STATE OF MISSOURI

PUBLIC SERVICE COMMISSION

TRANSCRIPT OF PROCEEDINGS

Hearing

July 25, 2007

Jefferson City, Missouri

Volume 2

In the Matter of an Investigation into an Incident in December 2005 at the Taum Sauk Pumped Storage Project Owned and Operated by the Union Electric Company, doing business as AmerenUE	Case No. ES-2007-0474

COLLEEN M. DALE Presiding,
CHIEF REGULATORY LAW JUDGE
JEFF DAVIS, Chairman,
CONNIE MURRAY,
STEVE GAW,
ROBERT M. CLAYTON III,
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P R O C E E D I N G S

JUDGE DALE: We are back on the record in Case No. ES 2007-0474, July 25, 2007. We were in the midst of the examination of Mr. Zamberlan by Mr. Gaw.

MR. THOMPSON: Your Honor, as a preliminary matter, I have redacted copies of Exhibit 5 and 6. I would like to provide them to you and the court reporter and Counsel.

JUDGE DALE: Excellent, thank you.

MR. THOMPSON: Thank you, Your Honor.

JUDGE DALE: You're welcome.

COMMISSIONER GAW: Good morning, Mr. Zamberlan.

THE WITNESS: Good morning, Commissioner.

QUESTIONS BY COMMISSIONER GAW:

Q. I want to pick up somewhere around where we left off yesterday. And we were discussing a conversation that you were having with someone at Taum Sauk regarding the routing around and alarm that had been set off by one of the Warrick probes. Do you recall that generally?

A. Yes, sir.

Q. And I'm trying to get, at this point, some sort of a tie-down on how that event occurred in

regard to other events.

Was that before the event where the Warrick probes, on the Hi and Hi-Hi probes, were reset from parallel to series?

A. I don't recall the exact sequence of when that program change was made and these others things happened. I believe it happened afterwards, but I don't have a good recollection of that.

Q. Which happened afterwards?

A. The programming happened after that event. I believe that because there were many issues around the Warrick probes, and we were trying to find good solutions on how to maintain proper operation of that system. And I believe it evolved into that program change. But again, it's a fuzzy recollection.

Q. Now when you say that, would part of the reason that you say that be because of the reason why you reprogrammed the Warrick probes, at the Hi-Hi and Hi level, from parallel to series?

A. Yes, it would be along those lines. Yes, sir.

Q. I believe you have testified, or you have stated previously, have you not, that part of the reason for that programming change was an issue with the alarms or the tripping of those Hi or Hi-Hi

sensors?

A. It was the tripping of any of the Warrick probes, and it's just the tripping function not the alarm function.

Q. Why don't you distinguish between those two for me?

A. As we discussed yesterday, the Warrick probes come into the PLCs -- all four of the Warrick probes. Alarms are generated off of one of the high probes and one of the low probes. Any time that point is activated, that alarm comes in. It's a direct connection, essentially. In a programming world, it's a direct connection.

The tripping scheme is a separate set of programming after that point where the alarm is generated. So if you want to call it secondary, that would be moderately appropriate. And in that tripping scheme, that's where the data from the Warrick probes is analyzed, and a determination is made by the program as to whether to trip the unit or not.

Q. What are the factors that are involved in whether or not it does or does not trip the unit?

A. Basically, on the Warrick probes, there was the timer we had talked about that made sure it was a valid signal.

Q. And that was the timer that initially was set at a short period -- shorter -- period of time that, at some point in time, would be programmed to go to 60 seconds?

A. I believe so. But again, I am not fully confident without looking at the program itself and how it evolved.

Q. I see. Go ahead.

A. After the timer times out, and that point is still active, it generated a trip to the turbine. Which would essentially mean a hard shut-down of the turbine. Completely different than the normal shut down procedure off the continuous level probes.

Those were the only factors, accept for the in-pump mode or in-gen mode. If you were in pump mode, it would only look at the high probes. If it was in gen mode, it would only look at the low probes.

Q. Okay. Now, when you're looking at -- you say you couldn't be for sure without checking the programming. Is that something that could be done today?

A. I do not know where those programs exist. They were maintained by Ameren. I don't know if, or whether or not, they exist.

Q. Okay. Why would they not exist today, what

would be a reason?

A. I actually don't know whether they maintained version changes or not on that system.

Q. Is it possible -- do you have to affirmatively do something to get rid of those changes so that they are not filed historically -- if that's the right way to say it?

A. If they were maintained in the copies -- which again, I'm not sure if they were or not. I think it was a separate system, so it would have been maintained in a different manner all together then the standard PLC backup procedure.

Q. Do you know whether or not there would have had to have been an affirmative act in order to erase or delete those program changes?

A. Again, if they were doing it -- I'm not sure if they were doing it -- and they were maintaining programs, and it's not available, it would just be logic to say that. If you can do it and it's not there, then something would had to have been done to change it. Again, I'm not sure if they were doing it or not.

Q. What do you mean doing it?

A. Backing up the program changes.

Q. Would you normally backup program changes

when you make a change?

A. When I'm making my changes, I do.

Q. Is that standard procedure for you?

A. When you're doing program changes like that during the start up, you make a change and you keep your backup in case it doesn't work, you don't like the way it turned out, you can go back to a standard version.

Q. Is that pretty much standard practice for people that work with program changes like you do?

A. I don't know about keeping more than the last backup or maybe two backups. But generally, the last backup of the program would be a normal thing you would keep.

Q. Do you keep any records of the programming work that you did on the system at Taum Sauk?

A. No. I had turned over, at one point, the backup I had to Ameren. I don't have any copies of it now.

Q. When did you do that?

A. That would have been in February. When I had left the site, I turned over my stuff to them, essentially -- the copy of the programs -- when I was done.

Q. February of what year?

A. In 2005, at the end of my outage there.

Q. Now, I'm going to get back into where we were going on this series.

You believe you had -- that the timing of this conversation that you were describing yesterday with the technician at Taum Sauk, about disabling the probes, occurred prior to the reprogramming of the probes so that they were in series?

A. I believe it did. Yes, sir.

Q. Do you recall anything else as far as your involvement with those probes prior to the reprogramming from parallel to series?

A. Not that I recall, sir. It was that problem we were addressing and then looking at the programming to see what we could do better to make it a more reliable or better system.

Q. And at what point in time did the issue come up, to your recollection, about doing something about the reprogramming those probes from parallel to series?

A. It was some time after that, but I don't recall the time frame. It was some time between December and February of 2005.

Q. In some of your statements, I believe there's some reference to the early part of December.

Is that, today, your recollection, or do you have some other recollection?

A. I believe some issues started around the beginning of December but continued through December and into January. Because it was a difficult problem to determine what was going on with those probes.

Q. Now, the difficulty with the probes, were you ever given any records or material that demonstrated that there had been a problem with the probes?

A. No, sir.

Q. How did you know again that there were problems?

A. Working with the plant staff, they would tell me they were having problems with the probes. I'd verify that the alarms were coming in and that it was showing a problem, verified that the computer systems -- the PLCs -- were working properly.

They thought they would be replacing certain parts and pieces up on the Warrick probes to see if that would be a resolution to the problem. I continued on with my stuff while they addressed those issues.

Q. Who are they?

A. They would be Rick Cooper, Jeff Scott and the plant maintenance staff.

Q. And the plant maintenance staff being -- you don't have to name them, but generally, what are you talking about when you say the maintenance staff?

A. These guys were maintenance technicians, electricians. They were the guys that physically did the work at the plant.

Q. Now, at some point in time, did you go back down to Taum Sauk to reprogram, or to work on the programming of these Warrick probes?

A. Well, on that logic, yes, sir.

Q. Yeah. And who did you talk to, if you can tell me, when you went back down there to deal with the probes at that time?

A. Again, my recollection is not completely clear, but it would have been making sure Rick Cooper and Jeff Scott -- and I don't remember if Tom Pierie was down there at the time or not -- make sure they were all aware of what was going on, of what the programming changes were, how they would be implemented. What it would take to do it. Maybe to give me permission to make the change or not.

I would check with the power dispatcher to make sure I had approval to work on the system. If he gave me permission to work on the system, I'd make the change. They would check the change. Assuming

everything was good, I called the power dispatcher back, tell them everything is back to normal, tell Rick everything was back to normal, and we would be done.

Q. And how long did it take you to complete this work?

A. That particular programming change was probably a 30-minute change, at most. It was planned out well in advance and this was how I was going to program it, etc. So, it was just going down and making the programming changes.

Q. Did the plant have to shut down any operation while you were working on it?

A. At the time of the programming changes were times between the cycles, between pump and gen, so it was times they knew they wouldn't be pumping or generating.

Thus the reason why I called down to the power dispatcher, to make sure he wasn't getting ready to push the button or have someone push the button to start the plant.

Q. And would you have, after working on the programming change, retested the probes to see whether or not they were working?

A. No. The probes themselves, the wiring

connection in from the field, was the same spots whether it was the first time I put them in or the last time I touched the system. They were always the same spots, so I knew that that was valid, as far as the data points coming. And they would be affecting the registers I was dealing with, so the rechecking of the probes was not done at that point just because there was a confidence in where the data was coming in. And it was more of checking the programming to make sure the logic in the programming was correct.

Q. And at this time that we're discussing, you made a change to the logic, or to the programming, and I want you to describe that for me. Although you already testified about it, tell me what you did?

A. The programming change was taking the two data points for the Lo and Lo Lo probes and the two data points for Hi and Hi-Hi probes and putting them in series for the tripping function so that both points would have to be active in order to generate a trip of the plant.

Q. And you did that for both the Lo and Lo Lo probes and the Hi and Hi-Hi probes?

A. Yes, sir.

Q. And did you discuss making that change with anybody at Ameren?

A. Oh, definitely. I don't make changes in somebody else's plant without their approval.

Q. Who did you talk to about that?

A. Again, that was -- as we had just discussed -- it was Rick Cooper, Jeff Scott, Tom Pierie, if he was available.

Again, I'm not one hundred percent positive who was in the room at the time, but I knew it was either Rick or Jeff, or Rick and Jeff, and Tom Pierie when he was available.

Q. Do you recall -- let me ask this, were there any individuals who you would ensure you had permission before making a change of this type as a matter of your normal practice?

A. I always made sure that Rick Cooper or Jeff Scott said, "Yes, go ahead and do that."

Q. Now, can you recount for me how the idea of moving from parallel to series originated, did it come from you, or did it come from one of the Ameren employees; do you know?

A. To be honest, I don't recall how that developed. I believe it was a group discussion; here's the problems we're having, what can we do to solve them. Details of it I don't recall.

Q. Do you recall what your impression was,

from that conversation, about how significant of a problem this had become in regard to the probes triggering shut-downs of the pumps or generators?

A. I knew it was a problem. Beyond that, how important it was outside of that wasn't really a concern. It was a problem we needed to resolve, it was on the list of things to get cleared up.

Q. Are you clear about whether or not the problem was related to the low probes, generally, or the high probes, generally, or both; do you know?

A. Generally, I believe it was the low probes that had most of the problems. But that was mostly because they were always conducting. I believe, if we were conducting on the high probes, we would have had similar problems.

But at that point, when you are conducting on the high probes, you are past your operating level and wanting to generate a trip anyway. It's not a normal condition to put water on the high probes.

Q. And what was the problem with the low probes, what were the problems?

A. I don't recall what the final root cause of the problem was. What I knew was going on was that spurious trips and/or spurious alarms were being generated by the low probes.

And beyond that, I don't know what the final result was on whether or not it was a bad probe, or a bad relay base that the probes connect to, or a voltage problem, or what. I didn't get involved in that part of it.

Q. And again, you weren't given any material, written material or evidence, that showed you that there were these trips occurring, you found out because Ameren employees informed you that there was a problem with them?

A. Correct. I wasn't given anything to show that.

Q. Now, you were aware, were you not, Mr. Zamberlan, that changing the probes from parallel to series essentially lessened the safety mechanism that the Warrick probes were there to accomplish, were you not?

A. And we, I believe, had a discussion to that. But we were changing the tripping logic, and the decision was to implement the program; otherwise, I wouldn't have done it, so --

Q. Was it your decision to implement this change?

A. No, sir.

Q. Whose decision would it have been?

A. Again, like we just said, we reviewed the programming change with Rick Cooper and/or Jeff Scott and Tom Pierie -- if he was available. And if they told me to do it, then I did it.

Q. Mr. Zamberlan, are you aware of the Highway Patrol report's version of Mr. Pierie's statements?

A. No, sir.

Q. If the facts showed that Mr. Pierie had stated that he was out of the loop in regard to the change in the logic from parallel to series, would that be a surprise to you?

A. Not necessarily. Like I was saying, I reviewed things with Rick Cooper and/or Jeff Scott, and Tom Pierie when he was available. There were many times where Tom was busy on other projects where he was not down at the site.

Q. How important was it for Mr. Pierie to know about what might have been done in regard to the safety features of the plant, particularly these probes?

A. It was his project overall. The majority of the knowledge needed to remain with Rick Cooper and Jeff Scott, since they were operating the plant, maintaining the plant, continuing down that road with the plant.

It is quite possible that Tom Pierie would have gotten another project somewhere else and not had to do anything further with the plant.

Q. Who would have been responsible for informing him of that change?

A. I could have sent him something. Jeff Scott could have sent him something. Rick Cooper could have sent him something. I don't recall who did.

Q. Do you know whether or not he was informed?

A. I don't recall whether he was informed of that change or not.

Q. Do you know -- have you had any conversation with Mr. Pierie about this, about this change in the program on the Warrick probes?

A. No.

Q. Would it surprise you to know that he -- if his opinion was that such a change should not have been made to the Hi and Hi-Hi probes?

A. If he wasn't present, he may have had that opinion. I can't say one way or the other whether, you know, his opinion was bad or not.

Q. Well, I'll come back to this in a minute perhaps.

Let me ask you this, do you know whether or not

the Hi and Hi-Hi probes were moved during the time frame that we're talking about, your involvement in December through February, December of '04 through February of '05?

A. My recollection of it is we had adjusted the continuous level transmitters -- like we talked about yesterday -- and that, while I don't remember this happening, there was a day on-site where we did apparently move up the Warrick probes -- the Hi and the Hi-Hi -- to just above the normal operating level so we didn't have competing trips -- or competing shut-downs. Other than that, I don't have any other knowledge of those probes being moved.

Q. What do you mean by competing trips or shut-downs?

A. If I have two shut-down methods that are set at the same level, for instance, 1596 exactly, both methods, I can't guarantee you that every time it would be a normal shut-down. I can't guarantee you every time that it would be a hard shut-down.

Whereas the safety trip is supposed to be set a little higher than the normal operating level such that a normal shut down would occur normally, and in the event that it doesn't occur, your safety shut-down takes care of it after that.

Q. Okay. Do you know whether or not the change in the height of the Warrick probes at the Hi and Hi-Hi levels was done at the same time that you were reprogramming the probes from parallel to series?

A. I believe it was done before I did the reprogramming from parallel to series.

Q. Okay. So, would it be accurate to say then that the probes were moved up and there was still a problem with the probes sending signals, as far as the Ameren staff was concerned?

A. Yes, sir.

Q. Do you have any recollection about how much time passed in between those two events?

A. Maybe a month, maybe.

Q. Do you recall making any other trips down to Taum Sauk in between those two events?

A. I actually don't recall. There were many instances between the outage and the period after the outage where it was a quick trip down to look at this or a quick trip down to look at that. I don't recall specifics of those trips.

Q. So, in other words, it would be difficult to look at your time sheets and figure this out --

A. Correct.

Q. -- from them?

A. Correct.

Q. From the standpoint of the movement of these probes, tell me what would have happened, or what you remember happening, in regard to moving those probes?

A. Like I said, that's the problem. I don't remember the event of the probes actually getting adjusted. I believe I was doing other things when that was occurring.

Q. What would your involvement have been in regard to that, what would you have been doing as your part of the responsibility of the probes being moved?

A. At the time, it would have been, "Are they moving the probes today? Yes, they are moving the probes today."

That may have been the extent of my involvement. I don't recall being up there with those probe moves.

Q. I'm not asking you whether you were up there with the probes at this point. I'm asking you whether or not you would have been involved, in some way, in checking the probes after they were moved or something with the programming, would there have been any function that you would have had responsibility for?

A. I may have checked the programming in the

Upper PLC and Common PLC to make sure the points were still there, still valid. Other than that, I don't recall anything else.

Q. And that would have been important because -- if you would explain?

A. Just to verify that the signals were still present, that there wasn't a problem with the PLC.

Q. Okay. Who would have been in the discussion with you about moving those probes?

A. Again, it was Rick Cooper, Jeff Scott, Tom Pierie -- if he was available. If they sought any other advice, I have no idea.

Q. Would you have been involved in determining the level at which those probes would have been placed?

A. I may have been in the discussion, but I didn't make any decisions to that effect. No, sir.

Q. Who would have made that decision?

A. That would have been Rick Cooper.

Q. Do you recall whether or not there was any discussion about the safety risks involved in raising those probes?

A. I don't recall any. No, sir.

Q. So, to your knowledge, there was no discussion about the safety risks?

A. I don't recall any. No, sir.
Q. Do you recall whether there was any discussion about the height of the wall, of the parapet wall around the reservoir, when the discussion was held about moving the probes?
A. I don't think there was a discussion at that time. No, sir.
Q. Would there have been a discussion later?
A. I don't recall any. There was general discussions of things but nothing specific that I can recall at this time.
Q. Were you involved in the initial determination of where to place those probes?
A. No, sir.
Q. Whose decision would that have been, to your knowledge?
A. Again, it would have been Rick Cooper and/or Jeff Scott. I believe it was also needing the help of a surveyor to spot the points along the wall, although he wouldn't have been involved, necessarily, with the decision. I believe Tom Pierie may have been involved. Other than that, I can't think of anybody else.
Q. Why would you need a surveyor?
A. Just because you know where your -- you

know where your set point is with your survey, your valid point. And it would give you a pretty accurate point on the wall where those probes could be placed.

Q. And when you say "they give you an accurate point," the purpose of needing an accurate point is what?

A. So that if you want to set a probe at 1524 or 1575 or 1596, you know that it's 1524 or 1575 or 1596.

Q. And why is that important?

A. The probes don't know where they are at, they are relatively dumb probes. They just conduct. So you want to know your point on the wall where they are fixed.

Q. They depend on the intelligence of human beings?

A. They need to be fixed in a certain spot where it's appropriate. Yes, sir.

Q. So, from the standpoint of ensuring that they are placed at the right point, who would have determined what level they should have been placed at?

A. Again, there were discussions based on the old system, I remember that.

Q. Okay.

A. There were discussions on how the system --

how the physical system mounted up there. But the ultimate "this is where we were setting them" was generated by Rick Cooper; this is where I want it.

Q. What would that decision -- do you know what that decision would have been based upon, what factors?

A. No, sir. I didn't query him on what his foundations were for his decisions. He's the Plant Superintendent, he knows the operation of the facility. If he says that's where he wants them, that's what we design it to.

Q. If he said don't put any up there, you would have done that, too?

A. Ultimately, we would have had a discussion as to why. And if him and his management said they didn't want them there -- I'm working as an hourly employee for them -- I would have designed the system the way they wanted it.

Q. Even if you had concerns about the safety of the system?

A. I would have raised those concerns. As I would with any client.

Q. Would you have documented that you raised those concerns?

A. In that case, yes, sir.

Q. In this case, you didn't document any concern?

A. I was looking at the entire system as a whole. The continuous level transmitters, the backup programming we had in there for safety shut-downs, at the Warrick probes as they were installed. And based on an entire analysis of the system, I didn't see any issues with the way it was being implemented.

Q. Let's walk through those safety features that you had. First of all, all the safety features depend upon the structural integrity of the reservoir; is that correct?

A. That makes sense, sir. Yes.

Q. Then there's a dependency, as the system works, upon -- and we're talking about the new system that you were working on at the time, in '04 -- there's a dependency upon the piezometers that are in there going down measuring pressure for depth?

A. Yes, sir.

Q. Then there's -- and that's the first mechanism that you have in regard to ensuring safety but also ensuring the functionality of the plant?

A. Correct.

Q. It's telling you how much water is in there, and you're basing most everything off of that

fact; correct?

A. Yes, sir.

Q. And then you have this other second line of defense, and it's really just a safety feature. It's designed to ensure that you don't put way too much water in this reservoir or empty it out too much?

A. That was actually our third line of defense.

Q. Tell me what the second was?

A. Inside the programming for the system, since we had a triple redundant continuous level system, we had programming inside the system such that, if an output for the system, to gently shut down the plant under normal operations, didn't occur and we reached a level just above the normal operating level, we would issue another shut-down of that same output but also generate a hard output at the same time for a hard trip. Such that, in the event we had a failure of the normal output, we had a backup output to secure the system.

Q. And describe a scenario where that would occur, if you could?

A. The relays that would be used to generate the output are used to actually cause the trip. There's a possibility that it would short out the

output on the PLC card.

In that event, you would get your normal operating level and you would try to shut down the plant, and it wouldn't happen. The water level would continue to rise. You hit this other level point, which used different outputs to generate the soft shut-down and the hard shut-down, just to make sure the plant was stopped at that time.

Q. Okay. Now, you know the old phrase about the chain only being as strong as its weakest link; right?

A. Yes, sir.

Q. Now, does that second line of defense depend upon the transducers -- the piezometers -- functioning properly?

A. They do.

Q. So, the first and second line of defense, from a safety standpoint, both depend upon that chain link function?

A. That is correct. But under a normal engineering practice, by using three transmitters to generate the level, you've then increased your margin of safety dramatically over using just one transmitter.

Q. Because the system is designed with three

of those piezometers going down into those tubes; correct?

A. Yes, sir.

Q. There were four of those tubes; right?

A. Vague recollection -- I think there was. But I don't remember, to be honest.

Q. Do you remember what the fourth tube was designed to be for?

A. No, sir.

Q. Are you aware of the fact that the fourth tube had another function to it in regard to helping to stabilize the other three?

A. No, sir.

Q. Were you involved with working with those particular matters?

A. No, sir.

Q. Was anyone with your firm?

A. No, sir.

Q. So, we know that the first and second line of defense depended upon that system working; correct?

A. Correct.

Q. The third line of defense then depends upon these Warrick probes functioning properly?

A. That is correct. Yes, sir.

Q. The original design, was it in writing?

A. It was on a drawing. Yes, sir.
Q. Did you see that?
A. Yes, sir.
Q. Was there more than just a drawing, in regard to the design of this structure, with the redoing of the liner and all of the other functions?
A. I guess I don't understand your question.
Q. Was there some sort of a -- there had to have been a plan of implementing these changes; right?
A. There was the drawing, sir.
Q. Just the drawing?
A. Yes, sir.
Q. No description about here's how this is going to be secured, for instance, those tubes being secured to the sides of the reservoir?
A. That may be the case. I didn't see any drawings involving the liner, the way the conduits were mounted to the side, any of that stuff. We had a drawing that showed how the Warrick probes were wired up, etc.
Q. And that's all you got?
A. Yes, sir.
Q. And do you recall raising any objection to the raising up of the Warrick probes to the high level?

A. No, sir.

Q. And were you aware of any information in regard to the lowest point on the parapet wall?

A. I knew the wall went up and down, as many people did, but I don't recall what the low point was to, you know, any level of certainty.

Q. And were you involved in determining at what height to move the probes to?

A. I may have been involved with the discussion just because it involved changing things in the program, documenting the program, things like that. But again, the ultimate decision was the plant.

Q. And did you make any suggestion about ensuring that the probes were not placed higher than the lowest point on the parapet wall?

A. No, sir.

Q. Why not?

A. I guess I assumed that the plant, in generating these levels, would know -- because it's their plant -- what the appropriate levels were.

Q. In hindsight, was that a good assumption?

A. I have to -- I have to give them some level of respect and understanding with their plant that they know the systems and how they operate, wherever I go.

Q. In hindsight, do you wish you had raised this issue?

A. Sure.

Q. Would Mr. Pierie had been involved in regard to the determination of the height of those Warrick probes?

A. The actual setting of the probes where they were going to be, he was involved with. Yes, sir.

Q. And would that have been true with the initial setting?

A. Yes, sir.

Q. And with the subsequent setting?

A. Again, if he was down at the site when that change was made he would have been involved.

Q. Do you know how often the alarms on the Warrick probes supposedly went off prior to you changing the logic from parallel to series?

A. I don't recall. It was frequent, that's about the best description I can give you, sir.

Q. And I wanted to make sure I draw this distinction because you did yesterday. What about actual trips, do you know?

A. I couldn't tell you how many trips there were. No, sir.

Q. You've had communication with the Federal

Energy Regulatory Commission about this case; correct?

A. Yes, sir.

Q. That was either done directly to FERC or through some independent panel?

A. Correct.

Q. Was that testimony that you gave or written statement; do you recall?

A. It was sitting down to before a panel. I couldn't tell you when it was. It was after the event, of course, but --

Q. Do you know whether it was transcribed?

A. I believe it was. Yes, sir.

Q. Have you had conversations -- and I'm going to limit this -- did you have conversations about Taum Sauk with Ameren employees subsequent to -- hold on -- subsequent to the breach of the reservoir and prior to the contract that your company entered into -- or consulting services -- for the investigation of the Taum Sauk incident?

A. No, sir.

Q. How was your firm contacted about that?

A. They were -- the call came in that they would like me down at the plant to help with the investigation. And that, essentially, was the beginning of my contract with them.

Q. And when was that?
A. That was very shortly after the event occurred. I don't recall the exact date.
Q. Do you know when the contract was entered into between your firm and Ameren?
A. Like I said, it would have been essentially the same time I was notified.
Q. Mr. Zamberlan, does it seem unusual to you for this contract to have been offered to your firm since your firm was directly involved in the very matter that the investigation is about?
A. No, sir. I knew the system rather well, and I believe they thought I could offer some advice on what was going on, and what happened, and how it happened.
Q. And your firm got paid for it; correct?
A. Yes, sir.
Q. And there is a nondisclosure agreement, that is part of that agreement that was entered into, that doesn't allow you to talk about anything that you might have done in regard to that investigation; is that correct?
A. That is correct, sir.
Q. Mr. Zamberlan -- well, I won't go there. I want to ask you what it is that -- in regard to

that agreement, if you know -- that prevents you from having discussions -- let me rephrase that.

Is that requirement that you have -- no discussion about that investigation -- something that can be waived by Ameren?

A. I have no idea, sir.

Q. There was someone else with your firm or others working with this project; correct?

A. Yes, sir.

Q. Who were they?

A. We had Randy Jackson, who was brought on as a Contract Drafter to assist with some drawing changes. We had Kelvin Walker, who came down on-site to do an analysis of the electrical system on the capabilities of the generators, the transformers, the lines coming out of the plant, an analysis of the liquid rheostat and whether it really needed to be replaced or not, and what the cost would be.

We had Frank Machara come down to assist with documenting actual wiring in the plant versus what the wiring was showing on the drawings, as a precursor to the other things we were trying to get done. I believe that is all.

Q. Were any of those individuals working on the plant subsequent to February of '05?

A. I don't think any of them were working on the plant subsequent to December of '04 after the outage.

Q. So, you were the last individual, with your firm, that was involved with the plant; is that correct?

A. That is correct, sir.

Q. And you had no more communication with any Ameren employees from that time frame in February of '05 until after the breach?

A. Not involving the plant control system as a whole, or making any changes to the plant control system, or anything like that.

I believe it was May, Tom Pierie called me up and told me he didn't have time to meet an Allen-Bradley employee down at the plant to take a look at some communication issues and asked if I would be able to free myself up and meet him down there and help him with that. I did, and the employee did his analysis, and we left.

Q. Was that the last time you had any communication with anyone from Ameren?

A. It was an e-mail to Tom: How's it going, how is everything? An e-mail down to Jeff Scott: How are you doing, do you need any help, anything? Stuff

like that. But I didn't do any other projects at Taum Sauk after that point.

Q. Mr. Zamberlan, have you read the FERC report on this incident?

A. Like I said yesterday, I know of it, but I did not read the report. No, sir.

Q. Did you look at the summary of the conclusions?

A. No, sir.

Q. Did it interest you?

A. It interested me, but I had other projects that I was working on that were requiring my time. I didn't go back and analyze the report at any length at all, sir.

Q. Regarding the first second and third lines of defense again. If those individual -- those three -- transducers were not reading properly, how would that impact the plant itself?

A. It would have a major impact on the plant.

Q. Explain all of the ramifications of that, if you could?

A. If those probes are not reading properly you wouldn't have a good knowledge of how much water was in the reservoir, be it either pump mode or gen mode, which could either mean you could run your

reservoir dry or pump over the top.

Q. If you knew that they were not reading properly, from your standpoint -- if you had been told these things are not functioning properly, how important would that be from your standpoint as an engineer?

A. I would have been very concerned, sir.

Q. Would you have been concerned enough to say something needed to be done immediately?

A. Yes, sir.

Q. Does it surprise you, Mr. Zamberlan, that once it was discovered that they were not functioning properly, that nothing occurred immediately in regard to fixing it?

A. Yes, sir.

Q. How much additional pressure, from a safety standpoint, does that put on the two Hi and Hi-Hi Warrick probes to be able to shut that plant down?

A. It's significant.

Q. Does it change dramatically the dynamic of how important it is to have those two Warrick probes able to trip before the water reaches the lowest level on the parapet wall?

A. Well, it's always a high level of importance. Yes, sir.

Q. Does it increase the importance of that if the first and second lines of defense -- as you put them -- are not functioning properly?

A. Well, certainly. When you're down to your last line of defense, it becomes very important. Yes, sir.

Q. You don't want the end to get around the safety, do you?

A. Yes, sir.

Q. Now, I'm searching for my Rizzo Report, so pardon me here.

Are you aware that there are implications in some of the material that is provided to the FERC, by Ameren, on your involvement in the setting of those Hi and Hi-Hi probes?

A. I was not aware of that. No, sir.

Q. Would it surprise you that you're the individual that seems to have fingers pointing at him?

A. That would, sir.

Q. Do you think that's a fair thing, if that's occurring?

A. That is not a fair thing. No, sir.

Q. And tell me why not?

A. Because at that facility I did not move the probes.

Q. And is it your testimony that you didn't make the decision to move them?

A. That is correct. Yes, sir.

Q. You were aware that they were moved?

A. I am aware they were moved. Yes, sir.

Q. And you were aware, at the time, that they were being moved?

A. I would have had to. Yes, sir.

Q. Did I ask you whether you had read the Rizzo Report?

A. I believe you did, and I have not read the Rizzo Report. No, sir.

Q. Mr. Zamberlan, when you look at the three piezometers, are you aware of the fact that at some point in time they became detached from the reservoir wall, you've been told that?

A. After the event and the post-accident investigation. Yes, sir.

Q. Do you have any understanding of what that dynamic would do to the readings from those transducers?

A. As we discussed yesterday, any movement of those continuous level transmitters would cause a change in the level of the plant as it was seen by the operators.

Q. Would it be possible to know what the appropriate level would be from readings off of those piezometers after they had become disconnected?

A. No, sir.

Q. So, guessing about it or giving a fudge-factor, would that have been a reasonable thing to do?

A. I don't believe so, sir.

Q. Would that also be the case if the water was continued -- if the goal of the water level was basically still the same as it had been before, in regard to its relationship to the top of the wall?

A. So, you're saying the same operating level?

Q. Yes.

A. You wouldn't necessarily know where that operating level is with the continuous level transmitters moving around; therefore, it would be an unknown.

Q. Unless, I suppose, you had someone up there on top of the wall that could call back down by walkie-talkie and say stop?

A. Correct.

Q. Would it surprise you to hear that the two Warrick probes at the high level were found to be -- according to an e-mail report -- four and seven inches

from the top of the parapet wall at the location of the panel they were placed?

A. My understanding of the way the system was configured, that would be a surprise. Yes, sir.

Q. Why is that?

A. That is not, again, my understanding of the way the system was configured. That was not where they were last left.

Q. Explain that to me, what to you mean by that?

A. I thought the probes were some distance down the wall. Four to seven inches, to me, is not some distance. It's a short distance down the wall.

Q. Why would you think they were at some particular distance further than that?

A. Just because the box was somewhat elevated to the top of the wall, I believe. If I'm remembering correctly, it sat a little bit higher. So, you had to get down to the point on the wall where it was accurate, which I thought was on the order of 20 or 30 inches -- in my vague recollection of things.

Q. Well, is your recollection from actually seeing it?

A. No, this is from discussions along the way of: Oh, I think it was about this far down.

And it kind of went in one ear and out the other at the time, because I was focused on the PLC side.

Q. And who would you have been in that discussion talking to about that?

A. It would have been Tom.

Q. I'm going to refer to the Rizzo Report --

COMMISSIONER GAW: Which hopefully someone is getting identified, Judge, per our conversation yesterday.

QUESTIONS BY COMMISSIONER GAW:

Q. On Page 116, there is a statement in here. I want to ask you if, first of all, if you understand it: Moreover, the dam safety instrumentation should not have been altered without significant input from people familiar with dam safety requirements.

Do you understand what that statement says?

A. Sure.

Q. Do you agree with it?

A. In my understanding, that was Rick Cooper and Jeff Scott and the guys that operated the plant.

Q. That's what you were relying on?

A. Yes, sir.

Q. So, another statement: Changes made to the instrumentation were not well documented and adequate quality checks were not performed prior to making

changes.

Do you understand that statement?

A. Yes, sir.

Q. Do you agree with it?

A. At the time, I thought we were checking out the system appropriately.

Q. So, do you agree with it or disagree with it?

A. I disagree with it then.

Q. Tell me what the documentation is to the changes in the instrumentation that you made?

A. Generally, the documentation in changes, on my side, were making sure things were done, documented in the program, and documented on drawings, so that they were a record for the plant.

Q. Where are those documents today?

A. Ameren would have them.

Q. Did you see those documents?

A. We made changes to those documents -- or to the program. Yes, sir.

Q. So then, when you made changes, there was a document that was generated showing those changes?

A. Yes, sir.

Q. Have you ever seen those documents subsequent to the breach?

A. I believe it would have been in the post-accident investigation I seen some of those.

Q. There's a reference in the Rizzo Report on 117 -- I'll read it to you -- in 9.1.1.3: Both sets of instruments are controlled by the same programmable logic controller, and there is no fail-safe path to shut down the pump in the event of a failure of the PLC.

Based on Siemens' investigatory work, there is no evidence of a hardware failure, in either the PLC network system or in the wide area network; nevertheless, it is obvious that a fail-safe should be considered if the project is rebuilt.

Mr. Zamberlan, do you agree with that statement?

A. No, sir.

Q. Explain why not?

A. The unit PLC, for both Unit 1 and 2, were fail-safe hot backup programmable logic controllers. If one PLC failed in that rack, the other PLC took over. So, it was a hard backup system, it didn't hick-up, it didn't stumble, it just continued processing like it was supposed to.

We brought the inputs through two separate paths for the Warrick probes to those redundant processors. So, we had essentially multiplied our redundancy

matrix -- if you want to call it that -- to spread out the possible problem of having a failure and bringing the data in through multiple paths.

Q. And I don't want to spend much time on this because it doesn't appear that this impacted the actual breach, but you disagree with the analysis from Rizzo on that point?

A. Based on what you read me, yes. I disagree with that statement.

Q. You hadn't read that before, I take it?

A. No, sir.

Q. Mr. Zamberlan, were you familiar with the height at which the water level had been kept, prior to the installation of the liner, in relation to the top of the parapet wall?

A. I'm vaguely familiar with that. I can't recall the actual numbers, but we did have that discussion. Especially where it involved programming of the control system for the operator interface.

Q. When did you have those discussions?

A. That was prior to the outage, but I don't have a specific date. It was prior to outage.

Q. What's your general recollection about that?

A. Prior to the outage, they ran in a summer

mode and a winter mode. Summer mode was somewhat higher on the wall -- parapet wall -- and the winter mode was below the base of the parapet wall.

The summer mode was somewhere between 1594 and 1596, I believe, although I don't have a good recollection of that. And the winter mode was somewhere around 1585 or below, somewhere in there. Again, I don't have a good recollection of that.

Q. Did you have involvement in regard to putting together the observation of the performance of the reservoir on computer screens? And I'll give you a specific example of what I'm asking.

There is, I think, a generation of a record -- perhaps a screen that comes up, I don't know -- that deals with the increasing volume in the Upper Reservoir, and probably there's one that does the same for the Lower. Are you familiar with that?

A. Yes, sir.

Q. Can you describe it fairly briefly?

A. This would be part of the HMI, or the Human Machine Interface, that we talked about yesterday -- or operator interface -- there were various other names they have for it.

It presented the data from the programmable logic controllers in various ways for the operators to

analyze and do things to the system if they had to.

One piece of this was the page that showed the level of the Upper Reservoir, the level of the Lower Reservoir, and a general trend of how many acre feet -- I believe it was acre feet -- of how much water was in the reservoir.

Q. And who would have seen that -- first of all, did it come up on a screen?

A. Yes, sir.

Q. And would that have been a continuous screen that would have been there to observe?

A. Not necessarily. It could have been changed away to a different screen. Any time I was at the plant, generally one of the two terminals had that up as a general statement. The system also had the ability of showing that screen outside the control room on the network computers inside the plant.

Q. Do you know whether or not that screen was available remotely from Osage or St. Louis or some other location?

A. I don't recall at this time, no.

Q. Would that screen have given you information if there had been an inconsistency in the volume of water in the reservoir as it was filling, would that have been something it could have shown?

A. It was showing general fill rates for pump mode or general rates of the reservoir lowering in generate mode.

There were alarms on the transmitters for when they failed -- or were a certain amount out from the average -- to tell the operators that, hey, you may need to look at your probes or select a certain probe to use that one until you get the other one fixed, or something to that extent.

Beyond that, I don't recall any other indications. That pretty much covered a lot of what was going on.

Q. Would that screen have had any kind of a line graph that would have shown how the depth of the reservoir was changing?

A. It's been a while since I've looked at the screens, but I believe there was a trend on those screens for the reservoir. Yes, sir.

Q. And if that trend, on a fail-mode for the Upper Reservoir, was showing jagged lines up and down, as during a fill-mode, would that have been something that would have indicated something about what was going on in the Upper Reservoir?

A. I guess it depends on the variations in the lines. If you're focused in real close and seeing a lot of jagged lines, it might be decimal places or

hundreds of decimal places change that you are seeing verses if you're zoomed way out, it could be a foot or two-foot or three-foot. It really depends on what they are looking at, at the time.

Q. Let's say there was a clear indication that the actual fill in the reservoir was trending upward but was showing drops and raises and drops and raises all the way up?

A. Okay.

Q. Would that have been an indication of something that was unusual?

A. Probably would have indicated there was a problem with the transmitters or something happening within the system.

Q. And is it possible that one of the causes of that would have been these transducers being unattached at the bottom and moving around on the pressures?

A. That is correct.

Q. And of course, that graph that we're talking about is reading off of those piezometers?

A. Correct.

COMMISSIONER GAW: If somebody else wants to go for a minute, that would be great.

COMMISSIONER APPLING: I wanted to ask --

that's just the moment I was looking for, a one minute break in my colleague's questioning.

QUESTIONS BY COMMISSIONER APPLING:

Q. I have one question, and that's the reliability of the computer system that gives you the information. But let me just mention a couple things before you answer that question.

I just want you to frame that for me and what your experience has been with the reliability of the computer system that is used to give you feedback on the height of the water which is being pumped back in the reservoir and all that.

You know that water is a powerful force. I have been out on aircraft carriers and thrown around like a sardine can. So, water can -- it's going to seek the weakest point, and that's where it's going to put it's forces.

With that said, we had what we call a chiller plant and we serviced several buildings, and there was a lot of pressure on the chiller water as it goes around the lake and pumps back into the chiller system.

But with all of that said, what has been your experience with the reliability of the computer system -- which you helped design and engineered --

give us the feedback. And were there requirements for somebody to watch the gauges, like I did on the chiller system, 24/7?

A. The computer system that was installed -- the PLC system that was installed at the Taum Sauk Plant -- was an Allen-Bradley system. And Allen-Bradley is one of the -- at least in the United States -- if not the world's largest manufacturers of programmable logic controllers. They have a very long history of high quality, highly reliable equipment.

In order to improve on that for the unit operations, we installed backup PLCs for the unit operations. Which meant that, instead of one computer controlling the unit, you had two. They were functioning together, one as a lead the other as a follower. But if the leader fell down, the follower would pick it up right away in a bumpless transfer. So that greatly increased the reliability of those controls within the plant.

As far as the whole system is concerned, based on the type of the equipment that was installed and the hot backups that we installed with the unit controllers, the system itself is a highly reliable computer system as far as its collection of data, processing of data, and displaying it for the

operators.

Q. Is there anything else that you haven't talked about -- that you can think of -- that you can add to this hearing this morning that you haven't already said, talked about, or heard, or whatever?

A. Not at this time, sir.

COMMISSIONER GAW: I'm looking for a document.

COMMISSIONER DAVIS: No, I don't have any questions for Mr. Zamberlan.

COMMISSIONER GAW: As soon as I have it I'll be about done.

JUDGE DALE: I hate to break this close to lunch, but let's go ahead and take a 15-minute break.

MR. THOMPSON: What time do you anticipate lunch break, Judge?

COMMISSIONER GAW: Never.

JUDGE DALE: If it's possible to finish Mr. Zamberlan prior to breaking for lunch, I would like to do that. But if it's not -- I don't know how many questions Ameren may have for this witness.

MR. HAAR: I would imagine, probably about 15 minutes.

COMMISSIONER GAW: And I do have what I was looking for.

JUDGE DALE: Then let's go ahead.
QUESTIONS BY COMMISSIONER GAW:
Q. Have you seen a letter from Ameren to Sergeant Thomas Breen, of the Missouri State Highway Patrol, dated May 23, '06?
A. No, sir.
COMMISSIONER GAW: Judge, I only have one copy of this and it doesn't even belong to me. But if we could --
COMMISSIONER CLAYTON: Make sure I don't have any notes on it.
COMMISSIONER GAW: Pass that down to the witness and maybe have it marked or something.
JUDGE DALE: Exhibit 9. I'm going to go ahead and reserve Exhibit 8 for the Rizzo Report, of which I do not yet have a copy.
QUESTIONS BY COMMISSIONER GAW:
Q. Do you have that letter in front of you, Mr. Zamberlan?
A. Yes, sir.
Q. I want you to go to the last -- first of all, can you tell me what it is -- what it appears to be?
A. It appears to be a letter from{sic} Sergeant Thomas Breen, with the Missouri State Highway

Patrol, from Mr. Mark Birk, Vice President of Power Operations of Ameren Corporation.

Q. Would you mind -- there's a series of questions and responses I believe. Do you see those?

A. Yes, sir.

Q. You can phrase it, whatever it says there -- I don't have copy of in front of me -- without reading it. Is that generally --

A. It's a request for information with questions and responses. Yes, sir.

Q. Go to the last question and response and read that for me.

A. Question is: Who moved the Warrick probes higher than they were initially set? Response: According to an e-mail from Tony Zamberlan -- dated December 2, 2004 -- on December 1st, 2004, Mr. Zamberlan was at the Upper Reservoir to pull up the high level Warrick probes to 1596.5. AmerenUE believes the Warrick Hi and Hi-Hi probes were moved on December 1st, but neither UE personnel nor Mr. Zamberlan recall who moved the probes on that date.

Q. Do you agree with that answer to that question?

A. Yes, sir. The probes -- to the best of my

knowledge -- were moved on that date.

Q. Well, there is a specific statement in there, that you just read, that says that the e-mail suggests that you were there to move the probes up?

A. I believe we went down there to do that, plus other things, and have plant personnel move the probes up would generally be one of those things if that was on the list of things to do. Yes, sir.

Q. When it says you were down there to move them up, your testimony is that, that is what you were involved with but you, yourself, did not physically move them?

A. That is correct.

Q. But you were aware, at that time, that the probes were being moved up to that height?

A. Yes, sir.

Q. You were aware of the height, supposedly, that it was moved to?

A. Yes, sir.

COMMISSIONER GAW: That's all I have right now, Judge. Thank you.

JUDGE DALE: If you only have 15 minutes, let's go.

MR. HAAR: That's an estimate, Judge.

MR. THOMPSON: Did you receive Exhibit 9,

Judge?

COMMISSIONER GAW: That's not really documented.

JUDGE DALE: I have several -- well, not several -- three exhibits that have not been admitted; Exhibit 7, which was the packet of e-mails; Exhibit 8, the Rizzo Report; and Exhibit 9, this letter from Thomas Breen -- to Thomas Breen.

MR. THOMPSON: Thank you, Judge.

QUESTIONS BY MR. HAAR:

Q. What I'd like to do is just clarify the chronology and also just highlight some things we know and don't know.

There was a reference to the fact that you did give testimony under oath in the context of the Federal Energy Regulatory investigation?

A. Yes, sir.

Q. And I think you testified, you started at LDP in January of 2002, so -- 2003. So that when you were working at Taum Sauk in 2004, that's during the course of your employment at LDP; right?

A. Yes, sir.

Q. And then the outage that you referred to a number of times was the outage for the liner replacement?

A. That is correct, sir.
Q. And that was in the fall of 2004?
A. Correct.
Q. During that outage, you were involved with dealing with a number of the programming issues with respect to the new systems that were being put in place?
A. Correct, sir.
Q. How would you characterize your area of expertise?
A. My area of expertise would be control systems, PLCs, operator interfaces, HMIs, networking, communications, and the associated wiring of those systems.
Q. And there was, in conjunction with the liner project, an upgrade in the control systems?
A. Correct, sir.
Q. Now, I think you testified that you were not involved, as best you recall, in the initial placement of the probe levels; is that correct?
A. That is correct.
Q. So, with respect to the Hi-Hi and the Hi probes during the outage, you don't recall being directly involved with the initial placement of those probes?

A. That is correct, sir.

Q. Now, my understanding is, what happened in the fall of 2004, after the liner project and the plant goes back in operation, is that the water level was gradually brought up in the Upper Reservoir?

A. Basically. Yes, sir.

Q. That's your understanding?

A. Yes, sir.

Q. And then in the -- and I think it was your testimony that it was your understanding, that in the course of bringing that water level up, after the liner replacement, that some problems developed with the Warrick probes; is that correct?

A. That is correct, sir.

Q. And do you have a recollection of, specifically, what problems you were alerted to in the course of filling the Upper Reservoir?

A. Specifically involving the Warrick probes, or just in general, sir?

Q. Specifically -- I think, to move things along -- the Warrick probes?

A. My recollection of the issues with the Warrick probes were; intermittent trips, or spurious trips of the unit based on a mis-operation of the Warrick probes, and then spurious alarms that came in

from the Warrick probes.

Q. Now, did these primarily -- as you understood it -- involve the low probes?

A. Yes, sir.

Q. Do you also recall, in that time frame, getting any information about a trip of the high probe at 1595?

A. I don't recall that. No, sir.

Q. Does it sound familiar?

A. It might, a little bit.

Q. Do you have an understanding as to who was involved in the initial placement of the Hi and Hi-Hi probes at the time of the liner replacement?

A. My understanding was, that they were -- that portion of the design calculations were done by Tom Pierie, but in order to place them, Sachs Electric was involved, a surveyor was involved. I believe that was everybody.

Q. When you began to hear of these problems with the Lo Lo probes, and maybe of a trip at 1595 on a high probe, was that roughly late November of 2004?

A. They were intermittent from late November/early December -- really early, very early December -- through January, I believe.

Q. And so, if there was a problem with respect

to the probes, someone would contact you from the plant?

A. Not necessarily just me. It could have went to Tom Pierie, it could have went to somebody else.

Q. No, I understand that.

A. If it was something I needed to be involved with, they got a hold if me. Yes, sir.

Q. Right. I understand they may have called other people, too. But I'm asking when they contacted you about an issue with respect to the probes at the plant, would somebody, normally, at the plant give you a call?

A. Yes, sir.

Q. Do you recall having any conversation with Mr. Pierie in late November of 2004, after getting a call from the plant, to alert him that he had placed the probes too low during the initial installation?

A. I don't recall it, sir.

Q. Now, you were shown, during your testimony, these Highway Patrol reports that have been marked Exhibit 5 and 6, I believe.

Exhibit 5 is an interview that occurred on January 23rd, 2006, which was about six weeks after the breach. Do you recall being interviewed by the

Highway Patrol in that time frame?

A. Yes, sir.

Q. And you were asked questions about this particular report, and specifically about a statement that -- well, let me ask you; do you recall that you were interviewed at that time by Sergeant Breen?

A. Yes, sir.

Q. And there's a statement in here that you stated, in December 2004, you were at the Taum Sauk facility and made the direct modification of the upper probe to level 1596.5 above sea level. And I think you indicated that is a response that you would change?

A. Yes, sir.

Q. And I just want to clarify. Is it your testimony that you didn't tell Sergeant Breen that, or if you said that, you were misspoken?

A. I believe it was either, in his summary of the statements he mistranslated what I said, or I misspoke at the time. However, my recollection was I was pretty clear at the time.

Q. But you indicated that the way you would change it is to say that you were involved in the modification of the upper probe during that time frame?

A. Yes, sir.

Q. But as you sit here today, you don't recall precisely what the nature of your involvement was?

A. No, sir.

Q. How do you go about -- if you're going to change the elevation in the Hi or Hi-Hi probe, physically what do you do?

A. The way that cabinet is arranged, there's wires come into the cabinet, and they are attached to what would be called in the industry a Kellem grip, which is much like one of those finger handcuffs -- those toy finger handcuffs that kids play with.

As it stretches out, it grips down on the cable. The cables were suspended from those down into the tubes. Those grips were at the top of the enclosure that everything came into, and the conduits were at the bottom of the enclosure.

If the change was going to be made, the difference would have been made in reference to the top of the conduits, based on the fact that they were spotted at the right level, and moving them up from there would be a reference point that everybody could easily see.

Q. And how was that reference point -- how was that kept track of?

A. I don't recall how that was kept track of,

sir.

Q. Do you recall a system involving tape?

A. Yes, sir. Yes, sir.

Q. And so that, if you put a probe in, you would put a piece of tape at the top of the conduit to kind of show where that probe should be?

A. That, and I believe the tape was also to give you an indication if it had fell or moved, or things like that.

Q. So, you knew it was at the level you had set it?

A. Correct.

Q. And so -- if I understand it -- if you're going to make an adjustment, one bit of information you need to have is what level is it at now?

A. That is correct.

Q. Which you can't really visualize that very well?

A. Correct.

Q. So, someone would give you the information, what level is it at now, and then the way you would determine -- in terms of bringing it up -- you would look at the top of that conduit, and if you wanted to bring it up six inches, you would bring it up six inches, and maybe mark the new reference point?

A. That is correct.
Q. That's your understanding?
A. That is my understanding of it. Yes, sir.
Q. So, if for some reason you got the wrong information about what elevation the probe was at, if you made the adjustment, it wasn't going to end up at the elevation you were intending to get it to; right?
A. That is possible. Yes, sir.
Q. Now, Exhibit 7 has been identified as the e-mail that you sent to Tom Pierie on December 2, 2004; do you recall that?
A. Yes, sir.
Q. And that's the one that says: We were up at the Upper Reservoir to pull up the Hi level Warrick probes to 1596.5, and we heard a terrible noise come from the Warrick relay. Do you recall that?
A. Yes, sir.
Q. And you did send this e-mail?
A. Yes, sir.
Q. Do you recall that it was December 1st, 2004 that you were at the Taum Sauk Upper Reservoir when this work was done?
A. I believe that is case. Yes, sir.
Q. They keep gate logs at Taum Sauk, do they not?

A. Yes, sir.
Q. So, you can look at the gate logs and see if a particular individual was on-site that day and for what period of time; is that right?
A. Correct.
Q. Because they sign you in and they sign you out?
A. Correct.
Q. So, if the gate logs at the Taum Sauk Plant indicate that you were there on December 1, 2004, that's not something you would dispute?
A. No, sir.
Q. And with respect to this e-mail, there's also reference that "we heard a terrible noise from the Warrick relay." Is that correct?
A. That is correct.
Q. And that's a relay at the Upper Reservoir?
A. That is correct.
Q. So, that's not something you would hear unless you were at the Upper Reservoir?
A. That's correct.
Q. Do you recall being up at the Upper Reservoir that day?
A. I remember hearing the buzzing.
Q. Now, you also indicated that, if you make

changes with respect to the probes, the logic of the probes, and maybe even the elevation of the probes, there are ways to make entry in the PLC program to that effect?

A. That is correct.

Q. And then those changes are saved. I think you referred to them as the backup?

A. That is correct.

Q. So, it may be possible, with respect to the backup -- if it still exists -- to determine what changes, in the system at least, had been made by that point in time?

A. That is correct.

Q. Now, do you recall that there was a system of drawings that were maintained with respect to the Hi and the Hi-Hi probes?

A. Yes, sir.

Q. And was some of that drafting done at your office?

A. Yes, sir.

Q. And do you recall, that the changes that were made with respect to the probes, in December of 2004, were reflected in drawings that were made at your office?

A. Yes, sir.

Q. Do you recall Tom Pierie, in fact, coming to your office to get those drawings?

A. Yes, sir.

Q. Have you had occasion to look at those drawings?

A. Yes, sir.

Q. Do you recall that they reflect that the change that was made to the Warrick probes on December 1st, 2004 was to move them to 15 -- move the Hi probe to 1596.7 and the Hi-Hi to 1596.9?

A. I remember seeing the drawing and those numbers on the drawing, sir.

Q. Of course, that's only going to be correct if whoever moved the probes had the right information where they were at the time?

A. As much as it's only correct if our drafter has the right information to put on the drawing. Yes, sir.

Q. And that whoever changes the probes has checked the drawing?

A. Yes, sir.

Q. Now, there's been testimony about the one minute delay, and I just want to clarify. Do you recall when you made the change in the logic on the one minute delay?

A. I don't recall the one minute delay. No, sir. I remember a delay in place, but I don't remember the length of time specifically.

Q. But do you recall changing the delay at some point?

A. Again, I remember a delay. I don't remember when those delays were done.

Q. And do you recall programming an additional delay at some point?

A. I remember programming the delays. Yes, sir.

Q. And do you recall whether that was on those lists of things to do on December 1st, 2004?

A. I don't recall. It may have been, but I don't recall.

Q. And was the reason for putting in the additional delay principally the Lo Lo probe's problem?

A. Yes, sir.

Q. And what was the nature of the problem that -- with respect to the Lo and Lo Lo probe -- that suggested an additional delay?

A. Again, it involved spurious alarms and spurious trips generated by the Lo Lo probe -- or Lo probe.

Q. But I think your testimony is, you don't have a specific recollection during this time frame of trips being a problem with the Hi and the Hi-Hi probes?

A. That is correct.

Q. So, if there was a change in a delay for the Hi-Hi probes that was the same as for the Lo and Lo Lo, was that just a matter of symmetry -- I mean, if we're going to change the lows, let's change the highs?

A. I believe that was the case at the time. Yes, sir.

Q. And my understanding is that you don't have a specific recollection of who you discussed those changes with; is that correct?

A. I do not. No, sir.

Q. You know what your practice was; right?

A. Yes, sir.

Q. But you don't know if, with respect to December 1st, 2004, you talked to Rick Cooper or Jeff Scott or Tom Pierie or somebody else?

A. I know I talked to somebody. I couldn't tell you specifically who it was.

Q. But we do know that you sent the e-mail to Tom Pierie on December 2nd, 2004?

A. Yes, sir.
Q. Now, after December 1st -- and I think you testified, that in terms of your involvement with raising a probe, the only time that occurred was December 2004?
A. Yes, sir.
Q. All right.
A. Yes, sir.
Q. And you were back at Taum Sauk on another date in February; is that correct?
A. That is correct.
Q. And do you recall the date?
A. It was in February, I don't recall the specific date.
Q. But if the gate logs reflected that you were at the plant on February 15, 2004, you wouldn't dispute that?
A. I wouldn't argue that. No, sir.
Q. And on February -- assuming it's February 15, 2004, and I know you don't have a recollection of the precise date -- what was the nature of the problem that resulted in you being out there in February of 2004?
A. To the best of my recollection, the problem at the time was -- excuse me -- was a problem with the

wireless network system that was at the site. There was a loss of communications to the Lower Reservoir that we were trying to determine what was going on, why that was happening, and whether or not we needed to replace equipment.

Or it could have been that day when we were replacing equipment on the large tower at the site.

Q. But what was it that brought on any discussion or thought to going from parallel to series with respect to the Warrick probes?

A. I believe, at the time, it would have been that there were still issues to be resolved, and that was a way of verifying that the data was accurate for the trip.

Q. Do you recall that the problems, again, were related to the low probes?

A. Yes, sir.

Q. And so you went out there to address the issue of the low probes; is that right?

A. And the network communications, I believe, but, yes.

Q. And my understanding is that, again, you would likely have gotten a call from someone at the plant: We're having this problem?

A. Yes, sir.

Q. And your expertise was to take that problem and suggest possible changes to the logic that might address it?

A. Yes, sir.

Q. And in this particular case, they told you: We're still having problems with Lo and Lo Lo probes. Is that right?

A. Yes, sir.

Q. And one of the suggestions you made: Well, one way to deal with that would be to put those probes in series as opposed to parallel?

A. That is correct.

Q. And again, you don't associate that visit with any particular problems at the Hi-Hi probe?

A. No, sir.

Q. So again, as best you can tell, was the decision to put those probes in series a situation: Well, we're putting the Lo Lo probes in series, and so -- I mean, again, symmetrically, we'll put the Hi-Hi in series?

A. I believe that's the case.

Q. It wasn't in response to a particular problem?

A. No, sir.

Q. And you don't have a recollection -- as I

understand it -- who specifically you spoke to with respect to that February 2005 trip to Taum Sauk; right?

A. It would have been Tom Pierie, Rick Cooper and Jeff Scott, one of them.

Q. And my understand is, again, you're relying on: This is my practice, I would talk to one of the people up there, those are the people I would normally talk to.

But as you sit here today, you don't have a specific recollection who you talked to?

A. No, sir.

Q. But do you think that there would have been discussion of changing these probes from series to parallel; is that correct -- I mean parallel to series?

A. I'm fairly confident there would have been a discussion; otherwise, I wouldn't have made the change.

Q. And specifically the problem they were dealing with was the Lo Lo?

A. Yes, sir.

Q. Do you have a recollection -- a specific recollection -- of discussing with the people at the plant changing the Hi and Hi-Hi probes from parallel

to series?

A. I believe I did.

Q. But do you have a specific recollection of having that discussion and with whom you had it?

A. Again, I can't tell you who it was, but they would have been somebody at the plant; otherwise, I wouldn't have made the change.

Q. But what you recall was suggested -- the change -- to you at the time was: Well, we're changing the Lo and Lo Lo to series, again, symmetrically, let's change the Hi and the Hi-Hi to series?

A. That is correct.

Q. And I think your testimony was that if you were ever asked to make a change that you thought compromised the safety of the reservoir, you would raise that concern?

A. Yes, sir.

Q. And you never had occasion to raise that concern when you were working up at Taum Sauk on these issues, did you?

A. No, sir. I was confident in the control system as it stood.

MR. HAAR: That's all I have.

JUDGE DALE: Are there any more questions

for Mr. Zamberlan?

COMMISSIONER GAW: Not at this time. That means, I hope you treat him the way you did Mr. Alexander; subject to being recalled.

JUDGE DALE: Yes, you are subject to recall. At this time you are excused.

THE WITNESS: Thank you, Your Honor.

MR. THOMPSON: I would like to move for the admission of 7, 8, 9 at this time.

JUDGE DALE: Any objection?

MR. HAAR: None, Your Honor.

JUDGE DALE: Hearing none, Exhibits 7, 8 and 9 will be admitted into evidence.

(Hearing Exhibit Nos. 7, 8 and 9 were then admitted into evidence.)

JUDGE DALE: I see that it is five to twelve. We will be in recess and reconvene at one o'clock with Mr. Bluemner.

(A recess was then taken.)

JUDGE DALE: At this time, Staff will call its next witness.

MR. REED: Yes, Judge. Steve Bluemner.

STEVEN BLUEMNER,

Of lawful age, being first duly sworn by the Notary Public, testified as follows:

QUESTIONS BY MR. REED:

Q. Mr. Bluemner, my name is Steven Reed. I work at the General Counsel's Office here at the Public Service Commission.

State your name and spell your last name, please?

A. Steven Bluemner, B-L-U-E-M-N-E-R.

Q. What is your occupation?

A. I am a Project Engineer.

Q. For whom?

A. For Ameren.

Q. How long have you been a Project Engineer for Ameren?

A. Fourteen and a half years.

Q. Where is your office?

A. Downtown St. Louis at the general office building.

Q. Mr. Bluemner, were you ever interviewed by anyone from the Missouri State Highway Patrol?

A. Yes, I was.

Q. And do you recall who the person was who interviewed you?

A. I do not.

Q. Have you ever seen a copy of the notes or the interview itself?

A. I have not.

Q. Can you tell us about when the interview took place?

A. I don't recall exactly. I believe March or April but --

Q. March or April of --

A. Of two thousand -- of this year.

Q. Of this year; 2007?

A. Yes.

Q. Other than the Missouri State Highway Patrol, were you interviewed by anyone else regarding Taum Sauk?

A. By the Federal Energy Regulatory Commission.

Q. And when was that interview?

A. I don't recall, exactly, the date.

Q. As a Project Engineer, did you have any duties at the Taum Sauk Reservoir?

A. I did. I was the Project Engineer for installing a geomembrane liner in the Upper Reservoir.

Q. And what period of time was that?

A. We tried it on a couple occasions. We tried it once in early 2002, and we did not complete the lining portion of it. And then we went back again, with a different contractor, in 2004 in the fall.

Q. Did you get any of it completed in 2002?
A. In 2002 we were able to complete what was called the toe block, a concrete pour around the perimeter of the bottom which was to provide for an anchoring system for the liner.
And we did get quite a few of the batten holes drilled in the wall. And we did get a little bit of liner down in the area called the "fish pond" of the Upper Reservoir.
Q. And you finished it in 2004?
A. Correct.
Q. What period of time was the liner done in 2004?
A. I believe we started September 15th, and we shut the door on November 15th.
Q. As the Project Engineer for the liner installation, did that include the gauges, or the sensors, that were installed?
A. No.
Q. Who was in charge of that project?
A. Tom Pierie.
Q. In Mr. Pierie's interview with the Highway Patrol, he indicates there that you had surveyed the reservoir there at Taum Sauk; is that correct?
A. That is correct.

Q. When did you do the survey?
A. Early October of 2004.
Q. How long did it take you to survey?
A. I want to make it clear that we did not survey the complete reservoir, we picked a section of the wall that appeared to have a low point in it.
Q. And where was that low point?
A. Panel 72.
Q. How did you know what elevation you were at to begin the survey?
A. I did have a surveyor that I hired come in to mark elevations on the finished liner, because we put lines on it with big numbers to see the elevation. So, they brought a benchmark in from outside the reservoir.
Q. And then you worked from the benchmark to get the elevations for the lowest part of the wall?
A. Correct. From the part I thought was the lowest by visual observation.
Q. And that was around panel 72?
A. Yes.
Q. What was the low point there?
A. 1596.99.
Q. Did you survey at the area where the gauge piping was?

A. Yes.
Q. And what was the elevation there?
A. 1597.92.
Q. And when I ask about the elevation -- so we're clear -- that is the top of the parapet wall; correct?
A. Correct.
Q. So, the top of the parapet wall, at panel 72, would be 1596.99 feet?
A. Correct.
Q. Why did you need to do the survey?
A. Well, as part of our FERC license we did a survey every five years of the elevations. And the problem with that survey was that we didn't actually hit the top of the wall, they measured -- they surveyed a point on the footing of the wall and then we knew the height of the wall, that's how we could determine the elevation all the way around.

Well, this was only done on increments of five panels, every five panels there was a survey point. And I -- by visually looking at this panel 72 area from the observation deck -- I could see a low point. Which -- and I went back to the other survey data, and panel 72 was not within those five panels. So, I felt there was a low point that I thought we needed to know

what it was.

Q. When you look back at the older survey data, did you see that there were changes from the survey you did in 2004?

A. I don't recall looking at that.

Q. Well, specifically, like around panel 72, where that was the lowest point, did you see changes from the survey that was done five years ago?

A. I don't recall that. I don't recall.

Q. After you obtained the survey information, what did you do with that information?

A. I transmitted that to Tom Pierie who was in charge of the controls.

Q. Did you give that information to anyone else?

A. No.

Q. What about Mr. Cooper?

A. I don't recall giving it directly to Mr. Cooper.

Q. What about Mr. Zamberlan?

A. I don't recall.

Q. In what form did you provide the elevation information to Mr. Pierie?

A. I had -- I did my notes in a field book, a small field book, and we made copies of the pages that

applied to that survey.

Q. And did you hand deliver that to Mr. Pierie?

A. Yes.

Q. Do you recall providing that survey information to anyone else?

A. No.

Q. At the time of the survey -- now this is after the liner is installed; correct?

A. Correct.

Q. The liner is installed in the fall of 2004, you completed your survey thereafter; correct?

A. The survey was completed in early October because he needed to get the control system in before we brought the system back online.

Q. Now, after the liner is installed and the survey is completed, are you at that point in time familiar with the operating levels of the reservoir?

A. No.

Q. How about since that time, since the fall of 2004, was there ever a period of time where you became familiar with the operating levels of the reservoir?

A. Yes.

Q. What's your understanding of what those

were after 2004?

A. This is all after the fact of the breach --

Q. After the breach you're saying?

A. When I became more aware of this information. Could you repeat that question?

Q. Well, I think you're saying that you, post-breach, in looking back at information, now you are you saying that's where you obtained information about the operating level of the reservoir?

A. Yes.

Q. Are you aware of Mr. Pierie and Mr. Zamberlan setting the Warrick sensors at a particular elevation?

A. Yes. I think I should clarify. I was given the elevations by that project team. They needed to know which elevations the probes -- the level sensors and the Warrick probes -- they needed to know what elevation they were set at. So, they give me the numbers, and I marked in the field where those were set.

Q. They give you the numbers where they wanted to put the level probes and the Warrick probes, and you marked, in the field, those heights; correct?

A. I marked on the gauge pipes themselves -- which were the conduits that housed the sensors,

transducers -- I marked for the level sensors, I marked for a Lo probe and a Lo Lo probe.

The other elevation information I gave them was the elevation at the top of the wall where these gauges were. And then they were going to measure down from that known point to where they needed to set their Hi and Hi-Hi.

Q. Did you know where they were going to set these Hi and Hi-Hi probes?

A. I knew the numbers because they had given -- yes, I did know those numbers.

Q. And was there any concern -- do you remember the numbers they gave you for those settings?

A. 1596 and 1596.2.

Q. So, below the level at panel 72, below?

A. Yes. Yes.

Q. Now, are you aware of those Hi and Hi-Hi sensors being moved to a higher elevation?

A. After the fact. When we learned the facts, yes, I was aware that that had happened.

Q. You're saying post-breach you learned about that?

A. Yes.

Q. The anchoring system for the gauge piping, were you involved in designing that particular anchor

system?

A. No, we had a consultant that did the design.

Q. And who was that?

A. EMCON.

Q. Were you at all involved in any modifications of EMCON's plan?

A. Yes. When we got in the field to actually do the installation, the field conditions were not as shown on the drawing. So, there were some modifications that had to be made to make this fit in the field -- with consultation with EMCON. I was on the phone with these guys letting them know this is how I was going to have to modify this. And we discussed it, and they were in agreement.

Q. EMCON came up with the original design specifications, and because of field conditions, you recommended some changes; correct?

A. Yes.

Q. And EMCON agreed: Yes, we can and will do those?

A. They did not update drawings. They agreed to our discussions on how it needed to be modified.

Q. Whenever the anchor system for the gauge piping was installed, were you present there?

A. Yes.
Q. That was part of your project?
A. Yes.
Q. The changes to the original design, were they put in as modified -- in other words, were there any other changes?
A. No.
Q. There was original plan, there were modifications recommended, and that's how it was built; correct?
A. Correct.
Q. When did you become aware that the anchors for the bottom portion of this gauge piping had broken free?
A. October 3rd of 2005.
JUDGE DALE: Excuse me, could you check and see if your microphones are on?
MR. REED: All the microphones are at a very low level. From back there they are hard to hear.
QUESTIONS BY MR. REED:
Q. October 3rd, 2005?
A. Correct.
Q. Now, when you became aware that the bottom part of that anchoring system had broken free, what

did you do?

A. I immediately notified the Plant Superintendent.

Q. Who is that?

A. Rick Cooper.

Q. What did you propose be done at that point in time?

A. Well, we knew we had to fix them.

Q. Did you come up with a plan to fix them?

A. I did.

Q. Did anyone help you with the plan?

A. No.

Q. Just you worked on the plan and came up with the plan?

A. I would say I consulted with peers in my office.

Q. All right. As far as primary responsibility for that, that was you?

A. Correct.

Q. You learned, October 3rd, 2005, that the piping was moving at the bottom; correct?

A. Correct.

Q. How long did it take you to formulate a plan to fix that piping?

A. I released -- I finalized the design on

October 24th, conveyed that to the Plant Manager -- or Plant Superintendent.

Q. You told Mr. Cooper that I have a plan -- and this was what date again?

A. October 24th.

Q. Did you have everything you needed to fix this anchoring system at that point in time?

A. That was the day that I finished the design. And from that date, I started ordering materials to have them there as soon as possible.

Q. How long did it take before you got all the materials you needed?

A. I was -- October 27th, I believe was the first day I was going to have everything there ready to go.

Q. It was a short -- just a few days -- and you had the material; correct?

A. Yes.

Q. Now, once you had the plan and you had the materials, what did you do next to get this project done?

A. When I conveyed to Rick that I had completed the design, Rick asked me to go ahead and contact the Power Supply folks to try to arrange an outage.

Q. Who did you talk to?
A. I believe the first contact was with Steve Schoolcraft.
Q. Do you know his job with Ameren?
A. At the time he was Power Supply Supervisor.
Q. Did you have conversations with anyone besides Mr. Schoolcraft --
A. No.
Q. -- in the Power Supply department?
A. Yes. After the first contact there were -- the Power Supply Supervisor; there is someone there around the clock, and they change, they are on different shifts. So, whoever happened to be there that day. I don't recall who the other ones I talked with were.
Q. But you remember Mr. Schoolcraft?
A. Yes.
Q. Is he in charge of that department as far as you know?
A. No.
Q. Who is?
A. I don't know.
Q. How many conversation did you have with Mr. Schoolcraft about repairing this anchoring system?
A. One for sure.

Q. Only one?
A. At least -- I only recall the first contact being with Mr. Schoolcraft.
Q. And whenever -- I've said conversation, but what about e-mails, correspondence of that kind?
A. I don't believe any e-mails were sent to the Power Supply folks from myself.
Q. Who would make the call about when this outage would take place so that the anchoring system could be fixed?
A. My -- the Plant Superintendent has a responsibility for the operation of the plant.
Q. So, would it be Mr. Cooper's call, in your opinion?
A. Ultimately, yes.
Q. What steps did Mr. Cooper take to help you plan for a period of time when this anchoring system could be fixed?
A. He just turned it over to me and ask that I try to get this done as soon as possible.
Q. Do you know whether he talked to anybody?
A. I do not know.
Q. Do you recall -- he turned it over to you, you indicated, so it was up to you to get this done?
A. Yes.

Q. And you had one conversation with Mr. Schoolcraft, that you remember?

A. With him, but there were other Power Supply Supervisors that I talked with on a daily basis.

Q. Tell me about the other contacts you would have had with those people in the Power Supply Department?

A. My recollection is; I contacted Mr. Schoolcraft, I believe it would have been the Wednesday, trying to arrange for a Thursday. Was told that I wasn't going to be able get it Thursday, call back tonight or tomorrow.

I called back the next day, tried to get it for Friday. Called back Friday, tried to get it for Saturday.

I believe I talked with one of them from my home on the weekend, on a Sunday, trying to get it for Monday.

Q. So, you called -- Sunday you called into the Power Supply Department; is that what they are called?

A. Power Supply Supervisor is the position I was contacting.

Q. To see if you could get some time the next day --

A. Correct.
Q. -- to repair the anchoring system?
A. Correct.
Q. It sounds like you called everyday for about a week?
A. For -- yes.
Q. And this would have begun around October 27, 2005?
A. Twenty-sixth, 27th. Yes.
Q. All right. Now, what continuing efforts did you make to get a period of time to fix this anchoring system?
A. None. I mean, Rick was aware that I hadn't been able to make it happen, obviously, because it didn't happen.
Q. So, I guess periodically you would talk to Mr. Cooper and say: I can't do it tomorrow, we'll have to try again?
A. Yes.
Q. It sounds like there was a week there when you called everyday and said I need some time to get this done; correct?
A. Yes.
Q. What about the next week, did you keep trying?

A. Well, at this time, I was starting another project, a big project at another power plant, and I was really focused on getting that project going. So, I had less time to be making these contacts.

Q. With regard to what needed to happen at the reservoir for you to make these repairs, tell us what that would be?

A. We needed to lower the water to an elevation where I could uncover most of the system.

We knew we were going to have to use a diver to do some of it because we wouldn't be able to drain the thing completely. But the diver can only work for a certain period of time at certain depths, so we needed it drawn down.

Plus, we needed -- you know, it's easier to install something above the water than below the water, so we wanted to expose as much of it as possible as we could.

Q. This gauge piping is probably heavy?

A. Not really.

Q. Could a person straighten out those pipes if the water were all drained or would you need water to assist with the weight of the pipes?

A. I don't know.

Q. Those communications you had about

scheduling a time to do these repairs, what kind of responses did you get when they would say -- what did they tell you that "you can't do it tomorrow," what specifically would they tell you why you couldn't do it the next day?

A. What I recall is, at that time of the year it was unseasonably warm weather, and they were not actually generating as much on a daily basis as they normally would in that time frame. So, the problem was, they were not generating down far enough to be able to get in and make the repairs.

Q. Do you recall at that point in time, in the fall of October/November 2005, how the reservoir levels were going up and down? In other words --

A. Well, just during this time frame, I know they were probably only dropping anywhere from a foot to ten feet at the most.

Q. Per day?

A. Yeah. Well, yes.

Q. Well, would the reservoir operate -- if they just dropped it ten feet to generate some power, would they then just fill it back up to the top?

A. I don't know.

Q. At some point there was a decision to schedule a spring 2006 outage. You're familiar with

that aren't you?

A. Yes.

Q. Do you know how that decision came about?

A. No.

Q. Who would make the call about when an outage -- let's say for a week -- would take place?

A. I don't know exactly who is all involved in that. Certainly the Plant Superintendent would be involved, but beyond that I don't know.

MR. REED: I have a few exhibits. It's not a large number. But could I get these marked?

JUDGE DALE: Yes. Start with No. 10.

QUESTIONS BY MR. REED:

Q. I just want to give you a few seconds to take a look at that.

A. Okay.

Q. Mr. Bluemner, it's about three letters, a couple of which are on Ameren letterhead; would you agree?

A. Yes.

Q. The first one appears to be signed by Mr. Cooper and the second by yourself?

A. Correct.

Q. I wanted to ask about this letter sent to the FERC, because it indicates, on the very front page

of Mr. Cooper's letter, it indicates that he certified that the construction of the liner, I take it, fulfilled the design intent and all construction was carried out in accordance with plans and specifications; do you see that?

A. Yes.

Q. And you have a letter that says pretty much the same thing?

A. Right.

Q. Now, regarding the plans and specifications, does that include the gauge piping system and the sensors that were placed in that gauge piping?

A. That would only include the gauge piping itself, not the control system or none of the sensors. Just the conduits to carry that instrumentation.

Q. Did you at any time work on the sensors themselves being placed into the pipes?

A. No.

Q. Do you know if a separate letter was sent to FERC regarding the construction and specifications for the level sensors and the Warrick sensors?

A. No.

Q. You don't know?

A. I don't know.

MR. REED: I have another. Exhibit 11, I believe, Judge.

JUDGE DALE: Yes.

QUESTIONS BY MR. REED:

Q. Mr. Bluemner, there are actually a couple e-mails here. One apparently from Mr. Cooper, that's the one on the bottom.

A. Right.

Q. And above that is one that actually you sent; correct?

A. That is correct.

Q. That's the one I want to ask you about, is the one on the top there.

A. Okay.

Q. You wrote this e-mail to Mr. Cooper, and you included several others there like Mr. Schoolcraft, Mr. Witt and Mr. Pierie.

I wanted to ask about that first paragraph where you indicate that: I don't think it justifies economically to drain the reservoir for these items alone. Do you see that?

A. Yes.

Q. Was that your opinion about whether it was economical to drain the reservoir or not?

A. Was it my -- you asked if that was my

opinion?

Q. Yes.

A. Yes, that was my opinion.

Q. How did you form the opinion about what would be economical or not to drain the reservoir?

A. I want to clarify that this is not talking about getting the gauge piping repaired here. This first paragraph does not apply to the gauge piping.

Q. It says the penstock liner?

A. That's the tube from the Upper Reservoir through the plant.

Q. Right.

A. Yeah.

Q. The date of this e-mail is November 23, 2005?

A. Right.

Q. By then you had been trying for nearly a month to get --

A. Correct.

Q. -- some time to repair the gauge piping; correct?

A. Correct.

Q. Was there any discussion, that you recall, with anyone, in say, the Power Supply group, about the economics of draining the reservoir?

A. No. I was only familiar that it would cost the company money to drain it and have to fill it back up. And what I was trying to say here was, just for the penstock liner and the liner in the Upper Reservoir, I didn't think we needed to for those items. I didn't think we needed to drain it. That's what I was trying to say in that e-mail.

Q. But you did know, at that point in time, that you needed to fix the anchor for the gauge piping as well?

A. Yes. And in the next paragraph you see where I addressed the gauge piping, telling him that I had been trying to get it done and was unable to do so.

So, I was basically -- the ball's in your court, if we are going to get this done, we got to have somebody who has the authority to take an outage.

Q. Yeah, somebody needs to pick the time; correct? And apparently, the time settled upon was spring of 2006?

A. I don't think that applies to the gauge piping. This was for other -- this was for a scheduled outage of -- there was other problems with the equipment in the plant.

Q. Would the spring outage have been the time

when you resigned to fixing the anchoring system in the spring of 2006?

A. No, it needed to be done immediately. It needed to be done as soon as possible.

Q. So, if you didn't have to, you weren't going to wait until spring of 2006?

A. No.

Q. Were you familiar with how the -- I think they're called the Druck sensors -- the level control sensors work?

A. Well, there's two. There's level sensors and then there's the Warrick probes, those were the Druck probes.

Q. Okay. The level probes, now those are the ones they function by measuring the height of the water --

A. Correct.

Q. -- based upon the weight that is pressing upon them; correct?

A. Yes.

Q. And you knew the piping was moving; correct?

A. Yes.

Q. So, were you aware that would change the readings of the levels?

A. Certainly.

MR. REED: That's all I have.

QUESTIONS BY MS. BAKER:

Q. For the anchoring field modification, what did those modifications entail?

A. We had to lengthen some of the support rods to accommodate for a -- the drawing was shown on a nice constant slope, but the actual condition was a big belly. So, we had to make up some distance. So, we had to lengthen the struts on the original design.

Q. Okay. Did that change where the anchors themselves were placed?

A. No.

Q. Did that change the markings of the elevations for the conduit because the slopes on the sides were different?

A. Well, the marks on the conduits were not put in place until the whole system -- until the gauge piping was installed. So, no.

Q. Do the marks on the piping correspond with where they are to be anchored?

A. No.

Q. Where there any as-built drawings that were made after those modifications were done?

A. Post-breach there was a sketch that was put

together.

Q. But not at the time that this lining project was certified?

A. There were no as-built drawings issued. There were as-built drawings issued by the consultant, but they didn't completely pick up the actual changes in the piping. The design intent was still maintained with what we installed, so while they did issue as-builts, it didn't exactly match -- the design intent was there.

Q. So, there were some nuances that were not in the as-builts --

A. Correct.

Q. -- because of field modifications?

A. Correct.

Q. Why did you not suggest, when they were looking at inspecting the penstock liner in the Upper Reservoir, why did you not suggest that maybe that could be done during the time frame that you were looking to lower the water level for repairing of the gauges, that would help with the economics, wouldn't it?

A. Are you asking me why we didn't pull up the spring outages into the fall?

Q. Yes, why did you not take that into account

in your economics?

A. That was really not my responsibility.

Q. Do you know if the movement of the conduits caused any outages to be -- did it cause any outages because of movement of the conduits?

A. I don't know.

Q. You don't know if it triggered any alarms?

A. I really don't.

MS. BAKER: That's all the questions I have.

JUDGE DALE: Department of Natural Resources?

MR. SCHAEFER: Thank you, Judge.

QUESTIONS BY MR. SCHAEFER:

Q. Mr. Bluemner, my name is Kurt Schaefer, and I represent the Department of Natural Resources.

I don't believe you stated your educational background. Can you please start with college and tell us what your educational background is?

A. I have a Bachelors of Science in Civil Engineering from Southern Illinois University at Edwardsville.

Q. Anything beyond that?

A. No.

Q. Are you a licensed engineer in the State of

Missouri?

A. Yes.

Q. How long have you been a licensed engineer?

A. Approximately 15 years.

Q. Are you --

A. I got my license in Illinois, and got it through reciprocity in Missouri.

Q. That was my next question. Are you licensed in any other states?

A. Illinois.

Q. And how long have you been employed with Ameren?

A. Close to 15 years.

Q. And you're still employed with Ameren today?

A. Correct.

Q. And has most of that 15 years been as a project coordinator?

A. Project Engineer.

Q. Is the project coordinator -- you were the Project Engineer for the installation of the new liner in 2004?

A. Correct.

Q. When did Ameren first start evaluating the need for a new liner inside that entire facility, do

you know?

A. I first became involved at the end of 2001. There was a Project Engineer that had the project first, and for whatever reason, it got passed along to me. So, the end of 2001 was when I was tasked with the project.

Q. Who was that Project Engineer before you?

A. Scott Plocher.

Q. Is Mr. Plocher still with Ameren?

A. No.

Q. Do you know why he's no longer with Ameren?

A. He owns his own construction company.

Q. So, were you involved in the process of evaluating what kind of liner would be necessary or what kind of liner would actually be installed at the facility?

A. By the time I became involved, I believe those decisions had been made as to the type of material.

Certainly all the details were not worked out, because the design hadn't taken place. But the material choice had been made.

Q. That was my next question. At the time you got it, the design had not been developed yet?

A. Correct.

Q. What was the purpose of installing the liner -- in other words, why was the liner necessary?

A. My understanding, it was an economic decision. We were losing a lot of water that could be used in generating electricity. We were losing a lot of water everyday to leaks.

Q. And do you know, prior to the installation of the liner in 2004, how much water per day the facility was losing, in terms of dropping in feet?

A. The numbers I used in the justification were roughly one-and-a-half feet a day.

Q. And are you generally familiar with how the facility works?

A. Very generally.

Q. Are you familiar with the concept of "head," or how that system works?

A. Yes.

Q. What is that concept?

A. That is the height of a water column above some elevation.

Q. Is there -- under that concept -- is there a distinction as to how much electricity can be generated from the top foot of the reservoir as opposed to, let's say, 20 feet down?

A. Could you rephrase that or ask that again?

Q. Sure. In the concept of head, does head involve how much force, in other words, how much water elevation is actually coming down through the pipe and going down the turbines?

A. Yes.

Q. So is it, in fact, true that you generate more electricity from the top feet than you do from the lower feet simply because you have more pressure when you have more water in the system?

A. That is correct.

Q. So, the footage that Ameren was losing, arguably, when the facility would drop, those are feet from the top; correct?

A. Correct.

Q. So, in order to avoid losing that profitable top footage, was that the reason the decision was made to install a new liner?

A. Could you ask me that again?

Q. Sure. Was the reason for the installation of a new liner to avoid losing that foot to foot-and-a-half on the top of the facility everyday?

A. Yes.

Q. Were you involved in determining the cost of the project?

A. Yes.

Q. And as you sit here today, do you recall what the as-completed cost of that liner project was?

A. I'm -- three to four million.

Q. Do you recall what the projected cost of that project was before you actually commenced the project in 2004?

A. When we originally started, you're asking what the projected cost was?

Q. Yeah, let's start there, sure.

A. Again, it's been long time, and recalling all those numbers -- I believe the original work order was in the range of two-and-a-half million.

Q. Did you receive any bonuses or compensation based on the cost of that project?

A. No.

Q. So in other words, if the project was going to run over what was anticipated, that would in no way impact your income or bonuses?

A. No.

Q. Would it impact anyone else's income or bonuses at Ameren depending on whether or not the project came in on estimated cost?

A. I don't know.

Q. Now, the project in 2004, that was done -- we've heard the term "scheduled outage." Correct?

A. Yes.

Q. Does that simply mean the system was going to have to be scheduled to be off-line for some period of time so that your project of the installation of the liner could take place?

A. Yes.

Q. And do you recall, prior to starting the project, did you actually supply, as part of your involvement with the project, an estimated time frame of how long it would take to do that project?

A. The first -- we tried this twice. The first time we were given a window by somebody, whoever schedules the outages, and said you have 30 days to do it.

Q. Who does schedule those outages?

A. I don't know.

Q. Please continue.

A. The second time -- after we had gotten through the first time and realized 30 days was not enough -- yes, I had input, with my contractor that I hired, in determining what window of an outage do we need to ask for.

Q. And who was your contractor?

A. GSI.

Q. And what was the window that you projected

you would need for the project?

A. September 9th -- the dates that we started, as I looked through one of these, I think I earlier said September 15th. But September 9th was when we took it off-line and November 15th, I believe, was when we closed the door, of 2004.

Q. So, in actuality, that is how long the project took?

A. Yes.

Q. But prior to September 9th, when you took it off-line, did you have estimate of how long the project would take?

A. That was it.

Q. So, the actual time that it took to do the project was exactly the same as you estimated the project would take?

A. We got it done in the time frame that we had defined we needed and asked for, yes.

Q. Thank you. So, you -- prior to shutting it down on September 9th, you had defined the time you would need for the project, and you requested from someone at Ameren to have it shut down for that period of time?

A. Yes.

Q. Who did you make that request to?

A. I don't recall. I would have been working with the Plant Superintendent.

Q. Who at that time was --

A. Some time along, it switched from Dave Fitzgerald to Rick Cooper. I don't recall when that occurred.

Q. Did you write any memos or letters that specifically contained your request for a time frame to have a shut-down?

A. No.

Q. You don't recall ever writing those?

A. I don't recall.

Q. Is it possible you did write documents or something immortalizing what your request was?

A. Yes, it's possible.

Q. After making this request, did you receive approval to have a shut-down for some given period of time?

A. Yes.

Q. Was it for the period of time you requested?

A. Yes.

Q. Were you to receive any bonuses or compensation based on whether or not the project was completed within the time frame that you had

requested?

A. No.

Q. So in other words, if you asked for a shut-down, let's say, until November 15th, or whenever you actually asked for the shut-down to, was there any financial benefit to you if you got it done sooner?

A. No.

Q. Was there any penalty for getting it done later?

A. No.

Q. Did you believe that you had the ability to request additional time if it was going to take longer than what it actually took?

A. I don't believe there would have been much of a choice, once you start something like that you have to finish.

Q. Okay. Fair enough.

Now, I believe you mentioned the term "fishpond?"

A. Yes.

Q. What's the fishpond?

A. Fishpond was a depressed area lower than the rest of the liner. I don't really know why. My understanding was they had issues with the subgrade when they were building it and they had to get a little deeper, and that's how it ended up. There was

no design function, as far as I know, for the fishpond.

Q. Prior to actually being involved in the developing the project for the liner, were you involved in any previous projects at Taum Sauk in plugging up the leaks at the facility?

A. No.

Q. So, you weren't involved in putting grout or plugs in the area of the fishpond?

A. No. The first time we did the liner -- or tried to install liner -- we knew we weren't going to get finished. There were some joints on parapet walls that we used an expanding foam to try and seal.

Like I said earlier, we did get a portion of the liner installed in the fishpond area, so there was -- at this toe block, this joint where the slab hits the floor, we poured some concrete over that area -- which was part of the liner design -- and that effectively did plug some leaks that were occurring in that area.

Q. You mentioned the foam.

A. Yes.

Q. That was foam that was sprayed in between the joints of the 60-foot sections of the parapet wall; is that correct?

A. Correct.

Q. Were you actually involved in deciding what product would be used?

A. Yes.

Q. And what was that product?

A. It was -- I recall it was called Froth Pack. I do not know the manufacturer. That might be the manufacturer. I remember it was called a Froth Pack.

Q. Did you actually, yourself, research that project and make sure that was appropriate for that use?

A. Yes.

Q. Was that product recommended for sealing water out of surfaces or sealing water into surfaces?

A. Yes.

Q. Going back to the fishpond, where is the fishpond in relation to where the breach actually occurred on the reservoir?

JUDGE DALE: I need to make sure that everybody is speaking into their microphones.

MR. SCHAEFER: Sorry. Judge.

THE WITNESS: The fishpond was immediately where the breach was.

QUESTIONS BY MR. SCHAEFER:

Q. The breach occurred right at the fishpond;

right?

A. That is correct.

Q. And are you aware that for years Ameren had problems with settling in that area of the fishpond?

A. Yes.

Q. Are you aware, in the early 1960s, a Dr. Nichols was hired by Union Electric as an independent consultant, in part, to evaluate the geologic conditions in that area, are you aware of that?

A. No, I'm not.

Q. You've never seen the Dr. Nichols --

A. No.

Q. -- information?

You are not aware that he determined that, actually, there was a high probability of settling in that area due to a clay seam underneath there?

A. I was not aware of that.

Q. And that was over the breach area; correct?

A. The fishpond area?

Q. Right.

A. Well, I have not seen this, so --

Q. Right. But the fishpond area and the breach area are all the same area, that's the northwest corner of the reservoir; correct?

A. Correct.

Q. But at some point in 2004, I believe you said you were involved in a survey of the top of the parapet wall; is that correct?

A. Part of our FERC, Part 12 -- our FERC license requirements -- were an elevation survey of the complete perimeter. So that was done on a five-year basis.

We did not measure the top of the wall. The procedure that was set up involved pins that were set in the footing of the walls, and then you could add the height of the wall and get the crest elevations.

That was part of an ongoing through our FERC license requirements.

Q. Let me ask you about that. First of all, the survey in 2004, did you do that survey yourself or did you hire a contractor to do that?

A. The survey in 2004 was not a complete survey. I did that myself with our company's equipment. We have the latest and greatest in survey equipment. And the reason I did that was because I saw a low spot in the wall that was not picked up -- I believe I described earlier, about this FERC survey that was done, it was only on every fifth panel. And it did not pick up what I could visually see as the low point in wall. So, that's why I decided I needed

to know what that elevation was.

Q. And you're not a licensed surveyor in the State of Missouri, are you?

A. No, I am not.

Q. I believe you said that, when you surveyed, you didn't survey the top of the parapet wall; correct?

A. No. What I said was the FERC survey did not survey the top of the wall. I did survey the top of the wall.

Q. Okay. And real quick on the FERC survey. Is the process that there is a reference pin somewhere in the side of the wall that you use, essentially, as your marker for determining an elevation?

A. There's a brass pin set in a large granite boulder 217 feet north of the north gate. That's where we got the elevation.

Q. How far is that pin from the actual top of the parapet wall?

A. Four to five hundred feet depending on what part of the parapet wall you're talking about.

Q. How about elevation-wise, how low is it from the top of the wall?

A. Hundred feet.

Q. And again, this facility is

approximately -- Taum Sauk Reservoir was approximately 55 acres in surface area; isn't that correct?

A. Correct.

Q. And the walls were approximately 90 feet tall?

A. The walls were ten feet tall, the parapet wall.

Q. Good correction there. From the bottom of the reservoir to the top of the parapet wall was approximately 90 feet; correct?

A. Correct.

Q. And then the parapet concrete wall itself is about ten feet?

A. Correct.

Q. So, you did your survey of the panel 72 area; correct?

A. Yes.

Q. And you did that based on the fact that you had made a physical observation -- a visual observation -- that you thought that looked like a low point?

A. Correct.

Q. Were you aware of that area ever overtopping?

A. No.

Q. Did you ever see any evidence of overtopping at that time, such as erosion on the back side of the panel?

A. No.

Q. Did you specifically ever look for that?

A. I accompanied our consultant on the Part 12 inspection where we looked at all that. So, yes, we were looking at everything on the top of the wall. I accompanied our consultant on the Part 12 inspection.

Q. On the panel 72 area, that was because you could see that -- it appeared to you to be a low spot; correct?

A. Correct.

Q. Do you recall, what was the variation in elevation from the top of the parapet wall, at panel 72, to where the gauge box was -- where the gauge is -- when you did that survey in 2004, if you know?

A. The low point surveyed on panel 72 was 1596.99, the elevation of the wall at the gauge piping was 1597.92.

Q. Let me ask you this, because panel 72 is 60 feet wide; correct?

A. Correct.

Q. And where, at the top of the wall, did you -- what did you use as your marker, was it the

left side, the right side or was it the center?

A. We measured each end of -- we shot the elevation at each end of each wall section. So, right on either side of every joint between panels.

Q. And it's your testimony that the elevation is actually the same on the left side and the right side of panel 72?

A. No.

Q. What was the elevation on the right side of panel 72?

A. I don't know.

Q. What was the elevation on the left side of panel 72?

A. Somewhere on 72 it was 1596.99, I don't recall if it was the left side or right side.

Q. Was one side lower and one side higher?

A. They weren't the same, so yes.

Q. And the number you're using for panel 72, was that the low mark or the high mark that you got off panel 72?

A. Could you ask me that again?

Q. Yeah. The figure you used -- and I didn't write it down. I believe it was -- what did you say the elevation was on panel 72?

A. 1596.99.

Q. Was that the lowest point on panel 72 or the highest point on panel 72?

A. That was the lowest point.

Q. Now, you are aware the breach occurred in, approximately, the upper 80s and 90s in panels; is that correct?

A. I -- I don't know exactly the panels.

Q. But you didn't survey any of those panels in 2004 when you were doing the liner?

A. No.

Q. I want to talk about your testimony about the system, as designed, to strap the gauge pipes down to the side of the facility. And were you involved in actually designing -- prior to the project beginning -- were you involved in designing how those gauge pipes would be actually held in place on the side of the reservoir?

A. No.

Q. That was a consultant that did that?

A. Correct.

Q. Who was that consultant?

A. EMCON.

Q. What was the recommended design by EMCON, prior to starting the project, for how Ameren would fasten those gauge pipes to the side of the facility?

A. The original design had four pipes tied together with pipe clamps onto a Unistrut, and that was attached to a one inch thick HDPE plate and then anchored through the liner into the concrete.

Q. How many anchors were there in that design prior to you actually implementing it -- originally in the design, how many anchors were there that was supposed to hold those pipes on that went through the liner into the concrete?

A. I don't know.

Q. Do those plans still exist somewhere, where someone could look and see what that design was?

A. The -- I would -- yes, we should have the original design release.

Q. But you use the term "field conditions." And you just mean the conditions there in the reservoir once you got the liner in?

A. Correct.

Q. Once you got that liner in and you put those pipes up there and you realized that you had to attach them, something in your mind changed on how those should be attached to the side of the reservoir; correct?

A. Correct.

Q. And what was that, what was the change?

A. The -- there was a concern expressed by my contractor with anchoring -- securing the liner and not letting it move freely.

This liner experiences large thermal growth. Which is; it expands and contracts as the temperature of the material changes, and if you anchored it in these places it would try to expand. And if it couldn't, it would tear itself apart.

So, there was a concern expressed by my installation contractor that this thing could tear itself apart.

Q. So, was the response to that concern to cut back on the number of anchors that actually went through the liner and into the concrete?

A. We wanted to eliminate all of them.

Q. Did you eliminate all of them?

A. Yes. We did not make any attachments through the liner.

Q. So, as opposed to what was designed for how that should be held in place, how ultimately did you change that plan so those gauge pipes would be held in place?

A. The final design entailed anchoring steel channel -- steel angle -- to the toe block, that I referred to earlier, and the batten angle at the

bottom of the parapet wall at the top.

This was a steel angle that was put over the liner to secure it at the change in direction from the slope panel to the wall.

And we anchored stainless steel wire rope, and tensioned those ropes. And that was going to support the gauge piping.

Q. Did you ever design anything like this before?

A. No. And I didn't design this.

Q. The consultant designed it?

A. Correct.

Q. But you approved it?

A. I reviewed it and approved it, yes.

Q. And at some point, and I believe it was Exhibit 11 -- and I apologize, I don't have it in front of me, I hope you do.

There was a letter that I believe you sent -- was it to FERC -- verifying that the work had been done in compliance with the plan as submitted?

A. The one that I signed?

Q. Yes.

A. Yes.

Q. Now I take it that at some point you had to tell FERC, when you were going to put this liner in,

what your project was going to be?

A. Correct.

Q. Did that include the plans that you had at that time, before you started the project, of how those pipes were going to be held to the side of that facility?

A. I believe the first submittal that we sent to FERC, at the time, we did not have a gauge piping design, the first time we were going to install it.

Q. Okay. I'm talking about 2004?

A. In 2004 we submitted -- could you ask me that again?

Q. Sure. I take it that this -- because this is a regulated facility, highly regulated by FERC?

A. Correct.

Q. Isn't it true that any time you make a change to it you have to tell FERC; right?

A. Correct.

Q. So, I'm assuming that, prior to your installation of that liner in 2004, you had to submit plans to FERC and say, "Hey, FERC, here's what we're doing. We're going to put this liner in."

A. Correct.

Q. Did that include your plan for how you were going to anchor the gauges which controlled this

entire facility?

A. I don't recall.

Q. So, you don't recall if you actually had to submit to FERC your design of how you were actually going to attach the gauges that control this facility?

A. I know we had to submit the design to FERC in the drawings. What I don't recall is the original submittal, if the gauge piping was even in the project at the time.

Q. Okay. And at some point in the project you decided that you would change the design from as-designed to something else to hold the gauge pipes on; correct?

A. That's not what I said, I don't think.

Q. Sure. Let me rephrase that, it wasn't very well put.

Prior to commencing the project, you had a design of how the gauge pipes were going to be held in place; correct?

A. Yes.

Q. And at some point after you commenced that project, conditions in the field, as you put it -- which just means, once you got some of the liner up, you saw how things really looked, you changed the plan; correct?

A. Correct.
Q. Did you ever tell FERC of the change in the plan?
A. I don't recall.
Q. Wouldn't that have been your job as project manager to make sure that FERC was aware of that change in the project?
A. Yes.
Q. But as you sit here today, you don't recall if you told FERC about that change?
A. I do not believe I did.
Q. And again, what we're talking about here is a change in design on the gauge pipes which control, not only the piezometers which show you the water level in the facility, but they also house the safety devices, the Warrick probes, which are supposed to shut this thing off if there's a problem?
A. Yes.
Q. Were you ever disciplined by Ameren for not submitting that information to FERC?
A. No.
Q. Were you ever placed on probation, or docked in pay, or experienced any other disciplinary actions from Ameren for not notifying FERC of the change in plans?

A. No.

Q. Now at some point you did become aware that the changed plan, the design you actually implemented, was not effective; correct?

A. Could you restate that?

Q. Yes. At some point, you became aware that the gauge pipes became disconnected from the side of the facility; correct?

A. Correct.

Q. So, the system that you designed to hold those in place, in conjunction with your consultant, did not work correctly; is that right?

A. I did not design the system, but I was aware that it didn't work.

Q. And what was the effect of that system not working? In other words, what was the effect on the system of -- let me step back.

You became aware at some point that the gauge pipes became disconnected from the side of the facility; correct?

A. Correct.

Q. So therefore, the gauge pipes were freely floating within the reservoir; correct?

A. All of the moorings had not failed, they were still tied to the cables. They were not freely

floating.

Q. Fair enough. But at some point between the bottom at zero feet and the top at 90 feet, it was disconnected and it was moving freely within the reservoir?

A. The elevation of the transducers were not -- they were where they were originally set.

Q. That's not my question. My question is, somewhere between the bottom of the reservoir at zero feet and the top of the wall, the pipes had come loose and they were freely floating in the reservoir; correct?

A. Correct, they had come loose.

Q. And they were never designed to come loose, were they?

A. That is correct.

Q. What was the effect of those gauge pipes coming loose on the operation of the system?

A. False level indications.

Q. And you became aware of that in approximately October of 2005?

A. Correct.

Q. Did that concern you?

A. Yes.

Q. Were you aware that there's a State Park

immediately below that facility that had upwards of 2000 people per day in it?

A. Yes.

Q. Are you aware that Jerry Toops and his wife and three kids lived immediately below that facility?

A. I did know that before. I know that now.

Q. Were you familiar with FERC's emergency -- I'm sorry -- with Ameren's emergency plan that it had to have in place for operation of that facility?

A. Yes.

Q. Are you aware there was a call list of people that Ameren was supposed to call if the facility ever failed?

A. Yes.

Q. Are you aware that Jerry Toops, the Superintendent of Johnson's Shut-ins State Park, was actually on that list?

A. Post-breach I was aware of that.

Q. You weren't aware of that before?

A. I did not see all of the names on the list. I was aware that there was a list with names on it.

Q. Who else was on that list?

A. I don't know.

Q. Is it fair to say there were people who would be impacted by a failure on that list?

A. Yes.

Q. Did you have any concern for those people, in October of 2005, when you knew that the gauges weren't working right?

A. Not all the gauges were disabled. We still had backup protection on our system.

Q. Okay, and what backup protection was that?

A. There were cut-off sensors, the Warrick probes.

Q. Were you ever involved in actually setting those Warrick probes to a level where they would be effective?

A. No.

Q. Do you know what those Warrick probes were set at in October of 2005?

A. I believe I stated 1596 and 1596.2.

Q. How do you know that?

A. Because that information was given to me by the Project Engineer on that.

Q. That's where you believe they were set in October of 2005?

A. Correct.

Q. And who is the Project Engineer that gave you that information?

A. Tom Pierie.

Q. Did you have the ability, once you became aware that those pipes were disconnected in October of 2005, to stop operation of that facility to correct the problem?

A. No.

Q. Who had that control?

A. The Plant Superintendent.

Q. Who was, in October of 2005?

A. Rick Cooper.

Q. And I believe you've testified that you brought this to the attention of Rick Cooper?

A. Yes.

Q. Did Mr. Cooper ever tell you whether or not you were going to get the ability to stop -- to shut down the facility to fix the problem?

A. No. Could you ask me that again?

Q. Sure. If I understand correctly from your previous testimony, you asked Mr. Cooper for a period of time to shut down the facility to fix the problem; isn't that correct?

A. No.

Q. Okay.

A. I notified Rick that we had this problem. And Rick asked me to come up with a design to fix it, and get it fixed, and let him know when it was ready.

I let him know when it was ready, and he said: Well, go ahead and try to arrange a time frame with the Power Supply folks.

Q. Well, let me ask you this. Because I believe you testified, that on approximately October 27, 2005, that you had the fix designed, and you were ready to do it; correct?

A. Correct.

Q. Did you tell Mr. Cooper: I got the fix and I'm ready to do it?

A. I did that on October 24th.

Q. Fair enough. And did that fix require the plant being shut down so you could do the fix?

A. It required a certain amount of water needing to be released from the Upper Reservoir.

Q. And I believe you testified that, at that point, your request was denied because -- let me go back.

The fix that you came up with, it required the plant lowering the water to a certain level so you would have access to the gauges; correct?

A. Correct.

Q. Do you remember what elevation it had to be lowered down to so you could get to the full access?

A. No. We knew we weren't going to get full

access.

Q. Right. But did you have to lower the thing half way down?

A. We hadn't gotten to the point where we said lower it to any elevation.

Q. I believe you testified that you had been told that it was unseasonably warm that fall?

A. Yes.

Q. And why is that relevant to shutting down that system?

A. I do not know.

Q. Is it because an unusually warm fall means there's not a big demand for electricity?

A. I don't know.

Q. Wasn't it true that, the fact that you didn't get the approval to draw it down, is there was no demand for electricity, so if the water was lowered down to the level you wanted, it would not provide any profit for Ameren, or any income?

A. I don't have any knowledge of those decisions.

Q. Who would have knowledge of that decision?

A. I would imagine the Power Supply folks.

Q. And please tell me again, you specifically spoke with someone at Power Supply; correct?

A. Yes.
Q. Can you give me his name again?
A. Steve Schoolcraft.
Q. And did you specifically request a draw-down from Mr. Schoolcraft so you could do that work?
A. Yes.
Q. And his response to you was --
A. It's not going to be tomorrow.
Q. Were those his exact words?
A. I don't recall his exact words.
Q. Did he say yes, did he say no? Tell me as best you recall what exactly did he tell you?
A. That they were probably not going to be generating the next day.
Q. And why was that relevant to your request?
A. What I was asking was that, after a day's generation, that they would leave the level down before pumping it back up so we could get in and make the repairs.
Q. Well, did they do that, did they leave the level down?
A. They didn't run it down far enough. They weren't generating enough.
Q. Did you ask him: Just run it down some

more so I can get access?

A. No.

Q. Why didn't you ask him that?

A. I don't know.

Q. Let me ask this, did he give you a time frame of when he would allow you to lower the facility so you could have access to do the repair?

A. It was a daily basis. We contacted him the one day, he said, not tomorrow, call back tomorrow in the afternoon, and we'll know what the schedule looks like. And that's how it went for three or four days or so.

Q. So, everyday you called, and he said call me back tomorrow?

A. Yeah, he said it doesn't -- yes.

Q. At some point, did you just stop calling him?

A. I believe there was -- I got wrapped up on another project. And the Plant Superintendent was aware that we didn't get this done, so he knew that it didn't happen.

Q. I just want to be sure of this. I believe you said you weren't involved in any way in helping to determine what factors Ameren used in turning the facility on and off; is that correct?

A. That is correct.

Q. As part of your project design, in designing the liner system and the shut-down period that that would require, were you involved in coming up with an estimate of how much money Ameren would lose by having the facility shut down for that period of time?

A. Could you re-ask that?

Q. Sure. Is part of your development of the project to install the liner -- I believe you said that part of that project was coming up with an estimate of some time frame that the facility would be off-line; is that correct?

A. Yes.

Q. Were you also involved in coming up with an estimate of how much it would cost Ameren, in terms of dollars, to have this system off-line for that period of time of the project?

A. No.

Q. Are you aware, did anyone else come up with an estimate of how much it would cost Ameren to have that system off-line?

A. I do not know.

MR. SCHAEFER: No further questions at this time.

JUDGE DALE: We will take a break, before we move on to Commissioner questions, until quarter of three.

(An off-the-record discussion was held.)

JUDGE DALE: We are ready for Commissioner questions, and Chairman Davis is going to begin.

CHAIRMAN DAVIS:

Q. Mr. Bluemner, did I hear you testify earlier that you gave a statement to the Highway Patrol, a sworn statement or deposition?

A. I don't believe it was a sworn statement, but I did interview with the Highway Patrol.

Q. You did. Was that interview included in their report, do you know?

A. I don't believe it was. I have not seen a copy.

Q. Do you have any idea why that interview was not included in their information?

A. I do not.

Q. Now, do you recall receiving an e-mail from Richard Cooper requesting a commercial diver to help fix the drifting Druck pressure gauges?

A. Yes.

Q. Okay. And do you recall a November 23rd, 2005 e-mail to Mr. Cooper informing him that the

pump-down request was overruled by the Power Grid Managers at Ameren headquarters in St. Louis?

A. Yes.

Q. And did you receive a request from Mr. Cooper regarding the need to anchor the tubes that led to the submerged probes in the reservoir?

A. Verbally, yes.

Q. Verbally, yes?

A. Well, I noticed on October 3rd that they had come loose. I immediately notified Rick, and Rick indicated we need to fix those. And I would have been the one to take on that task.

Q. Okay. And you received a request to schedule a diver to anchor the drifting probes?

A. Correct.

Q. And you recall the November 23rd, 2005 e-mail from Rick Cooper, and your response, where you discuss the inspection of the penstock liner in the Upper Reservoir in the coming spring?

A. Yes.

Q. And what was your analysis at the time regarding draining the reservoir for those items alone?

A. For the items other than the gauge piping?

Q. Yes.

A. As I said in the e-mail was, I didn't think it was necessary to drain it for those items only.

Q. In that e-mail, you indicated that all materials to make repairs to the level gauge piping were on hand, but that you had been unable to, quote, work out the schedule with the Power Supply due to the warm whether.

What does that phrase mean, "work out the schedule with Power Supply due to the warm weather?"

A. Well, after I completed the design, I notified Rick that I was done. And Rick said, go ahead and try to arrange the time frame with Power Supply to get this installed.

Q. Is it fair to say that the company makes more money by generating power during the warm periods of extremely warm weather?

A. I don't know.

Q. Is it fair to say that they have a tendency to want to generate more electricity from Taum Sauk during periods of warm weather?

A. I am really not the person to answer that. I do not know all the factors that are involved with how units are dispatched.

Q. So, they just told you, you know, there's warm weather, we can't do it right now. Is that your

impression of what you were told?

A. Yes.

Q. And you never asked, what does warm weather have to do with it?

A. Well, they explained it -- no.

Q. No, you didn't, okay. What specific request did you make of Power Supply?

A. It was a phone call to -- first contact I believe, as I indicated, was Steve Schoolcraft. Just a phone call indicating what I needed to do and that I needed to try to arrange a time frame.

Q. And do you have any idea what the components are for, you know, setting a time frame to make those repairs?

A. I'm not sure if I understand what --

Q. Well, I'll restate. What are the considerations in making that "when" decision? Do we do it now, do we do it today, do we do it tomorrow, do we do it next week, next month, do you know what those considerations are?

A. Well, one consideration would be safety. And at this point, I knew the plant had taken some measures to compensate for what we knew was -- what had happened. And I didn't feel that it was a dam safety issue at this point. I know that was a

consideration. I'm not sure if --

Q. And in your lay opinion, do you think economics are a consideration?

A. Yes.

CHAIRMAN DAVIS: Judge, I don't have any further questions at this time.

JUDGE DALE: Commissioner Appling?

QUESTIONS BY COMMISSIONER APPLING:

Q. Steve, how are you doing?

A. Very good, thank you.

Q. I'm going to run down a few questions, because I'm beginning to get a little lump in my throat.

I have spent the last 20 years of my life studying management and leadership. And when I leave State Government that is what I plan to do, is talk to people about leadership and management and having the guts to do what you need to do.

I congratulate you for bringing this to people's attention. But I also slap the back of your hands, for sometimes we don't put our job on the line when we feel that there is a safety issue.

I've read everything, and I've looked at everything, and I've set here in this hearing, when I started a couple days ago not to. Go do something

else, because I thought I heard everything I needed to hear about Taum Sauk. I really would like to see us put this back together, rebuild that plant, and get on with it and generate what it was doing.

When I sat here and I listened and I seen what was happening, and the warning that you get, and I can only say to myself that this was probably one of the classical mistakes that was made.

Now, you can tell me that the gauge piping was not the greatest safety factor, but they weren't tied down. How many gauge pipes were there, how many do you have at that dam?

A. There were four.

Q. And how many were loose and kind of flopping around in the water?

A. Well, all four were tied together with a bracket.

Q. And it was not giving you a true reading?

A. Correct.

Q. How much of a concern do you, as an engineer, a person on the ground, how much of a concern -- you were not the commander flying around in the helicopter upstairs, but you were on the ground -- what were your concerns? Was that a major concern for you?

A. Certainly it was. But I did not totally understand the whole control system of how the plant operated. And I knew the plant had taken measures to --

Q. Did you look Cooper in the face and say: Cooper, we have a problem here that we need to fix?

A. We both -- when we talked, we both realized together, yes, we need to fix this.

Q. Was that passed to St. Louis? I mean, to management up at St. Louis, the Vice President, did that get up to them before the incident happened?

A. My supervisor was -- my direct supervisor was aware of the situation.

Q. You know, I keep hearing people -- we're talking to people that were in the financial area of this organization.

My question is, if it's a safety factor, why the hell are we speaking to people that are in the financial part? We should be talking to people who are responsible for safety; am I on the right track here?

A. Yes. The Plant Manager was the sole responsibility for safety and operation of the plant.

Q. Mr. Cooper?

A. Yes.

COMMISSIONER APPLING: Is he coming up to talk to us? I think he is.

JUDGE DALE: He's been excused because of illness.

COMMISSIONER APPLING: Yeah, you told me that.

QUESTIONS BY COMMISSIONER APPLING:

Q. Did anyone ever come down from St. Louis, in the management area, i.e. Mr. Voss, Mr. Rainwater, any other Vice President, come down to Taum Sauk to take a look and listen to what was going on?

A. In response to this situation or ever come to Taum Sauk?

Q. Well, I have to ask both questions.

A. Certainly they had been to Taum Sauk Plant.

Q. How long have you been there?

A. This project started in the middle of September of '04 and finished in the middle of November of '04.

Q. That's when you started to work there, '04?

A. The first attempt of installing the liner was my project as well, that was two years prior, and I was down there for one month, or a five-week period at that time.

Q. Did Mr. Rainwater show up down there while

that project was going on to your knowledge?

A. I don't recall. I know Mr. Birk did and quite a few other managers. And I don't recall specifically.

Q. Okay. That's fine. I'm just concerned because, I think, of all the things that I read and everything that I've heard, I have to use this as the classic mistake that was made in determining this. And it leaves a lump in my throat that this did not get the attention that it should have gotten.

That's why you put the pipe in there. That's why it was put there. And how long did you -- how long was it when you noticed that they were loose until the incident happened, three months?

A. Two months.

Q. Classic mistake, from my perspective, and I think from yours, too. And I'm not putting words in your mouth, it's just that I've heard as much as I need to hear on Taum Sauk. All I suggest is that they move on. If someone asked me today if I had put my finger on what happened here, I would have to say that your testimony, and what has happened, gets pretty close to it.

Thank you very much for your time. There will be some other time that I might want to ask you other

questions. Thank you very much.

A. You're welcome.

Q. And I don't want you to go away thinking that I lashed you, I just needed to get this off my chest. Thank you.

QUESTIONS BY COMMISSIONER GAW:

Q. Good afternoon, Mr. Bluemner.

A. Good afternoon.

Q. If you wouldn't mind, give me what your position is in an organizational chart, who's above you and who's below you?

A. Presently?

Q. I figured that would be the case. I want you to give it to me at the time of the 2004 time frame, and then I'd like for you to tell me if it's changed after that?

A. Currently, I'm a Project Engineer that reports to a Civil Structural Group Supervisor who reports to a Manager of Generation Project Engineering, that manager reports to, currently -- we're talking back then, right? That manager --

Q. As long as you define it, I want both pieces of information. Just tell me which one you described?

A. At the time of the incident, my supervisor

reported to the manager of our department, which was the Generation Project Engineering Department, and he reported to the Vice President of Generation Engineering, Technical Services. He then reported to a Senior Vice President.

Q. Do you know who those individuals were?

A. At the time, my boss was Tom Hollenkamp. Tom's boss was James Witges. James -- it's hard, there's been changes in our -- I think James reported to Bob Powers.

Q. What was Bob Powers' position at the time?

A. Vice President.

Q. Is that Senior Vice President, or you said something about there being a distinction?

A. I think he was a Vice President.

Q. Do you know what his responsibilities were?

A. He was in charge of the Generation Engineering, Technical Services.

Q. And do you know who he reported to?

A. Alan Kelley.

Q. Alan Kelley, whose position was what?

A. Senior Vice President.

Q. And do you know what Alan Kelley's general responsibilities were?

A. It's hard to recall with a lot of the

changes that we've had.

Q. Tell me what it is now?

A. Right now, I report to Carl Rizonia. He reports to James Witges. James reports to Jeff Coil. Jeff Coil reports to Bob Powers, and Bob Powers reports to Alan Kelley, who reports to Gary Rainwater.

Q. He reports to Gary Rainwater. Where is Tom Voss in that diagram?

A. Tom is on the generation side for -- he's Senior VP of AmerenUE.

Q. Is it possible, Mr. Bluemner, that there's been another change that you're not aware of in regard to Tom Voss's position and Gary Rainwater's position?

A. Yes, that's definitely possible.

Q. The individuals that you listed, going up the chart, can you tell me what their specific positions are? It doesn't have -- it's not necessary if you don't know the title, just a description of what they do?

A. My supervisor, he supervises a group of Civil Structural Engineers, and he reports to the manager of the Generation Project Engineering who manages several different groups of different disciplined engineers.

Q. Okay. From the standpoint of Mr. Cooper

and his position in the organizational chart, where is he relative to you?

A. He's with a different company. He's with AmerenUE, and I'm on with Ameren Services.

Q. Now, this explains part of what you were describing earlier then. So, you are in Ameren Services?

A. Correct.

Q. You are not an AmerenUE employee?

A. Correct.

Q. So, when AmerenUE has a project, at times they get Ameren Services involved; correct?

A. Correct.

Q. And your involvement then, your contact -- is there any evidence of a distinction that you have to follow when you're doing a project as an employee of Ameren Services for AmerenUE?

A. I'm not sure if I understand.

Q. Can you tell a distinction in the protocol that you have to follow when you're doing a job for AmerenUE as an Ameren Services employee as opposed to if you were working directly for AmerenUE?

A. I still am not clear on what you're --

Q. Do you have to keep time sheets or anything like that for the work that you do?

A. Oh, yes.
Q. And those time sheets, do they specifically state what job you were doing when you were doing them?
A. Yes.
Q. Do they also have notes on them about what you were doing?
A. Well, project titles, yes.
Q. Do you keep it by hour: So, I spent three hours today on this project?
A. Yes.
Q. Would it have anymore descriptive information than that?
A. No.
Q. And how far back do you keep those?
A. Well, it's a computerized system, so however long they keep records for.
Q. Do you know what's done with those records?
A. No.
Q. And I assume you don't know how it's handled when work is done by Ameren Services for AmerenUE, as far as your time is concerned, whether or not there's some sort of billing that takes place from Ameren Services to AmerenUE?
A. That's all transparent to me.

Q. You can't tell, is that what you're saying?
A. Can you --
Q. What do you mean by transparent, explain?
A. Well, we'll take out a work order or an authorization for a project. And then I know there is, what they call, a service request that's created for Ameren Services. And somehow, you know, I charge it to this project, and then behind the scenes they transfer it from Ameren Services to AmerenUE and then --
Q. In your current position, what power do you have as an employee of Ameren Services to cause there to be a shut-down of an AmerenUE plant?
A. I do not have the authority to call out an outage.
Q. All right. Now, do you have some responsibility in your position in regard to conveying information about safety issues?
A. Yes.
Q. Describe that responsibility for me?
A. Well, if I was aware of any unsafe condition it would be made aware or brought to the attention of upper management.
Q. And who would that be that you would --
A. My first -- I would go to my supervisor

first.

Q. And would that be the extent of it?

A. I guess it depends on how it is handled from there.

Q. Give me an example of when you would go farther then that?

A. If maybe something that I felt was a safety issue, that maybe they didn't. And if I still did, then I could go to someone else.

Q. Okay. Have you ever done that?

A. No. I should backup. We recently had a situation at a Rush Island plant where we had a stack support beam failed, and I was called out to take care of that problem. And the plant wanted to run before we had the thing fixed, and we said absolutely not. And they did not run until we got it fixed.

Q. What did you do to cause that result?

A. Meetings with plant personnel.

Q. And when you say plant personnel, who would you be talking about?

A. Superintendent of Operations, Plant Engineer. Mainly Superintendent of Operations.

Q. And why would it be, Mr. Bluemner, that they would want to run?

A. That's -- I mean, that's what they're --

they generate electricity, that's what they want to do.

Q. And I understand that they do that, but these individuals that are running this plant, are they generally engineers, what are they?

A. Yes.

Q. They just like to here the generators turning, is that the story of it?

A. I don't know.

Q. Well, is there any -- does AmerenUE care whether or not those generators are running?

A. Well, certainly.

Q. Why?

A. Well, we're providing a product to the customers, and we've got to get our product to the customers.

Q. And what happens -- as far as Ameren UE's concerned, or Ameren, or any of Ameren's companies that owns generation -- whenever the generation units are not functioning or not running?

A. What happens?

Q. Financially?

A. I don't know. I'm not at all involved with the financial end.

Q. I'm not asking you specifically, but just

generally. Is there a revenue loss if the generation units are not running?

A. I do not know if -- I don't know.

Q. You don't know whether or not a company makes the same amount of money if their generation is shut-down as it does if the generation is running?

A. There are other places to get generation. We have peaking units. I really don't know.

Q. Are all generation units the same in regard to the cost to run those units?

A. No.

Q. How do you know that?

A. That's information that they make available to us. Off hand, I don't know where I know that from, but I know.

Q. So, in fact, there is a difference from a financial standpoint regarding which units are running to the company; isn't that correct?

A. Yes.

Q. Mr. Bluemner, you made -- let me go back just a minute.

As far as Ameren Services is concerned, and your responsibilities, do you do work for other Ameren affiliates besides AmerenUE?

A. Yes.

Q. Name them, please?
A. Ameren Energy Generating and Ameren Energy Resources.
Q. Okay.
A. Well -- AmerenCILCO, AmerenCIPS.
Q. Okay. Now, when you were having this discussion with the plant on the shut-down -- again, which plant was that?
A. The one where I --
Q. With the beam issue?
A. That was the Rush Island plant.
Q. Who owns that plant?
A. AmerenUE.
Q. And who was involved in that discussion, anyone else besides those at the plant?
A. My supervisor was aware of it.
Q. Okay. Did you have discussions with your supervisor about it?
A. Yes.
Q. Tell me about those discussions?
A. Basically, we had an unsafe condition. The stack could not be operated until it was fixed. Bottom line, we got to fix it.
Q. What did he say?
A. He agreed.

Q. But you had communicated with the plant and they said we don't want to shut down. I'm putting words in your mouth.

A. You are. No, the plant -- it took a couple days to figure out what had happened, what was going on, what we needed to do to get it fixed. And we were still developing a design to fix it, and the plant indicated that they wanted to bring the unit on before we were going to be able get this fix in place, and we said no.

Q. Did they say okay?

A. They pushed back and said you have to have it done by this date, or try to have it done by the end of the weekend.

Q. And you said what?

A. I said, I won't make guarantees, but that's what I'm working towards.

Q. And did it get done by that date?

A. It got done 12 hours ahead of schedule.

Q. And who was your point of contact there again?

A. There were a couple. The Plant Engineer, the Plant Superintendent would probably be the main one in discussing the outages; Dave Struberg.

Q. Do you have people who work under you?

A. No.
Q. And have you ever worked with Tony Zamberlan?
A. He was on the project, the controls project, and I did not work directly with Tony on that because that was not my responsibility.
Q. Did you work with him at all?
A. No.
Q. Okay. Who was responsible for overseeing all of the aspects of the Taum Sauk project in '04?
A. Well, I guess that would be -- see, I was responsible for the liner, Tom Pierie was responsible for the controls, and I'm certain there were other items going on at the plant that I was not aware of. I guess Tom and my supervisor is the boss.
Q. Who would that have been?
A. James Witges.
Q. And who did he work for, UE?
A. Ameren Services.
Q. Is Mr. Pierie's employer Ameren Services also?
A. Yes.
Q. The design of the Taum Sauk plant itself, prior to the work in 2004, were you familiar with it?
A. In what aspect? Familiar with the design?

Q. Yes.
A. How so?
Q. In any way.
A. I knew the basic principle of the plant, yeah.
Q. Had you done -- you had done some work on it before then, you said earlier; correct?
A. The first attempt at installing the liner was my first work at the plant.
Q. Before that -- at that time, did you review the design, the plans, in getting ready for that project?
A. Reviewed the drawings, yes.
Q. And you simply didn't have enough time to get it completed in the window they offered you at the time?
A. That's correct.
Q. But you did have the opportunity to do certain things around the bottom of the reservoir?
A. Correct.
Q. At what point in that timeline did you determine you couldn't get it done.
A. Probably within three -- I mean, it was only a four week outage window, so in the third week it was very apparent that it was not going to happen.

Q. And who designed the work that was being done in that time frame?

A. EMCON.

Q. The same company that was used later; correct?

A. Yes.

Q. And was that design changed prior to beginning the work in 2004?

A. The design of the liner was not changed.

Q. Was there anything else that was changed that you were working on?

A. The gauge piping design had changed from the first issue of that design.

Q. You were describing that earlier; correct?

A. Yes.

Q. Now, when did that occur, if you remember?

A. It was early October of '05 when we got the revised design.

Q. And that -- what caused that design change?

A. That was a concern that our contractor had with the method of attaching it.

Q. Who was the contractor again?

A. GSI, which is Geo-synthetics, Inc.

Q. This is a different contractor then what you had earlier engaged in 2000?

A. Right.
Q. Was it 2000?
A. 2001 the first time.
Q. Why didn't you stick with the original contractor by the way?
A. We were not comfortable they had a good game plan. They did not make the progress we felt should have been made on the first time.
We decided -- we bid them again. The first time was a negotiated contract, the second time we bid the project. And we bid them again, but they were not low.
Q. And GSI, did they supply the liner?
A. No. We purchased the liner from GSE, who was the first contractor, but they are also a manufacturer of the materials that we used.
Q. Had GSI done this kind of work before?
A. Yes, liner work. Nobody had every lined a reservoir like that before.
Q. So, describe for me the experience they had?
A. Land fills are the biggest applications for these materials, and that's the majority of their work. Or like at some of our plants we have ash ponds. These ash ponds are lined with this material.

Q. What studies were done, on behalf or by Ameren, to determine whether or not this liner was a suitable solution to the leakage problems?

A. We relied on our consultant who had thorough experience with this liner.

Q. And the consultant was who again?

A. EMCON.

Q. So, in 2004, at some point in time prior to beginning the project, there was a change because of the contractor suggesting that there was -- there would be a problem in attaching these conduits?

A. Yes.

Q. The original design had a number of attachments that would go through the liner; is that correct?

A. That is correct.

Q. And then into the concrete behind it?

A. Correct.

Q. And there was concern that that could cause some leakage, or tearing, or what, do you remember?

A. Well, this material expands and grows and shrinks, pretty much, with temperature changes, okay. So, if you anchor the thing at two points, and it's trying to get shorter, something is going to give.

And that was the concern, that if you didn't let

it move freely it would tear, and it would snowball and tear itself apart was the issue.

Q. Did that entity then contact you, is that --

A. They were the contractor that I had hired. They were basically giving me their experience with working with these liners.

Q. Is that how this worked, they contacted you?

A. Yes, if it came through me, yes. And I relayed that on to my consultant saying they've got a concern with this, we'd like to come up with something where we don't attach -- fix -- the liner.

Q. And then what did you do with that information?

A. That's with -- their new design?

Q. After they told you there's an issue with this design, what did you do?

A. I asked my consultant to come up with a new design.

Q. How long did that take?

A. I don't recall off-hand.

Q. At some point in time they came back with a new design?

A. Yes.

Q. And that is the design that was actually utilized to secure the conduits?

A. Yes.

Q. Do you know what kind of review was done on that design before it was implemented?

A. Well, the consultants, they have their own process for engineering design, and I'm sure it went -- I don't know what level of review they went through, but we reviewed the drawings and we accepted it.

Q. Okay. Did you find any problems at the time with that design?

A. Not upon first review. The problems did not really come up until we went to the field to install it.

Q. Then what occurred, what happened then?

A. Well, we had to figure out how to make it work in the field. And again, there's -- things are going on left and right. There's 50 guys crawling around everywhere and running the project. There was a lot of other things going on.

Once we got focused on this, we stayed with it until we came up with a solution. I got on the phone with the consultants -- we were in a remote location, we don't have all the technology communication, phones

were about it -- and we talked on the phone on more than one occasion about "here's the problem we have, here's kind of what we're looking at doing, what do you think." And they concurred with the solution we came up with.

Q. Describe for me the change between the initial modification and what you changed in the field for me?

A. The design they gave had two wire ropes stretched between steel angles that were attached to concrete. And from this rope you had assemblies that tied the four pipes together, and they were tied together with what's called a Unistrut, which is a steel channel that they use in the electrical industry for attaching electrical components.

They were secured with pipe clamps that held the pipes to this steel bar, and the steel bar had an eye bolt attached to the end of each side of this bar. And that eye bolt would thread on to that cable. That was the original design.

So, it had an eye bolt that stuck this high off the steel bar.

That would have been fine if the slope would have been a constant slope all the way down. The slope was not, the slope was bowed. When I stretched my cables

between two points, they take a straight line, so I had to -- all I did was, I had to compensate for that difference in elevation depending on where you were on that pipe.

Q. When you say pursuant to the original design, are you talking about the original design or the modified design?

A. The modified design that was released without attachments through the liner.

Q. That's what I thought you were talking about, I just wanted to clarify.

What else, if anything, did you change from that modified design in the field?

A. I believe that's all the -- yeah, I believe that's all.

Q. Now at the bottom of the conduits, again, how were they attached in for to secure the conduits?

A. Well, if I could make a drawing it would be easy.

Q. I know, it would be for me, too. I'm wondering if there's any kind of diagram --

A. I don't have any of my paperwork.

Q. -- or a picture or anything that might be available?

A. That would make it easier to see.

JUDGE DALE: We could turn on that and just use those things.

COMMISSIONER GAW: If you know how to do it.

(An off-the-record discussion was held.)

MS. HOUSE: Judge, do you mind if I come up?

THE WITNESS: This is not exactly the contour, but I think you'll get the idea.

JUDGE DALE: Just stand on that side of it.

COMMISSIONER GAW: And turn that microphone a little closer around.

QUESTIONS BY COMMISSIONER GAW:

Q. Now, you have just made a drawing; correct?

A. Yes.

Q. On that drawing it says something about design and actual. I want to ask you before you start the explanation, is that the modified design?

A. Yes, this is the design that we went into the field with, after the concerns by the contractor.

Q. Go ahead and describe what you've drawn?

A. This is the parapet wall, the face slab, this is the toe block that we indicated we did the first time. We have a steel angle that is anchored into the concrete here and here. And the original

design showed this with a cable stretched straight between those two steel angles.

Then you had your piping. This is what I referred to as the Unistrut, the steel channel. These are clamps that go over and bolt into the Unistrut that holds them together. This did not change at all between the design and actual.

Q. How many of those were there approximately?

A. Ten. Approximately ten.

At the end of this Unistrut, their design -- they make all kinds of clips and fittings that go into these. I guess if you look at a section of it, it looks like this.

So, you can slide attachments in here, and an eye bolt was to be threaded on to this nut, and then that eye bolt was threaded onto the cable.

Q. And how many cables were there?

A. Two. Two cables.

So, the eye bolt sat here and here, and then the cable went through the eye bolts. Okay, that's in a perfect world with a nice perfectly sloped -- that's how it would be.

We had areas where, now we had to keep the piping on the liner, it needed to sit on the liner. When you had the belly, you had to extend this, in some cases,

to match whatever the slope was at that point. That was the change.

Q. I wanted to ask you why you made the statement that it had to stay on the liner?

A. That's what we determined that we wanted, to keep it on the liner.

Q. Do you know why?

A. I don't recall.

Q. Go ahead.

A. So, the modification we made was to lengthen these eye bolts so we could get them onto the cable.

Q. Okay. And is that what happened in the actuality?

A. Yes. Not every one was modified, some of them we were able to keep just the eye bolt there. Others we had to add a threaded rod and a turnbuckle, and the eye bolt on top of the turnbuckle. The turnbuckle would allow us to make adjustments depending on what the slopes were.

Q. Any other adjustments made from the modified design to the actual construction?

A. No.

Q. All right. At some point -- yes, go ahead.

A. I just recalled, the original design didn't

have, like, a jam nut on the top here, you know, this would thread into here, but nothing would keep it from sliding. The design they gave me -- and I didn't realize this until we started putting it together -- the eye bolt threaded into this nut, and that was the design. I added another plate here so I could put another nut on there so I could crank that together to keep it in place.

Q. So, kind of like a lock nut?

A. Exactly.

Q. Anything else?

A. No.

Q. Now, we know that at some point in time something came loose with this structure. Tell me what that was, if you know?

A. It was one of these attachments came out of the end.

Q. Tell me -- be more descriptive with what you're pointing to for the record?

A. The turnbuckle eye bolt assembly came disconnected from the Unistrut.

Q. Now, where did that occur, do you know?

A. When I saw it on October 3rd, the whole gauge pipe was not exposed, some of it was still underwater. So, I couldn't tell at the bottom. But I

believe there were -- I don't recall exactly -- at least two or three.

Q. Okay. So, was the cable itself, or the cables themselves, still attached to the bottom?

A. Yes.

Q. So, there was -- and the placement of those -- I forget what you said those bands are?

A. Unistrut.

Q. Unistruts. The placement of those that were disconnected, were they toward the bottom, toward the top, in the middle, do you know?

A. I would say the middle.

Q. Do you know that for certain?

A. If I had -- no. I don't exactly know which ones.

Q. There are four of these conduits; correct?

A. Yes.

Q. Why were there four?

A. The original design -- back to the original, not the revised -- had one that, when they were anchoring it through the liner, one was to be filled with concrete for ballast.

Q. And why was that changed?

A. The consultant changed that when we went to the independent support because now we had this cable

that was to secure the pipes.

Q. And the thought was that would be a sufficient replacement for the original design; is that your understanding?

A. That's my understanding.

Q. What would have happened if you had filled that conduit with concrete under this actual design, do you know?

A. I don't know. I would imagine it probably would have helped, but I don't know. I can't say it would have kept this from happening.

Q. And I'm not exactly asking that question, but do you think it might have improved it somewhat?

A. I believe so.

Q. Have you had a chance to look at the Rizzo Report?

A. I believe I've seen it. I don't recall everything in it. It's been a long time.

Q. I understand. Do you know if you looked at the particular provisions related to this part of the construction, the conduits and how they were placed?

A. Yes.

Q. The report, would you not agree, is critical of the design that was actually used?

A. Yes.

Q. Do you remember whether or not you agreed or disagreed with the criticism in the Rizzo Report in that regard?

A. Based on the performance, it's hard not to agree.

COMMISSIONER GAW: Now, let me stop and see if anybody has any questions over this while he's up here.

COMMISSIONER APPLING: I think I'm okay. But I can understand how the eye bolt came loose. I can, you know, as an engineer for a long time, I can understand how that came loose and the swaying of that under the water.

So I don't have any questions, Steve. But I can see how that went wrong there. I can also see how you tried to design it so it would stay on top of the mat there because of the contour of the dam itself. Like you said, if you had a wall that went straight down, then that would have been an easy way to do it. But it wasn't, it was rock and everything else that kept it from being straight. That's all I have, Judge.

JUDGE DALE: I have a couple questions.

QUESTIONS BY JUDGE DALE:

Q. In the actual, where the contours are shown, isn't it likely that the ones towards the outer

edges would be the ones that did not have the extended eye bolts, and the ones in the middle would be more likely to have extended eye bolts just because it is the greater distance?

A. Yes. One thing you don't -- the slope actually does this. So, yeah, where the wires are further away from the slope you are going to have longer to make up that distance; that is correct.

Q. And if you had filled one of those conduits with concrete, would you have done it before you laid it in there, or after, so that it would adhere to the shape of the wall?

A. It would have been after. And it was one of the big issues with the concrete, was placing this in a pipe, to get concrete to flow into the pipe. But it would have been done after the pipes were in place.

Q. So, it could adhere to the contour?

A. Yes. It would have -- it would have filled the pipe however the pipe lay. Yes, it would have followed the pipe.

Q. How flexible are the pipes?

A. They are plastic, so they're relatively flexible.

JUDGE DALE: Thank you.

COMMISSIONER GAW:

Q. When the structure came loose from the cable in places, describe for me then the ability of those conduits to move, at least as far as maximum movement would be concerned?

A. Also part of the design, the original design, there were clamps put on the cables below each of these supports. So there were ten supports, roughly, evenly spaced. So, below every eye bolt there was a cable clamp on the cable.

So -- and I do know the bottom support was intact when we found it, so it had slid up and stopped at the next support where that clamp was on the wire. So that would have been the maximum.

Q. What was that distance?

A. I don't know off-hand.

Q. Do you have any kind of an estimate, are we talking inches, feet?

A. I want to say 20 feet.

Q. Twenty feet?

A. Yeah. On an average there were like ten, and it was roughly 70 feet along this slope, something like that.

Q. So the -- I want to make sure I'm getting this picture correct. The end of the conduit, as it goes down, was it riding along this cable and not

specifically tied down to a particular position on the bottom?

A. The whole thing was free to flow along the cable --

Q. That's what I thought you were saying.

A. -- yes. It was not -- yes.

Q. So, when the these things came loose, the ability of the conduit to move and ride along that cable was fairly significant?

A. Yes.

Q. Okay. Now there was, in the Rizzo Report -- see if you remember this statement: Overall, the substitution of a turnbuckle in a location where a bolt was originally specified was not adequate. From a generic perspective the mechanism of bolted connections is such that the nut is held in place by the friction of the nut by the part being connected. The friction acting on the threads is not credited as there is an inherent gap between the threads of the bolt and of the nut that allows the nut to turn. This gap allows a slight vibration to release the friction in the thread-to-thread interface. In other words, to rely only on thread-to-thread friction to maintain the integrity of a bolted connection is not adequate and is not

consistent with function of the bolted connection.

Do you remember reading that?

A. Yeah, I remember reading that.

Q. Do you agree with it?

A. Yes.

Q. What is it talking about, if you can describe it in other words?

A. Well, the dimensions of a bolt and the dimensions of a nut, they are not exactly the same, or you would never get the nut on the bolt. So there is some play there.

You can tighten it down, but there is still some play there. And if you get some vibration, it gives it some room for it to back itself off.

Q. And what was it, on that diagram. That would have been the backing off that they are describing?

A. Say, right there.

Q. Okay. Now, you said that you added this other nut there --

A. Yeah.

Q. -- because you at least anticipated the possibility -- I would assume -- of something happening along that line?

A. Yes.

Q. Why didn't your modification take care of that issue?

A. I can't answer that. I felt that it did. We thought -- we thought we were making it right.

Q. But this is one of the pieces that failed?

A. Yes. Yes. Right there.

Q. You can have a seat if you want to.

Now, there's always been fairly significant discussion -- and I won't belabor this too much -- in regard to the filing of this information with FERC.

And you -- did I understand you correctly -- you don't remember this actual design being filed with FERC, or is that accurate?

A. As-built drawings were submitted to FERC.

Q. But at what time?

A. After completion.

Q. Okay.

A. But -- and this was after I had a letter from my designer with engineering seals on it saying they've inspected it and everything was installed, they sent me this letter with the as-builts. Everything was installed with the intent of the original design. So, I had this letter from them, with as-builts, that they were in the field and they saw this installation and blessed it.

Q. And who is they again?
A. EMCON, the consultant.
So, that's what I submitted, the letter of them transmitting the as-builts and that they were comfortable with them representing the design. So, that's what I submitted.
Q. What was different between that and what actually was --
A. The design did not pick up the extended turnbuckles that I described to you.
Q. At some point later, do you know if FERC got a copy of the actual as-built?
A. After the breach.
Q. That's what I was after. Do you know when that was?
A. It's in our -- I prepared the sketch to send to FERC, so -- and I don't recall. It had to be -- it was after, obviously, after the beginning of the year in '06. I don't know the date.
Q. That's what I was going to ask you. Was it as late as '06?
A. Yes.
Q. Was that after FERC asked for that information, do you know?
A. I don't recall. As part of my

investigation, through all my records and putting the chronology together, I developed a sketch.

Q. Okay. Now, at what point in time were you aware of this -- of the conduits coming loose?

A. October 3rd of 2005.

Q. And you were contacted again by Mr. Cooper?

A. I contacted Rick to let him know, showing him the pictures and telling him this is what I found.

Q. Okay. Again, how did you discover the problem?

A. I was at the Upper Reservoir inspecting the liner.

Q. And how often did you do that?

A. That was the first time since we installed it, we completed it in November '04.

I was actually down at the plant looking at another issue on another piece of equipment, and talked with my boss, and we said this would be a good time to coordinate a one year inspection. Because we have a one year warranty in specifications installation specs. And so I coordinated my other work with inspecting the liner.

Q. What was the other work?

A. We were looking at the sluice gate at the lower dam. We were having issues -- we were doing an

inspection of the sluice gate at the lower dam.

Q. And who was with you when you were doing these inspections?

A. I had -- of the other equipment or the liner? All of it? Because I brought --

Q. Let's separate them into two. Who was with you on each?

A. Well, on the inspection of the sluice gate, I had -- I hired a diver to help set logs to isolate the equipment. We had plant guys that were supporting me, helping me. And I had another engineer from a mechanical engineering group that was assisting me with the inspection. And I had another -- I hired another consultant to do some scaffolding safety rails and stuff so I could safely work on the equipment.

Q. Were any of those individuals Ameren employees?

A. Yes. The plant guys were union personnel from the plant, the engineer that assisted me was -- worked in my department under a different group.

Q. What was his name?

A. Bill Stillman.

Q. Now, when you were dealing with the liner, who was that?

A. Matt Francking, and he was in the same

group that I was in.

Q. Okay. With Ameren Services?

A. Correct.

Q. Anybody else?

A. No.

Q. Now, were you aware, when you were making the inspection of the Upper Reservoir, that there had been an incident at the end of September in regard to overtopping?

A. Yes.

Q. How were you aware of that?

A. There was an e-mail that was sent out, that I was copied on, and I was aware of it.

Q. Were you involved in investigating why that overtopping occurred?

A. No.

Q. Do you know much about the investigation of why that overtopping occurred?

A. No.

Q. Was anyone in your division involved in that?

A. Well, Tom Pierie was involved, as the controls guy. Yeah, he was working with the plant. I really do not know who all was involved with working on it. It didn't fall under my responsibility because

that was all controls.

Q. Now, when you went up to look at the liner and the -- you saw the conduits; correct?

A. Yes.

Q. How easy was it to see that there was an issue with them?

A. Very easy.

Q. Describe what you saw for me?

A. I looked down the pipes, and you could see that they were not in line with the cables. They were bowed out of their original attachment.

Q. When you saw that, then what did do you?

A. I went down to the plant and notified the Superintendent that we had this problem.

Q. Was anyone else there when you made that notification?

A. That's a very little office. I'm certain there were people around there, but I don't recall who.

Q. Was the other individual that you said was with you on the Upper Reservoir, did he go with you down to the Superintendent's office?

A. I don't think so. Actually, I saw -- my inspection was going to occur on the fourth, because the third was the day I had lined up for the other

equipment inspection.

But I finished earlier that day, and I went up to the reservoir, and that's when I saw the pipes. Really the inspection occurred on the fourth, October 4th.

Q. Did you do more work on the fourth then?

A. We went around and checked attachments of the batten bars to the liner, looked over the parapet wall in certain locations where there was a ladder, so we could look over to see if we saw any other problems with the liner.

Q. Did you find any other issues?

A. Nothing major.

Q. Anything that you can note for me today?

A. I believe there were -- in the field of the membranes, we did put what we called ballast plates. And they were to, again, to hold the liner down in wind events when it was empty. But it allowed a little movement. It wasn't fixed rigid, but it held it down. And a couple of those had come out.

Q. How were they attached?

A. Just with a bolt and a flat plate.

Q. Through the liner?

A. Yeah, but it was designed so it would allow a little bit of movement there.

Q. By the way, how far was the top of the liner from the top of the parapet wall as a general rule?

A. The design was, the top bar was just a flat steel bar, and it was located with the center of the anchor bolts one foot from the top of the wall, not any given elevation, just where ever you were on the wall, one foot down, that's where the bolt goes.

Q. So, you went back -- you described some of what you did on the fourth. Is there anything else that you did on the fourth?

A. No.

Q. How long were you up there on the fourth, do you know?

A. Four hours. I don't recall exactly.

Q. Okay. Did you make a determination then as to whether or not it was possible for you to do anything about fixing the problem with the conduits on that day, in other words, that you could have done that day?

A. No.

Q. And that question was in artful.

A. Yeah.

Q. You were unable to do anything to fix the problem on that day; is that correct?

A. That's correct. I mean, I cannot do work -- I can't do work because of the union situations at plants.

Q. And it was your opinion that you needed a diver to fix the problem?

A. That was probably determined through discussion, between Rick and I, on how you would fix this thing. It's mostly underwater all the time.

Q. Okay. And that discussion would have taken place on the third or the fourth?

A. Probably the fourth, I don't know exactly.

Q. Did you come up with a -- well, let me ask you, tell me about the discussion between you and Rick after you discovered this -- whatever conversations you had with him?

A. It was brief, but we both realized that, well, here's the reason why I had these problems with your levels, prior, that we didn't know about.

We knew we needed to fix it. And Rick tasked me with: You've got to come up with a fix -- and not necessarily me, I could go hire somebody -- but you've got to get a fix.

Q. And the problems that you were talking about with him, that you thought -- that you had been having -- what did you mean by that?

A. Well, you referred to the prior e-mail about the level -- the overtopping.

Q. I'm just wanting to make sure we are on the same page here. That's what you're talking about?

A. Yes.

Q. Was there anything else that you were aware of, as far as the levels were concerned, besides that overtopping issue?

A. No. I knew that they had taken measures to lower set points and such, that's about all.

Q. Now, from a time sequence standpoint, the surveys that you did on panel 72 occurred when, again?

A. Middle of October.

Q. So, it was subsequent to this visit that we're talking about?

A. No, no. This was before we installed the gauge piping.

Q. Oh, it was the year before, I'm sorry.

A. Yes.

Q. Do you know when the previous survey had been done for FERC?

A. I submitted it to FERC in November of 2003, so it was done in the fall of 2003.

Q. Okay. And do you know how many panels were measured, approximately, for that survey?

A. I think there's 21 -- twenty, plus or minus five, monuments or bolt heads that are cast into the concrete that we survey.

Q. You basically survey the same ones every time you do it?

A. Yes.

Q. And 72 isn't one of those that you normally survey?

A. They were on increments 70, 75, 80, 85, 90. That's where the markers were.

Q. The panels that were breached, do you know if they were surveyed, prior to the breach of course?

A. I did not, with the survey that I did.

Q. What about the ones that were done for FERC?

A. I don't know exactly. Again, they were every five, so 85 was surveyed, 90 was surveyed, 95 was surveyed. So you had survey information definitely within that area.

Q. Now, the difference in the -- let me ask you this, do you know whether or not there had been notations of an issue of settling of some of these panels in previous years?

A. Yes, we had drawings that documented all these surveys and summarized the settlements, and that

was all submitted to FERC all along.

Q. Was that known within and around the plant, do you know?

A. I do not know.

Q. Who would have had knowledge about that, that you're aware of?

A. Well, certainly when I submit any information, the Plant Superintendent is copied. So whoever the Plant Superintendent is at the time would see that information.

Q. Would you give a copy of this record to anyone else within Ameren?

A. No.

Q. No one in St. Louis?

A. I only coordinated this survey one time, which was the 2003. Prior was done by someone before me.

Q. Do you know who?

A. I have no idea.

Q. Would it have been somebody in a totally different position than yours?

A. I believe it was -- I believe it was out of a group called Betterment Group that somehow was dissolved prior to us getting the Part 12 inspection responsibility.

Q. Why did you want to specifically look at 72, you saw that -- something disturbed you about it looking like it was lower, was that basically it, you just noticed it?

A. That was it. I stood on the observation deck, and I could eye ball, and I could see there was a low point, and I knew I needed to know what that number was.

Q. Did you give that information to Tom Pierie?

A. Yes.

Q. About when was that, that you gave him that information?

A. It was the middle of October. Middle of October of 2004.

I was hesitant to give that survey information because I'm not a surveyor. You know, I'm not a registered surveyor, but I know how to use -- part of my schooling we learn how to survey.

Q. In engineering school?

A. Yes.

Q. Civil engineering specifically?

A. Yes. So, I didn't want to necessarily publish this. But I had to -- this was just -- we were in the field just going, and there were guys

flying everywhere getting things done. And that's why I just needed to know for myself what these numbers were. And I passed it on to my guy -- or the Project Engineer that did the controls.

Q. You felt it was important to find out?

A. Yeah.

Q. And it was important because --

A. Because I knew he had to control elevations of the water.

Q. So, Tom Pierie was in charge, or at least -- maybe whatever words you want to use -- very involved in those settings of those levels; correct?

A. Yes.

Q. And especially in regard to the placement of the Warrick probes?

A. I do not know where those elevations were determined. There had to be -- I mean, we knew what prior settings were, so I don't know where the information came from on what elevations these probes get set.

Q. But you knew what they were supposedly set at; correct?

A. Yes.

Q. And when did you get that information?

A. It was prior -- right immediately before I

did the survey, because I had to mark some elevation numbers on the pipes down low for Tom to use.

Q. Okay. The assumptions that were being made, at the time that you had this information in '04, regarding the low point on panel 72, which you measured, and the placement of the Warrick probes, can you tell me the difference between those heights based upon your measurement and what you understood the placement to be?

A. The low point that I measured was 1596.99. The Hi probe was at 1596. So that would be .99 feet, one foot, for the Hi probe. And then the Hi-Hi probe was two tenths of a foot above that.

Q. And you've already told me that you've had -- you've been trained to do the engineering -- excuse me -- the surveying work; correct?

A. I knew how to use the equipment, yes. Yes.

Q. But you're not a licensed surveyor?

A. Correct.

Q. And you had not been doing the surveying work as a general rule, as a part of your responsibility, since you left college?

A. That's correct.

Q. Now, the margin that you're talking about here is less than a foot between this lowest probe --

and that's an assumed height, that's what you're told; correct? That it was being set at, the figure that you --

A. Well, I don't know where it came from, the 96.

Q. Somebody told you that?

A. Yes.

Q. Do you know --

A. Well, Tom gave me that.

Q. So, based on that assumption and the assumption that your information was correct, we're talking about less than a foot difference between the low point -- that you think was the low point -- on the parapet wall and the place where you assumed -- based upon information that Mr. Pierie gave you -- the lowest of the high sensors were placed?

A. Correct. And again, those were backup probes. They were not -- that was not the operating level, that was a trip set.

Q. Now, in October of '05 when you discovered that the piezometers were floating and couldn't properly read the level of the reservoir, at that point you were aware, were you not, that the only line of defense left were those Warrick probes?

A. Yes. I was aware that they had made some

changes, and I don't understand it all, or don't confess to understand, all the control system. But I knew they had done some programming changes, changing set points. I knew they had done some things to account for this. And yes, I was aware those were the two backup lines of defense.

Q. So then we're back to depending upon your measurement being accurate on panel 72; correct?

A. Yes.

Q. And the measurement of where the probes were set being accurate; correct?

A. Yes.

Q. If either one of those things, either one of those things is incorrect, it could be disastrous; correct? At that point in time?

A. It could be.

Q. In fact it was; correct?

A. Correct.

Q. Did you believe at that point in time there was a safety issue at the plant, in October of '05, when you discovered the problem with the transducers?

A. I did not.

Q. And again, why did you not believe that it was a safety issue?

A. Well, again, not -- and I understood

levels, controls, shut offs. But I was not totally up to speed on the whole control system. And I knew the plant manager knew all about the system. And he never made me feel that, you know, we want to get this done as soon as possible, but he never said we've got to get this done tomorrow, or you know, it was never put to me --

Hindsight is great. You ask me now, but at the time I did not feel it was a dam safety issue.

Q. So, it could wait until next spring to get fixed?

A. I didn't say that.

Q. Why wouldn't it have been able to wait to next spring to get fixed in your opinion, if that's your opinion?

A. Again, they were operating with some modified control programs and such, and we didn't want to operate that way.

Q. Did you examine what those control programs were and how that played into the fluctuation that might have been going on with the transducers?

A. No. Someone was, I did not.

Q. Okay. Do you know who that someone else was?

A. Yes. Yes. I know there were other guys

working on the -- yes.

Q. Who was responsible for that?

A. Well, ultimately the plant is responsible for that equipment. Once the equipment is turned over and accepted for operation by the plant, they are responsible for operating that equipment.

I believe that -- I know that Tom Pierie had been called, because he was the Project Engineer on it, so they were coordinating with Tom at the time.

Q. Do you know whether or not Tom Pierie knew, in October of '05, how far the Warrick probes were from the top of the parapet wall?

A. Tom thought they were at the elevation that he left them when he walked off the project.

Q. That's not what I asked you. I understand your answer, but what I'm asking you is, do you know whether or not he knew how far the Warrick probes were from the top of the parapet wall in October of '05?

A. No.

Q. You never had a discussion with him about that?

A. No.

Q. And if he would have been aware of the placement of those Warrick probes at four and seven inches from the top of the parapet wall, in your

opinion, should that have caused a concern if he would have also known about the measurement of panel 72?

A. Yes.

Q. If you would have had that information, would that have caused an increase in your concern about the safety of this structure knowing what you did about the transducers?

A. Yes, if I knew that information.

Q. What would you have recommended if you had known that information?

A. There's only one answer, is you can't operate until it's fixed.

Q. You've heard that old saying about a wing and prayer haven't you?

A. Uh-huh.

Q. Might have been a movie made about it, I don't know. Would you say, in this case, that the one wing that you thought that you had left wasn't really there and evidently someone forget to pray?

A. I don't know how to answer that.

Q. You don't have to answer that.

When the Upper Reservoir was being filled and the transducers -- I keep using different names, and I'm sorry. If there's one I should be using, please tell me so I'll be consistent.

A. You had level sensors, which you control elevation with. And you have Warrick probes which were --

Q. I'm clear on Warrick probes. I'm looking for the name you want me to call the piezometers?

A. Level sensors are fine.

Q. After you knew that they were disconnected, what would you expect, from water being pumped into that Upper Reservoir, as to its effect on those level sensors and their readings, in other words, there's turbulence coming into that reservoir when water is being pumped into it, isn't there?

A. Well, they don't completely drain it when they generate, so there's a certain level of water in there. And it's -- when they are generating, you'll see a small whirlpool. When they are pumping back, I can't say, I've ever seen it pumped back.

Q. Would you, as an engineer, would you expect there to be turbulence when water is being pumped into that reservoir?

A. It's -- to some degree, yes.

Q. And if there is turbulence, would you expect there to be movement in those conduits from the turbulence?

A. Yes.

Q. And if you saw a graph of the level of the Upper Reservoir as it was being filled on a computer screen, if you were observing something like that, and there were jagged lines showing an irregular jump and then drop and jump and then drop in the depth of the reservoir, would that give you any indication of something going on?

A. Yeah.

Q. What would it tell you?

A. It would tell you that your reference is moving.

Q. What concern would that raise?

A. Well, the level sensors you have to have in your program exactly what elevation they are set at to get an accurate reading. So, if that reference moves, the reading will move.

COMMISSIONER GAW: That's all I have, Judge. Thank you, Mr. Bluemner.

JUDGE DALE: Ameren?

QUESTIONS BY MS. HOUSE:

Q. I just want to talk about a couple issues here to clear things up that we're a little confused about.

You testified earlier about this spring outage that there was discussion of; do you remember that?

A. Yes.

Q. And I ask you to pick up, if you got it in front of you still, Exhibit 11.

A. Yes, I do.

Q. What was your understanding of this spring outage that had been scheduled?

A. The spring outage was being arranged for repairs to some other equipment. They had some equipment that they needed to repair, and they were trying to assign a window to get that done.

And what I was saying was, that I don't think -- if your outage doesn't need you to drain the Upper Reservoir, I wouldn't drain it only to inspect the liner or the penstock.

Q. Why didn't you think it was necessary to drain the reservoir at that time if all you were going to do was inspect the liner and penstock?

A. The inspection that I had made on October 4th of the liner, I didn't have any indications of any major problems that needed an outage or needed it to be drained to work on.

Q. Was it your understanding that this spring outage was separate and apart and had absolutely nothing to do with the discussions you were having about a potential outage in the fall related to the

gauge piping?

A. It was not related. We were still trying to get the gauge piping window arranged.

Q. Did you ever have discussions with anyone about delaying the fix for the gauge piping until that spring outage?

A. No.

Q. I ask you to turn to the second page in Exhibit 11. If you would take a look at the first page, that's the start of an e-mail from Mr. Cooper to a number of people, including you, on November 14th, '05?

A. Yes.

Q. Take a quick look through that. I'm going to make sure you take a look through it so you're sure to familiarize yourself. I'm going to direct you to the paragraph that's numbered 2 on the second page?

A. Okay.

Q. And if you'll just take a look through Paragraph 2, read it to yourself, let me know when you're ready?

A. Okay.

Q. If you would read that last sentence in Paragraph No. 2, the one that starts "we still."

A. We still have to repair the level gauge

piping soon, and by the spring we would be able to see if this is a permanent fix or not.

Q. So, is your understanding that, from Mr. Cooper's perspective, his intent was to get the gauge piping fixed that fall, as soon as possible, and inspect it once again to make sure that it worked in the spring outage?

A. Yes.

Q. I believe you were asked already about whether you believed, on October 3rd or 4th, when you saw the gauge piping, whether that was a safety concern, do you recall being asked some questions about that?

A. Yes.

Q. In the event that you believed that there was a safety concern that necessitated the plant being shut down immediately or needing an outage that day to get it fixed, what would you have done?

A. My first reaction, if I really felt it needed to, I would probably go to my supervisor and work with the plant. I would go to my supervisor and let him take it up for me.

Q. And that's what you did in the Rush Island incident that you talked about earlier?

A. I would say things have changed. But I

went directly to the Plant Superintendent, and yeah, we told him that we couldn't operate like that.

Q. And what was your understanding at the time, in October 2005, as to Mr. Cooper's authority and ability to require an immediate outage of the plant to address safety concerns?

A. As the Plant Superintendent in charge of operating, he had full authority to request an outage at any time.

MS. HOUSE: That's all I have. Thank you, sir.

MR. REED: Judge, could I move for admission of Exhibits 10 and 11, please.

JUDGE DALE: Any objections?

MS. HOUSE: No objections, Your Honor.

(Hearing Exhibits 10 and 11 were then entered into evidence.)

My other thought is we should go ahead and mark Mr. Bluemner's drawing.

JUDGE DALE: Yes, as Exhibit 12.

MS. HOUSE: I'll move it up here for now so we don't forget to mark it appropriately at the end of the day. I move admission on Mr. Bluemner's drawing, Exhibit 12.

JUDGE DALE: Any objections? Hearing none,

than it will be admitted.

(Hearing Exhibit 12 was then entered into evidence.)

Any other questions for Mr. Bluemner?

COMMISSIONER GAW: Not at this time.

JUDGE DALE: I hope -- you weren't here when the other witnesses were here. You are excused for now, but subject to recall in further proceedings. So you are not entirely released, but you are excused.

THE WITNESS: Okay.

JUDGE DALE: If I can get an estimate from people on how long it will take with Mr. Pierie.

MR. THOMPSON: Half hour.

MS. BAKER: Not long for me.

MR. SCHAEFER: Probably at least an hour.

JUDGE DALE: I don't think we'll be able to finish this evening then. Loath though I am to let us out half an hour early, I do not want to stop in the middle of his testifying. So, with that then, we will recess until nine o'clock Wednesday next. Which is the first I believe.

MR. THOMPSON: Bless you.

JUDGE DALE: Mr. Byrne?

MR. BYRNE: And on Wednesday, would you anticipate -- is there a list of witnesses for

Wednesday or are we going to continue with the list that we have today? Is that how we will handle things on Wednesday.

JUDGE DALE: I would estimate we will get through no more than three witnesses based on the pace that has been set.

MR. BYRNE: Can we just -- I mean, my concern is just a practical one. Are there certain people we can bring on Wednesday and count on not others or something?

COMMISSIONER GAW: That's something that ought to be done, too.

JUDGE DALE: Let's have Mr. Witt and Mr. Birk not have to come. And hopefully we will get through Pierie, Fitzgerald and Schoolcraft.

MR. BYRNE: That will certainly work on Wednesday. Then what do we do after Wednesday?

JUDGE DALE: Move on to Thursday. If we have to, Thursday is also available, and I have marked it on the calendar upstairs so this hearing room will not be booked for anything else. Is that going to present any problems for any witnesses?

MR. BYRNE: I believe those witnesses are available on those days, and that should not present a problem for them. It would only be Witt and Birk on

Thursday? Name the witnesses again, if you don't mind.

JUDGE DALE: It would be Pierie, Fitzgerald and Schoolcraft on Wednesday, and Witt and Birk on Thursday.

MR. BYRNE: That will not present a problem, we can do that.

JUDGE DALE: Does that work for everyone? I'm just going to presume for the Commissioners not in the room.

Is there any other matter that I need to address before we recess?

Then we are in recess and off the record until next Wednesday.

(WHEREIN, the recorded portion of the hearing was concluded.)

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EXHIBITS

(Original exhibits were retained by the Court.)