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U. S. NUCLEAR REGULATORY COMMISSION

INTERVIEW OF:

RICKY BARLOW
JOSEPH D'AMICO
MICHAEL LACKEY

Main Conference Room
Administration Building
Vogtle Electric Generating Plant
Waynesboro, Georgia

Tuesday, March 27, 1990

The interview commenced at 5:00 p.m.

APPEARANCES:

On behalf of the Nuclear Regulatory Commission:

WARREN LYON
AL CHAFFEE
BILL JONES

On behalf of INPO:

PAUL DIETZ

On behalf of CP&L:

MIKE JONES

PROCEEDINGS

MR. CHAFFEE: Okay, it's March 27, it's 5:00 and we've added two new people to our dialogue.

Whereupon,

RICKY BARLOW
JOSEPH D'AMICO
MICHAEL BRIAN LACKEY

appeared as witnesses herein and were examined and testified as follows:

EXAMINATION

MR. CHAFFEE: Would you please introduce yourself and what position you fill?

WITNESS D'AMICO: My name is Joseph D'Amico and my job is the outage scheduling supervisor.

MR. CHAFFEE: And what is your name?

WITNESS BARLOW: My name is Ricky Barlow and I'm a scheduling coordinator. I work for Joe.

MR. CHAFFEE: Okay. And what we're here to talk about is we're trying to understand how the outage is planned and what sort of things you consider in doing that, and we were trying to figure out how you coordinate all the various activities that need to be done. And of course, we're partly focusing on how things come together or how things pile up in terms of like mid-loop activities. So that's kind of where we're coming from. Those are the kinds of questions we're going to be asking you.

I guess we were in the process of talking about that, but things like what sort of considerations do you take into account when you're trying to lay out an outage, particularly as it pertains to trying to minimize getting too many things piled up on each other, such that you make the plant more vulnerable. Like for example what in a sense may have led to the event in a certain sense, having so many things going at the same time. So I guess the question I'm kind of throwing out to you as a group, is there some sort of strategy you use to try to lay that out, do people help you or how does that all work?

WITNESS LACKEY: I kind of addressed that earlier, you know, with our system outage windows, how we lay those out and we make sure we don't have any conflicts, that we take a support system out when we need the actual system, like NSCW, RHR relationship. As far as the electrical distribution and mid-loop, there was never really a tie between mid-loop ops and any specific increased electrical distribution needed for Mode 5 and 6 condition.

We had a safety evaluation done that allowed us to put both 1-E busses onto one of the off-site RATs and we've got a copy of that. We can provide you with that.

MR. CHAFFEE: Did that evaluation consider just the electrical line up or did it consider whether or not that electrical out was okay with you also being at mid-loop or

was that considered at all?

WITNESS LACKEY: It did not address that, it just said for Modes 5 and 6. And basically we're parallel to the electrical Tech Specs requiring a RAT, an off-site power source and a diesel operable in Modes 5 and 6. So the safety evaluation just paralleled that requirement. It just paralleled the electrical requirements of the plant.

MR. B. JONES: In the Tech Specs?

WITNESS BARLOW: Yeah, that's what we made reference to, was you know, that Tech Spec. For 5 and 6, you have to have one, you know, reserve auxiliary transformer and one diesel and that's what we addressed.

MR. B. JONES: You can only take out one whole side. You can take out a diesel and a RAT and a bus, you can take out all three as long as they're in the same train, is that right?

WITNESS BARLOW: Yes, sir.

MR. M. JONES: I have a question. With regard to the transformer which was out of service, what was the window for that and is that worked around the clock, realizing that that's --

WITNESS LACKEY: I don't know if they worked that at night or not. Do you know?

WITNESS D'AMICO: I think -- if I understand, I think they worked that around the clock.

WITNESS BARLOW: The guys aren't actually on it probably completely around the clock, but there are certain evolutions that I think they set up for like moving oil, that maybe only required one guy. It wasn't like they had a team of people completely around the clock. But when they did need a team of people to expedite, they had the team, you know, on the job.

MR. M. JONES: So let me see if I can establish where it was -- the three jobs that were of primary interest, the diesel during the overhaul, the reactor coolant system work and the transformer were all being worked on a priority, basically around the clock?

WITNESS LACKEY: Yes, sir, definitely.

WITNESS BARLOW: Yeah.

MR. M. JONES: That's all.

MR. LYON: When you take a piece of support equipment out or support system out, how does that get fed back into the actual operations process and particularly the depth of equipment that might be needed to support the NSSS as a function of the status, such as I've got lots of water in the RCS, I have water in the steam generators, I'm at mid-loop, I've got openings -- these kinds of things. How does that all fit together? How's that for a mouthful of questions for you?

WITNESS LACKEY: I wish I had a mouthful of answers

-- let's see what's the best way to address that. You know, the LCO program covers --

MR. LYON: Excuse me, LCO is?

WITNESS LACKEY: Limiting condition for operation.

MR. LYON: Okay.

WITNESS LACKEY: Operations has a specific administrative procedure where they have to write up whenever we make a piece of equipment inoperable, such as they would know -- they would have documented and they would know that their A diesel generator has been taken out of service. So if someone showed up with a work order for the B diesel generator, they would know what's already out of service, so they can consider that before --

MR. LYON: That's a Tech Spec oriented kind of a thing and it really wasn't the thrust of my question at all.

WITNESS BARLOW: You mean how do we look at that before?

MR. LYON: Yeah, forget the Tech Specs with respect to my question. What I'm after here is is someone looking at the state of the NSSS with respect to those kinds of things that I identified like mid-loop water, steam generators and so on -- is someone looking at that and assessing the need for a depth of equipment to support the NSSS and by way of example, generic letter 8817 addressed that you ought to have certain things available and it said

that you ought to take into account -- it recommended that you take into account the possibility of perturbing the system as a function of its sensitivity, if you will. And what we're really after is we're trying to get a picture of how all that folds together and it has nothing to do with the Tech Specs.

WITNESS D'AMICO: I think part of what you're aiming at is in the planning stages, how do we review or look at equipment and availability of equipment and its availability to take care of any event that would occur.

MR. LYON: In essence. For example, when you first go to mid-loop with a high decay heat, one might wish to have additional equipment available to provide water, one might wish to keep the containment in a closer state of closure because if something goes wrong there is less time to respond. How does that all fit together?

WITNESS LACKEY: I think we do that type of -- we do make those type of considerations. I can give you an example of that where we do look beyond Tech Spec requirements. It's not a mid-loop example, but I can give you an example of where we do things like that.

At power, we'll have system outages where we'll actually enter an LCO in the Tech Spec and do preventative maintenance, corrective maintenance on a piece of equipment to basically improve that equipment's reliability. Over an

18-month fuel cycle, if you never take out and do any maintenance on your safety systems, then by the end of the 18-month cycle you're probably in a pretty degraded condition on that system, so we've got a program where we look at all our safety related systems and on a certain frequency, maybe twice over the entire cycle, we'll look and see what outstanding corrective maintenance is on that system and take it out. We plan maybe a 30 hour duration and do all our preventative maintenance and corrective maintenance on that equipment, to make sure we maintain all our equipment in good operating condition.

Like entering the Tech Spec for ECCS systems that includes your high head charging, intermediate head and RHR system. That's all one Tech Spec, all one LCO. We've -- in putting this plan together before, initially our scheduler would lay that out as well, we only have to enter one LCO, let's go ahead and do all three of these at once. You know, we thought about that and we said well no, that's an unsafe condition, even though it's one LCO, one time clock, we don't want to do that because if, say, we would have a fault on the other bus and then we had all, high, intermediat and low head injection out on the other train, that's a condition we don't want to put ourselves in. We don't mind taking out maybe high head pump at a time by itself and if we get that same condition, well we just reduce pressure and

we've got injection with our intermediate head system and low head system.

So I think we do that type review where we do look further than just the words in the Tech Spec. We don't want to put ourselves in an unsafe condition but for this particular mid-loop scenario, I don't think we ever felt uncomfortable that having both busses energized from one off-site power source and having an inoperable diesel -- we didn't feel uncomfortable with that at the time.

MR. LYON: What I think I'm hearing in a sense here is at power, you're relatively comfortable taking out say one piece of equipment in a train of safety related equipment or something similar. I'm sort of contrasting that -- and I'm not sure it's a fair contrast -- to taking out a complete train during shutdown operation, such as a complete portion of your electrical system.

WITNESS LACKEY: I guess we didn't really feel like we were taking out an entire -- you know, half of our electrical system. We felt very comfortable that that one RAT -- you know, we've never had a problem with a RAT. Of course, things always happen at the worst possible time.

MR. LYON: Naturally.

WITNESS LACKEY: Murphy was with us. But we felt comfortable, we had reviewed it in detail, that we weren't going to overload the bus, that the RAT was capable and if

by chance we had a problem we had the diesel which was fully operational, we'd just done a lot of testing on the diesel and felt comfortable with it. We didn't actually look at it as having all our B-train really out.

MR. LYON: Let me go back to my original question, we're kind of skirting around it a bit.

In reviewing some of your operating history, I noticed you went through your first mid-loop before touching the diesel, is that accurate?

WITNESS LACKEY: Yes, sir.

MR. LYON: Was that deliberate.

WITNESS LACKEY: We had cause -- we were keeping one train sacred, operable. The other train was undergoing some tests. We were actually doing testing on that diesel, which made it inoperable at times just because of a line up where we may have done some blackout testing or had the diesel not inoperable for a long period of time but maybe just because of a hand switch alignment that wouldn't allow auto-start. For our other trains, we would like up all of our pumps on mini-flow so that when we did our actuation test everything ran on mini-flow. We would have the other train kind of in an off-normal configuration.

MR. LYON: Was there a deliberate plan to assure that you had two diesels available while you were in that first mid-loop?

WITNESS LACKEY: No, sir, we can't take credit for that.

MR. LYON: It just sort of happened that way.

MR. DIETZ: If you had not had to do the testing, would you have probably started the maintenance on one of the diesel generators?

WITNESS LACKEY: We quite possibly would have, yes, sir.

MR. DIETZ: Is there anything unique, is this testing something you have to do every outage?

WITNESS LACKEY: Yes, sir, we just scheduled it early this time, whereas last time it was scheduled later. The first outage it was scheduled later. We probably -- I believe in the first outage we did have a diesel out the first mid-loop.

WITNESS D'AMICO: In the first outage it was segmented in the middle of the outage and spread out.

MR. DIETZ: As we talked before, looking at the differences between the two outages, particularly diesel generators, reactor coolant system, you know, RAS conditions, how you went about what the differences were this time.

MR. CHAFFEE: So you're saying the last outage you think you had during the first mid-loop when you were coming down into the outage, that you had a diesel out during that

period of time or you don't know.

WITNESS D'AMICO: We think we did, we think we started taking that first diesel -- we started doing maintenance on it just prior to shutdown and we were heavy into maintenance on that diesel when we were shutdown.

MR. CHAFFEE: You didn't by chance also take the -- you did some work on a RAT in that outage also, I guess.

WITNESS D'AMICO: We worked one RAT in that outage also, but I --

MR. CHAFFEE: Okay.

WITNESS BARLOW: See, in the last outage, our diesel maintenance wasn't as extensive because it was our first maintenance and it wasn't quite as extensive. It was probably 40 percent less time working on the diesel.

WITNESS D'AMICO: I think the duration -- I believe it was like seven days duration for the diesel.

MR. CHAFFEE: In outage 11?

WITNESS BARLOW: Eleven is this outage. We can check and see what that relationship was in the first outage, if the diesel was back prior to that mid-loop.

MR. B. JONES: You had offered to give us some kind of comparison I think and that's something we'd really like to see.

WITNESS BARLOW: Okay.

MR. M. JONES: I'm coming up -- Mr. Bockhold brought

up this point that the diesels are a critical factor in the outage and you have to work them every 18 months and they take a big chunk of time. Is there -- it's a Tech Spec requirement I guess to do those every 18 months. Is the feedback you get from the people tearing them down that that's actually doing some good or -- in other words, if they're done on a clock cycle instead of on a basis of how many run hours or how many cold starts, is it necessary to take a diesel out every 18 months?

WITNESS LACKEY: I really don't know if we're really the qualified ones to say that. We'd have to talk to our maintenance and engineering folks to really -- McKinney Stokes, gentlemen like that, I'm sure y'all are going to interview, would probably the best ones to give you a feel for that.

MR. M. JONES: You see, if it's not necessary to do that based on run time of the diesel, then you could eliminate having --

WITNESS LACKEY: That would be great. If that could be done, I think it would be a lot easier, you would have to significantly extend the outage and you could get your diesel work done and still have both diesels for mid-loop operations.

WITNESS BARLOW: One half of our outage is with one diesel.

MR. M. JONES: It'd probably end up being safer and easier.

WITNESS LACKEY: It certainly would be.

WITNESS D'AMICO: The requirement to do these is a license condition that says we will implement the TDI owners' group recommendations. That's why we're doing it.

MR. M. JONES: Okay, so there is -- and that's based on 18 months, not on run time?

WITNESS LACKEY: It's based on run time, every 18 months we have to go in them and there's an end of cycle maintenance and that is every refueling outage, we have to go into both of them, but based on run time, that dictates how extensive that tear-down is.

MR. M. JONES: Thank you.

MR. LYON: I'm coming away from this discussion just now with a preliminary feeling that interacting with the condition of the NSSS and perhaps flexibility to support it in a sensitive condition versus perhaps when you flood it up, is kind of an ad hoc sort of thing. Do you feel that's accurate?

WITNESS LACKEY: No -- well no, sir.

MR. LYON: Good. If it is not, please convince me otherwise.

WITNESS LACKEY: I think with the amount of diesel inspections that we're required to do, it's --

MR. LYON: Not just diesel, but equipment all across the board.

WITNESS D'AMICO: I think part of the answer to your question is we had monthly outage planning meetings and then the closer we got to the outage, they were bi-weekly and as it got closer to the outage they were weekly, and at these meetings we discussed all sorts of things, some of which we would want to do particular maintenance activities and the operations people would say we can't do that during this time frame because we need certain systems operable or that would put us in an LCO condition and we can't do those type things. So I think part of the answer to your question is these things are discussed during all of these planning meetings.

MR. LYON: I understand. But remember that wasn't the thrust of my question. Did -- for example, did anyone say hey, you're really limiting me with respect to my ability to inject water into the reactor coolant system during this initial mid-loop when I have decay heat, I don't think we ought to do this then. Did something like that ever occur?

WITNESS BARLOW: We looked at the letter immediately whenever it came out about mid-loop operations and how to set yourself up properly with a vent path and if you're going to put dams in and an SI pump to be operable and all

those things. We had meetings with operations and discussed that and immediately in our planning stage, I guess even a year before the outage, wasn't it, Mike, we set all that up that this is the way to go, this is what industry is saying, this is what we've got to do, we've got to take that pressurizer manway off to support this work.

WITNESS D'AMICO: Part of the activities we had specifically identified when an SI pump had to be available for use and that was flagged near which pump was the designated pump, so those things were considered in the planning stages.

MR. CHAFFEE: I guess what I also hear what you haven't been doing is going out and doing your own little research project or innovative type thinking of how to go beyond what the industry is currently recognizing as good things to do. It kind of sounds like you're saying okay, well this is what the industry -- the industry has recognized there's a problem, so now we're getting with this one but you're not necessarily thinking --

WITNESS D'AMICO: In addition we get the feedback from INPO and from other Westinghouse contacts, we feed our Westinghouse contact information, so we would circulate that information amongst the planning group and operations and look at those things and say could this be a problem at Plant Vogtle. And if it is, then we would assign someone an

action to go investigate that and come back with some proposed resolution for that particular problem that some other plant had.

MR. CHAFFEE: So for example if this event had occurred at SONGS, you probably would have expected lessons learned out of that to find their way back here. In fact, doing what they did might not be too good and you guys would rethink that decision.

WITNESS D'AMICO: As a result of that, I think another utility had opened up the secondary by way of the steam generator through the secondary path and because of what happened at that utility, we specifically went and made it clear in our schedule so that we would clear that part of the secondary to ensure that we would not open the secondary and suffer the same type of event. So we did get that kind of feedback in the schedule.

MR. CHAFFEE: So basically you rely upon gleaning from industry experience everything you can to be able to figure out the best way to do it.

MR. DIETZ: So what we're saying is if the industry knew that this was a problem, industry has failed in a way by not laying it out clearly that this was a problem condition.

WITNESS LACKEY: I think that's a fair assessment because we do review all that information. RHR suction

valve interlocks to isolate RHR on high pressure -- I don't know of any instances where they isolate on high pressure, they always isolate on instrument problems or technician doing calibrations. So that's one of the first things we do in the schedule when we get in Mode 5 where we can do that, we go jumper those out.

MR. CHAFFEE: So in a sense you rely on industry experience and LCO's and generic letters to hopefully define the safety envelope that you can work within and expect to have a success.

WITNESS BARLOW: I can think of an example talking about RHR. We took -- you know, if you're flooded up, you can take one train of RHR out for maintenance. And we could have set them up in series and take a workload off the guys but we had a meeting and said let's overlap them when the core is offloaded and minimize the time that RHR is out of service so that -- even though you can legally do that, let's don't do that, let's just minimize it. That's an example of doing what y'all are talking about.

MR. DIETZ: So you decided not to have both RHR out while you were at mid-loop?

WITNESS LACKEY: Correct. While we were defueled, what we try to do instead of working them in series, do one train and then tag out the other train and do it, we said well we want to take full advantage of the defuel time in

the middle of the outage to work both trains. And if there happens to be some overlap, we'll just have that minor amount of overlap into the time we're actually loading fuel that we only have one train out. So we may start one train, if it was scheduled for three days, maybe start it a day before we got completely defueled and we still had one train and then start the other train immediately when we got defueled and finish up one train before we come out. So we minimize the time we're working on RHR in the outage.

You know you look at the other example, talking about mid-loop, that letter is designed to make the plant safer above and beyond Tech Specs. So we sit down and we talk about that and I guess everybody naturally would say well we had a good feeling about mid-loop, we're one of the first ones to jump right on this letter and take care of it and get set up. But who knew somebody was going to run into the RAT.

MR. DIETZ: What kind of impact would it be on your outage if you went down to mid-loop the first time, got the dams in place and flooded back up and then while you were moving fuel, had the steam generator access hatches in place to give you a second protection against breaking the dam, and only did the steam generator work during the time you were not moving fuel?

WITNESS LACKEY: It would be a real significant

impact because, you know, while we're up or while we're flooded back up, the reason for putting those dams in is so we can constantly be running the probes in and out the tubes and doing that eddy current testing. And you know, we could possibly reduce the time at that exposure, when you finish eddy current testing put the manways on and then -- until you get drained back down take them off, take the nozzle dams out and then put them finally back on. That's an area where you could reduce that exposure time but -- and not impact the outage, but it would really be impossible to have them on the entire time.

MR. DIETZ: I guess just to help me in terms of time, how many days do you spend in steam generator inspections and do you do all four of them at the same time, is it concurrent?

WITNESS LACKEY: Yes, sir, we did all four of them in parallel this time and we were in them about ten days. That's more than we probably ever will be again because we did over 3600 tubes and 5600 -- we did 70 percent of our tubes just about, so we had a major eddy current scope because we wanted a good base line to know where we're at and if we're having any tube problems.

MR. DIETZ: And how long did it take you in the first movement of fuel when you defueled, how long did that take?

WITNESS LACKEY: The time we were defueled?

MR. DIETZ: To defuel.

WITNESS LACKEY: It took us about four days to defuel.

MR. DIETZ: And then you were defueled for about how many days?

WITNESS LACKEY: Typically about two-three days.

MR. DIETZ: And then it took you another four days to --

WITNESS LACKEY: Another four, five days to reload.

MR. DIETZ: Okay.

WITNESS LACKEY: So -- generally though we'll hopefully only go into two steam generators and we'll only have maybe three days or so of eddy current testing that we could go back with those manways.

MR. DIETZ: So would it be possible to do the eddy current testing in the middle period while you were defueled?

WITNESS LACKEY: You could possibly do that, yes, sir.

MR. DIETZ: Which would limit the exposure from possible dam failure.

WITNESS LACKEY: Yes, sir.

MR. LYON: To go back to my question again -- go ahead.

WITNESS D'AMICO: I just didn't understand how we were going to limit anything from the dam --

WITNESS LACKEY: You weren't in here earlier, Joe, when they proposed what if a nozzle dam comes out while you're flooded up.

WITNESS D'AMICO: Oh, nozzle dam failure.

MR. LYON: We're sneaky.

WITNESS LACKEY: Yeah, I caught right onto that one.

(Laughter.)

MR. LYON: Could you contrast the way you considered the first mid-loop operation with the second mid-loop operation and the way things were scheduled, and did you really treat anything differently with respect to those two operations other than what you had to do out in the plant to maintain equipment?

WITNESS LACKEY: We did talk about those two mid-loops, we did talk about our valve maintenance and we did schedule most of our actual mid-loop valve maintenance for the second mid-loop and that was primarily a consideration for decay heat.

MR. LYON: Now that's the kind of thing that I'm after with my question. There was nothing in the regulations, the Tech Specs or anything else that required you to do that, is that correct?

WITNESS LACKEY: That's correct.

MR. LYON: Okay, could we pursue that a little bit and is there a process for doing that or is that just something that you folks voluntarily do because you feel it is better?

WITNESS LACKEY: Yes, sir, that's just based on our own training and knowledge. Of course the second mid-loop from a decay heat standpoint, you've got a lot more time to recover.

MR. LYON: Precisely.

MR. DIETZ: That lesson isn't documented in any kind of a --

WITNESS LACKEY: No, sir, that's just basically our philosophy.

MR. LYON: That's one of the messages that we tried to put across in generic letter 8817, was to consider those kinds of sensitivities. There's no administrative procedure, no operational procedure, nothing in writing anywhere that guides the performance of that kind of a consideration.

WITNESS LACKEY: Not to my knowledge. That was strictly internally generated.

MR. LYON: Pretty much by the three folks that are sitting here?

WITNESS LACKEY: Yes, sir.

MR. LYON: Do you feel it would be helpful if

something of that nature existed

WITNESS LACKEY: I think that's good guidance for plants. Of course --

MR. LYON: Provided it's done reasonably so that it doesn't really tie you up so much that you're significantly running your outage out.

WITNESS LACKEY: Yes, sir, I think that's the key. As long as those thoughts are in people's minds when they're making decisions -- there may be times when you need to get into a valve early on if you need to get into it because it was a problem valve, because you're not sure if that check valve -- you've gotten indications that that check valve may not be working properly. It may be a check valve you would want to have further -- later in the outage. So there's probably examples of times where at the first mid-loop you need to get into a valve and you need to go ahead and fix it.

MR. LYON: Okay. That's an excellent example. If you really needed to do that, would you take additional steps such as providing to SI pumps or something of that nature as compensation?

WITNESS LACKEY: Again, that'd probably be good guidance.

MR. LYON: I understand. Have you considered that kind of approach? Is there any example you could give us of

where that has occurred, if you have?

WITNESS D'AMICO: I can't think of an example.

WITNESS BARLOW: Like going for the CCP is the operable PD pump, even though you could use that for boron injection per Tech Specs, it's something that we always try to do.

WITNESS LACKEY: Yeah, we never --

WITNESS BARLOW: It's more -- you get more volumetric flow there.

WITNESS LACKEY: Uh-huh. But specifically I can't think of a good example for that case you just mentioned.

MR. LYON: Okay.

WITNESS D'AMICO: One part of the answer would be we're looking for ways to verify operability of check valves without having to open them up. That's one of the things we've looked at but we haven't been able to sell the NRC on it yet, using the different types of techniques for verifying that the check valve will in fact function. We couldn't say that yes indeed we know that check valve is 100 percent open, therefore, we've been forced to have to disassemble a check valve just to say yes, it worked, and then put it back together. To me, there ought to be some other way to tell that check valve flaps.

MR. LYON: Are you aware that there have been check valves that would indeed flap but when people opened them

up, they were in pieces?

WITNESS D'AMICO: Well I guess.

WITNESS LACKEY: I think that's -- those are really two I guess conflicting goals, is to tear into all these valves and do a visual inspection of them, and it turns out a lot of these valves are mid-loop required valves.

WITNESS BARLOW: That's right.

MR. LYON: But I also hear you trying to schedule those for the second mid-loop when things are less sensitive.

WITNESS LACKEY: Yes, sir.

MR. LYON: Okay. How -- have you considered something like taking all of the fuel out of the vessel and then doing all of these kinds of things while there was no fuel in the pot, and then putting it back, and what would be the order of magnitude impact on the length of an outage if you had to do something like that?

MR. DIETZ: What he's saying is drain it down to mid-loop, you know, take all the fuel out and go to mid-loop and do everything.

MR. LYON: Or drain it completely. Once there's no fuel, I don't care.

WITNESS LACKEY: That could -- again, I think you would see -- you could add close to a week to an outage based on that. If we were going to -- you know, there would

be a lot of reluctance to do the type of eddy current testing on generator tubes that we did this outage because we wouldn't want to be there for -- you know, by the time you get your nozzle dams in and get them out, we were probably two weeks and had about ten days of actually probing and then we ended up plugging like four tubes out of the 12,000 or so we probed but --

MR. LYON: So that could be somewhat detrimental to safety in a way because it would push people not to do certain things.

WITNESS LACKEY: You try to minimize that. You probably, you know, -- the check valve inspections, some are required surveillances, others are 8603 -- you have more flexibility on when you go into them and if you do -- what kind of sampling technique you use or do you do them all this outage. If you've got four loops, do them all this outage and don't do them for four outages, it may -- you know, it may be detrimental in ways like that because we did do some that aren't Tech Spec required, but they were per the SOER on check valves and we felt we should go into them. And if it was going to extend the outage, of course those would probably be looked at a little harder.

MR. LYON: While we're talking valves and things, do you do accumulator flow tests?

WITNESS LACKEY: I think that's what Joe was

mentioning, that no, we haven't been able to do that and because of that, that's a valve that we need to inspect at mid-loop.

MR. LYON: After you do the inspection of the valve, you don't then verify that it works by doing a flow test?

WITNESS LACKEY: I don't believe we do a dump after that, no, sir.

MR. LYON: Do you do a dump before?

WITNESS BARLOW: Like on the accumulator valve you don't, because that's the reason we've got to take it apart because it can't be tested -- the only way to test the accumulator check valve, if you did it by design, would be to plug it into the vessel.

MR. LYON: That is correct, but some people do that.

WITNESS BARLOW: Well I think that they don't just put 600 pounds on it and a passive injection and let it rip, they just let the -- they just watch the pressurizer level coming up a little bit and say yes, the valve was opening fine, we're getting good injection flow, but I don't think they let 600 or 700 pounds just blow into the atmosphere.

MR. DIETZ: No, they often bleed the pressure down to 20-30 pounds.

WITNESS BARLOW: Yes, just to get it moving.

MR. DIETZ: Yeah, just to show that it's working.

MR. LYON: But you folks don't do that?

WITNESS BARLOW: We can't.

MR. B. JONES: Why?

WITNESS BARLOW: Because of -- you're saying we can't take credit for not going in -- we can't take credit for the inspection in lieu of --

MR. B. JONES: So what you're saying is you've got to tear it down anyway so it doesn't do you any good to do the dump, is that right?

WITNESS BARLOW: If we're going to take it completely apart to say that it works.

MR. B. JONES: Yeah, okay, that's fine. Even if you did a dump, you can't take credit for it?

WITNESS BARLOW: In lieu of that, no.

WITNESS LACKEY: Yes, sir. I think the concern has been you can't verify that you get full stroke on the flapper, so that's why you can't take credit for that without the disassembly inspection.

MR. B. JONES: And that's a concern for you people at Vogtle, that's why you made that decision?

WITNESS LACKEY: Well we tried to get approval to do the dump test on the check valve, so we didn't need to disassemble it, but we did not get that approval.

MR. B. JONES: Approval from NRC?

WITNESS LACKEY: Yes, sir.

MR. LYON: By the way, I know last May Salem did do

tests at 600 psi.

WITNESS LACKEY: In lieu of or in addition to?

MR. LYON: As I recall, that particular one they had worked on the valve and then wanted to confirm that it would work properly. I'm not certain, I know they did plan on testing all four of the valves.

WITNESS BARLOW: Do you know what RCS pressure was?

MR. LYON: They were starting at essentially atmospheric pressure.

WITNESS BARLOW: (Whistles.)

MR. LYON: They made it through the third valve.

MR. DIETZ: That's when they injected the nitrogen.

MR. LYON: And then through an error, they did indeed inject nitrogen and they lost RHR for three-quarters of an hour.

MR. DIETZ: Most of the industry, when they do it drops the pressure down in the tank and then do the test.

MR. LYON: Exactly. I'm not aware of anyone else that tested like that.

MR. DIETZ: Or they do it as you cool down. And you know, when it gets below 600 they see it coming and they shut the valves. Well if you see too much, you stop the cool down.

WITNESS BARLOW: Right.

MR. DIETZ: And they use that for ensuring that

those valves are operable. I don't know about in terms of inspection and how often they're doing a full inspection.

WITNESS LACKEY: But you know, we verify the free movement of the flapper and do a good inspection and that's a --

MR. DIETZ: Do you do that every outage?

WITNESS LACKEY: One of the four every outage.

MR. LYON: By the way, I went to Salem --

WITNESS LACKEY: You were there too.

MR. LYON: I went to Salem, yes. How long -- I doubt if they test at 600 psi any more.

How long does it take to install a nozzle dam?

WITNESS LACKEY: It takes us -- we show 12 hours in the schedule. The actual physical time in the generator of course is less than 15 minutes total, but to -- by the time you get your alarm briefing, get your multi-batch packs and get in there and then go back in there and correct any bolts that are loose, we usually -- it probably takes an eight hour shift.

MR. LYON: But actual operation is only a few minutes.

WITNESS LACKEY: Yes, sir.

MR. LYON: Between the time I install one nozzle dam and I install the next, for example, if I'm working one steam generator and I go in through one manway and then I go

in through the other, what would the sequence of that operation typically look like? Would it be done all the same shift, could it be split between shifts or what?

WITNESS LACKEY: We usually -- since that is generally critical path, we roll those continual and we would do one generator at a time, install the cold leg and hot leg and then go to the next generator.

MR. LYON: Would you install the cold leg first followed by the hot leg in each steam generator?

WITNESS LACKEY: Yes, sir, do one generator and then go to the next generator.

MR. LYON: What assures the order in which they are installed, how do we know, for example that gee, it's more convenient to stick the hot leg in first so I'll do the hot leg and then I'll do the cold leg?

WITNESS LACKEY: You know, we bring in Westinghouse to do that piece of our outages and we have a long-standing agreement and we closely coordinate that with them. We have containment coordinators to make sure that the game plan is followed. They have their own nozzle dam coordinator that he knows that is our requirement. Plus, since that is the job that these guys do from site to site, I would expect them to be fully aware of that requirement.

MR. LYON: Have you checked to make sure that they are and that they do indeed follow your instructions

consistently?

WITNESS LACKEY: Yes, sir, I know they did here at this outage, I know they followed our instructions explicitly.

WITNESS D'AMICO: Westinghouse site representative is fully aware of the sequence that has to happen, it has been discussed with them several times, they are well aware of the sequence.

WITNESS LACKEY: They realize that it was very important, the order in which they were installed and removed, so they were aware of that and followed that. Again, there's not a big time difference here in each generator in versus the other, but we did follow that to the letter there.

MR. LYON: Would you estimate a time between the actual start of a steam generator on one side and the finishing of two nozzle dams in on the other?

WITNESS LACKEY: When I gave you the eight and 12 hour duration, that was for one full generator, so that would be I guess the start eight hours -- I'd say eight hours later we should have both the cold leg and hot leg dam in.

MR. LYON: Okay.

MR. DIETZ: Do you start the -- do you have the head off when you start that already or do you try to get in

there before you get the head off?

WITNESS LACKEY: That -- most of that happens before the head gets off. As soon as we drain down to mid-loop we start pulling the manways and start installing the nozzle dams. We've got some additional activities to do on the head itself, you know, we've got to break the head vent piping, we've got to remove all the missile shield insulation, got to break free the cono-seals and then start detensioning studs. So --

The heads were actively in the process of getting ready and detensioning and removing the head the whole time we're putting in these nozzle dams, but the way we schedule it, we get the nozzle dams in, we flood up a few feet above the nozzle dams, verify no leakage on those, and then that level is where we stay at waiting for the rest of the head level preparations. So generally the head is -- it will still be on after all the nozzle dams are in. We'll bring the level up and then we'll lift the head after the level is brought up above those dams.

MR. LYON: You lift the head with it exposed or under water?

WITNESS LACKEY: We'll flood up to about two feet below the flange and then we'll lift the head and set the head and at that time start raising the level.

MR. LYON: And the head will fill the cavity and

then you'll tackle the internals, the upper internals?

WITNESS LACKEY: Yes, sir.

MR. LYON: At what point in this process do you technically enter Mode 6?

WITNESS LACKEY: When we detension that first head stud.

MR. LYON: So that could occur almost anywhere in this process of nozzle dam installation depending on how it goes.

WITNESS LACKEY: Yes, sir.

MR. LYON: Is there any difference in the work that you were doing, the procedures, even the Tech Spec requirements for containment or supporting equipment between Mode 5 and Mode 6?

WITNESS LACKEY: Containment integrity for Mode 6, you know, you have to establish the refueling containment integrity.

MR. LYON: During fuel movement or during Mode 6 completely?

WITNESS LACKEY: We consider the actual head lift a core alteration and our own administrative controls -- even though Tech Specs don't require that per se, there are some Tech Specs that require low -- heavy loads over fuel as -- but there's many Tech Specs that just address fuel movement core alterations and we consider the head lift as a core

alteration so we have in pace our administrative controls for the head lift, which is a containment integrity.

MR. M. JONES: Is that written down?

WITNESS LACKEY: That's a Tech Spec interpretation I believe is where that's contained.

WITNESS BARLOW: And the UOP drives you to treat it that way, tells you to do that.

WITNESS LACKEY: And our procedures, our control room unit operating procedures --

WITNESS BARLOW: It says, you know, like prior to head lift do these things and those are the things that you do for a core alteration. So it doesn't say hey, this is a core alteration, go do this, it drives you to treat it as a core alteration.

MR. M. JONES: Do you consider that interpretation conservatively?

WITNESS BARLOW: Yes.

MR. M. JONES: So that the Tecn Spec interpretations are a means for you to take administrative measures that are beyond Tech Specs, at least in this case?

WITNESS BARLOW: Yes, sir.

MR. LYON: Is there any difference between the way you treat containment in Mode 5 versus Mode 6, based on this definition that you just provided to me, if you're say, not moving fuel or something of that nature or pulling the

head?

WITNESS LACKEY: No, there's no change there.

MR. LYON: In the process of getting ready to pull the head, at some point, you've got to disconnect all of your thermocouples.

WITNESS LACKEY: Yes, sir.

MR. LYON: Do you provide a temporary thermocouple connection at that time and then continue anything else?

WITNESS LACKEY: We disconnect the thermocouples at the last minute and when we break the cono-seals we hook I believe two of those back up in preparing for the head lift. I don't know if we used a jumper at that time. Do you know, Ricky, or they just broke the seal?

WITNESS BARLOW: I don't know.

WITNESS LACKEY: And on the reassembly we used a temporary jumper again to get two of them hooked up as soon as we got the head set in place.

WITNESS BARLOW: That's proceduralized too.

WITNESS LACKEY: Yeah, it is.

MR. DIETZ: Which one do you hook up?

WITNESS LACKEY: I don't think it specifies which one, does it, Ricky?

WITNESS BARLOW: No, it just says to hook up two thermocouples immediately, as soon as you can -- as soon as physically you can hook them back up.

MR. B. JONES: Who picks them?

WITNESS LACKEY: Probably I&C. Again, I should look at that procedure before I say definitely it does not tell you which ones to hook up because it may give you that guidance in there.

MR. LYON: But there is a procedure that covers it, we're just not clear here whether it specifies this guy and this guy?

WITNESS BARLOW: Yes, sir. It's 12006 or something.

MR. LYON: Would you estimate a time while you were without thermocouples during this process?

WITNESS LACKEY: And the head is on?

MR. LYON: Yes.

WITNESS LACKEY: It would be measured in hours and not days or shifts. I'd guess four hours, something like that. A lot of times you can run into a delay in actually lifting the head, you know --

MR. LYON: It's a real world out there.

WITNESS LACKEY: It's a real world. You get everything ready and then the control room decides that I've got to do my source range ACOT, you know, so you're standing there fucking rubber on your respirator and they're doing source range ACOT.

MR. LYON: I've never heard it expressed that way to run out of air, so to speak. I assume that's what you mean.

WITNESS LACKEY: Yes, sir, breathing through a respirator.

MR. LYON: Oh, okay. I thought you meant running low on air.

WITNESS LACKEY: No, sir. That happened to me this outage, so I'm sensitive to that one I guess. It wasn't a long delay but it seems that way when you're in the respirator.

MR. DIETZ: Do you have any provisions for going mid-loop without the head on or without immediately restoring the head?

WITNESS LACKEY: (No response.)

MR. DIETZ: I'll add the other part of it -- if you do or did, did you ever consider using some form of dunking chain or something to be able to sense water temperature?

WITNESS LACKEY: I guess that hasn't really crossed our mind because we -- you know, that would be the first thing -- we wouldn't want to drain down until we were ready to set the head because then you've got the contamination on the cavity walls and it's drawing out and a real potential airborne problem that -- we just wouldn't consider draining down because you can't do anything else until you get that head set and can get in there now and start deconning because you've covered your vessel. So I don't think we'd ever consider draining down and not setting the head

immediately, unless something happened after the drain down.

MR. DIETZ: You've not had to do any internal work in the vessel or anything like that where you had to lower the water level?

WITNESS LACKEY: No, sir. Most of that is probably done defueled I would assume, there may be some you do fueled, but no, sir, we haven't had that.

MR. LYON: Along that same line, is there a situation where you might have disconnected your thermocouples in preparation for a head pull and then for some reason you have to go back to mid-loop so that you wouldn't have those temperatures? And if you say we wouldn't do that, what would assure that?

WITNESS LACKEY: I think again that our unit operating procedure is real clear that you want to disconnect those at the last minute. If there was a delay, significant delay, you know, as far as any time you digress back in a procedure you need to pick up those steps that you've went back through. So I feel just following our procedures you would do that.

MR. LYON: In other words, if I flood up, I disconnect thermocouples and then for some reason I have to lower the level again, I would reconnect the thermocouples? But I might have been doing other operations and moving other equipment as well. If I followed that philosophy

completely, I would have to reinstall that other equipment as well before I went back, so I'm confused.

WITNESS LACKEY: Well our ops procedure is real clear that you want to keep those thermocouples hooked up until, you know, the last possible minute, until you've actually had to disconnect them to lift the head. The same on the other side, hook them up as soon as you get the head set until you can permanently connect them and I think that's contained in the procedure and that guidance is in there, but the point is there that you want them connected while you're there.

MR. LYON: Let me ask just a couple more things in the area of operations involving the RCS and then I'd like to go over into the containment realm for awhile.

In the draining of the reactor cavity, are you aware of what happened at Byron a year or so ago?

WITNESS LACKEY: I don't know what it was.

MR. LYON: All right, they were draining and the -- apparently some springs had weakened a little bit. A lot of the internals moved a little and they were draining by way of the RHR pumps, pumping down and they sort of closed off the connection to the reactor cavity and proceeded to try to pump the RCS down and got into trouble.

WITNESS LACKEY: Pulled a vacuum and --

MR. LYON: Well they started pumping air, sucking

air, and realized they were in trouble.

WITNESS LACKEY: Yes, sir.

MR. LYON: How do you factor those kinds of considerations and feedback into the way you do business with your planning?

WITNESS LACKEY: We did specifically address the flow rate at which ops can pump down the RCS, pump down the cavity. We allowed that amount of time in the schedule for doing that. I think we had like 12 hours to drain down the cavity in the schedule, and a flow rate of like 800 GPM is what we were looking at as far as actual pump down.

MR. LYON: So you were circulating at say 3000 and taking sort of a side stream back into the RWST at 800?

WITNESS BARLOW: We also installed those current transducers for RHR pump current to pick up on cavitation of the pump and everybody that's SRO licensed or unlicensed, practiced that in the simulator watching what happens when the pump cavitates when you're at mid-loop.

WITNESS LACKEY: That was a great addition. We -- that's one thing with operations background I wish we had more of is amp meters on pumps, but for RHR pumps it's a must and we now have those on our computer and we set the alarm point for those, so even if the operator is not visibly watching those, we'll get an alarm if we start getting fluctuations in your RHR pump amps.

But we did -- we had several discussions about the actual flow rate because we didn't want to, at that exact instant you're talking about was what sparked that. We knew there was a limited amount of flow that could pass through the internals and so that's why we limited that flow rate on the drain out.

MR. LYON: Okay. Let me move over into containment for a little while. One of the neat things I saw out in containment was you're providing some penetrations out there for cabling, sludge lancing, those kinds of things. How are whether those are opened or not controlled?

WITNESS LACKEY: Well during the -- you know, those are primarily done so we can do eddy current testing, we can do sludge lancing, all those activities while we're moving fuel. We have containment integrity maintained. In fact, we had to get Westinghouse to bring a special sludge lance trailer over from Europe because we weren't comfortable with the fact that these sludge lance hoses that are sucking out of the steam generators are not completely full of water, you know, there's just a small amount of water and it's half air, half water. It is sucking out of the steam generator and pumping back to this tank in the sludge lance trailer.

Most of their domestic trailers do not have a cover over the tank, so basically you're sucking water and air out of that steam generator and dumping it into a tank, then

that's vented to the atmosphere, filtered and pumped back in as injection water. So we had a concern that that really wasn't adequate, you know, we were moving some containment atmosphere directly outside if we did that. So we got the special trailer from Europe that has -- is a covered tank that has a check valve vent on it that only lets air in in case there's a vacuum drawn on the tank from the water rushing out and doesn't let air out and has a vent hose hooked that comes back into containment.

MR. LYON: So effectively the trailer becomes part of your containment boundary.

WITNESS LACKEY: Yes, sir.

MR. LYON: What is the pressure capability of that trailer?

WITNESS LACKEY: The tank itself, it was a big stainless tank, the hoses were I think 300 pound hoses but I didn't check the actual pressure rating on the tank.

MR. LYON: I'm not going to address whether it's safety related or not, that's something we clearly addressed in 8817.

WITNESS LACKEY: Yes, sir.

MR. LYON: So you did not look at the pressure capability of that tank.

WITNESS LACKEY: No, sir, we felt it was of a much better condition for us than having just a hose going to a

vented tank.

MR. LYON: I hear that. The penetration where that hose comes into containment, is there a seal there?

WITNESS LACKEY: Yes, sir, there's actual flange fit up on that penetration that only has like the actual hose connection or actual eddy current cabling connection that you'll tie right into.

MR. LYON: If I were to start to build pressure in containment, is that an intact kind of thing or is there a gap where I could leak through?

WITNESS LACKEY: No, that is intact.

MR. LYON: What is the pressure capability of that guide?

WITNESS LACKEY: I'm sure far above any that the hoses would withstand.

MR. LYON: You're saying the hoses are 300 psi capability?

WITNESS LACKEY: Yes, sir.

WITNESS LACKEY: So this is a heavy--

WITNESS LACKEY: It's a heavy flange, yes, sir.

MR. LYON: I'm willing to go on that.

WITNESS LACKEY: It's a heavy flange.

MR. LYON: We covered that in 8817 also. What kind of temperature capability does that hose have?

WITNESS LACKEY: Again, I couldn't answer that

question.

MR. LYON: Okay. This kind of equipment with these penetrations, could they all be in place during mid-loop operation?

WITNESS LACKEY: Yes, sir.

MR. LYON: These penetrations would be considered closed if you got into a condition where you had to say close the equipment hatch, button up the personnel hatch and so forth?

WITNESS LACKEY: We have manual shutoff valves on those penetrations. Of course the eddy current penetrations themselves for the cabling is the main reason for those coming through a penetration like that and it's -- you can have the hatch shut. I think a lot of plants used to use like a foam penetrant to seal the penetration.

MR. LYON: Yeah, I'm aware of that. It's not going to hold anything.

WITNESS LACKEY: That's right. We felt much better that this was a good way to get these out of the hatch itself and get them flanged up to a real secure fitting.

MR. LYON: I agree, it's far better than what we had in the past.

WITNESS LACKEY: But they do have manual cutoff valves on the hoses that could have been shut off quickly. In fact, any time that the system wasn't in use and the

hoses weren't pressurized with the water, they were required shut.

MR. LYON: Are these valves inside or outside containment?

WITNESS LACKEY: They were inside.

MR. LYON: And they're metal?

WITNESS LACKEY: Yes, sir.

MR. LYON: One of the concerns that we run into in this area is if you get into a severe core damage accident and start melting fuel, you're going to have a lot of chemical reactions and generate lots and lots of hydrogen such as happened, for example, at Three Mile Island. That will burn at some point and could easily give a substantial pressure and temperature. Would you assess the capability of those penetrations -- just kind of seat of the pants judgment, if you will -- to withstand a hold together under that condition. And if you want to compare it to your judgment of the capability of containment, that's okay too.

WITNESS LACKEY: I'm sure they wouldn't be as good as a containment itself, maybe as good as the equipment hatch being held on by four bolts.

MR. LYON: I'll bet your big flange would be better than containment.

WITNESS LACKEY: Yeah. It could be. I'd have to look at that a little closer considering a large pressure

spike, I guess our thoughts were more of a low pressure type, maintaining a boundary.

MR. LYON: When you put that valve on there, I felt much more comfortable about that big tank that you got from Europe.

WITNESS LACKEY: Yes, sir.

MR. LYON: All right. Do the procedures require if you have to close containment that you close all of those valves and if so, how do we know that is going to occur? For example, how do the operators know whether they're open or not, what procedure would cause that to happen?

WITNESS LACKEY: Those particular valves are probably -- I don't know of anywhere they would be covered in one of our procedures. Again, it would probably be similar to our actions during the recent incident that we depended on people's cognizant knowledge of what work was ongoing.

MR. LYON: I understand. Approximately how long does it take to open up one of these penetrations and get all of this equipment in place so that it's in the sort of sealed condition that you've described?

WITNESS LACKEY: That probably took us -- we just made that modification this outage, spent a lot of time welding the made-up flanges on there and getting those RT'd and -- but the actual hook up of the temporary flange, I

would think, you know, a shift probably would be a good estimate of hooking the flange up and hooking them to the hoses.

MR. LYON: If you were in a situation in which you had to close containment and you were in the process of this operation, which is faster, you could get these guys closed or the equipment hatch would be closed?

WITNESS LACKEY: I would feel comfortable you could bolt these up real quick and just shut those valves off.

MR. LYON: Got it. Okay. I think that's a good kind of thing to do, certainly far better than that foam.

WITNESS LACKEY: Yes, sir.

MR. LYON: Let me move over to the equipment hatch. In the process of these non-power operations, is any real consideration given to the equipment hatch, whether it's open or closed, except within the realm of generic letter 8817 and the Tech Spec requirements pertaining to fuel movement.

WITNESS LACKEY: You know, again we have additional administrative controls that treat the head lift as a core alteration which requires the hatch closed.

MR. LYON: I understand.

WITNESS LACKEY: For those evolutions. But other than that, I don't know of any other thoughts we've had as far as well we need to keep the hatch closed while these

activities are happening.

MR. LYON: Or we need a capability of closing.

WITNESS LACKEY: Yes, sir.

MR. LYON: All right.

WITNESS LACKEY: You know, we knew we needed to be able to close the hatch within an hour, 57 minutes is what we use here. Again, all that was based on having the hoist or the equipment or the crane available to do that too.

MR. LYON: This 57 minutes requirement, that is independent of how long it's been since you were at full power?

WITNESS LACKEY: Yes, sir, that was based on like being shut down for 48 hours which I think is a very conservative calculation.

MR. LYON: When you say based on being shut down for 48 hours, is that the time it would take to boil down to the top of the fuel?

WITNESS LACKEY: I believe that's correct. I'd have to check.

MR. LYON: Let me postulate a scenario. You got into a situation where you have a leaking steam generator tube and you want to shut down and repair that and get right back up to power, you want to plug it. What would be the time that you would anticipate before you were at mid-loop and pull the manway to get at that tube?

WITNESS LACKEY: I think it would probably be -- if everything came together real well, we could probably be there in two days.

MR. LYON: All right, let me take that two days, maybe three days if you like, and I am going to give you a loss of RHR while you're in the process of doing this. Would you hazard a guess as to how long before you would have boiling in the core?

WITNESS LACKEY. Say an initial temperature of 80 degrees or something like that?

MR. LYON: Sure. Then I'm going to complicate your life one step further.

WITNESS LACKEY: I figured that. Ten minutes.

MR. LYON: I would guess more like 20, but that's okay.

WITNESS LACKEY: I'm being conservative.

MR. LYON: That's fine. At the same time, I decided to take advantage of this to wheel some additional equipment into containment and do something else so I opened the equipment hatch. Is that a permissible operation?

WITNESS LACKEY: That is permissible.

MR. LYON: Okay, at 20 minutes -- 30 if you'd like -- I start bulk boiling. At time zero with the loss of RHR you initiate containment closure with the equipment hatch and it takes you -- you've said you're going to allow 59

minutes. How long typically would you say it would take to get a team together and get in there to start that operation if they weren't already in the vicinity?

WITNESS LACKEY: It would take ten minutes easy.

MR. LYON: Okay, so at about ten minutes I've got to get suited up and all the rest of that to come in?

WITNESS LACKEY: That would include suit up and briefing.

MR. LYON: Even in an off-shift or something like that, you're going to have these people that readily available?

WITNESS LACKEY: If it was, you know, the scenario we're in --

MR. LYON: Yes.

WITNESS LACKEY: -- one page announcement would be made and the guys would show up.

MR. LYON: All right, I believe that. You suit up faster than I do. Okay, so around ten minutes or so the people show up, they'll have whatever tools they need -- they way you're set up right now, you've got to bring -- pull the crane over to do that. How long would it take to get a guy up into the crane?

WITNESS LACKEY: It would take --

MR. LYON: And the next question is how long to move the crane and get the hook down to start working the hatch?

WITNESS LACKEY: You know, if we -- again if we had lifted the hatch, we probably would be still in there moving equipment, still have an operator but it would take a good three minutes to get somebody up top once they were headed in.

MR. LYON: He's in good shape.

WITNESS LACKEY: He's in good shape, yes, sir.

MR. LYON: Okay, and then can you drop that hook real fast?

WITNESS LACKEY: It's fairly slow. The aux hook is adequate and that's a little bit faster.

MR. LYON: I don't understand the time span, could you give us an estimate of minutes here?

WITNESS LACKEY: You know, I'm guess --

MR. LYON: Order of magnitude is plenty good enough for this example.

WITNESS LACKEY: Another five to ten minutes from the time we got them in to the time the hook was down.

MR. LYON: So somewhere in the vicinity of 15 or 20 minutes, you're really ready to start moving the hatch. And somewhere around 20 to 30 minutes all of a sudden comes this huge volume of steam out through this manway that's off of the steam generator. I don't think you're going to be able to do any more work. At this point you're talking on the order of 15,000 cubic feet per minute of steam pouring out

of that thing. Have you addressed any of that kind of thinking in your planning process and if so, how? And I'm not just talking my specific example but a number of other possibilities or classes of possibilities perhaps. You knew I was leading you down the primrose path, didn't you?

WITNESS LACKEY: Yeah.

MR. LYON: And you see, what I'm getting at here is here is an example of a case in which early on it may be impossible to accomplish the task that you want whereas later on in a shutdown there is plenty of time, but I'm hearing that your process and your planning don't take these kinds of things into account really. And I believe a lot of this will end up as a generic kind of thing because my judgment is there are perhaps a lot of other people that are thinking in a similar mode.

WITNESS D'AMICO: The thing I think about your scenario though is if we shut down because we had a leaking tube and we were going to plug a tube in the generator, I seriously doubt we would be opening the hatch without other stuff going on. We would shut down, get in there, plug that tube, start --

MR. LYON: Yeah, but as I say, I picked one where you've got a chance to do something else that you need to do and you're going to move some equipment in and take care of that at the same time.

WITNESS D'AMICO: The time may come when we'd do something on that.

MR. LYON: And as I say what I'm trying to do here is trying to develop a picture of that control process, that administrative control, procedures control, whatever it is as to whether -- how much this is factored into all of this kind of planning that goes on. And I think what I am getting a feel for here is there -- I'll go back to my previous feeling that we really don't have these kinds of things in place and perhaps some kind of guidance along this line is in order.

WITNESS LACKEY: Again, I think there's -- like we said before, we have responded I think real well to the industry events, we're aware of those and address those. The generic letters and publications, we've responded to those and taken all those actions and we do I think take our own considerations on safety like we talked about the scheduling, try to schedule most valve work --

MR. LYON: I don't mean to imply that you're operating in an unsafe manner here. What I'm trying to ascertain is a picture of the way in which you are operating.

MR. CHAFFEE: I think we've got that picture, don't we?

MR. LYON: I believe I've got that pretty well

established.

WITNESS D'AMICO: If you're looking for a programmatic approach to how we address these kinds of issues, I don't know if we have a programmatic approach in place. I think what we rely on is our own experience and sensitivity to the condition we would be in to try to minimize how we would jeopardize our --

MR. LYON: I hear that clearly. Yes, I hear that ad you're relying heavily on the judgment of a number of people.

WITNESS LACKEY: I think probably a month ago if you would have posed that scenario we would have been more likely to enter it and lift the hatch in a scenario like that than I think now we would. Because now the people making those judgments are more aware.

MR. LYON: I hear that.

WITNESS BARLOW: A lot more of what-if type talking.

MR. LYON: I hear that. Let me just ask one other quickie and then I'll be done with all of that.

Both with respect to the equipment hatch and the personnel hatch, do you still have to run cables or any kind of equipment or anything like that through either of those openings?

WITNESS LACKEY: No, sir.

MR. LYON: That's great.

WITNESS LACKEY: Yes, that is great. We're glad to get away from that.

MR. CHAFFEE: Any more questions?

(No response.)

MR. CHAFFEE: Thank you very much, we appreciate your time, you've been very helpful to us.

(Whereupon, the interview was concluded at 6:31 p.m.)

C E R T I F I C A T E

This is to certifv that the attached proceedings before the U. S. Nuclear Regulatory Commission in the matter of:

Name: Interview of MICHAEL LACKEY, RICKY BARLOW AND JOSEPH D'AMICO

Docket Number:

Place: Vogtle Nuclear Generating Plant, Waynesboro, GA

Date: March 27, 1990

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken stenographically by me and, thereafter reduced to typewriting by me or under my direction, and that the transcript is a true and accurate record of the foregoing proceedings.

William L. Warren

WILLIAM L. WARREN
Official Reporter

Ann Riley & Associates