

INTERVIEW OF JOSEPH H. CRANE

Case No.: 5-82-009

Transcript of tape
recorded interview of: Joseph H. CRANE

Date of Interview: June 17, 1982

Interviewers: Eugene J. POWER and Owen C. SHACKLETON
Jr., Investigators assigned to Region V,
U. S. Nuclear Regulatory Commission

Purpose of Interview: To obtain CRANE's comments concerning
some of the allegations made about
Unit 1, PVNGS, by Robert D. GUNDERSON
Jr.

Location of Interview: Management trailer for the Bechtel Power
Corporation at the Palo Verde Nuclear
Generation Station.

Conditions of Interview: Interview was conducted after CRANE
had been placed under oath.

INTERVIEW OF JOSEPH H. CRANE

SHACKLETON: This is an interview taking place on June 17, 1982 in the management trailer for Bechtel Power Corporation at the Palo Verde Nuclear Generation Station. This is an interview of Mr. Joseph H. CRANE, last name is spelled C-R-A-N-E. Mr. CRANE is a foreman in electrical and is in charge of a termination crew. Present to conduct this interview from the Nuclear Regulatory Commission is E. J. POWER, Investigator, and myself, O. C. SHACKLETON, Investigator, both of us assigned to Region V. Mr. CRANE, are we, uh, conducting this interview on tape with your permission?

CRANE: Yes, sir.

SHACKLETON: And as I understand it, Mr. CRANE, you would like to have a transcription of this tape, is that correct?

CRANE: That is correct.

SHACKLETON: O.K. The Commission will see that that is done and we'll mail it to your residence. Joe, we have a list of questions that are based on the allegations that were furnished to the Commission, uh, concerning some of the electrical work that's been done on Unit 1 and at this time ... the first subject that I want to talk about is termination cards.

CRANE: Yes, sir.

SHACKLETON: We have an allegation that some of the men ... I'm talking about the craftsmen ... from time to time have been directed by foremen to complete a termination card on work that they did not terminate.

CRANE: In some instances, this may be true. Primarily, engineering loses cards through the computer system. They refer a new card to the field to be redocumented and in which case, the foreman usually tries to find a journeyman that has done the card previously because we have a log of this, and so which journeyman done what card. And then we instruct the journeyman to either go and reterminate it or if he's satisfied that he done it before, sign the card off and return it to engineering.

SHACKLETON: Joe, when this happens, is it customary that the electrician will go look at the termination?

CRANE: Oh, definitely.

SHACKLETON: O.K. Now, what happens in the some of the cases, uh, where you've had, uh, men leave for some reason and you find that a card has been lost, however, and you've got to make a new termination card, and the journeyman is gone, now what happens? What's the procedure?

CRANE: Well, what the procedure is ... I usually instruct a man to go check it and re-do the ... cut the lugs and reterminate it.

SHACKLETON: And then he signs it with his name ...

CRANE: He signs it with his name.

SHACKLETON: ... and his, his crimping tool?

CRANE: His crimping tool.

SHACKLETON: Joe, have you ever known any occasion, uh, where someone else, some other foreman has directed a guy, uh, an electrician, to fill out a termination card for work that he did not perform? And not corrected as you've stated. In other words, leave it as it is, don't cut off the lugs and reterminate it.

CRANE: Not in my knowledge.

SHACKLETON: Gene, do you have any questions on that point?

POWER: Yeah, you made reference to a log. Who, who keeps the log up?

CRANE: Each foreman keeps a log of all cards that are distributed to him in the field.

POWER: O.K.

CRANE: And we sign the cards to the men by systems ...

POWER: (Unintelligible) Right, O.K. (Unintelligible)

CRANE: That way we have a track of where the cards are.

POWER: Yeah.

CRANE: But there seems to be quite a few cards that are lost in through the computer system.

POWER: Yeah, what, what's a guesstimate? Any idea of how many of them?

CRANE: No, it's not an enormous amount, but there are quite a few ...

POWER: No, is it 20 or is it a hundred or ...?

CRANE: Oh, yeah, I'm sure it is ...

POWER: ... a couple hundred?

CRANE: There's probably been 50 cards lost, you know.

POWER: Over a period of how long?

CRANE: About two, three years.

POWER: Yeah, I'll be darned.

CRANE: And, uh, we do get quite a few duplicate cards.

POWER: Yeah.

CRANE: When cards come out that we've already completed.

POWER: Right. Then what do you do with the completed ... how do you correct that problem?

CRANE: We refer it back to engineering ...

POWER: (Unintelligible)

CRANE: ... that it's already been completed.

POWER: Yeah.

CRANE: Previous.

POWER: O.K.

SHACKLETON: Joe ... excuse me ...

POWER: Yeah, is, uh, how far back do these logs go when the journeyman (unintelligible)?

CRANE: I ... roughly two years since we got into the basic ...

POWER: O.K. Is that a procedural requirement or is that just a, an on-the-job ...

CRANE: That's just an on-the-job ...

POWER: ... way to maintain ...

CRANE: ... just an on, on-the-job performance. The general foreman sets this up with his foreman.

POWER: O.K. So, what happens if a ...

CRANE: So, we have ...

POWER: ... foreman leaves ... If we wanted to go back say a year and a half ago, do you think we could possibly go back and, and check that ...?

CRANE: I think you could find the books still in the foremens' shacks, yeah.

POWER: Yeah, O.K. You made reference to, uh, instructions that you've given journeymen electricians to, uh, on a

termination. Is this a procedural written situation or is this just ...?

CRANE: No.

POWER: ... It's an oral deal? However (unintelligible).

CRANE: Just an oral deal, yeah.

POWER: O.K. When you look at ...

CRANE: Uh, I've never seen anything written on it.

POWER: O.K. When you get the cards back, do you know whether or not it's a, a retermination ... I mean is it a lost card, do you know that when you get the card?

CRANE: Usually when ... 'cause when we re-enter the card in our log book, uh, we can see where we've had the card previously.

POWER: Do you ... do you research it by card?

CRANE: Yeah, pretty well.

POWER: Oh, I'm surprised. I'm not ...

CRANE: Well, they're, they're ... our log books are not really that accurate because sometimes on the weekend they'll need cards from another foreman ...

POWER: Right.

CRANE: ... to work with another foreman, and there are some lost cards in there and, you know ...

POWER: Right.

CRANE: They're not really lost, but their traceability of the foreman loses ...

POWER: How, how do you track a card, what do you need to track a card?

CRANE: Track a card?

POWER: Yeah, no, you said you had a log and if a card comes to you, you knew you had it before so this is a, a second duplicate. Let's see, I think (unintelligible).

CRANE: Yeah (unintelligible).

POWER: That doesn't mean anything, that's just a ...

CRANE: There's another section of this card that's not here.

POWER: Yeah, right, but the printout on the side ...

CRANE: The printout out on the side that has the little tabs that goes on ...

POWER: The possum, yeah.

CRANE: O.K. On this card portion here the engineer, when he submits it, will put the system in here.

POWER: O.K.

CRANE: We log all our cards by the systems; our foremen do. O.K. And then we list the number here. The traceability of this card is through here.

POWER: Is through that number.

CRANE: Is through this number, here. That will give you the system it's on, what building it is, and everything is tied down to this number right here ...

POWER: O.K. But do you need the other little ...

CRANE: ... and usually the engineers write it down on the portion here that's torn off.

POWER: Yeah.

(end of tape)

SHACKLETON: I have a, a question, Joe. When, when you get a duplicate card, there's been a card lost, and, uh, you call a journeyman over that your records show is the one that did the work ...

CRANE: Uh-huh.

SHACKLETON: Do you, in any way, have him write on there that this is a duplicate card anywhere on that card?

CRANE: No, we, we never had that.

SHACKLETON: O.K. So there's no way, no way to tell without going through the record when you got a duplicate or, or an original?

CRANE: Uh-huh.

SHACKLETON: Any other questions?

CRANE: (Unintelligible).

SHACKLETON: Joe, the next, uh, subject I want to address is improper splicing ... pardon me ... splicing of quality class safety-related cables. Now we understand, and correct me if I'm wrong 'cause I'm not an electrician ... uh, for the most part on Q class cables, you can't splice 'em without going to engineering. I understand you would have to get some documentation to do it.

CRANE: That's right.

SHACKLETON: O.K. We have an allegation that there was some splicing done on some cable trays where damage was done by, uh, molten slag from overhead welding and rather than determinate and run a new line, the guys took a short cut and got a heat shrink tube kit, and, and made a repair on it, pulled the other cables over it ...

CRANE: I have no knowledge of ever ... any splicing on Q quality cable. On black cable. Right (unintelligible).

SHACKLETON: O.K. And the important thing ... you have never seen or ...

CRANE: Never seen it on Q quality cable.

SHACKLETON: Allright, fine.

POWER: Or ever heard of it?

CRANE: They're always ... they're always terminated in a junction box or the cables re-pull then.

POWER: Yeah, O.K.

SHACKLETON: The next point, uh, Joe, is some alleged problems with start-up where, uh, craftsmen have already terminated, there's been a buy off, and then start-up comes along and for one reason or another determinates and then puts the cabling back on and sometimes doesn't put it on as neat as it was originally was done, or doesn't put it on correctly, and later the foreman of the installation crew or one of his journeyman who work in that area comes along and finds it's happened. Has this been a problem for you?

CRANE: This is been very true, right, and possibly we'll get returned cards to reterminate a cable that someone else has disconnected, so what we do in this case, we'll reterminate the cable without putting new lugs on. We'll just lay it back down on the terminals, we'll sign the card off, with their name and number, but in the top portion there we put B-9999, which is no tool used.

POWER: What do you put on there? Just write it on the bottom, yeah.

CRANE: See it's ... this is the crimp tool calibration. If the man reterminates the cable, lays it down on the terminal strip without using his tool on it that somebody else has already put the lugs on ...

POWER: Yeah.

CRANE: ... then he puts B-9999, which is a code for no tool.

SHACKLETON: No tool used. 'Cause it, 'cause it was already previously done. The allegation we have is that in some cases start-up personnel are removing the wires without determination cards and leave them hanging in the cabinets.

CRANE: Whether they have termination cards, I have no ...

POWER: Yeah.

CRANE: ... authority on it.

POWER: Yeah.

CRANE: But we have gone back to re-lay down cables that someone else has ...

POWER: That someone else has (unintelligible)

CRANE: ... determined. Yeah, right. Who done it, I don't know.

POWER: How, how, how much of a problem is this? How frequent is it ...?

CRANE: It's not that great, but there are several instances ...

POWER: Is management generally aware of this? You know ...

CRANE: Yeah, but ...

POWER: (Unintelligible) general formant ...

CRANE: Yes, because they usually send us out with a new termination card.

POWER: Yeah.

SHACKLETON: Now, Joe, do you report to Hector NUNEZ?

CRANE: Yes, sir.

SHACKLETON: He's your immediate ...

CRANE: General foreman.

SHACKLETON: General foreman, O.K. So, usually it's NUNEZ then that would send you directions to have somebody correct something like that?

CRANE: That's correct.

SHACKLETON: O.K. And the next point is the use of improper insulation at high voltage termination. And what we're talking about here is allegedly at one time, not presently but some months in the past, uh, they were using a material called Scotchfill 2200 ...

CRANE: Uh-huh.

SHACKLETON: ... and apparently from information given to us, due to the heat we have here in the desert, a lot of this stuff, uh, was melting and running out on the terminations.

CRANE: That's true.

SHACKLETON: And they later, uh, they switched to this material referred to as 130-C?

CRANE: Uh-huh.

SHACKLETON: Has this been a problem, uh, you say it's true ...

CRANE: No, the 2200 was originally on the job site ...

SHACKLETON: Uh-huh.

CRANE: ... previous to approximately a year ago, I guess, and it was re-called and replaced with the 130-C, but it was never used to my knowledge on any high voltage. It was always on the low voltage motors.

SHACKLETON: O.K. When that was, uh, directed that it be 130-C replace Scotchfill, was there, uh, retrofitting? Did you have to go back and determinate?

CRANE: Yes, they reterminated quite a, quite a number of the motors.

SHACKLETON: And this would have been what kind of motors, Joe?

CRANE: Mostly small pump motors and uh ...

SHACKLETON: Were they related to class Q, uh ...

CRANE: No, no as far as I know, there were none of 'em on class Q ... all class Q requires a, uh, a, uh, Ray Chem heat shrink.

SHACKLETON: O.K. To make it seal tight.

POWER: Within the last year and a half, have you been on the, uh, high voltage terminations?

CRANE: No.

POWER: No? O.K.

SHACKLETON: O.K. The next subject, uh, was a situation where you have an electric motor and it's got a peckerhead with a one, one-bolt lug, and you run a field cable and it's got a two-bolt lug. And we're told this is, happens quite common, and now you've got a two-bolt lug to, to mate to a one-bolt lug. Now the allegation was that there are many cases the men were putting a second bolt in the, in the blank hole. Do you follow me? Am I get ...

CRANE: Yeah, I understand your theory, yeah, but uh ...

SHACKLETON: And what the one allegor apparently felt that this was a meth ... this was a method being done to, uh, make it look like there was two two-bolt lugs that were being placed together. Can you tell us what you know about this type of ...

CRANE: I was never involved with a situation like that.

SHACKLETON: O.K.

CRANE: Primarily my work has been in the control room.

SHACKLETON: O.K.

CRANE: And there are very few motors in there.

POWER: Yeah.

SHACKLETON: The next issue, uh, concerns QC inspectors. I understand on this job site, Joe, QC inspectors, they use the term interchangeably QC engineers. Is that true? Is that ...

CRANE: QC engineer ... I don't follow, no.

SHACKLETON: O.K. Then maybe it's not true. What do you call them, QC inspectors?

CRANE: Yes, sir. The QC we've had are, they come and inspect the men's work that he's done ...

SHACKLETON: Right. That's what I'm talking about.

CRANE: That's only ...

SHACKLETON: Well, I see an abbreviation, an acronym QCE ...

CRANE: QCE ...

POWER: Yeah. And an RFE bottom two signatures ...

SHACKLETON: I know what the RFE is; that's Responsible Field Engineer.

POWER: Yeah, yeah. The bottom line.

CRANE: This stuff here?

POWER: Yeah, right. That's a QC Engineer.

CRANE: I, I have not been ...

SHACKLETON: O.K. Well, some guys ...

CRANE: ... involved with that.

SHACKLETON: ... have told me that, uh ...

CRANE: QC will document our crimp tool number and this up here with this ...

POWER: Yeah, right, no yeah.

CRANE: That's the only involvement that I've had with QC.

SHACKLETON: Anyway, the allegation is that, uh, the QC inspectors are not properly trained or qualified for inspecting electrical, uh, installations. Now, what have your experiences been, you've been here about three years. What's your opinion on the QC inspectors?

CRANE: Well, they have, some of their inspectors are better than others. I haven't seen any real ...

SHACKLETON: If you were, you were the client, you were APS, would you be satisfied with the work that's being performed by the QC inspectors?

CRANE: The QC portion?

SHACKLETON: Yes.

CRANE: Yeah, I, I'd say so. You know, they've, they've been fairly thorough, I thought, you know. They make, they make errors too, you know.

POWER: Oh, yeah.

CRANE: Everybody's human.

SHACKLETON: No, everybody's human.

POWER: But they're, they're doing an adequate share ...

CRANE: Basically, I feel that they are.

SHACKLETON: Well, you've been in this for your whole life.

CRANE: Going on 37 years, and, uh, I, I think that expecially the two top men in that QC department there, Vince and, uh, Joe CRAWFORD, have been real cooperative, and, uh, they just try and do a good job, I thought.

SHACKLETON: O.K. Very good. Have you noticed or felt there was any problem, Joe, where construction - when I say construction I'm referring to yourself - people who are responsible for the installations - management as well as the crafts - of intimidating or overriding the QC personnel?

CRANE: No, I've never, never seen anything of that.

SHACKLETON: The next, uh, point we ... uh, concerns high potting and meggering.

CRANE: Uh-huh.

SHACKLETON: And we have an allegation that, uh, and this again is talking about high voltage lines ...

CRANE: Yeah.

SHACKLETON: ... and Class Q. Anaconda copper, according to the concerned parties, has a specification that, uh, high potting, they only guarantee their product for one high potting test, and the allegation is that, that there are ...

around here there have been a lot of lines that have been high potted several times ...

CRANE: This is true.

SHACKLETON: ... and, uh, the people who are concerned about it say it's because of start-up or what not comes along and there's, there hasn't been coordination with construction to find out if it's already been high potted. Can you tell us what you know of it?

CRANE: I can't verify that. I can only verify that I've seen cables that have been high potted several times.

SHACKLETON: Do you know why?

CRANE: Well, I thought it was lack of experience in some of Bechtel engineering.

SHACKLETON: Uh-huh. Not knowing how to do the test? Is, is it still going on, or are you going back in time, or, when you're talking about something ...

CRANE: This has happened in my experience for several years ago and when I had a break period of high voltage was under my direction.

POWER: Yeah.

SHACKLETON: What's the situation now?

CRANE: I really don't know, now. Primarily most of the high voltage is all done.

SHACKLETON: Uh-huh.

CRANE: I have seen them high pot cables several times, which I don't believe that they were Q cables, though that when I experienced ... they were non-class, feeders to the water wreck area.

SHACKLETON: Feeders to the water wreck area? The next point that was brought to our attention was, uh, omission of the use of O-rings. And what I'm talking about specifically, Joe, is that, and you'll bear with me on my terminology ...

CRANE: Yes, sir.

SHACKLETON: ... but as I recall them, you have control panels ...

CRANE: Yes, sir.

SHACKLETON: ... and where the cables come in, and they go into the panel, they want water tight integrity 'cause they've got piping over the head and you may get a leak and what not and they don't want to get a short, so they've got, uh, O-rings with a fastening device that screws down ...

CRANE: Uh-huh.

SHACKLETON: ... so that where the cable enters into the top of the panel, it's uh, tight. The allegation, the allegation is that, uh, there was omission of a lot of O-rings because Bechtel didn't have 'em for about six months and they had to go ahead and do their terminations without them.

CRANE: I was not involved with any of these. I understand these were in the containment?

SHACKLETON: Uh ... the cabinets downstairs in the Control Building at the 1000 foot elevation.

CRANE: I didn't know that was a water tight area down there.

SHACKLETON: Well, our engineer is going to be looking at it if they haven't already.

CRANE: The only water tight area I thought was concerned was the containment.

SHACKLETON: Uh-huh.. No, this apparently, uh, is an area where there's a lot of piping.

CRANE: Switchgear is open top from the control room 100.

SHACKLETON: Uh-huh.

CRANE: Of course the cable trays ... I, I think there is an error in there.

SHACKLETON: Yeah.

POWER: Yeah, could be.

SHACKLETON: We'll find out, because our ... we'll be in the field checking it out. The next point was concerning damaged conduit from drilling. And what this ... what I'm talking about here, we have an allegation that when the, uh, Auxiliary Building on the southeast corner by the 100 foot elevation and about 15 feet above the floor, uh, some workman drilled cores into the wall. They were gonna run some lines through ...

CRANE: Uh-huh.

SHACKLETON: ... and when they did this, they inadvertently drilled into some conduit ...

CRANE: Uh-huh.

SHACKLETON: ... and, uh, it was hard as hell to repair because it was like 18 inches into the wall, so they just used some kind of a, of a compound and plugged it up and went on about their business. Have you ever observed or known of any occasion where conduit has been accidentally ruptured like that by drilling and not properly repaired?

CRANE: I have no knowledge of any cable like that - conduit.

POWER: Do they have, uh, is it a common practice to put, uh, electrical ...

CRANE: Very, it's very ...

POWER: ... conduit within a wall ...

CRANE: ... very few drilling. The walls are full of conduit. There's a lot of conduit in the walls but, uh, very little drilling has ever went on that I know of.

POWER: Yeah. Would there be, uh, a special crew if there was, in fact, a damaged conduit? For instance, you take care of terminations ...

CRANE: Yeah.

POWER: ... would there be anybody that ...

CRANE: Well, there's supposed to be the conduit crew in the area where the ...

POWER: O.K.

CRANE: ... accident happened.

POWER: Yeah. Allright.

SHACKLETON: Joe, the, the next point, uh, we've already resolved is, is not a problem, but I just wanted to talk to you because you said you worked in the control room quite a bit. One of the allegations we have ... now a lot of times these allegations are because men don't understand ...

CRANE: Uh-huh.

SHACKLETON: ... and they're ... what the ... this party was concerned about was that you're running field cables coming into the control room in the back of the panels and the cable, the lugs were too large to fasten in, into the termination point inside the cabinet. So, you run a pigtail out, and then you had a splice ...

CRANE: That's true.

SHACKLETON: ... where you, where you join 'em. I don't know if the term splice is proper ...

CRANE: Yes, it is.

SHACKLETON: ... 'cause it's lug to lug ...

CRANE: Yeah, it is a splice. In basic essence it is a splice.

SHACKLETON: O.K.

CRANE: Uh-huh.

SHACKLETON: And, uh, this one party felt that, uh, this wasn't proper because you have a small line and a big line, but we have found - our engineer went through a lot of paperwork the last few days and found out that this has been, it's part of the design and there's no problem ...

CRANE: (Unintelligible) It has an NCR attached with every case that this happens ...

SHACKLETON: Right, right. We have a big stack of 'em.

CRANE: Right, uh-huh. So it should be all documented.

SHACKLETON: O.K. The only other ... well, we got one problem here. Have you worked in Unit 2 at all?

CRANE: Very little. I was a general foreman in Unit 2 way long ago ... when the conduit or, I mean the concrete sections.

SHACKLETON: When the concrete sections?

CRANE: And then they were just coming out of the ground.

POWER: Yeah.

SHACKLETON: Well, one of the allegations we have is that because of, uh, adversarial relationships going on between some of the craft and the QC inspectors and some of the foremen and the crafts over there down on the, uh, (unintelligible) bear

with me a minute ... this has to do with electrical trays and pipe supports and we're talking about the uni ... commonly referred to as unistruts ...

CRANE: Unistruts.

SHACKLETON: ... that support the pipes and, uh, and, uh, cable trays. After ... over in Unit 2, it's down in the lower levels, and it's not spelled out here exactly where but I know ... remember the allegation had to do with, uh, lower levels of the building, ... I think it ... anyway, QC when they buy 'em off over there, they buy off the unistruts, there's imbed plates I understand over there, and they have a stamp and they stamp their mark so to speak into the imbed plate, the QC does. This ... you're shaking your head ...

CRANE: I'm not aware of it.

SHACKLETON: You're not aware of it, O.K.

CRANE: No.

SHACKLETON: Well, what the story is, is some of these QC people aren't too popular with some of the crafts so after they buy off the unistrut, some of our electricians are going over there and modifying the unistruts so it's obviously wrong so that when foremen come by and see that this, uh, screwed up unistrut's in there and it's been bought off, the QC inspector will get canned. Have you heard of any stories like this?

CRANE: No, I've never heard of anything (unintelligible).

SHACKLETON: O.K. The same thing is supposed to be going on because a couple of foremen over there have gotten on peoples' backs about early outs and, uh, taking too long of coffee breaks and what not and, uh, so it's, uh ...

CRANE: I, I have no knowledge with anything like this.

SHACKLETON: ... an attempt to get even with them. No knowledge, O.K. And the final issue I ... we wanted to discuss with you, Joe, was the problem of the use of controlled drugs on site. I'm talking specifically about smoking pot, marijuana, the use of cocaine, uh, amphetamines, black beauties, and uh, hashish.

CRANE: I've never ... never been involved with any of them or know anybody. I, I have smelled pot at times.

SHACKLETON: Yeah. Do you ...

CRANE: But where it comes from, I don't know.

SHACKLETON: Yeah, you've worked on a lot of other big jobs, you know the word nuke ...

CRANE: Yeah.

SHACKLETON: ... and how does this job in your, from your own observations and experience ... do you feel that the drug problem on this site is any worse than you've experienced on fossil plants or anywhere else?

CRANE: No. I, I can't see any difference in here and any place else.

SHACKLETON: Do you ever hear any discussion among the men about buying narcotics here on site?

CRANE: No, not that I know of.

SHACKLETON: You can see it's, it's a real concern because ...

CRANE: Yeah. Like I say, the only thing I've ever ... like in the turbine building sometimes when you can smell it coming up through the (unintelligible) cabinet.

POWER: Yeah.

SHACKLETON: Yeah. A real pungent odor, yeah. Very ... it's easy to determine what you're smelling.

CRANE: Easy ... what you've smelled, you can determine it, right.

SHACKLETON: Gene, do you have any other questions you want to ...

POWER: Yeah, you indicated that you primarily worked in the control room?

CRANE: Control ... Control Building, right.

POWER: Yeah. The Control Building. Have you worked in the control room south of the 140 foot elevation?

CRANE: Oh yes, sir.

POWER: Unit 1? What, what is the required separation between cables' distance?

CRANE: Six inches in, in the cables.

POWER: Are you aware of any situations that, that has been reduced to less than six inches?

CRANE: Yes, but we've either had to come back and make modifica ... modifications either with a metal raceway or the clearance drops to one inch but, uh, on some of the panels I'm not sure after they get into the wiring, it's not traceable 'cause we don't have vendor wiring, you know.

POWER: Yeah. Do you have any reason to question, from an electrical point of view, the installation of that cable in the control room behind the, uh, for instance the annunciator panels under the (unintelligible). Do you feel that they ...

CRANE: No ... we ... we've tried our best to, to get our distance of separations up to the termination point on the terminal blocks, but where it happens inside the vendor wiring ...

POWER: You have no ...

CRANE: ... we have no traceability.

POWER: For that part that you actually have ...

CRANE: There's one particular, uh, panel up there that separates from one of the great problem on and, uh, I think it was a combustion engineering panel.

POWER: Panel?

CRANE: Uh-huh. But I feel that most of them have all been resolved, you know.

POWER: O.K. You say most ...

CRANE: Except that I've, that I've, uh ...

POWER: Yeah, I know, right. That you actually have knowledge of then that were corrected ...

CRANE: Yeah.

POWER: ... yeah.

CRANE: Yes.

POWER: Allright. In those situations where you can't ... the six inch requirement, do you have to write an NCR?

CRANE: They usually write an NCR on the panel and, and, uh, install ...

POWER: Engineering ...

CRANE: ... and raceway, you know, that separates it from the metal.

POWER: So basically, procedurally, it should all be documented if there's any ...

CRANE: It should be documented, right.

POWER: And you have no knowledge of any that are not?

CRANE: Not that I know of.

POWER: Yeah, right, yeah.

CRANE: There's, uh ... sometimes they have to terminate up there. I think there are separation problems but I think that they were waiting for, for ...

POWER: Disposition?

CRANE: ... for, uh, materials to come in for the panels, though.

POWER: Yeah.

CRANE: But basically, I think they're fairly well taken care of on separations.

POWER: Yeah. Have you got any reason to, uh ... well, what's your overall opinion of the craftsmen work from an electrical point of view that you have direct knowledge on this site?

CRANE: Uh ... it's fairly, fairly competent, uh, I feel there could always be improvements, you know.

POWER: Yeah.

CRANE: I, uh, feel that (unintelligible).

POWER: (Unintelligible)

CRANE: ... (unintelligible) with, from Bechtel's engineering, I feel that we should have the ...

POWER: From a procedural point of view, we've heard this comment that some of the electricians ... it's being installed properly ...

CRANE: Uh-huh.

POWER: ... it's being installed in a manner in which they would prefer to see in a different way ... a little better understanding for instance ...

CRANE: Very true. Very true, very true.

POWER: But, from a safety point of view or (unintelligible) ...

CRANE: From a safety point of view, I, I think it's ...

POWER: There's no reason to (unintelligible) ...

CRANE: ... no reason to question that, that I've been involved with.

SHACKLETON: Yeah, the problem that it ...

CRANE: I, I feel it could be done better, you know.

POWER: Yeah.

CRANE: Of course, I'm that way with everything.

SHACKLETON: Well, the problem that's been expressed to us is that up there where you've been working, is that there's been a lack of coordination in the ... and they make a termination and a lot of lines are on the floor, it's ... and then when they go to put them in, you got to overlap them and what not ...

CRANE: That's very true.

SHACKLETON: ... and if it had been done, you could do it much neater.

CRANE: It's neater and a far superior installation. I, I feel that this was what I referred to ...

POWER: Yeah.

CRANE: ... on the engineering portion there.

POWER: Yeah.

CRANE: But I'm not aware of a lot of their problems, so ...

SHACKLETON: Yeah.

CRANE: ... it would very well be in that area. That's why I say that I feel that the job could be done better.

SHACKLETON: Uh-huh.

POWER: Yeah. (Unintelligible).

CRANE: I'd like to improve on everything.

SHACKLETON: Is there ... Joe, is there anything that you know of in the area that you, you know, have direct experience on, that you feel our inspectors ought to look at, that you've got questions about, or concerns about that you feel, uh, that aren't being addressed?

CRANE: No, I don't really have anything. I don't know what all your specifications call for, you know when it ...

SHACKLETON: Yeah, well ...

CRANE: ... as far as the Nuclear Regulatory Commission is.

SHACKLETON: Yeah. Our, uh, concerns are all primarily with the safety-related systems.

CRANE: Safety-related, right.

SHACKLETON: Class Q. 'Cause if the ... a lot of these things can go haywire and it might have cause to shut the plant down, but it wouldn't endanger anyone's health or safety.

CRANE: Uh-huh.

SHACKLETON: That's what we have to be worried about.

CRANE: True.

SHACKLETON: It costs, uh, the company, the client, a lot of money because the plant wouldn't be operating ...

CRANE: Right.

SHACKLETON: ... but it wouldn't be ... endanger anyone's life, and that's where, that's where our concern is.

CRANE: Uh-huh.

SHACKLETON: O.K., uh, I appreciate it very much ...

CRANE: O.K.

SHACKLETON: ... and your time. The time is now, uh, 9:56 a.m. and we're closing off this interview with Mr. CRANE.

(end of tape)