GPU 6040

Designations from the Office of Inspection and Enforcement Interview of Leland C. Rogers, dated May 4, 1979:

6:18 - 7:16

7:17 - 9:3

9:20 - 10:4

11:21 - 12:10

16:13 - 17:2

19:4 - 20:3

21:20 - 22:17

22:18 - 23:13

23:14 - 23:25

26:5 - 26:21

27:19 - 28:12

28:13 - 30:25

32:1 - 35:12

40:20 - 41:12

44:3 - 44:25

45:20 - 46:7

46:8 - 47:6

47:10 - 49:13

49:20 - 50:3

51:22 - 53:12

54:13 - 55:21

57:5 - 59:18

60:18 - 60:25

66:6 - 66:18

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GPU 6040

with the GPU organization on completion of the unit 2 startup report to be filed with the NRC.

CRESSWELL: Those two individuals including Mr. Flint would have received other direction than from you?

ROGERS: Mostly only administrative, I was a B&W manager on site but in relation to the tasks they were doing they were assigned by the GPU organization for specific tasks which had been an ongoing task for the duration of the startup. So it was a long term type task.

CRESSWELL: Normally who would be directing the activities from the GPU side.

ROGERS: Some GPU management individual and that had been changing thorugh the past several months as the startup came to completion and they reorganized several times.

CRESSWELL: Lee, I would like to go back to the March 28, the time of the event. Do you recall about what time you arrived onsite on March 28?

ROGERS: Yes. I arrived on site sometime shortly after 7:00. I was at the north gate. And that was a bit earlier than usual. I received a call about 6:00 in the morning that the plant had suffered a turbine-

reactor trip. We were briefed. People around that call were Gary Miller from Met Ed, Jack Herbein from Met Ed, George Kunder from the control room and myself. We were briefed on the ---.

CRESSWELL: You were at home?

ROGERS: Yes I was at home.

ROGERS: We were then briefed on the then as known at that time, of the turbine-reactor trip transient at the plant we'd gone through. We were informed what the operating plant conditions were and the parameters were at that time. So I left ____ significantly earlier than usual. I usually do not leave home until about 7:30, get here about 8:00 I left a little earlier, I think. The call lasted from about 6 to 6:25, 6:30, somewhere around there. I didn't really note the time. It was approximately one half hour conference call.

CRESSWELL: What was the nature of the discussions that took place during that conversation.

ROGERS: Basically George ~~Hunter~~ Kunder in the control room was letting us know he was operating at that time out of the shift supervisors office near the control room. He was telling us what had occurred and what the plant conditions were and as a group we were discussing what we thought what ought to be attempted in trying to get the plant to a

stable condition because it was quite apparent it was not a normal trip at that point. The reactor coolant pumps were off and they had an indication of the drain tank rupture disk having failed and water in containment at that time from that event. That has happened at this site in the past on unit one several years ago. It has happened at other B&W plants, so there are certain things that we know to exist because of that type of event and ----.

CRESSWELL: What would be some of the types of things noted?

ROGERS: The first thing you'd note is that you would have some pressure in the reactor containment building, you'd have some temperature indication above normal, at some of the temperature indicators in the building. You would also expect to have some radiation alarms in the intermediate cooling letdown coolers area which are normally set on very low level; those are designed to be detecting any tube leaks in the coolers. So we have them understandably set very low. Even though we did not talk about radiation condition at the time that is something that you would normally expect to have happen in the it did happen that is exactly the condition existing. The fact that the plant was not in the normal post trip condition was that the reactor coolant pumps having been turned off and pressurizer essentially full of water and not able to get a bubble back in the pressurizer as the operators would normally have been able to do so. We are also informed, because of the moisture in the building, we expected that we had lost

a significant amount of pressurizer heaters which would have complicated trying to get pressurizer bubble and pressurizer normal operations again.

CRESSWELL: These symptoms that you went through before the high building reactor building pressure, the radiation level on the intermediate cooling water loop or ---

ROGERS: I would say higher than normal. I wouldn't say high, because high is ----

CRESSWELL: Ok. High is relative. What are the symptoms would you have noted prior to that beyond that which you have mentioned. What about sump levels? Would you have any observation on that?

ROGERS: You would expect to find water in the sumps, yes. Obviously, because of the energy release and they're going to condense that water; the reactor containment atmosphere is cool enough to cool the steam that would be coming out of the drain tank.

CRESSWELL: Would it be a fair characterization to say that because these other events occurred, these symptoms would be taken as something that had already been experienced, that you would expect under say less adverse conditions.

ROGERS: Yes, and from what I have been able to detect now in looking back everything really existed as one would have expected at that time, about six o'clock. Yes, that is essentially what we would have expected.

CRESSWELL: Was the high sump level discussed

ROGERS: No, we did not discuss that at all at that point. Mainly, we were more interested in getting the reactor coolant system in a more normal operating condition. Post trip

CRESSWELL: Okay. So during the discussion, did George initiate the telephone call or do you have any feeling for who initiated this conference call?

ROGERS: I, well we did'nt discuss it at the time later on. Gary Miller and I talked it over. He had stated that he was talking to George earlier and felt there was a lot of information we needed to get some more heads together. So he either himself initiated it or had George initiate the call. I can't be sure of that but it was at Gary Miller's request that the conference call was made.

CRESSWELL: You mentioned that Mr. Herbein was a party to the conversation. Do you remember what his comments were?

ROGERS: Specifically, no. I could'nt recall even my own comments. But questioning normal activity on a conference call like this you find out what was going on in the control room and you start asking questions to more clarify it in your mind. And I am sure that, Jack has always operated that way, and I'm sure that was what he was doing at that time. The thing that was not clear was whether or, to me at least, was whether or not the blowing to the reactor containment was under control. In other words whether or not the source or the cause of the drain tank rupture failure had been corrected. Some time during that call, that is one thing I do know that I did. I initiated my question to whether or not the block valve on the pressurizer automatic relief line had been shut. George replied that he did not know, but he dispatched somebody to find out at that time. And the answer came back, I could hear the answer in the back ground; Yes the block valve is shut. That was some time during the lengthy conversations. Not knowing why, I would not have asked what time it was when I got that question. We were satisfied at that point that we were not going to contribute to more blowdown to the containment; which is a concern of course, always, for additional cleanup later on. At that time not knowing what the extent of the cleanup was really going to be.

CRESSWELL: You mentioned, I believe, that the fact that the reactor coolant pump had tripped was known at that time. What sort of discussions went on about that item?

ROGERS: As George described the operators were getting indications of very unstable flow in the reactor coolant system. Current readings for the reactor coolant pump motors, a random reading, was oscillating all over and the initial action had been to secure the 2 pumps in the B loop. I maybe wrong here, but we secured two of the pumps in one of the loops as he described it and that seemed to s tisfy the conditions for a period of time within the same conditions compared in the other loop. And the operators followed their normal operating procedure to secure the pumps when you have these conditions existing, the unstable pump operations.

CRESSWELL: You mentioned readings for the pumps. What kind of readings?

ROGERS: The current readings for the motors on the control panels that the operator has right in front of him above the pump control center. And then the oscillations of flow indications are also right on the console right in front of the reactor coolant system flow. Direct system reading which is displayed for him.

CRESSWELL: Did you make any recommendations to the staff at during that conversation?

ROGERS: As a group discussion we all arrived at the conclusion that to try to reestablish reactor coolant system flow was obviously a step that had to be made. Then, of course, we probably, I have to say

CRESSWELL: That was the reactor building?

ROGERS: Yes.

CRESSWELL: What about the Aux building?

ROGERS: I didn't know whether we had any problems with the Aux building at that time. Of course as I went through the control room myself I looked at the indications and I did not get an awful lot of information from other people, but that was the obvious ones that I had that I could report back. I told Spangler then that I'd try to get my handle on what is going on and get back with each other later on.

CRESSWELL: What was the nature of your conversation with Spangler? What sort of things did you say?

ROGERS: I just gave him what information we had, what the plant conditions were, and that as soon as I could find out what more was going on I would get back to him.

CRESSWELL: Did you for instance mention that there was a site emergency that had been declared?

ROGERS: Oh Yes. Yes, that we had emergency conditions existing. I knew there was a site emergency at that point obviously because of the

difficulty in trying to get in and that was probably the only thing I knew at that time.

CRESSWELL: You gave some equipment status? Like the pump---

ROGERS: Yes.

CRESSWELL: I am not trying to put words into your mouth

ROGERS: No I think I already said that.

CRESSWELL: Did he ask you any questions?

ROGERS: Probably, but I don't remember what they are

CRESSWELL: How long do you estimate you talked with Mr. Spangler?

ROGERS: It was a very short call. I did not feel that I wanted to be out of touch. I was making that call from the instrumentation shop because the control room phone traffic was unbearably heavy at that point. I couldn't get a phone to use.

RESNER: At this time we will take a break to change the tape. The time is now 9:59 a.m. EDT. This is the continuation of the interview of Mr. Leland C. Rogers, the time is now 10:00 a.m. EDT.

ROGERS: No. I am sure I was more interested in getting into the control room myself than trying to see what was going on through the window. In other words I didn't pay any attention to it.

CRESSWELL: What was foremost in your mind? What type of information did you want when you walked into the control room?

ROGERS: Well the only information I possessed at the time I walked into the control room was what I knew at the end f the 6:00 to 6:30 conference call. And it was obvious because of the site emergency that something had changed. And I wanted to try to find out as quickly as I could what that was. That is when I found out that we had a high radiation levels of the reactor building itself. In fact they I asked them whether or not they tried to run the reactor coolant pump. And they said, yes they had and it had only been on for a short period of time but they had the same indications-in fact it was running about 100-110 amps of current which is essentially an uncoupled motor condition. It is the kind of current received when running the motor uncoupled, so your conclusion there is it wasn't pumping any fluid in that mode.

CRESSWELL: When you say uncoupled well that could be like a shaft broken or just a coupling?

ROGERS: Correct. It could be just running no load or more properly, turned is the no-load condition. Generally, when we see something

like that, when the Unit is uncoupled and you are running the motor to check out whether you're coupling up to the pump again during some maintenance or outage period.

CRESSWELL: Do you recall who the individuals were that you talked to when you went into the control room?

ROGERS: Bill Zewe was the shift supervisor. I noticed him. I don't know whether I -- yes, I think I probably asked him whether or not to pump had been run. Most likely I asked him, being the individual who would know conditions occurring. Gary Miller was there and I exchanged a hello with him and told him I was there for any kind of discussions that he needed. And I am not too sure any other individual, by name, that I spoke to. More than likely I did but I can't recall.

[C] What was Gary doing at the time?

CRESSWELL: What was Gary doing at the time?

ROGERS: He was getting all kinds of data fed into him. Plant conditions, station positions, and etc. I really wasn't paying much attention to the information flow in that area at all at that time. I was more or less trying to find out for myself where we were so that I could let Lynchburgh know just in a brief summary.

CRESSWELL: Where was Gary in the control room?

ROGERS: Physically, he was behind the desks port on of the control room.

CRESSWELL: That is the three desks group?

ROGERS: It separates the operating part essentially where they have the separation of keeping the operators away from other people in the control room.

CRESSWELL: Do you recollect who was with Gary at that point?

ROGERS: No I do not.

CRESSWELL: If I can go back, you asked Bill Zewe if the pump was running?

ROGERS: Yes, if they had tried to run the pump.

CRESSWELL: You told Gary Miller that you were there if he needed any help. What is the next thing you did in the control room?

ROGERS: I looked at the plant parameters to see if there was anything I could determine of what conditions were, and I noted the activity levels in the containment.

CRESSWELL: What were they at that time?

ROGERS: Numbers I would not be able to tell you. Most of them were in alarm as I looked at them and that of course was a significant change from normal. That was the impressive part of it.

CRESSWELL: Okay, so what other parameters did you look at beside the radiation levels? The radiation monitors.

ROGERS: I looked to see what the steam generators levels were and I saw that we had some level indications. I looked to see what the temperatures in the loops were and they were. numberwise. I would not be able to tell you what I saw that morning. There were abnormal conditions. The THs were not indicating on the panel at all on either loop. Of course, I would have expected that anyway with no flow. I would have expected abnormal temperature indications. So it did not necessarily surprise me seeing that the temperatures were abnormal.

CRESSWELL: From the information that you looked at, what did you think was happening inside the reactor coolant system?

ROGERS: Well, I guess as I looked at it I would have guessed that with no flow conditions obvious, the high pressure injection was operating although I can't say for sure whether it was operating or not. I really did not look at those indications.

CRESSWELL: But you said was operating ---?

ROGERS: I said I would have guessed it was operating. I can't be sure I saw whether it was or not I don't know.

CRESSWELL: That is not one of the things you checked out?

ROGERS: No. I did not. The pressurizer was obviously in a very poor condition. It was at or near full condition indications. And that is when I got another report that we did not have many heaters left. Which obviously made it difficult to get the try and get a bubble back in. I think I probably passed that on to Bill Spangler too, that we had lost a lot of heaters because of the rupture disc failure.

CRESSWELL: Would you go into that?

ROGERS: Yes. The high moisture content in the reactor containment has, in the past, grounded out some electrical equipment and the cables for the pressurizer heaters were known to be some of those cables that were susceptible to high humidity. And it was quite apparent that we did not have heaters a lot of the heaters that we wanted. And that we had more than likely lost the heaters because of the high humidity in the containment.

ROGERS: No, I don't I really don't. As long as I have been here, all these people are so familiar to me I don't bother to pay attention to who they are. I see them all everyday and they are totally familiary faces.

CRESSWELL: Do you recall what reactor coolant system pressure was at this time?

ROGERS: No. I think it was I think it was down around 1300-1500 lbs category but I am not sure.

CRESSWELL: So we are getting back to the period of time about when you would have gone over the instrument to make the call at 7:45 is that correct?

ROGERS: Yes.

CRESSWELL: You looked at the parameters and so forth and you made the call to Spangler, at B&W?

ROGERS: Yes.

CRESSWELL: So what happened after you got off the telephone call?

ROGERS: I came back to the control room. Time-wise I don't know exactly but I would guess that within a .ew minutes Gary Miller said let's retire to the shift supervisor's office and sit down and caucas. I do know that sometime between the time that I called Lynchburgh and the time that we had that caucas, Miller set somebody on the task of identifying to everyone that we had an emergency condition existing because of the activity levels in the building. That was his basis for stating that we have got an emergency condition here and better notify all of the agencies that are required. Get the book out and make sure that everybody that needs to be informed is informed. That happened before we ever had any caucas. So that happened sometime after that maybe five minutes of 8.

CRESSWELL: After you talked about to Spangler. He announced this to the individuals in the control room?

ROGERS: Yes. He assigned someone to that task to identify the conditions and notify all the people and were required by the procedure.

CRESSWELL: Then you mentioned that you had a caucas. Gary called for a caucas, how did that take place? Where did you caucus?

ROGERS: We went into the shift supervisor's office in the rear of the Control Room and essentially up brain stormed all this. This is where we are; this is what we know to be existing; what can be do from this

point; what should we do; let's see if we can get together some kind of plan. Essentially the guidelines of the caucus.

CRESSWELL: Do you recall who was in that caucas? Would it have been you and Gray Miller and who else

ROGERS: Joe Logan was there, Geroge Condor was there. I think Jim Sealinger the Unit 1 superintendent was there. I am not sure because he was in and out of the different caucuses and in the control room from time to time during the day. Again it is knowing faces and not trying to figure who they all are. You don't need to do that at the time.

CRESSWELL: Okay, so there was this brain storm session trying to come up with some sort of course of action. Well during the process of this brain storming session what sort of things were discussed?

ROGERS: Well, I think the thrust of this session was to try to get the reactor coolant system to a some kind of operable condition. It wasn't totally clear to us exactly what the conditions in the RCS were at that point, as far as temperatures and distribution of those temperatures. I believe that we decided at that point to again attempt reactor coolant pump operations. I know we did. That is one of the major thrusts of that first caucas. That is, let us go see if we can get a pump started again. And we talked over what we had seen before and

what the people in the Control Room had seen before. And thought, well it was worth the to try to try get a pump going. We had enough system pressure to be able to operate a reactor coolant pump so that was not an operating concern of the pump at that point.

CRESSWELL: That is as far as net positure suction head?

ROGERS: Yes I believe we are around the 13-15 lb category because that was not a question of significant pressure to run the pump. I believe the first conclusion arrived at was to go out and try to run a pump which was what we did. Some of the steps that occured there were some of the pumps did not respond to the operator action to try to run 'em.

CRESSWELL: In what way did'nt they?

ROGERS: I believe that we had trouble getting the lift, oil-lift systems started and we would not have started the pump unless we went through the normal sequence to start the pump, and backup lube oil system, backstop. We did try to run one pump in one loop that we were successful at and we saw the essentially steady state running currents of 100 to 110 amps with little or no flow indication on the loop indicators. I don't believe we saw any flow indication at all. I went over to the other loop and got the same thing. About that time it was quite obvious that everybody involved in this operation that

the lubes were filled with steam. The temperature indications the pump operating the way it was, we just concluded we had steam in the loops and there was no further sense in continuing attempting to put a reactor coolant pump on. We just had to do something to get the steam out of loops. To be able to run a pump later on. The next step was to begin raising system pressure; try to collapse the steam. Which was really a time related operation we had the system pressure up. I say we but the control room the system pressure up.

CRESSWELL: How did they do that Lee?

ROGERS: Increased high pressure injection flow was the source of our increasing the pressure. And assuring that everything was closed off that we knew that could be closed off.

CRESSWELL: That would be like let down?

ROGERS: No. I am not too sure that we did anything with letdown at the point. I don't really know I don't know the condition of letdown. I don't know whether we adjusted that at all. The blocked valve on the pressurizer; the electromatic relief line was closed and we ran a high pressure injection pressure up. We were successful brought the pressure up to normal operating conditions. Then became a question of how high will we go into pressure. It was generally agreed that we did not want to bump up against the code relief valve set pressures. So we tried to ---

CRESSWELL: Did everybody feel that if you got the pressure up you could collapse the bubble.

ROGERS: Initially we felt that that would happen. I don't know at what time this happened. We hooked up or had the instrumentation people hook up instrumentation bridges to the RPS panel indications of our hot leg temperature RTDs so that we could read a resistance out on them and with a calibration sheet along side of them we could look at it and see approximately what the temperature indication was. Now when we first got that information back into the group of people, we didn't believe that the RTDs were working correctly. We assumed that they're in a steam phase and that they were not probably telling us what exact temperatures were. They were at temperatures were over 700°. That kind of threw everybody off. That piece of information that did not seem to be correct with where we thought we were.

CRESSWELL: That would have indicated like superheated--?

ROGERS: Yes. Right. For temperatures to get that hot it would have been superheated for where we were. We did not realize that was the condition we had at the time. We stayed at the high pressure condition for, as I see the charts now, about an hour and a half and did not feel we were getting anywhere. So we again caucused and decided at that point, as a group, that maybe we should be trying to come down in pressure and float the core-flood tanks on the core, to insure in

anybodys mind that we had watered in the core. Even though at the time we all felt that there was water in the core. We had not really added up all of the things to tell us that we had uncovered the core at that point, even though now it's obvious that it had been but ---.

CRESSWELL: What indications did you have to determine you had water in the core or at least some water in the core?

ROGERS: Well, before we depressurized, we didn't have any positive indications that we had always had water in the core. It was felt then as we brought our pressure down by opening up the block valve line again and _____water into the reactor building, that we can bring our pressure back down and insure that we would have water in the core, because if we got down to the below approximate 600 pounds, the core flood tanks would come on in the system, that the water would go into the core, no matter what. And if it was more or less a decision that this is going to ensure that we've got water in the core area and bring pressure on down in an attempt to get that indication and than maybe float the core flood tanks as a water volume on the core until we can get some water in these loops and get this thing operating in a normal circulating fashion.

CRESSWELL: When you say float the core flood tank water on the core, you mean discharge the water in the core area?

ROGERS: Yes, if we maintain system pressure down near what the core-flood tank volume pressure was at then the core flood bank would always open up. The check valves would always open up and float water on the core area. And even though we knew we had steam in the lines of the reactor coolant system piping, uh.....

CRESSWELL: Which lines?

ROGERS: The hot legs and we also knew that the steam bubble was down as low as the pump impeller area. So we knew we had a large volume of steam in both legs. That was concluded earlier when we got the running indication off of the pumps. But the project I guess you'd have to say was to insure that we had that core in a wet condition. Using the core flood tanks as a known source of water that we felt that we could make sure that the core was flooded. As we came down in pressure and reached the point where the check valves would close on the core, the operator, who was standing at the back panel and core flood tank level indications, notified us that you have floated a little bit of water in. And we expect that if the core had been voided that as we got to a low enough pressure we would have had a large volume flow out of flood tanks into the core area. And when we got very small volume flow, everybody was then satisfied that the core was wet at the time and the core flood tanks are now floating on core.

CRESSWELL: Because they didn't ----?

ROGERS: Because they didn't discharge, it was just a very small volume of as the pressure came down and a little bit of water came out and equalized and that was not enough to consider that we had flooded the core because the core was below that, at those nozzle of points. We just felt that we were floating the core flood tank on the system.

CRESSWELL: So the water in core would have prevented the core flood tanks from discharging?

ROGERS: Yes, right.

CRESSWELL: Let's go back to the period and time.

ROGERS: If we could get lower pressure unfortunately you would eventually blow all your water out of the core flood tanks but the operator was bringing pressure down real slow so that when we got to that point it was a very small change of water.

CRESSWELL: You always consider it to be a hydraulic resistance with the water in?

ROGERS: Yes, with the water in it.

ROGERS: Well, I guess, maybe the impression would be that with the reactor coolant pumps off and post trip condition existing to have a pressurizer solid was certainly not normal, but that was something we had to face and see what we could do about it, but I think George had already told us that he had lost a lot of his heaters and that he had difficulty in using the pressurizer as a heat source in its own.

HUNTER: During the conversation with George and the fellows, were you under the impression that they had any idea of what happened to the plant at that time following the trip and what the conditions were?

ROGERS: No, I don't think they had a good handle on what had occurred at all. I guess the thing I was searching for when I ask whether or not the block valve for the electro magnetic relief line had been closed was that that was a possible source of losing volume to containment and somebody should have closed it. If it was not I wanted to find out if it was closed or not. When I asked the question I was told it was closed. It kind of closed that thing off in my mind as being a potential source of our real problem.

HUNTER: Ok Leland, in staying with the pressurizer level now, particularly, when you got to the plant was that one of the, did you in fact go and look at the pressurizer level at that time?

ROGERS: I think I did.

HUNTER: The chart or...

ROGERS: I think I looked at the level at that point. I don't remember what it was though.

HUNTER: Ok, I just to see

ROGERS: I am sure that I looked at and scanned all of the normal plant parameters. I am trying to recall. What I saw is something else.

HUNTER: Another Item I want to ask about is back in the conference call, we will talk about saturation pressure and whether that was brought up at that time with George Kunder and discussing the fact that the plant was at 1300 and 1400 pounds and with the specific reactor coolant temperatures, did you fellows discuss that particular item.

ROGERS: I don't think so, no. Not that I recall.

HUNTER: Does his discussion between Gary and you and Jack Herbein, did it take more of a general discussion rather than the specifics of the event?

wasn't necessarily, why did you do that, it was just that they had already been done.

HUNTER: No, I am not asking that I am just asking the reasons why and the logic that he used to secure the pumps - loss of suction pressure that type of logic that he used that was used to secure the pumps.

ROGERS: First, as I now recall, the reason the first two pumps were turned off, I better go back to make sure this comes out this way because the first two pumps were turned off because of the reactor coolant system pressure was down and he shouldn't have those four pumps running in that condition. They secured the two pumps in the B loop because of the temperature/pressure relationships. That's as he said it at that time now. You made my memory come back a little.

HUNTER: We have a sequence and I don't mind doing that to try do it and I am having trouble asking questions because I want to ask a question to get your impression of a certain tem. Don't worry about the times because that's -- we will fit the times in. If, in fact, he says we reached an the net positive suction head limits and we secured the first two pumps or whatever it was. That is what I was talking about.

ROGERS: No, I think as he said was we are at pressure temperature violation for four pumps and we turned two pumps off.

CRESSWELL: This is Jim S. Cresswell, again. Do you recall Mr. Kunder making any mention to fuel pen compression limits also in that time limit.

ROGERS: Yes, yes he did. I did hear that.

CRESSWELL: What was that discussion?

ROGERS: When the temperature or when the pressures had gone the way they had - I don't recall how it got into this and how he developed it but He said, I think we have exceeded our fuel pen compression valves. I think that is the way it came out - something like that - yes.

CRESSWELL: I have another question. When you entered the control room there was high activity in the reactor building indicated and your discussions of the time period later you indicated that people thought that the core was covered?

ROGERS: Yes.

CRESSWELL: To what would people have contributed the high radiation levels?

ROGERS: I don't think we tried to go back at that point. I really don't. I think everything -- we were more concerned with getting the

plant under control as it was then and not necessarily trying t reconstruct anything, not to that point. We had high radiation levels. We had the plant parameters the way they were and even though we didn't understand all the indications as we had them. As the day went on we got more understanding of them but the thrust of everybody's thinking, I believe, was to get the plant stable first. I don't believe we went back at all.

CRESSWELL: So you would more less ignore what caused the high radiation alarm?

ROGERS: Yeah, what caused it? Sure, We had it. We didn't want it to get any worse, we didn't want it to get out of hand, we didn't want it to get any place else. We knew we had it in containment and I believe, oh its pretty obvious in the early morning hours that we also had had water in the auxiliary building and had problems there. I wasn't personally involved in helping Met Ed contain their radiation problems. I was more instrested in stability of the plants.

CRESSWELL: I understand that. Is it a fair characterization that regarding the high radiation readings that the... say the release of that activity that the mechanism that caused that was unknown?

ROGERS: Yes, that true. I said that in when we actually brought the system pressure down delibrately by control action and we did not get

a large volume of water out of core flood tanks. I think we all, in our own minds, at that point felt that the core had never been uncovered. I really believe that we more or less all breathed a sigh of relief at that point. The core is not uncovered and probably has not been. Not really going any further backwards and seeing that there was a time that there may have been. I don't think we asked ourselves that.

RESNER: For the record that was Mr. Cresswell asking that last series of questions.

HUNTER: I wanted to cover again in the area you indicated that there was the bridges had been hooked up to the reactor protection system resistance thermometers and that you had read temperatures greater than 700 degrees Fahrenheit. Are you saying that the tempeatures were 701 or 2000?

ROGERS: No, I think the calibration curves go only up to 710 degrees or something like that.

HUNTER: Were they above that point?

ROGERS: The resistance was a little above that.

HUNTER: A little bit?

ROGERS: Yes.

HUNTER: Did you have any feel for what the temperatures might have been, like 750 or maybe 800?

CRESSWELL: I think he said, and you correct me if I am wrong Lee, that they didn't believe those indications.

HUNTER: I heard him? I understand that. Jim I want to know what they were.

ROGERS: Yeah, I am not to sure just how high the calibration curves go but it's only over a little of 700 degrees and the correspondence resistence that we are reading was a little above the highest value that the calibration curve goes to.

HUNTER: Ok, that's what I want to make sure and another thing at this same time, did you in fact, or was discussed in the caucus did you discuss the incore thermocouples and read in all of those?

ROGERS: Incore zone thermocouples?

HUNTER: Right.

CRESSWELL: I don't know if we did in caucus. In the general control room discussions and conversations, I overheard, "What are the incore thermocouples reading?", and because you had to go over and call it out to get it, whoever the operators were that did that, I am not sure, they reported it. They had a lot of them that were not printing out and we weren't to sure of what it was saying to them at the point. That's kind of conversation that I did overhear. Some of them are reading pretty high and some of them are reading 600 and some degrees. A lot of them are not reading or not indicating and we don't know what it means. I believe it was either Gary Miller or Kunder or one of the other supervisors in there asked the IT (instrument technician) operators to hook a bridge and read them out before the input to the computer to see if you get a direct reading on them.

HUNTER: Leland, where do you go down and read those off a millivolt bridge you know?

ROGER: I am not sure. I think it's down in the relay room but it could be --in the relay room is the most logical choice.

HUNTER: After they had done that particular evolution, hook onto the millivolt bridge onto the thermocouple were you aware of any thermocouple readings that were provided to Gary Miller or yourself as giving you an indication of?

ROGERS: Yeah, we heard some numbers but they varied from 200 to 600 to one that reads extremely high. No one knew was sure what that was really meaning at that point.

HUNTER: Ok.

CRESSWELL: Just a moment, an IT is an instrument technician. Go ahead Dorwin.

HUNTER: Ok can you give us a feel for the time when you were made aware of the thermocouple readings or when you felt like they came up?

ROGERS: It was in the morning, that's all I can say.

HUNTER: Ok, alright, that's fine. In the area of a reactor coolant pressure you had a low pressure condition, OK, 1,350 pounds. Getting back when this was the plant status when it was given to you.

ROGERS: Yeah, right.

HUNTER: During the morning in that time frame and the power operated relief isolation valve had been closed, as indicated to you and by you during your telephone conversation somebody had indicated it was closed. Was there any discussion concerning a loss of coolant from another source other than the power operated relief valve at that

time; or a discussion as to why you could not maintain system pressure above the high pressure injection set point of 1,600 pounds?

ROGERS: The control room also indicated that they though they had a leak in the "B" steam generator and consequently the "B" steam generator was bottled up as I got to the control room. I am not sure whether George in the conference call told us about the problems with the "B" steam generator suspected leakage. or not. I not sure whether that happened or not. I think, maybe, it had but its pretty hazy at this time.

HUNTER: Can you give us your input as far as the reactor system as you understood it? After the conference call and even at eight or seven when you came in at seven, almost eight o'clock? Your feelings about reactor coolant system pressure still at the level at the level of 1200 to 1300 pounds throughout the morning from four o'clock right on until seven o'clock and then you guys, caucus, decided to charge the system pressure back up?

ROGERS: I am not sure what your question if that is a question, what is means.

HUNTER: Ok, looking at the event, OK, generally the plant set at saturation temperature pressure conditions for a long period of time and trying to get a feel for any discussions or any questions of that

condition by you, by Gary Miller any discussions with Jack Herbein that we need to increase the pressure and get the plant above saturation pressure?

ROGERS: Not that I recall. I don't think we talked about saturation pressure temperature conditions existing at all.

HUNTER: Do you recall what you were keying on or what those fellow were keying on? What you keyed on were... you know you are the site operations manager, what did you key on?

ROGERS: I frankly didn't have any idea of where the coolant system temperatures were, what we were dealing with. On the panel indications we were off scale on the TH. Our TC's were low. They were in a low temperature range. I guess, maybe I am going back to the years and years of looking at regular reactor coolant systems conditions and figuring that when they don't have reactor coolant system flow by pump our RTDs are not telling us anything about the conditions in the core. I kind of forget that it's really telling me anything about core conditions because I don't have anything I can directly read the core I am not directly looking at the core or a reactor vessel area. Also I guess I'd admit at this point thinking as long as we have no flow I wasn't necessarily believing any of the RTDs telling me system conditions. That would be my impressions of my thoughts.

CRESSWELL: That's assuming no natural circulation? You said you don't believe the RTDs are representative core conditions?

ROGERS: Well, I have a B steam generator isolated; I knew that that was going to give me indications there that weren't going to give me any flow indications obviously or natural circulation. It didn't look like we had after we recognized the we had steam in our loops, there was no indication that we could ever get flow, natural circulation or otherwise until we had water back in that loop. So I guess I just totally discounted the fact that those temperature indications were giving me anything I could use in analyzing where we were and what was going on.

CRESSWELL: Would that core have been hotter than they indicated? or cooler?

ROGERS: It could have been either one. Your injection flow could keep the core considerably cooler than the steam that you had trapped in the loops. You know you are putting colder water in than what you had in there to start with. So you are sure that your high pressure injection flow is more than likely got the core in considerably safe condition. Colder than what the conditions were when we got steam in the loops. I just wouldn't rely upon my loop indications as telling me anything about what other water in the system is unless I could get some kind of known circulation in there.

RESNER: For the record TH is for temperature hot and TC is temperature cold.

HUNTER: Looking back again I want to make sure that the emergency feed water system and the comment before is .hat - and I want to make sure that I follow is that, generally in the caucus and in your discussion that really wasn't picked up until the next day, if I understand you right.

ROGERS: That's correct.

HUNTER: OK.

CRESSWELL: If you have a minute there Dorwin I would like to ask a question. Could you go back and look at the day of the 28th and discuss with us the contacts that you made personally with B&W? We have already established that you had a discussion somewhere around 7:45 in the morning with Mr. Spangler. When was the next time you made contact with B&W in Lynchburg?

ROGERS: They felt that I could talk easier to my guy Greg Schidell offsite in the local area. It was a local call and so I didn't call Lynchburg directly until later on in the day so any conversation that I had with B&W people it was through Greg Schidell I used him as my communications assistent because I could call directly out to his home

in Harrisburg on a local line rather than trying to get a long distance line which were relatively impossible to try to break through. I called Greg and talked to him.

CRESSWELL: At home?

ROGERS: At his home and feed him the information. The first time I talked to Greg I believe he was in the visitors center. He got shunted off to the visitors center right as he came in to work that morning. I believe he called me from there to let me know that he was there and available. Then we restablished at some point and time during the day later on with him at his home. I used that as a communication flow to his home and let him talk to Lynchburg. He could make the long distance call a lot easier than I could.

CRESSWELL: Ok, so about what time would you have Mr. Schidell at home?

ROGERS: I don't know. I know that I talked to him about four or five times during that day before I next called Lynchburg directly myself but timewise I couldn't tell you.

CRESSWELL: About what time did you call Lynchburg yourself.

RESNER: At this time we will take a break to change the tape. The time 10:58 a.m. eastern daylight time. This is a continuation of the interview with Mr. Leland C. Rogers. The time now is 10:59 a.m. eastern daylight time.

CRESSWELL: Leland, I would like for you to go back to the time that you were talking to Mr. Herbein and making a suggestion to him about gettin a reactor coolant pump started.

ROGERS: Yes, Jack and I had concluded our discussions with -- we will get in touch with Lynchburg and get them on board with us on starting the reactor cooling pump in A Loop. At that point in time when I got off the phone with Jack I called Lynchburg and got through to them. We started discussions then. We felt that it was the proper move to start a reactor cooling pump and they were agreeing with us. As I find out later they were arriving at the situation about the same time we were. Independent of each other. We didn't know that. It took quite a period of time, and by that I'm saying they didn't say go ahead and start it. There was a discussion of give me all your plant parameters. So, therefore it took me a while to get all these pieces of information to them of where we were plantwise and they wanted us to verify our seal injection lineup, or seal return lineup and our temperatures and so on in the nuclear servicing system and everything associated with running reactor coolant pump. After we arrived at that, OK, we got everything in a condition where we can run a pump.

It was concluded that instead of going in and saying, let's run a pump let's give it a bump first to see what is going to occur a delibrate act of a short run, let's say a 10 second run or something like that. Similar to what you are doing when you are venting your reactor coolant system, in order to give your pumps a bump just to sweep small sections of the system. It was around 7:25 or 7:30, something like that, somewhere around in there where we actually went ahead and started the pump for that short bump. I left the phone off the hook in the supervisor's office and went out and observed the conditions. When they ran the pump for that short bump and came back and reported to them what had occurred, we had seen some indication that we had moved some water into the B Loop and the T_HRTD had taken a significant change downward. They had to increase HP high pressure injection flow to make up the collapsing of the voids, I guess, is the best way to say it. System pressure did take a fairly severe transient during that first bump.

CRESSWELL: In what way?

ROGERS: Downward.

CRESSWELL: What did you attribute that to?

ROGERS: Collapsing of the the voids and the volume was changing the system. The high pressure injection was on and there was an operator calling out the flow rates of the high pressure injection system.

Somebody else was call out the systems pressures as the transient progressed. Pump was then tripped off and Miller said to me, how long do I have to wait to get it to run again? I said, well normally 15 minutes. That's a normal limit precaution we have on a pump motor. Starting current overheats pretty well if you keep bumping them like that so we -- I just went back to my normal, wait 15 minutes. Plant conditions were then being observed by the operators. At the time the 15 minutes time frame was up Miller wanted to get the pump on again. I was on the phone with Lynchburg and Lynchburg had not necessarily said go ahead and restart it, when Miller did. He ordered the operator to start the pump. Because of the lights flashing and the numbers being called out the control room as the transient progressed. I realized that the pump had been started so I told Lynchburg that the oe A pump had been started and it was running normal. We had flow indications temperatures were starting to stabilize out. I think everybody in the control room almost let out a big "oh boy." Because all of a sudden we had something we could look at again. The operators were back into a condition where they knew what was going on.

CRESSWELL: Would you say that this is the first point in time were they had a handle on what was going on in the reactor coolant system?

ROGERS: The first time we could look at all the normal operator parameters and know what was going on yes, that is true.

RESNER: For the record, the final question by Mr. Cresswell. Tim,

MARTIN: Tim Martin here, Mr. Rogers at any time during the period you were in the No. 2 control room did anyone refer t the side panel primary system temperatures that are on a recorder. If you walk into the control room and you are facing the panels it's on a back panel to the left.

ROGERS: You mean the multipoint recorder up to 800°? I don't really know I can't say for sure.

MARTIN: Mr. Rogers to your knowledge who made the ultimate decision to repressurize at approximately 5:00 on the 28th?

ROGERS: That came from the visitor's center so I would say that was either Jack Herbein or anybody else that was in there at that time. I know Jack was the person to communicate it so I suppose it was Jack.

MARTIN: At anytime during the day did anyone outside agency express concern that the core was covered and ask that the temperatures both thermocouple and T_H be considered real and that they in fact indicated a superheated condition?

ROGERS: Not to my knowledge. I am not going to say they did not but I don't know.

ROGERS: There may have been I don't know. I know the emergency control station over in Unit 1 Control room was in communication with the observation center in that regard as far as plant operations go I don't know of any communications or directions that were coming from them at all. No, I don't know.

MARTIN: What problems were experienced in Unit 2 control room relative to communications when you had to find yourselves in respirators?

ROGERS: Any communications is difficult in respirators. Except for a few individuals who had the right resonant voice frequency it is very difficult. I say that in somewhat lighter circumstances because Dick Dubiel voice is one of those voices that is unbelievably tuned to the resonnance of the respirator face mask he had on. He was at one side of the control room speaking in conversation with someone standing next to him and everybody in the control room could hear him. Something I never realized was that critical but it certainly was. Yes respirator communication is less than desirable.

MARTIN: We had reports that people had to temporarily remove their masks to communicate in some cases because of difficulties in this area, is that true?

ROGERS: I don't know of that it may have been but I don't know that.