opinion a lot of their work was questionable. Normally

Mr. Kirsch: Was your opinion based upon direct observation of unsatisfactory performance of nondestructive examination techniques?

Mr. Kent: Now when you say this, is a wide open area

Mr. Kirsch: No I'm asking did you observe

Mr. Kent: subjective

Mr. Kirsch: Did you observe them performing nondestructive examinations?

Mr. Kent: Yes I have.

Mr. Kirsch: Did you those individuals that you observed performing nondestructive examinations do you have any reason to believe that they did not comply with the requirements of the nondestructive examination features?

Mr. Kent: Examinations did not comply with the requirements. I believe that they did not comply with 100% of all the requirements that they had the burden to discharge.

Mr. Kirsch: What requirements didn't they comply with Earl?

Mr. Kent: I'm saying from my work with them, it is my feeling that their caliber left a lot to be desired relative to a accuracy, relative to reporting, relative to trying to put it down on paper. Almost the inability at times to spell common words on the on the report. Many many times you'd see all kinds of words misspelled, even Bechtel was misspelled on some of the reports.

Mr. Shackleton: Getting away from the misspelling, what technical inadequacies did you observe then performed?

Mr. Kent: Well when they were were operating some of the a conversations where they a would have an oversight in some areas for instance. Be in the vicinity and the fellow says, "Ah gee whiz I forgot to do this or I forgot to do that or I forgot to you know". A suddenly he realized that he forgot something or check his specs. He forgot to have his procedure there with him and he had to stop and go get his procedure. Things of this nature that a

Mr. Shackleton: Gentlemen, a excuse me interrupting Earl. We want to change the tape.

Mr. Kent: Okay.

Mr. Shackleton: The time is now approximately 11:32. This is a continuation of the interview of Mr. E. Earl Kent. The time is now approximately 11:33 a.m., October 15, 1982. Please continue Earl.

Mr. Kent: Let me ask a question. A how low a caliber would you be happy with a as someone come in there that totally could not spell but a could go out without even a first grade education and perform _____ testing? A would you be happy with a allowing him into a nuclear plant and letting him perform that way?

Mr. Kirsch: The criteria which we inspect to is: that any individual who performs a technique utilized in nondestructive examinations of metal be qualified to perform that technique in accordance with ASNTTC1A which is an accepted industry standard for the qualification of nondestrutive examination personnel. That is our criteria. Everything else we feel is subjective.

That is the only objective evidence of qualification that is established as a an industry standard.

Mr. Kent: Well I have seen the time that a there have been documented on one of these reports fillet weld (fillet weld was spelled in the report as filet one l instead of two, and wel instead of weld).

Mr. Kirsch: Okay. Was there anything wrong with that fillet weld other than the fact that the word was misspelled?
What is the hardware? Was the hardware acceptable according to the codes and standards?

Mr. Kent: If the fellow elected to pass the hardware on a visual examination of whether it was required and he did pass it. And did not document it any better than that, I feel sorry for the industry.

Mr. Kirsch: That I feel is a subjective conclusion on your part Earl.

Mr. Kent: That may very well be. May very well be.

Mr. Kirsch: And you haven't given me any information that would indicate to me that your opinion is based on objective evaluation

Mr. Kent: I would suggest

Mr. Kirsch: of welding (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: I would suggest I would suggest I would suggest that a all Peabody personnel at that point and time that had anything to do with testing at the San Onofre be retested by an independent agency and indepth. Really determine their caliber individually.

Mr. Kirsch: I'm not in the position to pass to pass judgement or any opinion on your suggestion. We'll take it we'll take it as a matter of record. But in my own mind I am certain that we have no grounds or legal req legal requirement to go retest every individual perf that was qualified by Peabody during that time.

Mr. Kent: I believe (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: The fact that an individual may have qualified been able to qualify and satisfy the standard qualif qualification of nondestructive examination personnel at that time has no relationship to his ability in nondestructive examination at this present time.

Mr. Kent: You have a very good point but by the same token I had the point that it would be extremely informative to know the exact caliber of the people doing the nondestructive examination and testing at San Onofre for instance Units 1, 2 and 3. And to really determine the true caliber not the caliber as stated on paper necessarily.

Mr. Kirsch: You have the desire to do that Earl (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent)

Mr. Kent: may be mismatched.

Mr. Kirsch: You have the desire

Mr. Kent: You may find things you may find things that'll really open your eyes.

Mr. Kirsch: Okay. Now you have a desire to see that done

Mr. Kent: Yes and I think it warrants it.

Mr. Kirsch: and a

Mr. Kent: Very definitely.

Mr. Kirsch: But a is there anything in the industry in the industry code and standard that you know of that requires that to be done?

Mr. Kent: Not currently and the standards of the existed date. Theoretically if the fellow passes the examination, even if a he wasn't qualified, once he gets permission to a do a nondestrutive examination and a testing and so forth a theoretically a he has qualified. There have been numerous people who have obtained, now I'm not saying this here to _____, but I do know this for a fact, have obtained qualifications through granting a favor or or material benefit to the examiner.

Mr. Shackleton: Do you know of any instances where that occurred at the San Onofre

Mr. Kent: No not specifically

Mr. Shackleton: Generation Station?

Mr. Kent: Not specifically. But I do know in my past knowledge there have been examiners that have examined inspectors and have passed inspectors when they weren't truly qualified.

Mr. Shackleton: Do you know of any any inspectors that worked or are working at the San Onofre site for Peabody Barnes that are qualified to be inspectors that fraudulently obtained those qualifications or were passed when they shouldn't have been?

Mr. Kent: No I do not know of any presently obtained qualifications at San Onofre.

Mr. Kirsch: Okay. I think we've a covered this in sufficient detail. A I that is all of the concerns that I have written down that I was able to glean from my conversations on the telephone with a Earl. And a so if you two folks would like to pursue any new concerns go ahead.

Mr. Shackleton: Okay, we'd like to at this time a we've only been talking now for nearly 2 hours. We'd like to take a rest break

Mr. Kent: I'd just like to continue if you'd like to.

Mr. Shackleton: Well it's up to you. I don't want you to be uncomfortable.

Mr. Kent: No I'm not uncomfortable at all.

Mr. Shackleton: Okay. What we'd like to a obtain at this time then, you mentioned earlier that you have additional concerns a in in addition to those that Dennis just went over from prior telephone conversations wih you. Could you please at this time a give them to us and we can record them on tape

Mr. Kent: I'll give you I'll give you a good one. I'll give you a good one. Are you aware that mild steel a in the _____ condition

Mr. Joukoff: Excuse me in the _____ condition?

Mr. Kent: In the _____

Mr. Joukoff: _____ _____ _____ condition?

Mr. Kent: _____ condition when the seal has not been normalized, you have directionality characteristics.

Mr. Joukoff: I'm aware of that yes.

Mr. Kent: Okay. You have fiber end characteristics, okay?

Mr. Joukoff: You have a non-homogeneous

Mr. Kent: non-homogeneous material

Mr. Joukoff: material.

Mr. Kent: That's correct. A by the same token are you aware that the all of the mild steels in the _____ condition does have a surface coat? We'll say for rim steel and the rim steel is relatively soft, relatively weak as a skin if you would on the steel member. Does it roll, shape or break?

Mr. Joukoff: Well the important thing I want to get to Earl is

(Several voices, unable to understand any of them)

Mr. Kent: valid point here. Objective penetration beyond the beyond the weak skin into the parent plate for a adequate integrity. The the amount of depth penetration of the ~~well~~ *well* if you ~~well~~ *will*.

Mr. Kirsch: How thick is that weak skin?

Mr. Kent: Now this is another thing that varies and it does a exist on all rim steel for instance. And all cases at the skin in a different thicknesses of the members of the skin will vary in thickness. Okay?

Mr. Kirsch: What is the maximum thickness? Are we talking 1 or 2 mils?

(Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent)

Mr. Kent: No, a some of the skin can exist on the order of a thirty thousandth of an inch thickness we'll say. (Unable to understand Mr. Kent) Sometimes there's 20,000, sometimes 25,000, sometimes 30,000, sometimes 35,000 skin

Mr. Joukoff: Okay.

Mr. Kent: in thickness.

Mr. Kirsch: Your _____ just fell. Do you know do you know anything have any knowledge. I I

Mr. Joukoff: I don't have any knowledge of that.

Mr. Kent: Well aren't you familiar with rim steel?

Mr. Joukoff: Well okay. You have what you're talking about is a is a rolled piece of material. All right. A subsequent to rolling or other heat treatments and normalizations that are done to the material (Mr. Joukoff and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: normalizations that are left in the _____ condition.

Mr. Joukoff: Well in the _____ condition then we'll have to go back and see or you are going to have to tell us what is done in post-rolling in order to see if in fact this does exist.

Mr. Kent: Now there's no cross-rolling normally applied to the place for instance and the shapes as they are rolled. A in essence mostly hot rolled steel existing in the hot roll non-normalized condition does have piping characteristics. And it does have a skin on it especially if it is a rim steel. And a skin that is normally found to be on the order of different thicknesses relative to the thickness. Because if you're reducing it down then then in _____ place then naturally the skin is pinned down with the plate. You follow? On both sides of the plate. In thick plate like _____ 1 inch thick you might find the skin that is thirty-five thousandth of an inch thick skin, that is that is relatively soft skin, relatively soft steel as a skin. In rim steel this is a inherent in the characteristics of the steel.

Mr. Kirsch: Hey where are we going with this?

Mr. Kent: Greg what would you ask to determine to determine whether or not you have extensive rim steel allowed in structural applications all through San Onofre Units 1, 2 and 3. And if you have rim steel it is non-homogeneous steel.

Mr. Kirsch: Do you know of any rim steel?

Mr. Kent: This is what I am saying. That I feel that it is our burden to determine the extent of rim steel as used. Now it was allowed to be used under ASTM A7 which was discontinued in 1967, as being unfit in a structural applications. Some of the plates and shapes have been left in warehouses for years and years after that and used at job sites. Still it's ASTM A7. What I

I am saying is that in the rim condition you have certain places where it is allowed and you have other codes do not allow it. The a U.S. Navy currently under general specifications does not allow rim steel in combatant ships for instance as an example.

Mr. Kirsch: But we're talking about San Onofre.

Mr. Kent: I know we are. I know we are.

Mr. Kirsch: It is my impression of all of the Bechtel of all of the specifications at San Onofre, the minimum steel that is allowed on is purchased for nuclear application at that site is at minimum ASTM A36.

Mr. Kent: ASTM A36 is very very similar A7. You take samples of A36 and samples of A7 to a laboratory and many times the people in the testing laboratory can't tell the difference between the two of them. They are so similar. The only true requirements between a ASTM A7 and A36 is the fact that the minimum yield is a little higher in A36 steel and has to be 36 psi minimum in the uniaxial direction. Not the triaxial direction or biaxial direction. A in the A7 steel you have wide open chemistry

Mr. Joukoff: Wait a minute wait a minute

Mr. Kent: except

Mr. Joukoff: I I miss missed that. The A36 steel has to have a minimum of 36 psi

Mr. Kent: yield strength

Mr. Joukoff: yield strength in the uniaxial ten tensile test.

Mr. Kent: Yes.

Mr. Joukoff: Okay.

Mr. Kent: As a minimum.

Mr. Joukoff: That's right. As a minimum.

Mr. Kent: That's thirty-six thousand pounds per square inch 36 psi as a minimum.

Mr. Joukoff: I I realize that. Okay. Now you when start talking about triaxial loading.

Mr. Kent: I said I said in uniaxial direction. A this is this is the way that it is determined. It's not determined in a biaxial nor triaxial state of loading.

Mr. Joukoff: Tell me what you consider to be a biaxial and triaxial state of loading.

Mr. Kent: Well okay. Where you have a transverse loading you have biaxial loading as well as uniaxial longitudinal loading. Okay? And then if you have

triaxial loading you have now longitudinal but biaxial and the two thickness direction in the third direction to the thickness of the plate.

Mr. Joukoff: If you're talking about putting it in in tension in all six

Mr. Kent: In all three

Mr. Joukoff: In all three directions.

Mr. Kent: In all three basic directions,

Mr. Kirsch: Yes.

Mr. Kent: x, y and z directions. That is correct.

Mr. Joukoff: Okay and

Mr. Kent: It's radically different

Mr. Joukoff: Okay.

Mr. Kent: from elongation for A36 steel and A7 steel in a triaxial direction. And you will find this the elongation is radially different than the elongation in the uniaxial direction for A36 steel. The same member

Mr. Joukoff: Okay. Is is the yield the same?

Mr. Kent: The yield is may be similar in the biaxial direction and it may be similar in the triaxial direction but the elongation is radically different. Normally in the triaxial direction, the elongation is extremely important for the steel to be able to be ductile and move.

Mr. Joukoff: I'm aware of that.

Mr. Kent: Be elastic.

Mr. Joukoff: I'm aware of that.

Mr. Kent: Okay. Now in the triaxial direction I have seen cases where the the true elongation is only a small fraction of the theoretical elongation we'll see and then the longitudinal direction, the uniaxial direction.

Mr. Joukoff: If you allow it to exceed the yield (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) because you're apt to exceed yield prior to elongation.

Mr. Kirsch: Uh huh.

Mr. Kent: You will you will you will have appreciable yield, measurable yield. Okay? If you're talking about the offset. Okay, are you talking about the offset?

Mr. Joukoff: I'm talking about

Mr. Kent: on the stress strain curve

Mr. Joukoff: on the stress strain curve

Mr. Kent: On the SM curve.

Mr. Joukoff: on the SM curve of a mild steel like A36 you have a very defined yield point.

Mr. Kent: You have a very defined yield point as long as you don't offset it. (Mr. Joukoff also speaking, unable to understand him) Okay.

Mr. Joukoff: You can take either one. Depends it depends on what the designer is taking.

Mr. Kent: Okay.

Mr. Joukoff: You can take you can take either as read on the actual dip or you can take the 2% offset. Two percent offset is normally used on higher strength steels (Mr. Joukoff and Mr. Kent both speaking, unable to understand either of them) definite dip. Then it is assumed to be 2% offset. But a designer will normally use the actual peak on a low strength steel because that it is in fact the actual amount. It's not an interpreted 2% offset like you need to use in high strength steels.

Mr. Kent: Are you aware then that you will have a difference in value under biaxial loading and triaxial loading?

Mr. Joukoff: Well the the point that I'm coming to is if you don't exceed the yield what what you're telling me about elongation, I don't understand what the point we're coming to is. If you don't exceed yield you don't have elongation.

Mr. Kent: All right. Now when you said when you said exceeds the yield, are you aware that the yield is different in the triaxial direction we'll say than the yield is in the (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: What's the triaxial yield of A36? What's the triaxial yield of A36?

Mr. Kent: They do not specify that in the code. They demand it only in the longitudinal direction, the uniaxial direction. This is what I'm saying is that there are other

Mr. Joukoff: Okay. So we are getting into a code problem.

Mr. Kent: Well we're getting we're getting into we're getting into indepth indepth things here now.

Mr. Joukoff: Okay, wait a minute. Let's back up. Are we getting into a a have a problem with the way the code is written for this testing or you're getting into an actual problem that exists at San Onofre?

Mr. Kent: I'm saying that in in the real world in the real world you have you have many many joints undoubted thousands of joints that are subjected to biaxial and triaxial stress in addition to uniaxial stress.

Mr. Kirsch: A the question though is: Is your concern in this area related to the adequacy of the code requirement being the ASTM codes or is your concern in this area related to the failure of Bechtel or Southern California Edison at San Onofre to adequately implement the requirements of the existing code. Which is it?

Mr. Kent: I will say that in my opinion the code here should address these other problems as vital parameters that have not been expressed in the code. Because they do exist in the real world; not in the theoretical world.

Mr. Kirsch: Okay. Again I have to reem reemphasize Earl, our concern here is not with the adequacy of industry established codes. Our concern is with the satisfactory implementation of those established industry codes at San Onofre.

Mr. Kent: And this is what I am bringing to your attention. Is we have the real world where the true loading very often is not only biaxial but also triaxial, which is quite different loading from a uniaxial direction. As normally they take an average and say that theoretically this will be subjected onto uniaxial stress. And then consequently we will give a certain

value will assign a certain value to this and this is theoretically adequate. What I am saying that is in the real world the actual condition very often does not conform to the theoretical condition.

Mr. Kirsch: Do you know of any instance at San Onofre that they have failed to implement the requirements of an established industry code or standard?

Mr. Kent: Well here getting back to the wrap-arounds. A as we mentioned before that's a a prize example right there.

Mr. Kirsch: No, I'm talking about these I'm talking about what you're talking about right now. In the ASTM A7 and A36 steel, have they in their specification at San Onofre, do you know of any instance where at San Onofre, Bechtel or Southern California Edison failed to fly with the requirements of established industry codes and standards in this area of steel.

Mr. Kent: I do know of some mix-ups in documentation where they did get a wrong steel in different areas once in a long while. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Were those mix-ups fixed?

Mr. Kent: Yes. But if you will read in the public document room in San Clemente in a Section S for Unit 1 and then Section S of Units 2 and 3, you will see a lot there, where they did inadvertently a call for instance a stainless steel to be type 304. And what document is 304 in and in reality it was not; 304 steel as an example.

Mr. Kirsch: Okay.

Mr. Kent: And the same with chrome molly where one a key was a in a key-weighted field but documented as chrome molly steel 4000 series and in actuality is 1000 series.

Mr. Kirsch: Did and do you know again. Let's repeat the question. Do you know of any instance at San Onofre wherein Bechtel Power Corporation or Southern California Edison failed to implement requirements of established codes and standards?

Mr. Kent: Well what I have to say is that (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: that exists today

Mr. Kent: a lot to be desired in the code (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I reit re

Mr. Kent: tremendous amount (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I reiterate again Earl, our investigation here is not related to the adequacy of established codes and standards. That is outside of our purview of authority.

Mr. Kent: Let me ask you then. Do you agree that A7 should be allowed a as material for structural hangers, and a electrical tray supports and things of this nature?

Mr. Kirsch: I do not know that A7 has been used at San Onofre. Did can you tell me if A7 has been used at San Onofre? Do you know

Mr. Kent: To the best of my knowledge a it has been included in some items at San Onofre.

Mr. Kirsch: Where?

Mr. Kent: I believe it to be in pipe hangers and I believe it to be tray hangers and I believe that some of these structural members were were A7 and A36. And there's very very little difference between A7 and A36 except in yield. The chemistry can be quite similar. If you look at the requirements under ASTM A7 there are only two residuals that are required in A7. Both are elements that you can't either get rid of totally. And phosphorus is limited to .04 of 1% maximum and sulfur is limited to .05 of 1% maximum. There is no control on carbon. Do you or do you not agree that carbon is a an element that is required to control when you weld the steel?

Mr. Kirsch: Of course.

Mr. Kent: Okay. Then why isn't carbon called as a minimum or a maximum? Why isn't maximum at A7 steel for carbon?

Mr. Kirsch: Isn't there one?

Mr. Kent: No.

Mr. Kirsch: There is none. Right.

Mr. Kent: No there is not.

Mr. Kirsch: Okay.

Mr. Kent: No there is not.

Mr. Kirsch: How about ASTM A7. That doesn't require a carbon control. Does it?

Mr. Kent: A7 did not con require and again and in A36 it only has a maximum. In A36 .25 of 1% maximum, no minimum (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I must reiterate

Mr. Kent: in place of inner shapes is .26 of 1% and shapes 1 point above.

Mr. Kirsch: I must reiterate Earl, our concern here is not with the ad the adequacy of the codes as or standards as

Mr. Kent: Leaves a lot to be desired.

Mr. Kirsch: perceived by you. That is your opinion.

Mr. Kent: A I'll give you an opinion too.

Mr. Kirsch: In Perhaps so. All we're concerned here is with the adequacy of the construction at San Onofre. Not with the not with your perceived inadequacies in the industry established codes and standards. Do you know of any instance at San Onofre where Bechtel Power Corporation or Southern California Edison failed to implement the requirements of established industry codes and standards be it either A7 or be it A36?

Mr. Kent: No. I do not. But I will tell you that the code in certain areas is wide open. In certain areas like ASTM A7 _____ throw in the kitchen sink where the you don't have a minimum or maximum carbon. And carbon is extremely important from a weld and building standpoint we'll say. And yet is not demanded to be a minimum or maximum under ASTM A7 and hasn't been for decades. (Mr. Ken and Mr. Kirsch both speaking, not able to understand Mr. Kent)

Mr. Joukoff: Do you know where A7 do you know if A7 has been used at San Onofre and where?

Mr. Kent: I am of the honest opinion that if you will check the mill test reports, the MTR's, in San Onofre you will find in those MTR's a considerable amount of A7 steel as called out. Besides A36 steel

Mr. Joukoff: What

Mr. Kent: and there is very little difference between the two (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: What information that you have has led you to feel that A7 does exist there? What have you seen or heard or who told you? How did this come to your attention?

Mr. Kent: It appears to me in the best of my memory that in the mill test reports to the best of my memory, I have seen A7 steel in the mill test reports.

Mr. Joukoff: You reviewed the mill test reports yourself?

Mr. Kent: I have reviewed the MTR's. Yes. And this was in preparation of the end end product packages, working in OB1, Harpers Building 1.

Mr. Kirsch: Also hold it now. Office building 1 is merely an office building. It is not related to the safety of the reactor or reactor support system

Mr. Kent: No but it's related to the safety of the humans working in it. And when you have wells and girders and beams and so forth that are there do not even meet the code under the AWS structural welding code. When you have people working there and the structural members do not even meet that as a minimum well size. A isn't this hazardous to the people that are actually working there? (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: We, the NRC do to limited resources and limited regulatory authority in those areas, do not inspect any area that has not that has no relation to nuclear safety-related applications.

Mr. Kent: Would you be concerned under seismic loading if the building falled down.

Mr. Kirsch: Not me.

(Several people speaking, not able to understand any of them)

Mr. Kirsch: Not from a regulatory standpoint.

Mr. Joukoff: We're trying to get this through to you Earl: We're only our only responsibility as an agency. As a human being we're concerned. The same as you. And Dennis has gone over and over this. But our authority, given to us by Congress, is strictly in the nuclear field.

Mr. Kent: In other words, your hands are tied. (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: Well no. We don't have any jurisdiction over office buildings.

Mr. Kent: Even if you wanted to even if you wanted to a

Mr. Joukoff: That's right.

Mr. Kent: to pursue these avenues

Mr. Joukoff: Now that doesn't mean that we we

Mr. Kent: pursue these avenues

Mr. Joukoff: that we sit in silence. We definitely would pass the information on of your

Mr. Kent: And it should be passed on.

Mr. Joukoff: of your concerns to Southern Cal Edison.

Mr. Kent: And it should be passed on.

Mr. Joukoff: But we as an agency have no jurisdiction in a the construction of non-safety related a structures at _____. Now I want to get back we initially when we got on this part of our interview, we asked you for any additional concerns

Mr. Kent: I have numerous other concerns.

Mr. Joukoff: Well you started off Earl by addressing a varietal ignorants. Because of the four of you who are here, I'm the only one who's not a technician. I'm the layman. And you addressed rim skin thickness and we've we've gone a long way away from that. And we haven't solved it according to

my layman's understanding. Do you have any knowledge that we have rim skin or whatever the proper terminology is

Mr. Kent: Rim steel.

Mr. Joukoff: rim steel

Mr. Kent: with a soft skin

Mr. Joukoff: used in in safety-related structures

Mr. Kent: I do not know that it is exactly used in SR structures. No.

Mr. Joukoff: At _____. That's

Mr. Kent: I I did not have the time and the authority to go out actually find these specific points where this was used. A were it was used.

Mr. Joukoff: Do do you know if this type of steel was at the site?

Mr. Kent: I believe it to be at the site and in fact I believe you will find it in the mill test reports. I think in the mill test reports you will numerous

Mr. Kirsch: Do you know that it was at the site? Other than a belief of a a belief? Do you have objective evidence or have you seen objective evidence

that the steel was at the site and was used in nuclear safety-related applications?

Mr. Kent: I do not know that it was used in the SR equipment per se.

Mr. Kirsch: Okay. I recommend that we just a that we drop this line here. I don't think we're getting anywhere with it.

(Several people speaking at same time, unable to understand any of them)

Mr. Kent: It is critical. It is critical in the sense that it does reflect on welding, for instance: gas chunks in arc welding forming a _____ gas, the depth of the puddle very often if not deep. The depth of the puddle is relatively shallow and sometimes with the depth of the puddle is not beyond the thickness of rim steel. You have a potential problem that could occur.

Mr. Kirsch: Is it nor I don't think it's normal it would be that the gas tungsten or the taking, or make whatever you want to call it, is going to be that technique would ever be used in that kind of steel?

Mr. Kent: Yes they do use it. They do use gas chunks in arc welling from tank tungsten nerve gas. And they have used it extensively in mild steel as well as stainless steels. And I have seen numerous cases where the actual a arc puddle was relatively small and evidently the volume of any instant in time was a relatively small volume. And consequently, the melt depth was not really deep down into the parent metal.

Mr. Kirsch: Well isn't it normally though? Use 6010 or a (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: Now now that's a Shield sheet metal arc (Mr. Kent and Mr. Kirsch speaking, unable to understand Mr. Kent)

Mr. Kirsch: I know but I mean that's normally what's used on this kind of steel.

Mr. Kent: No. The majority of the welding is granular stick electrodes. Okay. But they have used an awful lot of gas tungsten arc ~~welling~~ welding from a big tungsten nerve gas. In other applications including _____ _____ but basically on stainless steel and and other alloys.

Mr. Shackleton: Gentlemen please let me change the tape. The time is now 12:00 noon, October 15, 1982.

This is a continuation of the interview with Mr. E. Earl Kent. Time is now approximately 12:01 p.m., October 15, 1982.

Mr. Joukoff: I think we've established here that there is no direct knowledge of any failure by any contractor at San Onofre Nuclear Plant to comply with established industry codes and standards in this area of steel usage.

Mr. Kent: Now at th t point and time when a ASTM was a discontinued in 1967 and it was deleted from the the code that it was purchased to. Do you feel that a Bechtel had the burden of a of a going through their stock and a making sure that no more ASTM A7 was brought in (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: As I understand it Earl, Bechtel doesn't maintain a stock of steel.

Mr. Kent: Well I mean I mean our our our check. The mill test reports when come to the gate if you would.

Mr. Kirsch: Unless only if it's a (Mr. Ker t and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kent: standards and a supports and things of this nature.

Mr. Kirsch: My understanding of the quality assurance program implemented at that site is that if a material is used in a quality application be it nuclear safety-related or if it is classified as quality class 1 or 2 that the

material certification reports are reviewed by quality assurance and quality control personnel as a matter of course prior to that steel being used on construction activities at that site.

Mr. Kent: I believe it to be a cursory review and not an indepth review. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Do you have any knowledge wherein that steel that some steel was installed and did not meet the requirements of applicable industry codes and standards?

Mr. Kent: I cannot think of any specific item where I could go out and give you the specific a configuration and so forth that a is of such a configuration.

Mr. Kirsch: I'm not asking that. I'm asking do you know of any steel that was used at San Onofre that did not meet the requirements of applicable industry codes and standards.

Mr. Kent: Well for instance in a the ste l like I did mention earlier, where they a documented ____304. In actuality it was not 304 steel.

Mr. Kirsch: That one was caught and fixed.

Mr. Kent: Okay. Right and

Mr. Kirsch: Their quality assurance program worked.

Mr. Kent: And then the same with a the failure of the key in the the key wave when it was stuck in it as being 4000 series. Wasn't it called molly steel, really chromium litnum alloy steel. And a the documentation showed to be 4000 series. In actuality it was 1000 series.

Mr. Kirsch: Again Earl the quality assurance program

Mr. Kent: After the failure.

Mr. Kirsch: established worked.

Mr. Kent: After the failure.

Mr. Kirsch: But it was found. It was caught.

Mr. Kent: It was found after the failure and after they lost the cooling water.

Mr. Kirsch: Do you know of any instance that is at San Onofre wherein steel which has not met the established industry codes and standards was installed in the plant and exists there today?

Mr. Kent: I do not have specifics on it. But I honestly believe it warrants an investigation as to how much ASTM A7 exists in the plant and where it exists. And if it is SR related, then very definitely in my opinion, should be removed and replaced with adeqate steel.

Mr. Joukoff: We haven't established yet that you know that A7 was ever delivered to the site.

Mr. Kent: To the best of my knowledge a A7 exists at San Onofre Units 1, 2 and 3, especially at Unit 1

Mr. Kirsch: Where?

Mr. Kent: In pipe supports and a hangers, structural applications and things of this nature. Because I do remember when I was working on the inside packages on the mill test reports there were actual certifications for the steel that was there that included in ASTM A7 as well as A36. And there is very very little difference between the two except in yield.

Mr. Youkoff: In where was that A7 installed?

Mr. Kent: I do not know. I do not know that it was actually used on SR equipment. But what I am saying is if it was in fact used on SR equipment by all means you should find it. Determine if it is very very critical and if it is remove it and replace with adequate steel.

Mr. Joukoff: When was a you said ASTM A7 was removed from use in 1967?

Mr. Kent: Yes it was deleted as being unfit in 1967.

Mr. Joukoff: Okay. Okay. And you said that you know exists at San Onofre Unit 1.

Mr. Kent: No. I said you'd probably find it existing more in Unit 1 than you would find it in existing in Units 2 and 3 because Unit 1 is older. And structural applications are probably more
than Unit 1 and secondary or whatever structures listed. An and a I don't know if that safety-related structures or not. But you'll probably find a larger percentage of it in mild steel in Unit 1 than most likely you'll find in Unit 2. You'll probably find higher percentage of A36 steel in Unit 2 and 3. But by the same token a except for yield strength, very little difference in the chemistry of A36 steel and A7 steel in the laboratory.

Mr. Youkoff: What's the yield?

Mr. Kent: The laboratory cannot tell the difference between the two.

Mr. Youkoff: What's the yield strength of of a ASTM A7?

Mr. Kent: Normally 32 ksi minimum. That's 36 ksi for A36 of course in the uniaxial direction now only. In the real world you not only have a longitudinal direction, you have a transverse direction and you have two thickness direction loading; uniaxial, biaxial and triaxial.

Mr. Kirsch: I don't know

Mr. Joukoff: The only thing I can say is a a San Onofre Unit 1 was built at such time that was an acceptable material. And San Onofre Unit 1 is currently

Mr. Kent: Is this a reason a (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: is currently going through a complete upgrading of its seismic ability involving many things being changed in the plant.

Mr. Kent: Do you know whether or not the A7 was a used in any of the four a pipe supports that recently failed there in Unit 1?

Mr. Kirsch: No.

Mr. Kent: Do you know if their chemistry was checked out to make sure that a was an adequate seal and a was applicable under that original code as a defined then?

Mr. Joukoff: I don't have any personal knowledge (Mr. Joukoff and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: It'd be it'd be it'd be very very interesting

Mr. Joukoff: I have no personal knowledge of the (Mr. Joukoff and Mr. Kent both speaking, unable to understand Mr. Joukoff)

Mr. Kent: to see the actual material and the the actual design and see why it failed and see if the welding was originally a thought to be adequate and the rest of the material was thought to be adequate

Mr. Joukoff: Okay.

Mr. Kent: at that point and time of design. But where you have failures and this is proof. You have had number of failures in Unit 1 for instance that should have never occurred; theoretically should have been perfectly good for the full service life of the plant, 25 or 35 or 40 years. But here we find failures in the actual plant that was never estimated evidently by designs. Does that mean the designer was incompetent? Does that mean the engineer was incompetent at that point and time? What occurred? Did it mistakes?

Mr. Joukoff: A nobody can I have no personal knowledge of those four supports from any other supports. I can't even comment.

Mr. Kent: But

Mr. Shackleton: Earl can we we're here for a purpose of identifying concerns at that the plant and not to discuss codes and and history

Mr. Kent: When it relates to welding and it relates to joining members together like the skin. Like on end steel where the skin is thicker and welding in it like in the gas tungsten arc glowing be depth of it melt. What I am saying is that when you're with a shovel full and you're not going deep past the skin very deep. You may have a weld there that is of the required size but not had a total integrity of that weld.

Mr. Joukoff: I understand that. Do you have any

Mr. Kent: Exclusive of the fibering action a in the actual condition which is another thing.

Mr. Joukoff: Can

Mr. Kent: The ability to tear a along the the direction of the fibers.

Mr. Joukoff: All right. Can we obtain from you have any other additional concerns?

Mr. Kent: I have numerous other additional concerns that may take a long long time to bring them all out.

Mr. Joukoff: Well what's

Mr. Kirsch: The concerns that we will are interested in Earl

Mr. Joukoff: The ones that we have jurisdiction over (Several people speaking at once, unable to understand any of them)

Mr. Kent: Here again here again your hands are tied and many many things in my opinion that a should not be so. I am of the opinion that you should have the ability to at least suggest that they be different than what they are.

Mr. Kirsch: Congress has not given us that purview.

Mr. Kent: Why undoubtedly

Mr. Kirsch: and a but we're we're asking is do you have any other int instances to your knowledge wherein Bechtel

Mr. Kent: I can give you

Mr. Kirsch: any of its contractors or Southern California Edison at San Onofre Units 1, 2 and 3 have failed to implement the requirements of established industry codes and standards.

Mr. Kent: All right. Here's one that's that's impossible in the code. As you probably well know, there are different configurations where you have a junction of one member to another member. And if you will look in the code at that point and time like 1974 and so forth. You will see at at certain configurations you have an opening of 0 inch to well say for for talking purposes of 1/8 of inch allowed. And where you have a 3/8 inch thick member here under gas metal arc welding at that point and time pictorially showed the weld to be down inside like this and like this. And other areas it did show other things like this, one plate to another plate. And here again we're talking about 3/8 inch thick members and an opening of 0 inch to 1/8 of an inch. In the real world on the gas metal arc welding _____, there is no way in my honest opinion you're ever going to get the configuration as shown. And this includes Bechtel's own documents that were transcribed if you would from the code that shows full penetration down in here and over here and over here and over here. In the real world on the gas metal arc welding in my honest opinion I have never seen any case where they had the ability to do as shown in the code diagrams of doing this. They have 0 being here. You may have a weld that looks like this and like this and like this and like this

with a built in flow if you would between the welds. Now what I am saying is that there are some things that are allowed in the code that are not realistic. And this is one of them. This is allowed.

Mr. Kirsch: Uh huh.

Mr. Kent: If you look at the codes if you look at the codes you find them where they do allow 0 opening to inclusive of 3/8 inch thick not just in the square butt joint here, but also the T configuration and things like this. What I am saying is that in the real world you are not going to get the overlap that they show down inside of the weld under that gas metal arc welding process, especially when you use especially when you use a short circuit motor metal transfer on the gas metal arc welding formally made _____ gas. There is no feasible way in my mind that you could possibly do this.

Mr. Joukoff: Is this configuration allowed by the existing code?

Mr. Kent: Now just a second. At partial penetrations at certain areas it is. Okay. But for full penetration, they're showing full penetration wells now, and in the real world you cannot attain certain things that they're showing in the code. Okay?

Mr. Joukoff: Their work at San Onofre is does it meet the requirements of the code code?

Mr. Kent: The pictorially they have shown the same mistakes in the code that's impossible to realize in the real world on the gas metal arc welding formula _____ _____ gas. They have shown

Mr. Joukoff: I have to ask you the same question again. Are they complying with the code? Or are they not? (Mr. Joukoff and Mr. Kent both speaking, unable to understand Mr. Kent)

Mr. Kent: They are complying with what's in there.

Mr. Joukoff: Okay. Okay. Again

Mr. Kirsch: Our issue again is not

Mr. Joukoff: again we can't do anything for you in reference to the codes.

Mr. Kent: Now here again I reiterate that in the real world the code as such, has errors in it and unrealistic configurations in certain areas that are impossible to execute as they pictorially show them to be executed. In the real world you cannot do the

Mr. Kirsch: Earl

Mr. Kent: that have been transferred into Bechtel's own specs.

Mr. Kirsch: have you brought your concerns with code adequacies or inadequacies

Mr. Kent: I took them to

Mr. Kirsch: to the ASME

Mr. Kent: I took them to the AIC, I took it to the AIC to Jim Jim Marsh at 714 W. Olympic Boulevard ir Los Angeles in 1971 I believe it was. And asked him to eliminate some of the unrealistic things that they had in the code there ones such as fillet welds in fatigue for instance in figure 19 in the Appendix there. And fatigue applications showed reversal of stresses positive or negative. To where they allowed on the order of 17,000 pounds a square inch to load it believe it or not on one-sided fillet welds. And this is absolutely asinine. It's totally stupid to have a configuration on one side of fillet welds and allow this to be in fatigue applications. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: What did the code committee do with your

Mr. Kent: They quietly they very very quietly in revision a 0. It did not exist in the 7th edition of AIC code. They quietly in revision 1 added the welds in on the side 90° to the existing one's that there, top and bottom on the plates and gave it adequate structural integrity without putting in any errata.

Mr. Kirsch: Okay. I would I would recommend that you would write all of your concerns regarding code adequacy down in a letter and send them to

Mr. Kent: I have numerous numerous (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them)

Mr. Kirsch: the a code committee. Because we can do nothing

Mr. Kent: They do exist

Mr. Kirsch: for you there Earl

Mr. Kent: This same configuration this same stupid configuration with one sided fillet welds does exist in the ASME and I can prove it in Section 3. And I can give the actual page of given year where it exists there. One sided fillet welds and Bechtel copied the same thing from the ASME code and and and without even thinkg about the integrity of it, used it in their applications also as a as a possible configuration to used in in designing and so forth. What I am saying is that this is a chain reaction error that originally was generated way back in the AIC code and taken from the AIC code. I've seen it in AWS also. Believe it or not. In several of their publications a had AWS on it. And then also a

Mr. Kirsch: Okay. Earl

Mr. Kent: weakens materials and so forth. And this has been a real sleeper because it's progressed and it to the best of my knowledge it still exists.

Mr. Kirsch: We can do nothing for you in changing the codes. The code

Mr. Kent: I believe (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: committee is required to change the codes.

Mr. Kent: I believe that it's a critical error. I see it's a critical error that has been allowed to be a sleeper and has worked its way into the code and consequently worked its way into Bechtel specs. And this is something that is totallly unrealistic is to have one sided fillet welds in the peak applications, where you have reversal of stresses. And you can easily crack them out, very very easily crack them out. And no where will they sustain a long long service life in a fatigue.

Mr. Kirsch: I I really don't seen any point in continuing that a this sort of thing.

Mr. Kent: What I am saying in the in the in the real world, I keep pointing out error after error after error that has existed not only in the AIC code but in the AWS code and in the ASME code and things that should be addressed and eliminated from there. Because you are correct in saying that these things should be written down and and and sent to to the ASME people. I did this when I was in Venezuela at the Amway refinery several years. And I got no reply in writing from the people on the ASME code committees and so forth. And and no a word as to what they would do about it. But to the best of my knowledge they have not been eliminated. But what about the years it's been allowed to exist in prior editions of the ASME code including Section 3, Nuclear.

Mr. Joukoff: Earl

Mr. Kent: And that's were it is. It's in Section 3 Nuclear.

Mr. Joukoff: Earl I want I want to get away from the code because we've gone we can't do anything about the code. But I'm looking for the record at a newspaper article that appeared in the Contra Grosted-Times in California dated Thursday October 14, 1982. And I quote, "Can't claim the welds on piping and electrical systems supports are important to the cooling system that keeps reactors from melting."

Mr. Kent: No, I didn't use those words.

Mr. Joukoff: If the welds fail he said the pipes and conduits could break threatening the cooling system.

Mr. Kent: I didn't use those exact words.

Mr. Joukoff: Well we know how the press sometimes

Mr. Kent: Yes.

Mr. Joukoff: gets things off.

Mr. Kent: Even even the Times didn't a do a 100% thorough job and I was disappointed with them. (Mr. Kent and Mr. Joukoff both speaking, unable to understand either of them)

Mr. Joukoff: The point I want to get to because we have the responsibility for the health and safety of the American public concerning these plants. You're relating to welds on piping and electrical system supports and to the cooling system. Have we now in our position all of your concerns?

Mr. Kent: No you do not.

Mr. Shackleton: Other than code code problems?

Mr. Joukoff: Other than these code problems, which we can't as an agency do anything about.

Mr. Kent: Give you an example. Give you an example. A the E7018 electrodes under the AWS structural welding code demanded that the electrodes taken from a hermetically conainer be used within 4 hours maximum time, before you could actually start using the rods. Whereas Bechtel's codes allowed you 8 hours. Have you ever reviewed this and found out why they allow more moisture in the cooling of the E7018 electrodes?

Mr. Kirsch: No that's not that's not the case Earl. We've looked at that.

Mr. Kent: I will tell you

Mr. Kirsch: The requirement is a I can't remember precisely where what the requirement on the the for 4 hours is. I think that relates 9018.

Mr. Kent: No it does not. It relates to 7018.

Mr. Kirsch: Okay 7018

Mr. Kent: There's 2 hours for 9018.

Mr. Kirsch: Okay. 7018 though the requirement is that you take it out and if you leave it in the atmosphere for 4 hours then you must do then you then you've got to get rid of it. You've got throw it.

Mr. Kent: No you can rebake it one time.

Mr. Kirsch: You can rebake but normally they don't rebake. Okay. Because it's expensive proposition.

Mr. Kent: You are (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: So normally what they will do is they'll waste that rod.

Mr. Kent: Yes.

Mr. Kirsch: Okay. Now here's what happens out here at Bechtel and every Bechtel site that I have been at, Palo Verde and Southern California Edison. They remove it from the can. They put it in an oven. That oven is maintained at a temperature of a minimum, I believe my memory serves me right of 250° to

Mr. Kent: No. No. It has to be in excess of 300.

Mr. Kirsch: Okay. In excess of 300 then. Okay. Excuse me. I was wrong.

Mr. Kent: That's all right.

Mr. Kirsch: But they maintain this temperature up. The keep it in the oven to preclude moisture entry into that electrode, the coating on the electrode and therefore they have the 8 hour. They have that that control on. So they don't waste it at because just because they put it in the oven. Bechtel also uses a little rod oven heater. They take this little heater and this little heater is it's not a hermetically sealed, agreed. But it has

Mr. Kent: That's correct. It's not.

Mr. Kirsch: it's a electrically heated unit that keeps the rod warm and precludes moisture from entering that (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: Entering any environment it still can. Entering an environment

Mr. Kirsch: Not really because the problem that you have here is, as long as long as you keep that electrode temperature up, you're far above the due point and being far above the due point

Mr. Kent: No you have to be above the the point of steam to really drive off the moisture. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: And you are above that point. (Several people speaking, unable to understand any of them)

Mr. Kent: Pardon.

Mr. Joukoff: We're above 212.

Mr. Kent: Yeah, but the code

Mr. Kirsch: They're far about 212.

Mr. Kent: the code demands that you be in excess of 300 in a baking oven and then and the canisters as you would you know. A have you in in your a review ever found these canisters not to be plugged in and found to be cold and with the electrodes in them? I have.

Mr. Kirsch: We have a found that. We have issued notices of violation

Mr. Kent: Yes I

Mr. Kirsch: in that area. And a that rod was been wasted.

Mr. Kent: Yes.

Mr. Kirsch: And Bechtel has sufficient has taken what we consider sufficient

Mr. Kent: All right.

Mr. Kirsch: action to assure that it does not happen again.

Mr. Kent: And doesn't it occur again and again and again? (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: It occurs periodically.

Mr. Kent: Yes, absolutely. Again and again and again. I've seen it happen.

Mr. Joukoff: Do you know any place where it occurred when the rod was in use?

Mr. Kent: Rod what?

Mr. Joukoff: And the rod was then subsequently used instead of being wasted?

Mr. Kent: I'll give you an example. I saw I saw a cold container at Palisades that was not plugged in

Mr. Kirsch: I'm interested in San Onofre.

Mr. Kent: Okay. As as a point in my memory, that was very vivid. And I asked the welder what in the hell is the idea of having the rods in here in a cold canister. You know. He's all I'm sorry he's says says it probably became unplugged. And it is a possibility people walking over it, tripping a you know the a cord, things of this nature. It is possible.

Mr. Joukoff: Was that rod used?

Mr. Kent: Pardon?

Mr. Joukoff: Was that rod used after that?

Mr. Kent: I really do not know the length of time from the time that it was introduced into the canister, or whether or not the rod was used. I do know that the burden was on the welder to make sure that that rod did not exceed the time limits and the temperature limits and so forth. But the canisters are a still subject to obtaining moisture in a marine environment especially not at Palo Verde particularly, but in a marine environment like you had at San Onofre. I was appalled when I first saw Bel Bechtel's welding specs allowed electrodes E7018 to be used in marine environment up to 8 hours, taken out of hermetically sealed container prior to the use in welding. I was absolutely appalled because at that point and time the AWS had tightened up down to 4 hours. And it is more stringent in the AWS than it was in the ASME applications for instance.

Mr. Kirsch: Bechtel has (as a point of information for you) Bechtel has presented to the staff, NRC staff, documented justification for that practice and that practice by the use of their small portable ovens contain oven containers has been accepted by the NRC staff, as acceptable. As a perhaps while it is not the letter compliance with AWS B11, it meets the intent of AWS B11. That has been done.

Mr. Kent: The the exact wording in AWS B1.1 where it is applicable should be satisfied and that is a maximum of 4 hours on any E7018 electrodes regardless of whether they're safety-related or not, as a maximum time for it to exist in

any environment, marine environment included, outside of hermetically sealed container. Now when you get into intent

Mr. Kirsch: Tell me Earl

Mr. Kent: intent of the code the intent is very subjective in certain areas when you say that I say or anybody else says that in my opinion this may seem intent of the code. Because a that can be very very subjective instead of objective.

Mr. Kirsch: Agreed. But you've told us several instances today about what you believe to be have been the intent of the code and thereby the code was in error.

Mr. Kent: The code has been in error in numerous places over a period of years of allowing certain things and not addressing certain other parameters that that should be addressed in my opinion. A like a in intergranular stress corrosion cracking for instance. Where in the ASME code do you find a requirements you know of the use of a stainless and environment a that would do this use. Where you would get intergranular stress corrosion cracking. What I am saying is that there is some things that's outside the code and then granted your hands are tied. You cannot introduce those ends of the code.

Mr. Kirsch. Uh huh.

Mr. Kent: I cannot I do not have the time to sit down and write letters all day long to the people on the ASME committee and say look, "this is something

that should not be like one-sided fillet welds that they copied from the AIC and the very stupid configuration and didn't even think about it. And they put it in a Section 3, Nuclear, no less in the ASME code.

Mr. Kirsch: Well are the all I can say is Earl, the Bechtel method of assuring or precluding moisture entry into the coating of E7018 rod has been reviewed by the staff and accepted.

Mr. Kent: A do you or do you not agree that this is a major source of a frosting in the welds? That a this is the reason that so many so many many thousands of welds have been ground out and redone?

Mr. Kirsch: No. I have I have

Mr. Kent: In nuclear applications?

Mr. Kirsch: no basis to a to make that statement or agree with it or disagree with it. I have no I I have no opinion on it. Whatever I say would be subjective Earl.

Mr. Kent: Well in in the literature that I have read on the subject and extensive literature at that, a you will pick up moisture immediately that you take it out of hermetically sealed container in any environment but especially in the marine environment. And it will start to absorb moisture similar to the way that a sponge or a blotter will absorb a liquid. And consequently, a you can't even after several hours in marine environment have moisture on there that really borders on the point where you can have excessive porosity,

even after 2 hours in a marine environment. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I was under the impression that the reason for precluding moisture was to preclude the hydrogen in the a to preclude hydrogen embrittlement of the weld area.

Mr. Kent: Well see hydrogen a is introduced as steam into the molten pole. The molten pole, normally mild steel, has a great affinity for hydrogen in the liquid state. But in the solid state it does not have a an infinity for and intends eject it. Consequently you have tremendous internal pressures in within the weld itself, probably even the base metal. (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them)

Mr. Kirsch: Agreed. Agreed.

Mr. Kent: that has translated in the base metal. And consequently you can have a invisible cracking with the weld itself.

Mr. Kirsch: A I really don't see any point to going on with this one. It's already established that the Bechtel practice has been has been reviewed and

Mr. Kent: But was not more stringent. Because the AWS was the more stringent code to

Mr. Kirsch: Yes sir.

Mr. Kent: a interview for E7018 electrodes. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kirsch) That is absolutely correct.

Mr. Shackleton: Okay.

Mr. Kent: Also in diametric electrodes the AWS code a only allows 5/32 of an inch diameter electrode as the maximum diameter in the vertical and overhead positions for fillet and grooved welds. But you do not have this in the ASME code.

Mr. Kirsch: Agreed. This is a code inconsistency.

Mr. Kent: Absolutely. It's still a critical parameter.

Mr. Kirsch: Again Earl we have no regulatory authority.

Mr. Kent: It is still a critical parameter.

Mr. Kirsch: We have no authority in this area.

Mr. Shackelton: Earl we're trying to address your problems at _____ that come under the jurisdiction of the Nuclear Regulatory Commission. Do you know of any any other problems in what you observed while you were at that plant?

Mr. Kent: Yes, a for instance a open craters at the end of some welds. Do you or do you not agree that a that a should not exist? That a a craters should be buried?

Mr. Kirsch: What's code requirement?

Mr. Kent: In the AWS D1.1 for instance

Mr. Kirsch: Okay where's _____? Let me write this down 'cause maybe we're getting somewhere now.

Mr. Kent: The termination of a the ends. A let's just get it here.

Mr. Kirsch: No it's not the AWS, its the A this is the AISC.

Mr. Kent: Almost the same thing exists in in the the AWS too. In fact I have a a book with some of the a a AWS if a you'll give me a few minutes I'll go out and get it and bring it in and we'll read it directly out of that and so forth. But it's very very similar in a in this and a

Mr. Shackleton: We're just about ready to go off on this side of the tape. So I'll go ahead at this time which approximately 12:28 p.m. and will change the tape.

Mr. Shackleton: The time is now 12:47 p.m., October 15, 1982 and this is a continuation of the interview of Mr. E. Earl Kent. Go ahead Earl.

Mr. Kent: Okay. I have found a number of errors in Bechtel's specs and for the record I'd like to bring one forth that a concerns reenforcement height because you can have stress raisers with excessive material deposited at the crown of the weld in excess of the allowables under the ASME code as spelled out in tables in the ASME code. They have a maximum height for a given thickness of material but in WQ2 which is a Bechtel document on sheet 20. I'll show this to you gentlemen. It says 1/8 of an inch I I'm oh I'm sorry. I'll back up here a a second here. A I have here on my paper 1/8" inch maximum for a given thickness. I was talking about Note air in Note 1 shall not exceed 1/3 of an inch. That's the way it reads and so forth and so forth. A partial quote right in here. As shall not exceed 1/3 of an inch and so forth and so forth. And it should read: shall not exceed 1/8 of an inch and so forth and so forth. Now there's a lot of difference in reenforcement between 1/3 of an inch in height and 1/8 of an inch height in hundreds if not thousands of grooved welds.

Mr. Kirsch: Wait a second.

Mr. Kent: Probably thousands upon thousands of grooved wells. Now isn't the burden on Bechtel to make sure that they a weed the errors out of their specs and

Mr. Kirsch: Just a moment. Just a moment. We've I want if we get this written down Earl. Okay?

Mr. Kent: Sure.

Mr. Kirsch: Okay. Where's the 1/8"? Where's this a criteria come for this 1/8" criteria come from?

Mr. Kent: It's from Bechtel and Bechtel took it from ASME. ASME has a code table.

Mr. Kirsch: Where's where's where's this is that included in the ASME?

Mr. Kent: It's in a it's in Section 3, Nuclear. Quite sure in the ASME code in a reenforcement of grooved welds, reenforcement height. And incidentally that table has changed over a period of years and it is different from the 1974 edition including the summer of '75 changes there and the current table reads today. Under the old code I would think that you would have to adhere to the requirements then at that point and time. Not the changes as they have evolved. But the point I bringing here is that this is one of the errors that's in one on Bechtel's specifications taken from the code and is incorrect. And this is why I couldn't understand the very high crowns on awful lot of the grooved wells that I have seen especially in Palisades. Where the crown was for in excess of the maximum allowed in the ASME code. And I researched it and this is my note on it. That's where it was.

Mr. Shackleton: Earl just let me inter interject a when you discuss your concerns at Palisades with Region 3 of of NRC, did you give them this information.

Mr. Kent: Yes. I did.

Mr. Shackleton: Okay fine. I just wanted to make sure that they have it.

Mr. Kirsch: This a WQ2 is also in effect at San Onofre?

Mr. Kent: To the best of my knowledge it is. To the best of my knowledge you'll probably find WQ2 and you'll probably find a page 20 and you'll probably find the same thing. I believe the source to be the the home office, at 50 Beall Street out at San Francisco. I do not know this for a fact but I believe this to be the case. This is this is one of the oversights and this is one of the errors that I found in the Bechtel specifications. And you inspect to Bechtel's specs. You do not inspect to all of the requirements in the ASME code for instance and the AWS code. A this is supposed to be translated on 100% accuracy from one to the other.

Mr. Kirsch: Yes.

Mr. Kent: As you see here is not. Okay?

Mr. Kirsch: Okay. We'll look into that. Thank you.

Mr. Kent: I wish you would. I wish you would all through Units 1, 2 and 3 especially down here in San Onofre.

Mr. Kirsch: Uh huh.

Mr. Kent: Absolutely and inspect them for high crowns. Because in fatigued areas a this can be a stress raiser on each side of the well and initiate

cracking even years from now, say 10, 12, 15 years from now. Even in the SR equipment. In your safety-related a areas absolutely should not exceed the

Mr. Kirsch: Okay is this

Mr. Kent: maximum (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: now this is on grooved welds, right?

Mr. Kent: That is in grooved welds. That is true.

Mr. Kirsch: Okay. Okay at San Onofre

Mr. Kent: in many many many places in grooved wells. In essence the _____ _____ of these documents _____ exists in the other nuclear plants to the best of my knowledge that a they have and say San Onofre. A lot of them are generated at the home office. And going back to to the original procedures and this is another one of my concerns. An original procedure as it comes out of San Francisco at 50 Beall Street when you have quite a spectrum and range of of anchorage allowed. And you have a number of electrodes allowed and just for talking purposes, the anchorage range just for talking purposes we'll say the anchorage range was between 70 amps and 350 amps per electrode between we'll say 1/8 of an inch diameter, well 3/3 hexadiameter even on up through a we'll say for just for talking purposes 3/16 or 1/4" diameter electrode. Where you are able to pick out from a procedure a a given diameter of electrode that you are going to use. And yet you have a

quite a wide spectrum of anchorage. In my mind this is too open far far too open for a excellent welding integrity. What I am saying is that the ideal would be to isolate down to 1 diameter of electrode. And then that for that diameter electrode where given a position, a say in the vertical position, a give the range what a diameter electrode within a confined limit of

Mr. Kirsch: How does the curvely implemented practice

Mr. Kent: It's quite right.

Mr. Kirsch: of welding procedure specification deviate from code requirements?

Mr. Kent: Now the burden is on the a here again, the designer and the welding engineer to make sure that it is adequate.

Mr. Kirsch: That's right.

Mr. Kent: And the people at the San Francisco office have evidently thrown together a number of procedures that a brought a wide gauntlet if you would of amperages that are allowed. And you can select sometimes different electrodes from those amperages. And consequently there are times that you do not really operate near the optimum optimum conditions.

Mr. Kirsch: Well again I want to pursue this. How in what way has Bechtel deviated from code requirements? Have they if they have the

Mr. Kent: Well like this one up here. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kirsch)

Mr. Kirsch: No, no. I'm I'm asking you about the electrode and the amperages. (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) How have they deviated from code requirements in their welding procedure specifications?

Mr. Kent: The code does not address specifically welding procedures per se.

Mr. Kirsch: Okay. You feel that it may be bad practice.

Mr. Kent: It is very bad practice (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Okay that's what you feel.

Mr. Kent: for welling integrity. I know this from (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: But the code is very

Mr. Kent: welding engineer.

Mr. Kirsch: The code though allows certain latitudes and have has Bechtel deviated from the requirements of the code?

Mr. Kent: I never said they de deviated from the requirement of the code. What I say is that their procedures that a points and time do leave a lot desired from a an actual welding integrity standpoint relative to damage of electrode closer to the spectrum allowed a in the range of amperage from relatively low amperage to relatively high amperage. It's very similar to a doctor saying, here's a prescription that has in this bottle between 2 and 12 pills, sometimes when you feel like it, you take any number you want. What would you think of a doctor that would not prescribe tighter or closer requirements of the number (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Your beef then though as I understand what you're telling me. Your problem, your concern is with the adequacy of the code.

Mr. Kent: The code does not address welding procedures at all. The burden is on the individual

Mr. Kirsch: Oh it does address welding procedures.

Mr. Kent: Well I mean (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: AWS B11 is very very (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: qualified status to welding procedures

Mr. Kirsch: and also Section Division 3 Div. Div. 1, Section 3

Mr. Kent: Yes.

Mr. Kirsch: requires welding procedures and qualifications of welding procedures.

Mr. Kent: That's true. But it does not spell out the exact welding procedures and given domains and and given applications and given specifics, given types of (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: That's up to the engineer to determine

Mr. Kent: Absolutely, that's what I'm saying.

Mr. Kirsch: what his welding criteria and parameters are and to qualify his procedures.

Mr. Kent: And here again when you qualify one that's been used many many many years ago. Is it still valid to take something that has been qualified even several decades and say that it's still correct to date?

Mr. Kirsch: What are the what are the essen the code also goes into a the essential variables

Mr. Kent: Yes.

Mr. Kirsch: and non-essential variables

Mr. Kent: Yeah. Absolutely.

Mr. Kirsch: If the essential variables remained the same, what is wrong with it?

Mr. Kent: Because your your steels change. Your electrodes change. The composition of E E7018 electrodes has changed. A even the hatching drawer seal has changed. Even the requirements under HSRE A242 for instance has changed radically over the period of many years.

Mr. Kirsch: Your your then as I understand what you're telling me, your problem is with the industry standards and not with the implementation of those industry standards.

Mr. Kent: It leaves a tremendous amount to be desired. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: The industry standards you feel are in error.

Mr. Kent: For total integrity, a lot of errors do exist in industry standards and I can point them out to you. And I can show you where the the oversites and errors and omissions (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Earl, I have to say again. I must say, I don't believe that you understand me. Our concern here is not to resolve your concerns regarding the adequacies or inadequacies that you feel exist in currently established industry standards. Our concerns here are to establish whether or not Bechtel, its contractors or Southern California Edison have complied with industry standards.

Mr. Kent: Okay let's go through some of the stuff besides the end returns that are missing in thousands of places. Do you a agree with this joint here that a if you have 3/18 material maximum under gas metal arc welding and here again it's just so it won't seem like you're saying, here's the 3/8 I was talking about earlier as a maximum and here's the route opening 0 that is allowed. In actuality in the real world on a gas metal arc welding short circuit motor metal transfer, that no way in the world 3/18 thick material, 0 opening will be able to get (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Again your problem is with the code Earl.

Mr. Kent: Right. They show this. They show this in the code. Right.

Mr. Joukoff: Right.

Mr. Kent: I I agree.

Mr. Joukoff: Okay.

Mr. Kirsch: Your problem is with the code.

Mr. Kent: Okay. Okay. All right.

Mr. Kirsch: We have no juris nothing.

Mr. Kent: Let me as you another question. Let me ask you another question. When you have a slope in transitions do you or do you not agree that this is the maximum slope here; 1 riser, 2½ of run?

Mr. Kirsch: That's wha that is what is required by the code.

Mr. Kent: That's right. Okay. I will give you examples that have I seen. For instance at Palisades I saw one like this right in here where no where near post-settlement of this configuration here in the diesel generator room on the piping that was on the order of a 3½ inches thick. I'm sorry, 3½ inch nominal size, I guess. And what occurred here in the transition we had a condition that was actually like this. The weld itself was like this and the weld was done like this on this side in here.

Mr. Joukoff: Did you advise Region 3 of this when you talked to them?

Mr. Kirsch: Did you tell Region 3 of this?

Mr. Kent: I certainly did. I drew it on the blackboard and I showed them on the blackboard (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: Does that exist at San Onofre?

Mr. Kirsch: Does exist at San Onofre?

Mr. Kent: I have reason to believe that you will find cases at San Onofre.

Mr. Kirsch: Where?

Mr. Kent: Where there are violations. I I don't know the exact specific location right know but if you take a walk down and se thoroughly search for things of this nature.

Mr. Kirsch: Earl we are only a small group of people. Bechtel (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) has in San Onof at Southern California Edison and their contractors have literally hundreds of QC people inspecting out there.

Mr. Kent: With QC people passing (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: We are very yeah but we are a small group. You tell us to go walk down everything in that plant. We cannot do that Earl.

Mr. Kent: Well I will say that it does warrant an actual examination, an actual visual examination

Mr. Kirsch: Of what?

Mr. Kent: Of all of the critical welds in all SR applications to make sure that all welds are full sized. Because I have seen some concave welds that I didn't have the did not have the time to go and get my fillet weld gauges and go in and check the actual size and check the blueprints and so forth. I did not have the time in that frame to go and check the actual size. But I have seen concave welds in piping that did appear to be wide and extremely concave in certain areas. And I have reason to believe that the actual theoretical throat is no where near the actual (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Were are those welds at Earl?

Mr. Kent: I would be happy to show them to you. Happy to show you cases where they exist that are too concave. In fact at Midland I found them documented undersized fillet welds and (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: How about SONS? SONS?

Mr. Kirsch: How about San Onofre Units 1, 2 and 3?

Mr. Kent: I have seen some concaved welds at San Onofre that I believe do not meet the minimum code thickness as deposited to meet the side of that member in application (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: These are concave fillet welds?

Mr. Kent: Concave fillet welds and a we'll say socket welds, for instance, 90° socket welds if you would to where some of the the welds appeared to be too concave. They're wide, very wide but I have seen some that were extremely concave and the actual theoretical throat in my opinion, visually looking at it you know, appeared that it would not be thick enough. Now I did not have the time to go and get the blueprint and find out what pressure was in that line and what fluid was going to be used in it. And what temperature and the actual minimum size required for that. But I would like to walk through the plant and search for just at random concave fillet welds especially in socket welds. And I will give you another example.

Mr. Kirsch: Do you know of any place where they exist?

Mr. Kent: I I can't specifically walk right out and say this is mark number such and such used on such and such a (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: What elevations or buildings or?

Mr. Kent: I I saw a lot of this at Jeff Mesa. When I was working over at Jeff Mesa on some of the piping. And give you another example

Mr. Joukoff: Wha what kind of piping were you working on?

Mr. Kent: Small board.

Mr. Joukoff: Small board for which system?

Mr. Kent: Numerous different systems. Numerous schools.

Mr. Joukoff: We want which systems?

Mr. Kent: I don't recall exactly which systems.

Mr. Kirsch: What did you what did you do in _____ when you saw these apparent violations of code requirement Earl? What did you do to resolve these violations?

Mr. Kent: I mentioned to my superior that I had seen some of the concave welds and mentioned that it appeared in my mind that a they were too concave.

Mr. Joukoff: What did your superior tell you about that?

Mr. Kent: If I recall correctly he said they they probably were okay. They were probably passed.

Mr. Joukoff: Who was your superior a Earl?

Mr. Kent: Well several different people were my superior at different points and time. I'll give you another example. While working at Jeff Mesa on this same (Mr. Kent and Mr. Joukoff both speaking, unable to understand Mr. Kent)

Mr. Joukoff: Wait a minute. Let's back up. Let's back up.

Mr. Kirsch: Hold on before we go on.

Mr. Joukoff: Let's back up. Let's back up. Who what were the names of those supervisors? If you had more than one name all your supervisors.

Mr. Kent: Yes a besides Don Martin a

Mr. Joukoff: Now is he included in this?

Mr. Kirsch: Was he out at Jack Mesa?

Mr. Kent: He was in charge of some of the workers at Jack Mesa I'm quite sure. And in a in charge of some of the small wall piping. A Beznick a Besich (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Nick Besich?

Mr. Kent: Nick Besich was also in charge of some of the the work.

Mr. Kirsch: I think he's dead.

Mr. Kent: Besich, I'm quite sure, not a k an h.

Mr. Kirsch: Yeah. I know Nick.

Mr. Kent: And a in our particular domain of work

Mr. Joukoff: Do you recall which one of these two you mentioned this to?

Mr. Kent: I most likely mentioned it to both of them and I probably mentioned it to some of the other people I was working with like Woody Lahr

Mr. Kirsch: Was Woody Lahr at Jack Mesa too?

Mr. Kent: Yes he was and a I'm quite sure if you contact Woody and ask him if he saw any concave welds in socket welds at Jack Mesa, he'd probably tell you that he's seen a number of concave welds. And he's a very honest man and I think that he would come forward and tell you what he saw. I will tell you another example of Jack Mesa working on a small bore piping, when the A&I, the authorized nuclear inspector had passed a one of the welds on the spool and had a found nothing wrong with it. And it was taken outside and subsequently painted and turned over 180° around. The Bechtel inspector had already passed it and I found a pinhole that you could put a large needle down inside of a pinhole in this socket weld. Evidently high pressure I thi I believe it to be about schedule 80 pipe

Mr. Kirsch: What did you do about that one Earl?

Mr. Kent: I told the fellow in there that he had to go and not ship it. He had it on the dolly to be shipped. It made him mad because it had to be pulled off the dolly. He said his shipping papers were already made out and that consequently this member would be missing as soon as it got over on the other side of Jack Mesa into SONS. That a when they looked at the the shipping tag they would find that this particular spool was missing. And it burned him up that a I had insisted on the spool being repaired. He wanted (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Did they remove the spool and repair it?

Mr. Kent: Yes they did.

Mr. Kirsch: Okay.

Mr. Kent: At my insistence. At my insistence they did. They (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: You did your job. That's very good.

Mr. Kent: They they gouged out the defect and and you could large needle, a large needle

Mr. Joukoff: So that was repaired?

Mr. Kent: Yes it was repaired.

Mr. Kirsch: Okay. Well good.

Mr. Kent: A&I had already inspected inspected it and passed it after Bech Bechtel inspector had passed and I found it.

Mr. Joukoff: Did you know

Mr. Kent: I did my job. That's what they paid me for.

Mr. Kirsch: That's right.

Mr. Joukoff: Do you know of any other a parts a similar to that that had defects in them that are installed in the plant that were not caught?

Mr. Kent: I have seen other pipes had on unequal legs on them. Now unequal legs per se are not as such (Mr. Kent and Mr. Kirsch both speaking unable to understand either of them)

Mr. Kirsch: themselves redeckable. That's right.

Mr. Kent: All right. That's right. As long as the theoretical throw is there in the inscribed isoceles triangle a it would be all right. But it it makes them suspect. Okay?

Mr. Joukoff: Why does it make them suspect?

Mr. Kent: Because because with unequal legs it makes you wonder if the welder is not a (Mr. Kent and Mr. Kirsch both speaking, unable to understand either of them)

Mr. Kirsch: isoceles triangle the code says that is acceptable. Now where we have Now what makes those things a violation of code requirement with an unequal leg?

Mr. Kent: Well here again you have stress raisers and in certain fatigued areas where you can have a junction at the top of a small (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I'm asking Earl again. The code, where does the code say that that is a rejectable condition?

Mr. Kent: It does not.

Mr. Kirsch: Okay.

Mr. Kent: Okay. But would you say that this is gross negligence to have something like this?

Mr. Kirsch: I don't know the conditions or the system (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: I'd certainly like to have photographs of it. I would I I wished I could a had a camera?

Mr. Kirsch: Is it out at San Onofre? (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: No. No. I'm telling you I was telling I wished that I could have had a camera and taken pictures of this. This is a classic almost unbelievable that a Bechtel inspector would actually pass and documented something like

this as being adequate when it's absolutely not. Which here again reflects on a the caliber of some of the inspectors and some of the engineers.

Mr. Shackleton: Unfortunately Earl this is a problem of quality that people face all over the country with a employees.

Mr. Kirsch: Okay. Tell me, the concave fillet and 90° socket welds; you observed them at Jack Mesa and the fab shop.

Mr. Kent: In the area no not not now outside the fab shop, when I observed this particular item it was laying in many many hun probably hundreds of spools a in in a in piping. I a there's far more than just dozens of spools. There are probably 200 or 300 spools of piping, small bore piping that was placed out on dunnage a in the area, in the vicinity of the fabrication shop that had been fabbed in the fab shop. I believe it to be 100% fabbed in the fab shop and was layed out on the dunnage out in that area.

Mr. Kirsch: Are you saying that though the concavity in the concavity was in excess of code requirement? Violated the code requirements?

Mr. Kent: I said that it it appeared it appeared to be wide but very very shallow and (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kirsch)

Mr. Kirsch: Did you measure the concavity?

Mr. Kent: I did not have time. It would've done me no good to leave my work and measure it. Because even if I had measured it, I still didn't have time to go in and get the blueprints and bring it out and find out which one it belonged to and what the minimum size of the a code was a for that particular joint and things of this nature. I did not have the time to to do this.

Mr. Kirsch: There are other QC inspectors that are assigned the responsibility of measuring and accepting these welds.

Mr. Kent: Yes and I do believe that some of them were in error in in passing them, because these these were accepted welds that here again like I said, I have seen (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Again you did not measure those welds. You did not compare them. This is based on

Mr. Kent: I didn't have the time. In my a discharge of my duties as assigned to me I had to work within the framework that I was given. And I do have (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: You know of no instance Okay. Let me let me ask this question. Do you know of any instance where you have objective evidence that concavity of 90° fillets or 90° socket or fillet welds are installed in San Onofre wherein the concavity exceeds the code requirement?

Mr. Kent: Now you said as installed. I did not see them install these pipes that were laying out there on the dunnage. So consequently they may have repaired some of them. They may have found them. They may have gone through and found they made errors on them. As they have made many many errors in different things. They may have corrected this. I do not know this to be the case. But I wou I do believe honestly that if you allow me to walk down this equipment, I will be able to find some of the socket welds that are too concave relative to the thickness of material and the pressure it carries. And I I believe that I will be able to find some for you that are not with an adequate throat thickness. Don't take my word for it. Ask Woody Lahr what he thinks of it.

Mr. Kirsch: Okay.

Mr. Shackleton: Ready to go on?

Mr. Kirsch: Ready to go on.

Mr. Shackleton: You have another item? We've got about 5 minutes more, maybe 3 minutes on the tape a and we're going to have to discontinue for a while.

Mr. Kent: Here again I'm quite sure that if you check the _____ and transitions most likely you'll find violations in SONS just as I found violations in the others areas. And like with the policies and so forth (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Now tell me where the violations exist?

Mr. Kent: Now here again I can take you out and show you exactly the mark member and exactly the the _____ that it's on and this that and the other thing.

Mr. Kirsch: Do you personally have knowledge of violations in beveling what you by violations, your obser observation of violations in the beveling requirements of the AWS at San Onofre?

Mr. Kent: They may have corrected some of the things that I believe were in violation, appeared in certain areas, that some of the junctions were not at a rise of 1 to 2½ run in certain areas. But when you do not have the time to go out, your given work frame, and actually measure these, it gives you the feeling that there are violations there but you're not positive exactly whether they do or do not conform. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: They had a all they had a lot of other QC inspectors that were just as capable as as you Earl.

Mr. Kent: I don't know about that.

Mr. Kirsch: And a you or they're they're assigned to doing that.

Mr. Kent: I do not know about that. I don't agree with that at all. I I'll put my capability up against any QC inspector that Bechtel has at San Onofre and also Palisades and also Midland. And if you want (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Are you saying that those other QC inspectors were incompetent?

Mr. Kent: No, I didn't say that. What I said was I've I have seen inspectors make errors. Okay. In Bechtel. (Mr. Kent and Mr. Kirsch both speaking, unable to to understand Mr. Kent)

Mr. Kirsch: Have you ever made an error Earl?

Mr. Kent: Yes I have. I'm not perfect. Nobody in the world is perfect. But by the same token I will tell you that I try to avoid errors like the plague. I try to make it accurate. And try to make it to the code. And try my best to make it conform to what it is (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: All of us do.

Mr. Kent: Okay. By the same token I will tell you if you will check the expertise of the inspectors at San Onofre, I don't care who they are in Bechtel, find one of them that has the experience that I've had as a journeyman, as a welding instructor for years, as a welding engineer for years, as a quality engineer for years, and as welding _____ for years and see if their caliber is at least of my caliber. I don't know any. I'm not saying that I'm anywhere near perfect. I'm not. I'm learning everyday. Believe me I hope to learn every hour.

Mr. Kirsch: Do you know of any other instance at San Onofre where Bechtel, its contractors or Southern California Edison did not comply with established codes, industry codes and standards?

Mr. Kent: Now when you say did not comply, here again going back to the fillet welds on hangers and so forth where they welded on two sides without any returns and so forth. But then irregardless of that, the the fillet size, relative to the size required, theoretically if you have uniform stress theoretically you may comply with the code. But in the real world you might have actual stress cranked into the weld (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I'm asking about code compliance because the code is the best It is the only instrument that the industry has to regulate its performance. Now did they comply with the code requirements or not?

Mr. Kent: They certainly tried to in my opinion as the code read. But in the beginning of the ASME code it will tell you that the burden is on the designer. And the designer has left a lot to be desired in many many areas from what I've seen. So all the things not spelled out in the code, as we've discussed a number of times this morning already. It's already this afternoon.

Mr. Kirsch: But you understand that we that is outside of our regulatory purview.

Mr. Kent: But the the burden, the onus is still on the on the designer and on the responsible engineer to make sure that it is adequate. And yet you have had failures in Unit 1 that have been inadequate and lessen the service life. And this does tell you something does it not?

Mr. Shackleton: of the interview of Mr. E. Earl Kent. Time is now approximately 12 or pardon me 1:54 p.m., October 15, 1982. We had an intermission here while I went out to acquire some new tapes. And now we'll continue with the interview please.

Mr. Kent: Are you aware of the 92 page NCR generated by Bechtel?

Mr. Kirsch: Which one is this?

Mr. Kent: on electrical tray hangers. Pardon?

Mr. Kirsch: 92 page

Mr. Kent: NCR generated by Bechtel.

Mr. Kirsch: On what?

Mr. Kent: On electrical tray hangers, on the tubes, on the supports?

Mr. Kirsch: No.

Mr. Kent: You haven't read it?

Side #7 – Lost

Side #8 – Tape is damaged.
Tape is recorded but will not respond. Is transcribed until to stop, rewind or backup. Needs to be duplicated to be transcribed.

Mr. Kirsch: No don't read every NCR Earl.

Mr. Kent: Sorry.

Mr. Kirsch: Too many of 'em.

Mr. Kent: Well you're probably right then. You'd probably go blind if you did read all the _____.

Mr. Kirsch: Okay. What's wrong with that NCR?

Mr. Kent: I'm not saying anything is wrong with the NCR. A what I say is that if you read the origin of the NCR you'll find that the tables originally used in a lot of the electrical tray hanger supports was very ambiguous and could be interpreted numero··· ·ays, the way the table was set forth. And the notes are set forth in the a tail of the arrow that pointed to different welds in different places. And the interpretation of the welds themselves as to size and a depth within the peripheral weld configuration a of the structural tube too, its overhanging girder or beam support. They did

Mr. Kirsch: Okay.

Mr. Kent: object to this to this condition extensively and it was a kicked up in the air. And they did have numerous ways that it could be interpreted. And finally they had numerous people give their input as to how they interpreted it, what it meant to them, a how it should be reconstructed, how it should be brought forth and things of this nature. I do not how many welds

were actually executed prior to the outcome of this 92 page report but I believe that there were many many hundreds of welds possibly even thousands that were deposited prior to this outcome.

Mr. Kirsch: Question: Did the nonconformance report fix the original problem?

Mr. Kent: I do not know that they went back and fixed the original problem. I have reason to believe that the original problem showed that it was gross inadequacy in the table and the definition of the notes to make it very very ambiguous. In the first place, this 92 page report, I am told is the most extensive NCR generated within the Los Angeles Power Division of Bechtel.

Mr. Kirsch: Was this generated at San Onofre?

Mr. Kent: Yes it was. It was generated by Woody Lahr, Woodgrove Lahr. And Woody will tell you that a the original was very very ambiguous. And a lot of the other people that had input to it did agree; they did concur that there were points that could be misconstrued and taken different ways, different interpretations.

Mr. Kirsch: Okay.

Mr. Kent: Here again the burden is on the designer and the engineer to make sure he has clear cut directions to the people involved to make sure that they understand his intent.

Mr. Kirsch: I don't get that out of there. Okay. We of the NC the _____ _____ and found some problems on a interpretations. They made an NCR. Obviously they decided that some of those welds were not conforming and a Wood Lahr knows about it. Do you have problems with the final resolution of the NCR?

Mr. Kent: I do not know the present condition today of of whether or not they went back through and reworked all the ones that were in existence prior to the resolution of the N NCR in question.

Mr. Kirsch: Where the questions then is: Where the welds made prior to NCR generation fixed?

Mr. Kent: That's correct. And any after that did they conform to the requirements of the the new interpretation of the tables and notes and so forth. Because even that was quite extensive.

Mr. Kirsch: Do you have any indication that a subsequent welding did not conform to the new interpretation of the tables?

Mr. Kent: I wasn't there a after August of '81. I do not know if they went back in and a reworked all the prior work or not. I this is why I'm asking. A this is why I would like to know as to whether or not they did a bring it up. And a it is my understanding

Mr. Kirsch: We can find out for you

Mr. Kent: I wish you would. I wish you would.

Mr. Kirsch: whether or not they have done

Mr. Kent: I definitely wish you would. I I definitely ask you to and find out if every single one that was done prior to that point and time where the NCR was finally arrived at and finished out at 92 pages; if all this other work has been done.

Mr. Kirsch: That's an easy thing to track. Okay?

Mr. Kent: By the same token

Mr. Kirsch: But why why do you want to find that out?

Mr. Kent: Well if you will check with Woody Lahr he will tell you that he and I both talked about the depth of the weld down into the groove and

Mr. Kirsch: No, I'm my question is: Why do you want to find out whether all of them were worked? Do you have reason to believe that they were not worked?

Mr. Kent: In quantity, it's so extensive and it's so much work that I have reason to believe that you didn't get all of them reworked if any of them were reworked. Because they're all over the place.

Mr. Kirsch: Just based on the magnitude and the quantity of the numbers?

Mr. Kent: Based on the (Mr. Kent and Mr. Kirsch both speaking unable to understand Mr. Kent) the numbers. The total numbers.

Mr. Kirsch: Do you have any reason to believe that the all the subsequent welding did not conform to the new interpretation of the tables?

Mr. Kent: I have no reason to believe that they didn't a immediately jump on the final results and do it right then. They may have. I wasn't there after August of '81. So I do not know. But I will tell you that that original table was so damned ambiguous that it practically had Philadelphia lawyers to decipher the damn thing. And left a lot open to interpretation. And a lot of different people were contacted. And a lot of different people had different ideas. They thought that it meant this. Others that it meant that. And others thought it meant something else. And they really kicked it around. And one fellow named Ted there, gave his interpretation and drew out separate diagrams and separate groupings and subgroupings and things of this nature. Trying to say that in his opinion this is his interpretation only, but this is the way he saw it through his eyes. I forget Ted's last name. But he is one of the fellows that did work on it. Woody would probably remember his last name. Woodrow Lahr would most likely.

Mr. Kirsch: Do you remember or do you have any reason to believe that Bechtel did not go back in and repair all of those

Mr. Kent: I have no reason

Mr. Kirsch: previous welds?

Mr. Kent: to believe that they did not. But by the same token the quantity is so large, I would be appalled if they spent that much time and money and effort and everything going back and trying to find and track down and rework all this. Now it is possible. They may have done it. I do not know. But it it it would be very very extensive if they did it and I would

Mr. Kirsch: Okay.

Mr. Kent: be happy to walk through and check and see in these areas if they did this.

Mr. Kirsch: I really see no reason to have you walk through there right now Earl and a

Mr. Kent: I would like to.

Mr. Kirsch: Well I know you would like to but I see no reason. I don't know what this would contri what your walk-through would contribute to the conduct of our activities.

Mr. Kent: I request that you ask Woody Lahr his opinion of our conversations that we had on this subject and the depth or lack of depth of the weld down into the floor bevels in the structural supports, on the electrical tray hangers in particular, and other areas. And see if he didn't agree that in our opinion it should have been poured deeper than the actual welds were as found to be at that point and time.

Mr. Kirsch: All right.

Mr. Kent: Now they may have gone in and reworked everything since I was gone. I do not know. But I do know Woody was unhappy as I was with the lack of depth penetration of the welds themselves if the floor bevels in the grooves. In fact he was very uptight over it. It could be a thorn in side because he certainly did not like what he saw.

Mr. Kirsch: Yeah. Okay. A do you know of any other instances at San Onofre where codes or standards were not complied with?

Mr. Kent: Let me ask you a question then. In a marine environment isn't it necessary to normally paint something that's new and a mild steel to avoid corrosion or at least to delay the onset of corrosion? Have you seen a lot of the piping out near the beach? Where it had been rusted for many many years and apparently had never received even one coat of paint.

Mr. Kirsch: Piping on near the beach.

Mr. Kent: Yes. It may not be ASAR piping but I'm talking about piping and and a corroded gauges and fittings and things like that. I can show you lots of piping that's outside of Unit 1 out near the beach that apparently never had a single coat of paint applied.

Mr. Kirsch: That's that's it's

Mr. Joukoff: Has nothing to do with

Mr. Kirsch: it's not it's not it's not safety-related appplication. They have corrosion control practices instituted (Mr. Kirsch and Mr. both speaking, unable to understand Mr. Kent) out there for sa safety-related appications. What they do with non-safety related material and piping is their business. They can replace it every year if they wish.

Mr. Kent: But they haven't. I have seen massive corrosion in some of the piping out there

Mr. Joukoff: In safety-related

Mr. Kirsch: In safety-related

Mr. Kent: I didn't say in in (Mr. Kent, Mr. Kirsch and Mr. Joukoff all speaking, unable to understand any of them)

Mr. Kirsch: I can do nothing about non-safety related (Mr. Kirsch and Mr. Joukoff both speaking, unable to understand Mr. Kirsch)

Mr. Joukoff: Let's drop drop that completely unless you want to talk

Mr. Kent: All right. Now what about identification?

Mr. Joukoff: about safety-related.

Mr. Kent: What about identification where some of the welders identified the number on the socket weld with a scribe and it's so light that you can't

really read it. Isn't behoovement upon Bechtel to make sure that it is legible and that you can read it?

Mr. Kirsch: Can you could you read it?

Mr. Kent: There have been times that I've seen them use steel wool trying to take the rust off so they could read

Mr. Kirsch: Uh huh. Okay now

Mr. Kent: the identification.

Mr. Kirsch: Okay now. Their program re Bechtel's program requires that the individual who made the weld on safety-related welds put down his what do you want for a lack of a

Mr. Kent: Identification.

Mr. Kirsch: Identification number (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) or it's a yeah and the weld number and a a number of other information. We may have identification letters, it may not even be a number.

Mr. Kent: Yes.

Mr. Kirsch: But you're supposed to scribe them into the pipe for (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: Shouldn't they be legible?

Mr. Kirsch: It is incumbent upon that individual who is a QC people to person who doing the inspection to come back and to assure himself that is done.

Mr. Kent: I've done this. Because I've seen errors, I've seen missayings, I've seen cases where it wasn't deep enough, wasn't correct, errors in a

Mr. Kirsch: Its got all it has to be is legible for the QC guy who came back and inspected it. Okay? That's when it has to be legible.

Mr. Kent: And we've had cases where we've had them grind it down when they made mistakes and errors in a in designation of the numbers and the letters and so forth. Things of this nature and make it right.

Mr. Kirsch: You QC guys then did your job.

Mr. Kent: That's right.

Mr. Kirsch: What is wrong with what they did?

Mr. Kent: In marking sometimes when they use a scribe, years downstream even stainless steel will corrode a certain amount in marine environment. And you will have difficulty in real real light markings of identifying 10, 15, 20 years from now, certain numbers if you have to go back in and cut into those lines and change the configuration, the schematics or so forth. And add

things or delete things. I saw them use steel steel wool out (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Is there any requirement in the codes for maintaining those markings for the life of the plant?

Mr. Kent: Not that I know of from maintaining (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Very well. There is no requirement in the code for that those markings be maintained for the life of the plant.

Mr. Kent: But a normally shouldn't should they not or not? Should they or not?

Mr. Kirsch: The code does not address it. It does not say. As far as we are concerned those markings are put there for quality tracing of the welding at that plant.

Mr. Kent: And they do disappear over a period of time.

Mr. Kirsch: As long as that after that QC guy has inspected it, watered off, the marking is a ancillary. It's superfluous. It's for quality control.

Mr. Kent: I have seen them use stainless steel wool pads trying to scr scrape the rust off and a trying to determine the actual identification number before they cut into pipe to change it. To make sure they had the correct pipe, to

make sure that they had the correct spool before they cut in and a rerouted some of the piping. And I don't know it'd be SR related or not, but it was safety-related piping

Mr. Kirsch: If it's outside and down by the beach on the Unit 1 it is not safety-related.

Mr. Kent: Well this is where a lot of it was and it was very badly corroded. Massive corrosion in some areas of the piping (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: It's not safety-related though Earl

Mr. Kent: Okay. Well then

Mr. Kirsch: down in there.

Mr. Joukoff: Okay let's go on to concern. We've established that's not safety-related.

Mr. Kent: And a before you do, you're probably well aware of the massive corrosion that they've had in Unit 1

Mr. Kirsch: Where?

Mr. Kent: In the repair work.

Mr. Kirsch: Where?

Mr. Kent: Well in the tubes for instance. You know in a a the

Mr. Kirsch: Steam generators?

Mr. Kent: Oh yeah.

Mr. Kirsch: They didn't fix those. Those were without power rated. That's a (Mr. Kirsch and Mr. Joukoff both speaking, unable to understand Mr. Kirsch)

Mr. Kent: As a question. As a question. Should not have that a lasted many many years beyond the length of time that it did last?

Mr. Kirsch: Earl the industry has had problems with steam generators tubes.

Mr. Kent: Absolutely. Absolutely.

Mr. Kirsch: I not going to argue the mer merits of that point. I just know it they have. The Technical Specifications contain limits as to what leakage is allowed from the primary system to those tubes. The Technical Specifications also require that you perform inservice examinations of those steam generator tubes on a periodic basis by means of an eddy-current test. And they also have fairly specific limitations as to what kinds of indications from the eddy-current test, in other words wall thickness,

Mr. Kent: Yes.

Mr. Kirsch: and so on is allowed and what isn't and when you have to plug the tube. That is covered. I am not going to sit here and say that that steam generator should've lasted for 50 or 100 years or 30 years or whatever.

Mr. Kent: Or 1 year.

Mr. Kirsch: I'm not going to sit here and say that. We have instituted programs to verify the integrity of steam generator tubes and maintain steam generator tube integrity.

Mr. Kent: What happened if they had problems all over the United States in steam generator tubes and a corrosion

Mr. Kirsch: Indeed.

Mr. Kent: Absolutely. And doesn't this a underscore that the then gross mismanagement relative to the pH value of the water and so forth.

Mr. Kirsch: I'm not going to sit here and say that.

Mr. Joukoff: What personal knowledge do you have of of the tubes at a Unit 1 that we that you feel that we don't know about?

Mr. Kent: You probably know about everything that I know about there in the tubes and so forth.

Mr. Joukoff: Okay. Is there any other area that you'd like to discuss with us?

Mr. Kent: Well like a the identification a tags like on the a the identification for nuclear a the a the enstamp, the ASME code stamp where it painted over. Do you object to that being painted over where you can't read it? I can't read the numbers. I can't read the other things.

Mr. Kirsch: When you clean it up.

Mr. Kent: Well I've seen a lot of them painted over that were never cleaned up.

Mr. Kirsch: You can still clean it up. If you need to have those numbers you can 'em up Earl. Is there any requirement that says you cannot, thou shall not paint over?

Mr. Kent: Common sense would tell you that they'd mask it off.

Mr. Kirsch: I'm not common sen I'm not talking common sense. I want to know is there any requirements that says that shall never ever be painted over?

Mr. Kent: No, it doesn't say that in the code unfortunately.

Mr. Kirsch: Very well.

Mr. Kent: But I have seen many cases where they've even have the the code tag hidden on the backside against the concrete wall. And you couldn't even read it was it was installed.

Mr. Kirsch: Okay. Is there a requirement?

Mr. Kent: Here again, no.

Mr. Kirsch: Okay.

Mr. Kent· But I have seen them remove the code tag and a and and reinstall it in other areas where you could read it.

Mr. Kirsch: I have too.

Mr. Kent: Yeah. And what do you do when you find a loose code tag?

Mr. Kirsch: You go in and reattach.

Mr. Kent: That's right.

Mr. Kirsch: Have you ever seen any instances where they haven't?

Mr. Kent: No but a I you probably seen loose code tags just like I have. I saw 2 nuclear tags up at a for instance at Midland that were on the floor. It's a wonder they weren't swept up in t'· trash. The two stainless steel

valves in one of the rooms there and a I and another man (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Have you ever seen this down at San Onofre?

Mr. Kent: Not specifically I have no.

Mr. Kirsch: Very well. Let's go try let's try and confine our remarks to the San Onofre. Did you did you tell the a (Mr. Kirsch and Mr. Kent both speaking, unable to understand either of them)

Mr. Kent: the inspector down there? Yes I certainly did and

Mr. Kirsch: Okay.

Mr. Kent: the Bechtel man and I a went and got the blueprint. And we a (noise on tape, unable to understand Mr. Kent) determined which ones were missing the two nuclear tags. And a we did find them out of dozens and dozens of valves that were in that room.

Mr. Kirsch: Well you did then you therefore did your job.

Mr. Kent: Yes we did.

Mr. Kirsch: Good.

Mr. Kent: Made sure that the man did wire them back on and he was

Mr. Kirsch: Good.

Mr. Kent: aware that he should've never let them a come loose.

Mr. Kirsch: Any others? Any other problems at San Onofre?

Mr. Kent: You mean that I'm aware of? That I (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: That you're aware of.

Mr. Kent: I'm appre apprehensive of. Here again a lot has to go back into metallurgical aspects of depth of weld, depth of the puddle, a fibric characteristics of the hot rolls of steel that were never normalized; things of this nature, as related to the a codes and like we discussed earlier the wide open chemistry of a A7 and the almost wide open chemistry of A36.

Mr. Kirsch: Is there anything that you know where they have not complied with at San Onofre with the requirements of any industry codes and standards?

Mr. Kent: Let me ask you a question. Under the ASME code a do you a object to irregular welds like grooved welds, a even if they come from northern Ireland and things of this nature. Where you have 4 ripples per lineal inch. The ripples are spaced out ¼", ¼", ¼" and ¼"; four ripples and a weaved weld. Isn't this a erratic welding?

Mr. Kirsch: It depends on what size of rod was allowed and what size of rod they used.

Mr. Kent: But wouldn't you (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent) irregular welds?

Mr. Kirsch: There I don't know that I can (Mr. Kirsch and Mr. Kent both speaking unable to understand Mr. Kent)

Mr. Kent: very irregular?

Mr. Kirsch: There are limits as to irregu as to the amount of ripple, the depth of ripple, the a appearance of the weld. These sorts of things there they are criteria established. And

Mr. Kent: Don't you think some of it has been violated there?

Mr. Kirsch: Where?

Mr. Kent: In San Onofre.

Mr. Kirsch: Tell me where.

Mr. Kent: Well like the (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: I don't know of any instance where it has.

Mr. Kent: Well I've I've seen I have actually measured some of the equipment that came in from northern Ireland up on the turbine deck where you had a wide weave weld on the order of may be of a ½ 1½ inches wide

Mr. Kirsch: That's the turbine though.

Mr. Kent: and here again

Mr. Kirsch: That's not safety nuclear safety-related

Mr. Joukoff: What kind of equipment?

Mr. Kent: That's your job. I don't know if its SR, but I'll tell you

Mr. Kirsch: The turbine is not nuclear safety-related. Yes, it was manufactured over there. It is not a nuclear safety-related piece of material.

Mr. Kent: Well some of the welding was real crappy.

Mr. Kirsch: Perhaps that is so (Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kent) That is outside of our purview.

Mr. Kent: Some of the welding is horrible. Okay?

Mr. Kirsch: That is outside of my purview.

Mr. Kent: Four ripples per lineal inch. Very erratic and very bad.

Mr. Kirsch: If it's on the turbine or up in the turbine deck, that is outside of my purviews.

Mr. Kent: Did they ever take x-rays on it or didn't have to?

Mr. Kirsch: I don't know. I don't get involved in that welding or in the nondestructive examination of that non-safety related applications. I do not. If they wanna make electricity and make money they should get involved in it. If they don't care about making money or the failure of it. And correspondingly the fail if the if that thing failed the plant would have to shutdown to repair it and they would be losing that revenue. That's their business. That is not my business.

Mr. Kent: Okay, are you or are you or are you not concerned with the safety of a concrete anchor bolts like the gilded bolts as used a in support plates? (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Nuclear safety-related applications, yes.

Mr. Kent: Okay. Has anyone ever checked the chemistry of the gilded bolts and made sure that the chemistry was correct and a

Mr. Kirsch: The gilded bolts of a in a a have been accepted used in the industry for years. They hav been throughout the country specified and used building concrete scratch and anchors. And a we I don't have any reason right

now to question the judgement of the engineers that have specified the use of

(Mr. Kirsch and Mr. Kent both speaking, unable to understand Mr. Kirsch)

Mr. Kent: Have you have you have you seen them failed and in a brittle manner?

Mr. Kirsch: A what?

Mr. Kent: A failed and brittle manner. Brittle manner. Manner.

Mr. Kirsch: You've seen the bolt fail?

Mr. Kent: The gilded bolt. Have you ever seen a

Mr. Kirsch: No.

Mr. Kent: gilded bolt fail in a brittle manner?

Mr. Kirsch: No, I haven't.

Mr. Kent: You haven't.

Mr. Kent: Let me show you. I'm sorry I do not have it right here. I a was given a gilded bolt by an individual and I cannot tell you his name.

Mr. Kirsch: From where?

Mr. Kent: From San Onofre. That failed into brittle matter.

Mr. Kirsch: Why did it fail?

Mr. Kent: Because it didn't have the cup and comb fracture that is indicative of ductile failure when it a is pulled apart.

Mr. Kirsch: I want to know I I know the difference between brittle failure and ductile failure. I want to know why it failed? Where was it installed when it failed?

Mr. Kent: The individual that gave it to me did not tell me exactly which plate it was installed on and whether or not it was SR. I do not know that. (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: Okay. What you're telling me is it's all this is all heresay. You have no direct knowledge of it.

Mr. Kent: I saw (Mr. Kent and Mr. Kirsch both speaking, unable to understand Mr. Kent)

Mr. Kirsch: You didn't tell me the individual's name.

Mr. Kent: I saw I I I am obliged not tell you his name because it was given to me by this individual and consequently I have to honor the _____ that he was making.

Mr. Kirsch: Until you can do that Earl, I can't do anything with it. I'd like to interview to talk to that man.

Mr. Kent: It might be arranged. Okay. It it may be very well be arranged that

Mr. Shackleton: Gentlemen, I'm going to go off the tape and we'll change the tape. The time is now about 2:18 p.m.

This is a continuation of

3 tapes — #10, #11, & #13

Side #9 is on tape #8
on tape reading at 3:08 p.m.
10/15/81.

Side #10 is blank.

Side #11 becomes #10 on tape
which resumes recording
at 3:34 p.m. 10/15/81.

Side #12 is blank.

Side #13 ends recording.

Mr. Shackleton: This is a continuation of the interview of Mr. E. Earl Kent and we went off Tape No. 7 at approximately 2:34 p.m. and we are now resuming on Tape No. 8 at approximately 2:34 p.m. Please continue.

Mr. Kent: Uh, not on SRA equipment, although they may have lifted a lot o SRA equipment with this particular crane but I saw a case where one of the very, very large cranes down there was lifting a lot of equipment in place and it only had one clip at the end of the line. California safety orders do not, does not allow loads to be lifted with only one clip on the wire rope.

Mr. Kirsch: Did you report that to OSHA?

Mr. Kent: I told the crane operator that it's a violation of OSHA, and a violation of California safety orders and he says, "you're right, it is." Because there should be more than one clip there.

Mr. Kirsch: Did they drop any SRA equipment?

Mr. Kent: I do not know that they did. Let me back up here a second and tell you. You are probably aware of the load that if it is dropped on Calabreddi, I think it is Calabreddi. I was told in, uh, this area that at a nuclear plant, Calabreddi evidently owns a nuclear plant there where that worker was killed, crushed by that load of steel.

Mr. Kirsch: We don't have any first-hand knowledge

Mr. Kent: About a month ago.

Mr. Kirsch: We don't have any first-hand knowledge. Personally, I don't think we (NOT UNDERSTANDABLE)

Mr. Kent. I was talking to a person last week. I heard about a month ago that a worker was killed over there when a load was dropped on him.

Mr. Kirsch: Okay.

Mr. Kent: There is so much negligence in the things that I have seen that it's not even funny. (NOT UNDERSTANDABLE. MR. KENT AND MR. KIRSCH SPEAKING AT ONCE.)

Mr. Kirsch: Is that unique to the nuclear industry, or is there negligence in the _____ as a whole?

Mr. Kent: No, I didn't say it was the nuclear industry, I have seen negligence all over, both nuclear and nonnuclear. What I am saying is there is no excuse for having negligence in the nuclear industry to where it looks like a lot of people just don't care, whether it's OSHA, or California safety orders, or whatever. I know of other fatalities where they have had dropped steel on people.

Mr. Kirsch: That's out of our purview.

Mr. Kent: Okay.

Mr. Kirsch: As an individual, I share your concern. However, and as far as our mission of the agency, okay, it is out of our legal jurisdiction. Can we get back to talking about the safety-related equipment?

Mr. Kent: Okay. I don't know if it is safety-related or not, but the boom that fell several years ago and just narrowly missed that welder down in San Onofre, had it been moving a lot of the SRA equipment around do you know?

Mr. Kirsch: I don't know. Do you have any information from first-hand knowledge or from hearsay that any safety-related equipment was dropped?

Mr. Kent: No, but I was told, I was told that this large boom did drop and just narrowly missed killing a welder

Mr. Kirsch: That's a point.

Mr. Kent: When it landed just about within a couple of feet of him.

Mr. Kirsch: I can understand

Mr. Kent: It picked him up just like you flip a coin in the air.

Mr. Kirsch: I can understand that. I can understand your

Mr. Kent: It's a miracle he wasn't killed; he was thrown back in the sand.

Mr. Kirsch: I can understand your concern in that area also. Do you have any knowledge that any safety-related equipment was dropped?

Mr. Kent: I didn't see any dropped, no.

Mr. Kirsch: Do you have any hearsay that any safety-related equipment was dropped.

Mr. Kent: Not specifically, not specifically, not as far as I know.

Mr. Kirsch: Therefore, you have nothing you can tell us in the area although you are concerned about cranes, and you are concerned about human life the same as we are that bear on our agency mission, that no information that you have we could look into over there in reference to them dropping equipment with cranes.

Mr. Kent: Not in SRA equipment, no.

Mr. Kirsch: Okay. Are there any other areas you would like to discuss with us?

Mr. Kent: Well, I have seen, I have seen rodents in holes in the area of Unit 1, for instance, and undoubtedly they go into Unit 2 just as well, and, uh, there was a rodent that did trigger electrical failure at Unit 1 at San Onofre as you are well aware. Let me ask a question. Why don't they eliminate those rodents in that area?

Mr. Kirsch: I have no idea

Mr. Kent: Keep them out of the electrical, keep them out of the electrical areas that they can

Mr. Kirsch: I really don't know. I really don't know.

Mr. Kent: Isn't it possible to eliminate the rodents?

Mr. Kirsch: I have no idea. I don't profess to be an expert in rodent control at all.

Mr. Kent: But where a rodent actually triggers electrical outage, don't you think they would have a tendency to not let it be repeated, and, uh, get rid of the source?

Mr. Kirsch: I really, I don't have any first-hand knowledge about that at all. Do you have any first-hand knowledge where you can tell us where you have seen rodents eating electrical cables in Unit 1, 2, or 3?

Mr. Kent: I haven't seen, I haven't seen, I haven't seen that, but I was there at Unit 2 the day the Southern California electrician got electrocuted cleaning some of the equipment. Let me ask you, why didn't he have a backup that was standing there helping him and making sure that he everything was all right?

Mr. Kirsch: That's not our jurisdiction, Earl, we're trying-- How many times do I tell you Earl, that's not our jurisdiction. How many times can I tell you. Worker safety is an OSHA situation. The Nuclear Regulatory Commission is only, only, uh, only authority granted to them by Congress under the Atomic Energy Act as amended, is only safety-related equipment.

Mr. _____: I can appreciate your concerns, and we share them with you, but what else can you tell us that will be within the jurisdiction given our agency that we can work on?

Mr. Kent: I don't know if that's _____ or not, but the, uh, the equipment outside of Unit 1 there, you're telling me that none of it is SRA whatsover, and no place (NOT UNDERSTANDABLE)

Mr. Joukoff(?): You are going to have to tell us what the systems are, or where it is located, and Dennis Kirsch has a very good idea of the site and he can tell you whether it is safety-related or not safety-related. Do you have another area you would like to discuss with us?

Mr. Kent: I would like to ask you a question whether or not you believe that the craters should exist by the end of the wells, or should the craters be buried in the middle of the well

Mr. Shackelton: Earl, I think we are getting away from what we originally intended here. We are interviewing you. We are asking you for instances whether, where you know that there are problems existing as installed in San Onofre.

Mr. Kent: (NOT UNDERSTANDABLE) 180 degrees backward (NOT UNDERSTANDABLE, ALL PARTIES SPEAKING AT ONCE)

Mr. Shackelton: Documented (NOT UNDERSTANDABLE)

Mr. Kent: Doesn't that tell you something about the caliber of the some of the people that sat there for months, about seven months, without them realizing that it was installed backward? Does

Mr. Kirsch: Oh no, no they knew it, they knew it. Somebody is missing the point here.

Mr. Shackelton: Okay, now what my point is, I don't, I'm not going to be fielding your questions. That is not the function of this interview. However, the function of this interview is to document and get down for prosperity your concerns relating to inadequate construction or failure to follow codes on nuclear safety-related equipment, systems, or systems and equipment that are important to nuclear safety at San Onofre. It is not to get my views or to examine me as to my knowledge of the code.

Mr. Kent: Or your workmanlike quality where the code demands quality or good workmanship of this nature.

Mr. Shackelton: I am not going to sit here and pass judgments on the adequacies or inadequacies of the code. The code is established by regulation.

Mr. Kent: Then it leaves a lot to be desired, unfortunately.

Mr. Shackelton: Well, again

Mr. Kirsch: Earl, the day is, we have been at this since 9:30 this morning and it's now past 10 minutes to three. We're very willing to pursue any issue that comes under our jurisdiction

Mr. Kent: Including the, uh, the depth of dope as used in, used yonder

Mr. Kirsch: If you have first-hand knowledge that you can give us, that we can work with, we can take that information and do something with it. Unfortunately, I know that dope is used in every high school, intermediate school, nuclear power plant, and every other construction site just as well as you do. And what is it you can tell me that I can do something about at San Onofre?

Mr. Kent: Well

Mr. Kirsch: Are you passing judgment on society

Mr. Kent: Well (NOT UNDERSTANDABLE, KENT AND KIRSCH TALKING AT ONCE) U.S. Navy had a, had an unannounced shakedown where they took

Mr. Kirsch: You can't do that, those are enlisted personnel in the Armed Forces. You cannot, we cannot violate a person's constitutional rights. If you feel that way, then why don't you see how happy you would be if you go home now and the police have unlawfully searched and seized property in your residence without a warrant. You are asking us to do the same thing. It's against the law in this country.

Mr. Kent: Of course, but in nuclear

Mr. Kirsch: No, because it protects you and me and Owen and Dennis as well as everybody else, and that's our society. Whether it works or it doesn't work, it was written that way in 1776.

Mr. Joukoff(?): Earl, let me tell you something about narcotics with all these plants. Southern Cal Edison people, Nuclear Regulatory Commission, all the various agencies are aware of the narcotics program. This isn't something new, and, but it's a tremendous job, it's so easy to sneak it in and use it. They don't want it there, Southern Cal Edison, any more than you do. But it's a problem, as Bill has addressed, all through the country.

Mr. Kent: Well why can't they be more stringent in shaking it down in searches and getting rid of it?

Mr. Kirsch: Because we have laws here that don't permit that and do not allow you to search people down.

Mr. Shackelton: The rights of the individual

Mr. Kirsch: And, it's a big problem and we share your feelings with it. Two of the people at this table are for law enforcement, and who very well share your feelings with you and that's the way

Mr. Kent: Can you imagine people that are stoned doing nuclear welding or nuclear

Mr. Kirsch: Well, it's extremely discouraging

Mr. Shackelton: Do you have any first-hand knowledge where an individual who was stoned performed nuclear welding or did nuclear-related quality control inspection?

Mr. Kent: SRA work or equipment?

Mr. Shackelton: Yes. Do you have any first-hand knowledge of that?

Mr. Kent: No, I've heard stories though. Working in there, usually where it comes apart.

Mr. Kirsch: Yah. Well, we are aware of this but you have to understand that we can't work in generalities, Earl. You have to have specifics. If somebody can tell us that yesterday there are ten welders working in the control room in Unit 3 and they all are smoking pot, then we can klink people up there who will look into it. Just that they are using narcotics at a construction site that has literally thousands of employees, is too general. Uh, I can't speak for Southern Cal Edison, but I know their concerns. Uh, all public utilities that are building nuclear power plants face this problem. Because it's in the construction trade.

Mr. Kent: I would like to know the depth of this at San Onofre.

Mr. Kirsch: Well, we don't know the depth of it, and we can't comment on it. Can you provide us, getting back to, we are trying to elicit information from

you. Can you give us any information that will assist us in curtailing this problem?

Mr. Kent: I can't, but I certainly would like to. But what I've been told of the difference towards, usually where there's smoke there's fire, it makes you really wonder, makes you really apprehensive that people can be stoned on the plant and have to be taken out

Mr. Kirsch: Earl, we have addressed this. Now, is there anything additional? I don't want you to go away from here if you've got any other item that you feel we should know about relating to safety-related equipment, please give it to us.

Mr. Kent: Let me ask you a question.

Mr. Kirsch: Well,

Mr. Shackelford: Let me read one thing here first. This was something else that I got from John Odell, a concern that you had expressed to John Odell. The Vepco construction specifications, CSP207-7, dated April 18, 1980, pages 13 to 19, were being telexed to our individuals from San Onofre or to us. The paragraphs, 5.6 and 5.7, contain visual examination criteria used by Bechtel and reference the ASME Code, Section III, Subsection NF, pipes and _____ criteria. The alleger has reported to the recorder that the visual criteria used by Bechtel in the construction specifications is not according to the point of the Code. Is that your statement?

Mr. Kent: It was my understanding that, ah, a lot of the supports, including electrical spaces, tray hangers and so forth, are to the AWS Code, not the ASME Code. And I was told at San Onofre by several people that it was to the AWS Code and this is my understanding when I first went there that it was to the AWS Code.

Mr. Shackelton: There are certain of them that are. Those electrical hangars or electrical tray supports are to AWS.

Mr. Kent: No, that's not true.

Mr. Shackelton: However, pipe supports supporting or anchoring ASME Division I, Section III, piping are built to subsection NF.

Mr. Kent. Okay, let me ask you a question. Why was it that I passed by Unit 2 on the outside and noticed that the welds appeared very, very skimpy on one of those carrying cooling water and, uh, I went (NOT UNDERSTANDABLE)

Mr. Shackleton: What equipment number?

Mr. Kent: I don't know the exact location of it and the exact diameter, but the diameter was on the order of several feet, and the weld must have been in excess of one inch thick. I believe that to be the case. And I went in and got the blueprints that matched that mark number and brought the blueprint back out and saw that some of the welds that had been accepted on that support did not meet the blueprint. They were missing Consequently, I called two responsible people and asked them to look at this and they did. They looked

at the blueprint, they saw the welds were missing, and they said that the order had been accepted several months prior to that point in time. It was embarrassing, but they would write an _____ forms report and they would bring it up to the blueprint.

Mr. Shackelton: Were they fixed? Were they, was that

Mr. Kent: I insisted on them being fixed.

Mr. Shackelton: Very good, you did your job.

Mr. Kent: I demanded they be fixed.

Mr. Shackelton: Do you know of any instance wherein deficient welding was noted by you or anyone else and was not fixed?

Mr. Kent: They may have fixed them. Of the other things I do not know because I haven't been allowed in San Onofre in a long time. I volunteered with Stonepacker to go back in and have a walk-down, but he said no, it was impossible, that they had tightened up on security and so forth, even though I had clearance there before. He indicated that it wouldn't be okay.

Mr. Shackelford: Okay, let's get back to this one here, though, from what was given to me from John Odell. The paragraphs, do you feel that the paragraphs, those paragraphs that I mentioned in the construction specification, V207, do not implement the requirements of the ASME Code?

Mr. Kent: I do not know the full extent of this, but when it was read to Moss Davis by telephone, Moss Davis and his _____, according to John Odell, said that it wasn't even good enough for an outhouse.

Mr. Shackelton: Moss Davis, though, is AWS.

Mr. Kent: Yes, he is.

Mr. Shackelton. Okay, I'm talking about

Mr. Kent: He is an authority on the AWS, if there ever was one.

Mr. Shackelton: Okay, but I'm talking paragraphs 5.6 specifically reference the subsection NF.

Mr. Kent: I don't know the actual pipe that good. From what I was told, what I had been led to believe, that the AWS does suggest in certain areas for electrical tray hangers and pipe supports and ASME comes into play for the SR, uh, piping, and uh, equipment and so forth, and uh, reactor, and major components. To the best of my knowledge, this is the way that I was told and this is the way I understood it. That basically, basically, the, uh, electrical tray hangers and the pipe supports are AWS. The 1.1 code and must conform to all the requirements of that. Let me ask you a question. You just mentioned, didn't you just mention that the electrical tray hangers, electrical tray hanger tubes, those supports are under AWS. Why don't they have end returns?

Mr. Kirsch: That is one of the allegations you are concerned with that we are going to be investigating.

Mr. Kent: Absolutely, absolutely, absolutely, and I am happy that you are. Because I saw many, many of them, probably several thousand of them, that did not have end returns.

Mr. Kirsch: Anything else, Earl?

Mr. Kent: I have a question on the open craters. Even under the AWS, wouldn't you think that they should bury the craters in the middle of the, or under code B1.1 don't you think they have the obligation of burying the craters even in the end return?

Mr. Shackelford: I don't require the code requirement regarding that.

Mr. Kent(?): Uh, let's dig it out.

Mr. Kirsch: Let's look under, uh. Go back down here in this and, uh, look at the

Mr. Kirsch: While Earl is going through the manual, we will go off the tape.

Mr. Kent: In the AWS B1.1 construction welding code, as an example, '974 Edition, Revision 2. Uh, page 25 under Technique, paragraph 4.6, quote: "Root weld termination," this isn't a root weld but we will get the code for that after a while, "Root weld shall be terminated at the end of those joints

in a manner that will ensure sound welds. Where possible it shall be done by use of extension boards or runoff plates." May I ask a question?

Mr. Shackelton: I have seen extension boards or runoff plates. Do you have any first-hand knowledge of where extension boards or runoff plates were not used?

Mr. Kent: I have yet to see, I have yet to see total compliance with this at San Onofre for root welds where the runoff plates extended on out. They were cut off and ground back down gradually with a grinder.

Mr. Kirsch. I understand that.

Mr. Kent: Ar you saying that

Mr. Shackelton: Do you know of any instance at San Onofre where they have not done this?

Mr. Kent: I have seen places that they did not use uh, backup plates, and runoff plates, uh, sort of plates and runoff plates

Mr. Kirsch: What did you do about that?

Mr. Kent: Mentioned it to my boss for one thing.

Mr. Kirsch: Who was that?

Mr. Kent: Whew-w-w

Mr. Kirsch: Was it Nick Pestis, or was it, let me think of the name. I can't think of the name, can you think of the name?

Mr. Kent: One of the basic reasons is that when you have, these plates that enhance the integrity of the weld at the beginning and the end of the weld

Mr. Shackelford: I understand the purpose of the plates.

Mr. Kent: Yes.

Mr. Shackelton: I just want to know where, this is where it happened, where you

Mr. Kent: I have seen instances where it has happened, I've just called

Mr. Shackelton: Where they didn't use them or where they didn't properly use them.

Mr. Kent: I was trying to recall specifics where there would be one that you might be able to trace it down. Why don't you ask the welders there if they know of any cases where they never, where there are any cases they were ever missed in being used? I should think you would find a lot of them. Probably lots of th welders could tell you places they were not used.

Mr. Kirsch: In safety-related equipment?

Mr. Kent: I don't know about SR.

Mr. _____: That's the only thing we can get into. Here we go again, let's try again.

Mr. Kirsch: Do you know of any areas where they run off plates and other equipment that is not used in safety-related

Mr. Shackelton: Or other general areas of the plant?

Mr. Kent: I've seen areas where the backup strip was left, where there was no extension of runoff for the overhead, uh, beams and girders in splicing. I was trying to think now, there were some cases, I'm quite sure, where they were flush with the edge of the flange itself. Like the bottom flange and the splice and also the top of the flange when it was spliced. I'm trying to think of some of the areas where it did not extend beyond that. And this says, "where possible, it shall be done," shall is mandatory, "by use of extension boards or runoff plates." Now, I have seen group welds that evidently did not have these runoff plates and I think if you search it out, you will find some that have concrete, if I remember right, concrete above these beams and girders, and most likely you will find some that never had any traces of runoff plates.

Mr. Shackelton: Are they in areas of the plant where you were assigned when you were working there?

Mr. Kent: Yes, I worked in some of the areas, yes, and I have had quite a lot of the other areas. I worked in a lot of different areas. I worked in, uh, the areas where, where there are Woody Larhill people, but I think if you check with Woody Larhill-- I also mention that he has seen many, many things in there that in his opinion, that he would be apprehensive about.

Mr. Kirsch: What areas of the plant did you work in when you were there?

Mr. Kent: I worked in numerous areas of 2 and 3

Mr. Shackelton: What areas, specifically?

Mr. Kent: I don't know the actual names of rooms right now. I can't recall the

Mr. Shackelton: Elevations?

Mr. Kent: I can't recall the elevations. I worked up and down all over the place. Inside and outside of the plant, wherever I was required. But it says here, I will repeat, "group welds shall," and that's mandatory, "be terminated at the end of the joints in a manner that will ensure sound welds." To me, that means sound welds throughout the length of that groove, not just out toward the edge and then have an unsound portion

Mr. Shackelton: Do you know of any instances where there are unsound portions?

Mr. Kent: Well, I have seen numerous places and some of the beams and girders, that I certainly would not leave it that way myself.

Mr. Kirsch: Gentlemen, excuse me, just a moment, we are going to have to change the tape at this time. The time is now approximately eight minutes after three in the afternoon.

Mr. Shackelton: 3:34 p.m. We just went off, pardon me, 3:34 p.m.. We just went off, uh tape, Tape No. 10 and we are still continuing with the interview with Mr. E. Earl Kent. While at the present time Mr. Kent looks through his manuals, we will go off tape.

Back on tape at 3:34 p.m., October 15, 1982.

Do you generally know of any areas where partial joint penetration groove welds were used in SR equipment?

Mr. _____: Don't you?

Mr. Kent: Nope, and this is why I'm asking the question because I know of other areas where it has been used, and, uh, I wanted to make sure because evidently (NOT UNDERSTANDABLE) to SR equipment and I wanted to ask you some questions about it if, if you do.

Mr. Shackelton: Do you know of any instances where they violated Code requirements on nuclear safety-related equipment or equipment important to safety regarding the partial penetration groove?

Mr. Kent: I'm trying to recall here now places where there should have been full penetration welds and evidently there have that in.

Mr. Schackelton: Presumably, you haven't

Mr. Kent: At that, I've only seen lines, okay. Even in your SR, okay, equipment, all right. At what what point in time have you ever seen them control the dewpoint, for say argon gas as a shoo-in gas, at a minimum -40° Fahrenheit for welding applications and, uh, gas _____ arc welding (NOT UNDERSTANDABLE) comes in there with gas. Have you ever seen this new procedure called instant control dewpoint?

Mr. Shackelton: Where is that required at in the Code?

Mr. Kent: For as of line integrity, now here again,

Mr. Shackelton: Where's that in the Code?

Mr. Kent: Okay, here again you are correct. The Code, unfortunately, does not address it but it is a parameter that should be addressed and it is a parameter

Mr. Shackelton: Did you find it in the central variable by the code?

Mr. Kent: Unfortunately it is not, and here again we are getting back into something like we did before, if it's not in the Code, we cannot do anything about it. Unfortunately, the dewpoint is extremely important in welding, they

don't use wet gas, argon gas, in welding because you can't have caustic in excess of the allowable by the use of wet argon.

Mr. Kirsch: Okay, it's not in the Code, so what happened is unfortunate

Mr. Kent: Even in SR equipment

Mr. Kirsch: Is there another area you would like to go into?

Mr. Kent: Okay. And, we already covered the short-trigger mode of transport before, and I think

Mr. Shackelton: Earl, forget the book will you please. Just talk to us about what you know about the plant.

Mr. Kirsch: We can read the manual, Earl. It's the plant we're concerned about. You have expressed concerns to the press, you've gone to the GAP,

Mr. Kent: I didn't get the results into Southern California Edison I hope to get. Well, I went to them first.

Mr. Kirsch: I'm sorry, but we will pursue anything reasonable because of our responsibilities to the public. You've got some concerns out there in that plant that you observed other than what you have already discussed with us, we want to know it so that Dennis can evaluate it and assign some of his engineers to look at it.

Mr. Shackelton(?): Now wait a minute. You said you didn't get the results that you wanted from Southern California, so this is why you're taking this route, okay? I can understand that. What results will be acceptable to you?

Mr. Kent: I was very diligent, in Region III even, trying to get things set straight. When I found them documenting undersized skillet welds as being full-sized socket welds when they were not, and this (NOT UNDERSTANDABLE) and I saw them do it, and I get fired over it like people rocking the boat, and I go to Region III at my own expense and talk to them and draw them pictures on the board and draw them diagrams and show them what was being done, and showing them they were not making them core, and documenting that, I suppose when they were not, to me, this is out and out bordering on

Mr. Shackelton: What do you want from me, Earl? You have given us a number of your concerns that I can go do something about that are not, better, specific enough so that it is not going to take me eight months to go chase. Okay? Or some unreasonable period of time, and are specific enough for me to believe yes, there may be something here. Now what do you want from, what would be acceptable from my point of view

Mr. Kent: Let me ask a question, let me ask a question then. If you find on the electrical tray hangers, on the AWS Code requirements, if you find thousands of places where the end returns do not exist, will not you enforce that before some deposit goes in

Mr. Joukoff: Indeed, I will!

Mr. Kent: Congratulations, then.

Mr. Kirsch: We've addressed that then.

Mr. Joukoff: I'm going to work on the end returns. I've already told you.

Mr. Kent: Thank you, thank you, sir. I appreciate that.

Mr. Kirsch: Okay, anything else.

Mr. Joukoff: If they have violated the code requirements

Mr. Kent: Because I told the same thing now to (NOT UNDERSTANDABLE, TOO MANY PEOPLE TALKING AT ONCE)

Mr. Joukoff: And it's very, very common, but here's what I am telling you. If they have violated the Code requirements, and I am taking the Code as literal interpretation, if they have violated the Code requirements and they cannot prove to me that by analysis,

Mr. Kent: No, no. Analysis be damned. Tests have not been performed as best I know. But they still have the burden of conforming to the requirements of the Code whether they like it or not. It is still within the Code domain and they have to perform according to what is put down, and shall is mandatory,

Mr. Shackelton: According to the Code, shall is mandatory

Mr. Kirsch: Earl, shall is mandatory

Mr. Kent: You're damned well it is.

Mr. Shackelton: Shall is mandatory, where possible.

Mr. Kent: Oh, no, it says where practicable. Where practicable, when you cannot return the corner around because you have an obstruction, like another structural member that pre_____, that's understandable, that's understandable.

Mr. Joukoff: We are going to evaluate, we are going to evaluate their compliance of their procedures to the Code. What else do you have for me Earl?

Mr. Kent: Okay, I'm going through it now, and I'll, uh, rehash this with you. If you, let me ask you a question. Have you essentially checked the effective length of fill-up welds where they have had intermittent welds and made sure that, uh, it did conform to

Mr. Joukoff: I personally have checked the effective length of fill-up welds in accordance with their design drawings.

Mr. Kent: No, no, now wait. Not in accordance with design drawings, but in accordance with the Code, AWZ121 where inch-and-a-half is the absolute minimum, under the Code, and it's right here

Mr. Joukoff: Believe me, I have personally had

Mr. Kent: Have you ever seen cases where it was left an inch-and-a-half in length, net, in length? That's what I am asking you. You never have? I have.

Mr. Joukoff, Mr. Kirsch: Where, Earl.

Mr. Kent: All right, right here, where they have intermittent welding.

Mr. Joukoff: Okay, intermittent welding is normally used for mounting of electrical or main controller control panels onto embedded angle iron steel.

Mr. Kent: Wait a second. Anything that falls under the AWS, they had the burden of going a hundred percent by this for intermittent welds, for inch-and-a-half in diameter, okay?

Mr. Joukoff: Where did they do it, where did they do what you saw?

Mr. Kent: I can show you where it says an inch-an-a-half, you want to, I'll dig it up for you, okay?

Mr. Joukoff: (NOT UNDERSTANDABLE) a paragraph

Mr. Kent: It's a paragraph, okay? But, uh, before we get to that

Mr. Joukoff: I want to continue here, I want to know what the Code says, what they violated in their installation out in the plant.

Mr. Kent: Now here, we are out of the SR domain again. I'm sorry.

Mr. Kirsch, Mr. Joukoff: Forget it, forget it. If it's outside of SR, we can do nothing.

Mr. Kent: Boy, that really shackles me, that really shackles me, that really shackles me, that is bad

Mr. Kirsch: I don't know how many times we can tell you, we do not have _____ jurisdiction.

Mr. Kent: That is bad, that is bad.

Mr. Kirsch: The government's responsibility through this agency is if that plant has something, you talked about the welding from hardware that was furnished by some manufacturing firm in Ireland in which there were ripples.

Mr. Kent: The point, four ripples per inch in fact

Mr. Kirsch: The point I want to get over to you, if the turbines and the generators for some reason fail and they have to shut the plant down, as Dennis explained, Southern Cal Edison and their stockholders lose money. But nobody's, the public health, is not endangered. That is the responsibility of the Nuclear Regulatory Commission. You may not have any electrical power, the plant may shut down, and they'll have to pick up power on the grid system from somewhere else, but if there is no release of radioactivity, there is no danger to the public. That's the job Congress gave us.

Mr. Kent: In other words, you don't want a repeat of Three Mile Island out here at San Onofre?

Mr. Kirsch: Oh no, naturally we don't. I don't think anybody wants a repeat of Three Mile Island anywhere.

Mr. Kent: That's right, that's right, not anywhere. And you can very well have that here if you are not extremely careful.

Mr. Kirsch: Why didn't you tell us something

Mr. Kent: Now wait a second. Now I want to tell you my opinion, my personal opinion. They didn't give that credence at the fault zone, even though that could happen before it happened, okay. All the experts said was, well forget about it, it's not fault that will rebound, okay?

Mr. Kirsch: Well we are aware of that and that's why we are here talking to you.

Mr. Kent: Hindsight, okay, hindsight.

Mr. Kirsch: We are here talking to you to make sure something like that doesn't happen again.

Mr. Kent: Well I hope to hell it doesn't.

Mr. Kirsch: Okay, well do you have some information you can give us that you haven't given us about safety-related systems of interest

Mr. Kent: When I see workmanship and things like this down here, so questionable to me, well it makes me wonder about the caliber of the people doing a lot of the work, and the caliber of the engineers and designers. I've seen some real

Mr. Kirsch: Do you have some specific areas you can tell us about?

Mr. Joukoff: Earl, we've got to have specifics

Mr. Kent: And it has to be SR, then?

Mr. Joukoff: It has to be SR

Mr. Kent: Unfortunately, an awful lot of _____ is not in the realm of SR. We're grinding our, our teeth here for no result if it has to be totally SR

Mr. Joukoff: It has to be in safety-related equipment.

Mr. Kirsch: It has to be in safety-related equipment and systems.

Mr. Kent: SR?

Mr. Kirsch: It's got to be SR.

Mr. Joukoff: Now there's still, we don't want to get the idea here to just forget it. If you got some legitimate concerns, write them up and give them to Southern Cal Edison.

Mr. Kent: I talked to Stonepepper down there, and I offered to go out in the plant, and investigate that spatial plate that is missing on the inside containment door.

Mr. Joukoff: But if you have, you know, a lot of things that are bugging you that you feel that are wrong, and you know it's in nonsafety-related equipment, then I _____ to in writing.

Mr. Kent: Well, like, like I seen corrosion, inside the pipe and things like this. When you see it cut in, if you don't have time to (NOT UNDERSTANDABLE)

Mr. Kirsch: I don't know if that's SR or not,

Mr. Kent: Uh, granted the Code does allow uniform corrosion all around the inside of the pipe over a period of years and so forth, but as an example, I saw very extensive pitting of the _____ cable, when we cut into that emergency water piping up there. And in my opinion, some of those isolated pits did go halfway through that pipe.

Mr. Joukoff: Did you bring this to the attention of the people in Region III?

Mr. Kent: I brought it to their attention in Region III, I mentioned it to them when I went back and talked to them about it, and I suggested they go out

and test everything, that's why I'm bringing this up again because it does warrant in Unit 1 going through with UT, especially on the bottom pipe and checking the actual thickness on, here again, SR pipe and area where it would be corroded very badly at the bottom of the pipe. Even if you took an examination only in one line, not all the way 360 degrees around it, you won't find much of it that's top quality.

Mr. Kirsch: Do you have any first-hand knowledge that this exists at San Onofre Unit 1?

Mr. Kent: I have reason to believe it would exist because of the correlation between the length of time the policies have operated in marine environment and San Onofre has existed in a marine environment. Although this is faulty, and that is not.

Mr. Kirsch: Okay, are there any other areas

Mr. Kent: I asked, I asked, in fact, asked that they do run a a third check on the thickness left on the bottom of all the SR piping in Unit 1 to make sure that the UT values do not show pipe that is weaker than the minimum wall left

Mr. Kirsch: We cannot, we cannot force the licensee to do that.

Mr. Kent: You cannot do what?

Mr. Kirsch: Force the licensee to do that.

Mr. Kent: That's unfortunate. Cause I certainly hoped that you would be able to.

Mr. Kirsch: No.

Mr. Kent: I would certainly like to know that if had the pipe

Mr. Kirsch: Based upon the fact that you have nothing more than a concern, backed by no physical evidence, it is unreasonable for the Commission to force the licensee to do this.

Mr. Kent: Well, when you see maximum corrosion on the outside of the piping, even though it's SR, okay? You

Mr. Kirsch: SR or non-SR?

Mr. Kent: I said even though it's not SR piping, okay? You know that in a marine environment like that when it can corrode on the outside so badly, that surely the inside of a lot of the pipes must be damaged and must be isolated, corrosion point, if you would. It would deserve a third check.

Mr. Kirsch: Are there any other areas you would like to discuss with us?

Mr. Kent: And you mentioned earlier there, you can't keep the rodents out of the electrical equipment running in and out of

Mr. Joukoff: I asked you earlier if you had ever seen a rodent eat an electrical cable

Mr. Kent: No (NOT UNDERSTANDABLE) I have seen rodents at San Onofre in their holes and running around outside their holes. I've seen them running across the equipment

Mr. Joukoff: Well we might have some, there's nothing we can dc about that unless you have seen them in there eating on safety-related cabling.

Mr. Kent: No, I've never seen that.

Mr. Kirsch: Okay, are there any other areas

Mr. Joukoff: Have you ever seen safety-related cabling that has been nibbled upon? That has been damaged?

Mr. Kent: Now when you say has been damaged, besides the nibbling,

Mr. Kirsch: We are talking about rodents, we're talking about rodents.

Mr. Kent: Okay.

Mr. Joukoff: Have you seen safety-related cabling at San Onofre that has been damaged by rodents?

Mr. Kent: I don't recall any specific areas that I have seen this, no. By rodents. I have seen a lot of other things, though, in cabling other than rodents that I questioned.

Mr. Kirsch: What?

Mr.Kent: As an example, you have some of these trays and layers upon layers, upon layers, now some of these cables are not on the small cables on the large cables as you are well aware. Does anyone know the actual true stress that these welds are subjected to other than to the top of the theoretical stress?

Mr. Joukoff: There is no requirement in the code to determine

Mr. Kent: Here we go again, here we go again

Mr. Joukoff: the test. Stresses are computed by taking an analysis of the maximum allowable cable fill tray, fill volume, and the weight of that maximum allowable volume, and the weight of the tray, and any dead load and seismic forces that would be induced upon that, and summing those, and determining the maximum stress that the weld has to withstand.

Mr. Kent: Okay, and theoretically, the, the, the weld may not be overstressed. It may be the weak link in the chain theoretically and still survive, and may survive for weeks or months, or even for some years. But if allowed to stay like that, I predict, and I hate to predict, I will predict that you will have some weld failures, including electrical tray hangers. Cause I've seen too many cases where they have made the weld the weak link and forced it to carry

the load, the stress and the strain, from the loaded members underneath. I don't care if it's electrical cable or so forth, through the square and rectangular tubing, into the supporting beam or girder.

Mr. Joukoff: You say you've seen this, seen this instance at San Onofre? Can you tell me where

Mr. Kent: It's all over the place in electrical tray hangers at the top where it joins girders and beams where you have uh, small, locally small weld relative to the thickness of the member, like I've seen cases where some of the

Mr. Joukoff: An engineer has determined, by his analysis and his best judgment, that size of weld is required and he's put that down on a drawing. He has also determined, that in certain quality control aspects regarding the welding has got to be complied with. Mainly, the inspection to verify compliance with the engineer's requirements as far as the weld hold, the thickness, or whatever you else you want to call it. The size of the fillet. Now, are you telling me that that engineer, using his best judgment, has made a mistake?

Mr. Kent: Maybe he has no judgment, except a theoretical judgment. Maybe he has no knowledge of the real world.

Mr. Kirsch: Are you saying that the Bechtel engineers are not qualified?

Mr. Kent: No, no, I'm not, let me back up there a second. I did not say they were not qualified. What I say is I've seen some designs coming out of Bechtel that border on the Rube Goldberg variety where they make the welds the weak

link in the chain so to speak. And it burns me up that they force the welds to be overstressed, and not an actual uniform stress, it's concentrated stress.

Mr. Joukoff: Can you tell me

Mr. Kirsch: You said overstress. Can you tell us of any welds that are overstressed?

Mr. Kent: In my opinion, in my opinion, they will have (NOT UNDERSTANDABLE) do neck down, and in the literature, you can find yourself, when you have stylized strips full line, that neck down like, like a Venturi effect, down into a small area, small volume, and then back out again from a larger volume than before, back out again to a larger volume, you will have stylizied strips full lined and you will have necking characteristics that will give you an actual, real world trip of three, if not four times, the theoretical stress. Now theoretically, he might be able to say well these welds are good, if you have uniform welding and if you have no stylized stress (NOT UNDERSTANDABLE) and if you don't have concentrated stress, if you're don't have residual stress, if you don't have reaction stresses. A lot of them don't even know, a lot of the engineers don't even know what stylized stress (NOT UNDERSTANDABLE) or stress ranges either, and not (NOT UNDERSTANDABLE).

Mr. Kirsch: Earl, is there anything further. I think, I think we ought to be bringing this to a close.

Mr. Kent: I will bring it to a close then.

Mr. Kirsch: No, I'm not going to bring it to a close, if you've got something about the plant that's a legitimate concern in the safety-related area, then we want to know about it.

Mr. Joukoff: Can you tell me any Bechtel designs, or weld designs, point me to any of them that are used in a safety-related applications

Mr. Kent: Now, here you tie my hands with that story.

Mr. Joukoff: are

Mr. Kirsch: Well, we have told you ten times that we cannot do anything but SR

Mr. Kent: It's unfortunate, it's unfortunate.

Mr. Kirsch: You've told me ten times it is unfortunate. I have agreed with you ten times it is unfortunate, but all we've got

Mr. Joukoff: If there are any Bechtel welding designs that do not, that are not adequate, for the loading that is placed on them

Mr. Kent: In my honest opinion, some of them would be termed inadequate. I would suggest

Mr. Joukoff: Which ones?

Mr. Kent: (NOT UNDERSTANDABLE) explains them right here. Make prototypes of them and actually load them with an impact loading equivalent to seismic load of, we'll say a value of 8 on the Richter scale, and see what it takes to tear a weld apart at the top. You have a fulcrum up at the top, you have in essence a lever, if you would, that's hanging down, loaded, and when you load the lever sideways, you

Mr. Joukoff: I fully understand

Mr. Kent: Like a crow bar, like a crow bar, the tip of the crow bar is going to be subjected to tremendous loads.

Mr. Joukoff: I fully understand the configurations that they have out there. Now I'm asking, are there weld designs that you have evaluated and found to be inadequate?

Mr. Kent: In my honest opinion, many of their designs are inadequate.

Mr. Joukoff: Which ones?

Mr. Kent: The electrical tray hangers for instance. As I mentioned before, where you have two lines of welds and you have four points on a square tube, a rectangular tube, and two sides are welded, and you only have two lines of weld, exclusive of the wraparound, exclusive of the subject of wraparound, okay. And even if you put the wraparound, it may very well be given size where you come into a 5ET6 plate up above to a tube that's a half-inch thick and you only have a three-sixteenth's pillet weld, or even a quarter-inch

pillet weld, you're forcing the pillet weld to be the weak link in the chain so to speak. Even with wraparound.

Mr. Joukoff: You say that that's, that they are inadequate of what

Mr. Kent: In my honest opinion a lot of welds are forced to be inadequate in size, as well as the lack of wraparound I've seen already in more than a thousand cases. Where in my mind, the weld is incomplete.

Mr. Joukoff: Incomplete from what standpoint?

Mr. Kent: Even, even, even, well. (NOT UNDERSTANDABLE) standpoint. Even if you deposit from the wraparound, two times wall size minimum, net, you're still not fully welding around this joint. The joint is still the weak link in the chain, so to speak. Very, very often

Mr. Joukoff: You are saying that every joint should have a full weld around?

Mr. Kent: I do not say, I do not say that every joint should have a full weld around. What I said that ideally the joint should develop the strength of the members it is connected to. In my honest opinion, and (NOT UNDERSTANDABLE) that we have here now, it is behoovent upon the builders and designers to make sure that that weld does not overload and fail. The weld, in my opinion, should be full strength as the members connecting it. If the member connecting it is, we will say a half-inch thick tube, going into a half-inch thick plate or five-eighths inch thick plate, or whatever, then across the weld the weld should be filled out instead of being a skimpy weld, theoretically that might

survive to be filled out to be adequate for securing the stress across that joint without fitting. I am tired of seeing them make the welds the weak link in the chain so to speak. It bugs the hell out of me.

Mr. Joukoff: Okay. You made a statement that electrical tray hanger welds are of, are of inadequate design to support the load. Now you said that's based on your opinion. Is your opinion based upon your independent analysis of the situation, of the loading?

Mr. Kent: It's based upon things I have seen that existed out there to where the welds are the weak link in the chain so to speak.

Mr. Joukoff: What is your opinion based upon? Is it based upon your independent analysis of the loading?

Mr. Kent: It is based upon many things. And, in my background, what I have seen through my eyes for many, many years reflects on that because to my eyes I have seen many, many problems that will appear over a period of time including weld failures, and I don't like weld failures, as well as basemat failures, and I want to avoid them like the plague. And when they stress up the welds to make the welds the weak leak in the chain, it burns the hell out of me.

Mr. Kirsch: Have you done any calculations?

Mr. Kent: Look at my literature. The things I have quoted, and the things and calculations of fitted wall sizes and other things, okay? And you will, here, let me show you a (NOT UNDERSTANDABLE) Let's see, it's right in here.

Uh, (NOT UNDERSTANDABLE) in 1951, okay? I'm the author of that, okay? As you see right here, see my _____ right down at the bottom? Okay, and the adjacent one is also mine, fillet welds, okay. And that's when the code, at that point in time, was 13,60C pounds per square inch shear on the weld _____, okay. When the code went to 15,800 I had to change my graph to reflect that and change my examples to reflect that and bring it up to the, uh, so that at that point in time. Then when it changed to 21,000 I had to do it again, and then add in the fields that they then let in, not just the high tension alloy steels, but the other proprietary steels at, that were under the definition of the AISA, and so forth. What occurs here, is that this chart as one of my charts, and calculations that I did all personally myself, and all the examples that I developed, and that's a hundred percent mine.

Mr. Joukoff: This is not the industry standard. It is

Mr. Kent: Now (NOT UNDERSTANDABLE, KENT AND JOUKOFF SPEAKING AT ONCE). Now wait a minute. This does conform to the requirements.

Mr. Joukoff: Okay. The AWS says that for each 1/8th or 1/16th inch of weld leg that you are supporting, you are capable of supporting so much load, so many

Mr. Kent: Let me see that. It doesn't say that, it doesn't say that. It's been changed. It says, that on the theoretical throat or the described isoceles triangle, okay. Here again, we go to the inscribed theoretical throat and that throat is where the shear plane is, theoretically, in shear. All right. And by the same token, they have added a new requirement that they

cannot exceed the base metal fusion strength in the base metal from the weld metal. Now, it used not to be that way. It used to be that it was of the old way to where everything was only, only, theoretical throat and the inscribed isoceles triangle. Now they have added a new requirement in at the junctions of the base metal. Okay?

Mr. Joukoff: Okay, but that's, they've, by analysis that is shown to be (NOT UNDERSTANDABLE, KENT AND JOUKOFF TALKING AT ONCE) support

Mr. Kent: But you can draw, you can draw, you can draw any number of cables. For God's sake you can draw anything under the sun.

Mr. Joukoff: But if so shown, that so _____, so many

Mr. Kent: It doesn't say that right in here, no. But by the same token, people have made these seals, I've seen what you are talking about, okay? Okay, I see what you are talking about, but by the same token I have the prerogative of going in and making my own

Mr. Joukoff: But your welding engineer determines what it is that is weld using his processes and his procedure qualifications, and based upon his testing of his coupons during procedure qualifications, what they are capable of withstanding.

Mr. Kent: For each WP there is a PQR, right.

Mr. Joukoff: That's right.

Mr. Kent: Here again, we go back to things have been tested. Years and years ago, similar material, and sometimes even decades ago, we extrapolate and say that it is currently okay in a lot of areas for other people. A lot lot of people, a lot of people take issue with that because the steels do change, electrodes do change, and just because something survived 30, 40, 50 years ago, it doesn't

Mr. Joukoff: The Code does not address that. The Code addresses essential variables and material types.

Mr. Kent: I know that. I am well aware of that. And there is a lot of controversy between the AWS and the ASME people that

Mr. Joukoff: Therefore, the conclusion is, the only conclusion is that I can draw, is that they are in compliance with the Code. You have not shown me where they are not in compliance with the Code.

Mr. Kent: It is unfortunate, because the Code leaves a tremendous amount to be desired.

Mr. Kirsch: A lot in your opinion.

Mr. Kent: Not just in my opinion. A lot of other people's opinion lead

Mr. Joukoff: Okay, okay, I'll

Mr. Kent: Many other people.

Mr. Joukoff: I'll give you that one. But, we enforce compliance with their commitment to Code

Mr. Kent: And a lot of the ASME Code stinks.

Mr. Joukoff: Where have they not complied with the Code?

Mr. Kent: Where? Okay, a lot of the ASME Code leaves a lot of holes open in the net

Mr. Joukoff: I'm not going to get into the distinction

Mr. Kent: In the safety net, in the safety net. A lot of big holes in the safety net.

Mr. Joukoff: Okay, I would like

Mr. Kent: Like this gas metal arc welding where you are dead and alive half the time they do not outlaw it. The AWS did outlaw it. They retracted _____ status to it, but ASME has not. And, that is, is, is, uh, sticking at times with no welding underneath the weld. Now that is horrible when you allow nuclear applications, even if it is allowed under the Code.

Mr. Joukoff: I would like the record to read regarding the electrical tray hanger welds that are often, in the opinion of Mr. Kent, to be of inadequate design to support the required load. That his opinion has no established basis in fact that I have been able to determine.

Mr. Kent: Well, my opinion is based on my years as a welding journeyman, as a welding instructor, for years as a welding engineer, for years in the quality engineer, and for years of welding (NOT UNDERSTANDABLE) and I've developed a lot more than just these two sheets here like you saw in the welding encylopedia over there. But,

Mr. Shackelton: Excuse me. Earl, at this point we are going to have to go off. This tape is about ready to run off. The time is now 4:03 p.m., October 15, 1982, and we will change the tape.

Mr. Shackelton: Excuse me gentlemen, just for the record, we had placed a cartridge in the machine and it failed to function, and we have had to replace it so we have lost some of the interview which began at 4.34 p.m. The time is now approximately 4:38 p.m. And during this discussion, Mr. Kent was giving his opinions regarding the qualifications of QC weld and inspectors and now we are resuming our conversation.

Mr. Kirsch: Okay. Earl, I do not wish to become embroiled in a philosophical discussion about what is good practice and qualifications of quality control inspectors in the welding area. What I do wish to be, however, is informed of any knowledge that you have wherein an inspector was qualified either under fraudulent means or using a program of qualification that was not in compliance with the Code requirement. Do you know of any of those?

Mr. Kent: Not specifically that, But in my honest opinion, they leave an awful lot to be desired when you have people, especially very, very young

people, inspecting nuclear welds and they have no true in-depth knowledge of welding per se.

Mr. Kirsch: As I told you before, Earl, that's philosophical in nature and has no relationship to the Code.

Mr. Kent: No, I think that's a direct relation, I think that it has direct bearing on it because just like flying an airplane, you wouldn't want the pilot to be just, uh, just a fellow who just soloed. You wouldn't want the fellow to just have his license, and you be on the plane the first time after he has soloed. I wouldn't care to be. And yet you have a similar situation here where you have the inspector with no, very often, no real in-depth real knowledge, having worked as a journeyman for years prior to becoming an inspector where they really understand welding and all that's required. Theoretically, they may be able to do it on a sheet of paper if you made a test, very _____, you had them do certain things on the test, theoretically, they might be qualified but in my mind, they should never be allowed in nuclear work, especially SR areas, safety--related equipment and so forth, to inspect work when they don't really understand the in-depth requirement of welding. A lot of them don't even begin to understand the theory of welding, let alone the actual welding. Many of them, evidently, haven't never worked for years as welders. And, in my opinion, it has a direct bearing on the, on the acceptance or rejection of very, very critical welds in nuclear applications including the SR equipment.

Mr. Kirsch: Let the record show that Mr. Kent has failed to show an instance wherein Bechtel at San Onofre has not qualified their welding inspectors in

accordance with their program or where they have not qualified their welding inspectors sufficiently to perform the level of _____ inspection that Bechtel requires.

Mr. Kent: It is my honest opinion that their program leaves a lot to be desired; the program is inadequate.

Mr. Kirsch: We've already gone through that, Earl. We have that on the tape four times.

Mr. Kent: All right. That's fine. In my opinion, I would certainly change the program

Mr. Kirsch: Why:

Mr. Kent: for qualification. I would certainly change it. And I would certainly cull to make sure that the people doing the nuclear inspection actually knew welding instead of just a cursory review of what is theoretically required on paper.

Mr. Kirsch: Let us go on to another topic.

Mr. Shackelton: Earl, we've got, the day is, the sun is going down. Is there any more issues, without getting into the philosophical, because I'm going to cut off on the philosophical. We've got to know if you've got a safety-related issue out there.

Mr. Kent: Now when you are saying only SR, you are tying my hands again.

Mr. Shackelton: Well, Earl, let's not go into that anymore.

Mr. Joukoff: We are not tying your hands. The law has tied everybody's hands. We are only dealing with SR. What other areas do you have that concern SR?

Mr. Kent: Now you actually ask me give me specific, particular items in SR that I cannot give you.

Mr. Shackleton: Well, give us something that we can use

Mr. Kent: A location?

Mr. Shackelton: Yes, give us something we can work with

Mr. Kent: I've been trying to think of one. Let me ask you a question. Have you ever observed in any SR equipment that the anchor bolt did not come completely out beyond the nut the several threads required?

Mr. Kirsch: Yes, I did observe that this week out at San Onofre. I examined their action and resolution of that instance, and I found that they did write a nonconformance report. It was evaluated by engineering, analysis was performed, and deemed acceptable in that application.

Mr. Kent: And the original acceptance of it, was the man who accepted it, a

Mr. Kirsch: A man did not accept it. He identified it as a nonconforming condition.

Mr. Kent: As a nonconforming report. Yes, very definitely, that's what he should have done. But in my, uh, lifetime I have seen many instances where anchor bolts coming out of the concrete did not project the two threads beyond the nut as demanded

Mr. Kirsch: Where is the two threads required, Earl? In my knowledge of the Code, it does not require two threads beyond the nut. It requires flush.

Mr. Kent: No, I do not agree with that because

Mr. Shackelton: In spite of the philosophical discussion, do you know where in the Code is says that flush is not acceptable?

Mr. Kent: I think your research, I think if you will research it, that you will find that

Mr. Kirsch: The EISC standard for A325 and A490 bolting requires flush.

Mr. Kent: I do not believe that because I think it has to be, here's the ASCE right here, and I think it has to be inacceptable for flush.

Mr. Kirsch: They don't have 325 and 490 bolting

Mr. Kent: I do, I have, have both high strength bolting, A325 and A490, yes, I do. Absolutely, I do.

Mr. Shackelton: We will be going off the tape while Earl looks through his manual.

Mr. Kent: Largest as two threads, minimum, as projecting beyond the nut after it has been tightened down.

Mr. Kirsch: The back of your memory I think, Earl, is referring to the United States Navy standard on bolting. That requires one-and-one-half threads.

Mr. Kent: No, it was beyond,

Mr. Kirsch: Mill standard

Mr. Kent: No, this was beyond the mill standard one-and-one-half threads. This had to do with two threads. Somewhere in my memory there are two threads.

Mr. Kirsch: I don't recall that, Ear .

Mr. Kent: Well, well I recall that in the back of my memory that two threads is the minimum projection beyond the nut.

Mr. Kirsch: I would appreciate your finding that for me.

Mr. Kent: Well let me ask you if you would please check Bechtel's specs and that may well be where it is.

Mr. Kirsch: No, Bechtel specs require flush. In (NOT UNDERSTANDABLE) the ISC

Mr. Kent: Well somewhere, somewhere, somewhere I read that flush was not acceptable.

Mr. Kirsch: No, in accordance with AIS, it requires flush.

Mr. Kent: Where in AIS does it say that it can be flush?

Mr. Kirsch: I asked you, you told me two threads. I'm telling you that I know where it's at.

Mr. Kent: Well I have never heard that it's acceptable when it's flush. Never in my life. Never. But here on page 517, 5177,

Mr. Kirsch: (NOT UNDERSTANDABLE) ASMP, its okay.

Mr. Kent: This is ASMP 225 bolts, and it says that there preceding values are generalized but do allow for manufacturer tolerances to provide for the use of heavy semi-finished hexagonal nuts with adequate stick-through at the end of the bolt. Okay, now how do you define stick-through?

Mr. Kirsch: In the preceding values that they are talking about here, are these values here for the heavy semi-finished hex nuts?

Mr. Kent: Yes, or for a bolt with a shank, and the shank is the underside of the head. Right here, the bolt length is from the underside, the underside here, out to the end here. But somewhere in my mind, it sticks through, that, uh,

Mr. Kirsch: I remember that, Earl. I would like you to find that.

Mr. Kent: I certainly would like to find it as two threads because somewhere in my mind, it is two threads as a minimum projection. Let me look, let me look under A4-- it may be under A490, under installation, may be under installation here. Here's installation, under A325 bolts. Let us see if we can find it here. Let's see if we can find it here. That's the procedure (NOT UNDERSTANDABLE, MR. KENT IS MUTTERING WHILE LOOKING THROUGH THE MANUAL.) Maybe it's under here.

Mr. Shackleton: While Earl is looking through his manual, we will go off the tape.

Mr. Kirsch: Do you know anything of

Mr. Kent: My opinion is that they should be spiked to where they can't vibrate off. Because they have lost

Mr. Kirsch: They do require spiking of the bolts to prevent vibration

Mr. Kent: Well they have lost bolts in Unit 1, as you are well aware.

Mr. Kirsch: Do they require that, Earl.

Mr. Kent: No, the Code does not require it. But by the same token you have lost bolts in Unit 1, and when you lose a bolt in a nuclear power plant, I don't care whether its in flanges or where it is, this is evidence that the nut has vibrated loose and the, the bolt has dropped out.

Mr. Shackelton: I would take that up with one of the Code committees. If we can get it into the Code, then we can enforce it.

Mr. Kent: I would certainly like to see all of the bolts spiked to where you have to keep

Mr. Shackelton: Maybe you could write that up and get it into one of the Code committees.

Mr. Kent: To keep, to keep the nuts from backing up on the bolt, and this can be done with a center punch or a chisel, it doesn't have to be a deep cut, but the external thread is not down at the root. Just the external surface, just enough to, uh, cut it enough to where the nut cannot back off easily.

Mr. Shackelton: Okay, Earl. Do you have any other areas where

Mr. Kirsch: Other than a philosophical discussion, do you have any evidence at San Onofre that bolting has been improperly done and accepted?

Mr. Kent: Now when you say improperly done and accepted, I will give you an example where I did not allow them to install it improperly. One was on the waste decay tank, uh, that was gas, gas decay tank there, waste tank, that was being modified while I was down there, and they had

Mr. Shackelton: Is this Unit 1, Earl?

Mr. Kent: No, no, this is Unit, uh, wait a second, I'm sorry. I'm sorry, wait a second, let me think. No, I think it is in Unit 1.

Mr. Kirsch: Well, you said modification

Mr. Kent: Yes, modification, yes. It is in Unit 1. That's correct, absolutely correct. On this particular, uh, tank, they had done some reinforcing welding on it, for hours. And when they were bolting this back up, I was observing their bolting patterns, cross bolting as demanded, and Bechtel specs which are very good for delineation of requirements. But I noticed the men doing the work, that they were cranking these bolts back on this big cover plate at the gasket, that one bolt, they didn't appear to crank it down all the way they should have. After they felt that they had finished their work, they said that's all done and I says, no, it's not all done. Throw me the wrench. And I borrowed a wrench and I was able to turn that particular nut on that bolt probably to a north of 20 degrees. That bolt was supposed to be tightened so tight that you couldn't turn it all, not even half a degree. They were appalled that this was possible.

Mr. Kirsch: Therefore you did your job. Let the record show you did your job, the quality assurance program did catch that deficiency, and corrected it.

Mr. Kent: And not only that bolt, not only the nut on the bolt, but I was able to turn several other nuts on several other bolts on that same cover plate, but not to about 20 degrees.

Mr. Kirsch: Earl, you did your job, Earl.

Mr. Kent: Good, I had to check every single bolt after they finished it by cranking it myself.

Mr. Shackelton: You did a good job. So then we don't have to look at that, everything is fine with that particular

Mr. Kent: But you should have seen the expression on the workers' faces, all of them there, when I was able to crank that first one there around about 20 degrees. Around to an arc of about 20 degrees. They could not believe it. They could not believe it. They were

Mr. Shackelton: Do you have any other areas you would like to go in?

Mr. Kent: Uh, you indicated earlier that I can't really ask questions on, (NOT UNDERSTANDABLE)

Mr. Shackelton: Earl, we're getting your concerns now, if you have more concerns

Mr. Kirsch: That was the purpose of this meeting, to get your concerns. We are not a review board on that plant.

Mr. Shackleton: Do you have any more concerns that you would like to bring forth?

Mr. Kent: But you did mention earlier that you will check the, uh, hydro line that we mentioned earlier and will check the wall to make sure that the, uh, the remaining wall would be able to withstand the pressure in that alignment?

Mr. Kirsch: We will take a look at it.

Mr. Kent: Very good. I hopefully saved at least one human life when I brought it to the attention of the responsible people, and it may have been more than one human life at that point in time. I believe that I saved Southern California Edison from having a major hydrogen fire within Unit 1.

Mr. Kirsch: Do you have any other areas that you would like to go into?

Mr. Kent: I wanted to ask some questions, but, here again, uh

Mr. Shackelton: Do you have any other concerns that you want to raise?

Mr. Kent: Now when you say concerns that I want to raise

Mr. Kirsch: Those that you have seen, that you know, or feel are not correct with the Code for normal procedures on safety-related (NOT UNDERSTANDABLE, KIRSCH AND KENT TALKING AT ONCE)

Mr. Kent: And, uh, just trying to think of, uh, some other areas that I should bring forth about now.

Mr. Shackleton: While Earl is considering this, we will go off the tape.

Mr. Shackleton: Okay, the time is now 5:02 p.m. in October 15, 1982, and we are going to bring this interview to a close with Mr. Kent. And during the time we were off tape, we advised Mr. Kent that we are always available. We have furnished him with our telephone numbers and our names, if he has additional concerns, that all he has to do is call us collect, and we will respond to any of his concerns that relate to procedures and hardware that come under the jurisdiction of the Nuclear Regulatory Commission in regards to the San Onofre Nuclear Generating Station that we are discussing during this lengthy interview. And at this time, we will bring this interview to a close at approximately 5:02 p.m., October 15, 1982.

Date: October 16, 1982
Time: 1:30 pm.

I, E. Earl Kent, voluntarily make the following statement to Messrs. Philip V. Joukoff and Owen C. Shackleton Jr. who have identified themselves to me as investigators for the U. S. Nuclear Regulatory Commission (NRC). I make this statement freely with no threats or promises of reward having been made to me.

I am 57 years old and have worked since ~~March, 1943~~ JUNE 1942 E.K. as a welder, welding quality control inspector, welding engineer, E.K. ETC. E.K. and author of welding articles for welding journals. In ~~1955~~ JAN. 1955 I received a diploma for completion of the Structural Engineering Course from the International Correspondence School, Scranton, Pennsylvania. I worked for Bechtel Power Corporation as a Senior Quality Control Engineer in welding at the San Onofre Nuclear Generating Station (SONGS) from October, 1980 until ~~September~~ E.K. AUGUST, 1981.

During my employment at SONGS I identified the following concerns which were identified to me by the NRC personnel who interviewed me on October 15, 1982 as possibly affecting nuclear safety systems, AND OTHER ITEMS. E.K.

(1) Pipe fitters, SOMETIMES E.K. used pipe cutters to make scribe marks for socket weld fitup measurements. These scribe marks caused grooves in both stainless and carbon steel pipes about 1" back from the weld area. I am concerned that these grooves might cause stress raisers. These conditions exist on socket welded fittings ~~all over~~ Units 2 and 3, E.K. POSSIBLY A FEW IN UNIT 1. E.K. AT RANDOM IN E.K.

(2) Bechtel designers ~~only~~ use fillet welds on ~~welded~~ connections of beams in pipe supports and tray hangers and do not weld all around the joint to restrain forces in all directions. I feel this is a code violation. No prototype tests were conducted to verify the adequacy of these welds. Therefore, the actual structural strength of the electrical tray hanger/tube steel welds used on the actual material at SONGS ~~has~~ E.K. not been truly known. This also applies to pipe supports. E.K. I also feel that the failure to weld all around the joint is a generic problem. Unfortunately, and in my opinion, ~~wrongly~~, the codes do not demand ~~full penetration welding~~ E.K. FULL PENETRATION WELDING, E.K. ALTHOUGH NOT. E.K. ASME requires adequate root penetration of fillet welds. I recall that some of the vendor supplied welded hardware ~~did~~ not have adequate root penetrations. The one vendor I can recall is Zack, I believe a supplier of HVAC equipment. I remember one instance on a piece of Zack hardware where a fillet weld with inadequate root penetration- E.K. E.K. TO MY PERSONAL KNOWLEDGE, E.K. APPEARED TO E.K. OFTEN PART JOINTS. (LIKE T FULL JO INTEGRI E.K. NOT ALWA E.K. WELDING

was identified during inspection on site. This instance was subsequently corrected by weld repair before installation in the plant. I don't remember if this equipment was used in SONGS Units 2 or 3. I recommend that the NRC examine the beginning and end of fillet welds to assure root penetration at these areas, and conduct destructive testing of selected supports supplied by this vendor to determine if other fillet welds have inadequate root penetrations, OR OTHER CODE VIOLATIONS.

(4) A steel bracket was placed between a Unit 1 hydrogen line on trip for steam generator. This was done because the hydrogen line had worn thin due to rubbing with another line. I believe maintenance people at the site who were working during the period when damage due to the Unit 1 diesel generator fire was being corrected would remember and be able to locate the design change and spacer. I don't recall the exact location of the hydrogen line. To my best recollection there wasn't equipment within ten feet. I don't remember if there was any nuclear safety-related equipment nearby. I am concerned for the integrity of nuclear safety-related equipment, if located nearby, and about the potential for loss of human life and fire, should this line rupture. I recommend NRC conduct an examination of this hydrogen line and make certain it has sufficient wall thickness to be safely operated. MOST LIKELY, I PREVENTED A MAJOR FIRE IN UNIT AND PROBABLY SAVED THE LIVES OF SEVERAL (OR MORE) WORKING THERE.

(5) I am certain that weld end returns are not required on Bechtel drawings. This is in violation of AWS-D1.1, Section 8, paragraphs 8.8.6, 8.8.6.1, and 8.8.6.2. These conditions exist on details in structural applications. A two page Bechtel Power Corporation table establishes that certain pipe supports must conform to AWS-D1.1 requirements.

(6) Bechtel Construction Specification CS - P207, Revision 7, dated April 18, 1980, paragraphs 5.6 and 5.7, contains visual examination criteria used by Bechtel for pipe supports and reference the ASME B2PV Code, Section III, Subsection NF. I told John O'Dell, investigative reporter for the Los Angeles Times, that the visual criteria of CS - P207 are not in accordance with the above code requirements, particularly in CS - P207 paragraphs 5.6.1.3 ( porosity and slag), weld convexity height acceptance criteria, 5.6.1.9 (underfilled groove weld craters), 5.6.1.11 (arc strike acceptance criteria, and 5.7.2 (allowing groove welds with fillet caps to be welded as fillet welds).

(7) Bechtel generated a 92 page NCR on electrical tray hangers. I question whether the welds made on electrical supports prior to the NCR resolution were fixed.

(8) Bechtel has not complied with the requirements of AWS D1.1 (1974 edition), paragraphs 5.12.1.5.(2).(X) and 8.15.1.3, regarding filling of open weld craters on tray hangers to full

(5)

cross section of the weld.

(9) Bechtel has not removed arc strikes from base metal of pipe supports or structural steel as required by AWS D1.1 paragraph 4.4.

(10) I observed instances where run off plates were not used as required by AWS D1.1 paragraph 4.6 of groove weld terminations. I cannot recall any specific locations, but I do recall observing this condition on beam and girder splices.

(11) I believe that a spacer plate is missing on the upper inside door hinge of the Unit 2 containment personnel hatch because I observed a gap in the weld joint of about 1/4 inch. I brought this to the attention of my supervisor who also shared that belief. I believe that by bringing this condition to the attention of my supervisor I had properly performed my duty to identify this condition. I did not compare the drawing requirements to the installed condition in making this determination of a missing spacer plate.

(12) I believe that Bechtel has misinterpreted the requirements of the ASME Section III welding standards regarding socket weld engagement length without initiating a code case and obtaining appropriate code relief. The ASME code requires a gap between the pipe end and the fitting of "approximately 1/16 inch". I believe that the code should provide a more definitive acceptance criteria than merely "approximately 1/16 inch".

(13) Bechtel specification WQ-2, sheet 20, note 1, requires "shall not exceed 1/3 inch..." regarding maximum groove weld reinforcement height. This requirement should read "shall not exceed 1/8 inch..." as required by the ASME Section III code on groove weld reinforcement. The 1/3 inch height is implemented at San Onofre.

(14) I believe that the caliber of individuals employed by Peabody Testing to perform nondestructive examination (NDE) on welds in nuclear service applications was not acceptable. This belief is based on the observation of many spelling errors, such as the incorrect spellings of the words "fillet" and "weld", on NDE reports prepared by these individuals. Because of these observed spelling errors, I question the abilities of these NDE personnel to perform the required examinations as required by their procedures. I believe that established industry standards regarding the qualification of NDE personnel are not sufficient to assure an adequate level of personnel capability and knowledge in this very important area of inspection.

I have advised the above named NRC personnel of other concerns I have regarding inadequacies that I [illegible] in Industry Codes and Standards (i.e. AWS, ASME, AISC, etc.). The NRC representatives have told me that these areas are not within the jurisdiction of the NRC and although I do

not necessarily agree with this, I do understand that this is the case.. The NRC representatives have also told me that I can report my areas of concern regarding Codes to the applicable code committee. HOWEVER, WHERE SAFETY & LIFE IS AT STAKE, I ASK THEM TO HELP MY EFFORTS AS MUCH I further have advised the NRC representatives that I have many concerns re regarding welding done on non-nuclear safety related systems and equipment. I have been advised by the NRC representatives that these areas are also not within the jurisdiction of the NRC. The NRC representatives have told me that I can report these concerns directly to the utility, SCE, or whatever other local, state, or federal agency that has jurisdiction.

E.K.
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E.K.

I have read the foregoing statement consisting of this and four other typewritten pages. I have made and initialed any necessary corrections and have signed my name in ink in the margin of each page. I swear that the foregoing statement is true and correct. Signed on _____ at _____.

Signature: _____
E. Earl Kent

Subscribed and sworn to before me this _____ day of _____, 1982 at _____.

Investigator: _____
Owen C. Shackleton Jr.

Witness: _____
Philip V. Joukoff
Investigator, OISFFO

October 19, 1982

On Saturday, October 16, 1982, at approximately 2:44 p.m., in the city of Cypress, California, E. Earl KENT stated to the undersigned that he would not sign his attached sworn statement. Mr. KENT, in response to questioning, further stated that the statement, as amended by him, was true and correct as amended.

INVESTIGATOR: Owen C. Shackleton Jr.
Owen C. Shackleton Jr., Acting Director, OISFFO

WITNESS: Philip V. Soukoff
Philip V. Soukoff, Investigator, OISFFO