

35-9A

# OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: U.S. NUCLEAR REGULATORY COMMISSION

Title: INTERVIEW OF: JIMMY PAUL CASH

Docket No.

LOCATION: WAYNESBORO, GEORGIA

DATE: TUESDAY, MARCH 27, 1990

PAGES 1-38

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Jimmy Paul Cash  
 (Print Identity of Interviewee)

Page	Line	Correction and Reason for Correction
3	14	that <del>was</del> <sup>dash</sup> the maintenance on the B RAT was complete - clarify statement
4	2	Delete "Okay?" - unnecessary
4	4	replace "give" with "perform" - clarify statement
5	14	Delete "by manually closing it too far and we've had the" - unnecessary
5	15	Delete "meter operators" unnecessary
5	16	Add " <sup>2nd</sup> hand crank" after manual - better description
9	23	"Rush Simmons" - correct spelling
9	24	"Rush Simmons" correct spelling
11	7	Replace "I go" with "I was already there" clarify statement

Page \_\_\_\_\_ Date \_\_\_\_\_ Signature \_\_\_\_\_

NOTE: INTERVIEWEE DID NOT COMPLETE REVIEW

U. S. NUCLEAR REGULATORY COMMISSION

INTERVIEW OF:

JIMMY PAUL CASH

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

Tuesday, March 27, 1990

The interview commenced at 9:54 a.m.

APPEARANCES:

On behalf of the Nuclear Regulatory Commission:

WILLIAM LAZARUS  
WARREN LYON  
AL CHAFFEE  
GENE TRAGER

On behalf of INPO:

PAUL DIETZ

On behalf of CP&L:

MIKE JONES

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PROCEEDINGS

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2 MR. LAZARUS: Today is March 27, 9:54 a.m. We're  
3 at the Vogtle Plant. My name is William Lazarus, we're  
4 interviewing Jimmy Cash.

5 Whereupon,

6 JIMMY PAUL CASH

7 appeared as a witness herein and was examined and testified  
8 as follows:

9 EXAMINATION

10 BY MR. LAZARUS:

11 Q For the record, would you state your name and your  
12 title?

13 A My name is Jimmy Paul Cash, I'm an Operations  
14 Superintendent.

15 Q On Tuesday, March 20, during the loss of vital  
16 power incident, will you describe your activities and what  
17 part you played in the incident?

18 A Yes, sir. At the time of the beginning of the  
19 incident when we lost power, I was in my boss' office, Jim  
20 Swartzwelder's office, on the second floor of the service  
21 building. The lights went out in the office and basically  
22 we both held our breath, praying that Unit 2 hadn't tripped.  
23 There was a page announcement -- and I think the entire  
24 plant went quiet at that time -- there was a very quiet,  
25 calm page announcement "Unit 2 reactor trip".

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1 Mr. Swartzwelder picked up his hard hat and headed  
2 to the control room. I went to my office which is in the  
3 other end of the service building. Picked up my hard hat  
4 and also proceeded to the control room.

5 When I arrived in the control room, I entered at  
6 the controls area for Unit 2 directly. I looked back  
7 through the platform area and saw that the lights were out  
8 on Unit 1, emergency lighting was on. I observed the Unit 2  
9 activity for a minute or two to make sure that the SS had  
10 everything under control, and he did.

11 I then proceeded up onto the platform area and  
12 asked Jim Swartzwelder what did he need me to do. He  
13 directed me that -- or he informed me that we had lost the A  
14 RAT on Unit 1, that the B RAT, the maintenance was complete  
15 and he wanted me to coordinate getting the B RAT back.  
16 Someone -- and I do not remember right now -- was looking at  
17 the clearance we had in-house on the 1-B RAT.

18 I called Georgia Control Center and talked to them,  
19 told them our situation. They were aware that we had lost  
20 the A RAT. I said I had been informed that the work was  
21 complete on the B RAT, they verified that. That's actually  
22 the division that did the work on the B reserve auxiliary  
23 transformer -- I'm sure you know the terminology by now,  
24 RAT. They said that all sub-clearance holders on their  
25 clearance were off and that when we desired, they would hot

1 up the high side of the RAT. Okay?

2 I informed Mr. Swartzwelder and Mr. Hopkins of  
3 this. Mr. Hopkins was the Shift Superintendent that day. I  
4 was then directed to go out to the B RAT and give a physical  
5 walkdown of it, make sure there was no grounding straps on  
6 it and that it did indeed appear to be intact. I proceeded  
7 through the Unit 2 turbine building to the B RAT.

8 When I walked out of the back of the turbine  
9 building, I looked to my right and there was a truck -- the  
10 truck in question that backed into the C-phase of the 1-A  
11 RAT. It appeared to have been pulled forward from the pole,  
12 it was no longer right at the phase, and there were -- I  
13 think at the time there was only one security guard out  
14 there that I saw, but subsequently in the next minute or so,  
15 quite a few more security guards appeared.

16 I walked towards the truck. When I got to the  
17 truck, the guard stopped me. By this time, I could see the  
18 phase where the insulator had broke off and there was a wire  
19 on the ground. He said we're not sure if the wire is still  
20 hot, we're keeping everybody out of the area until we verify  
21 that. I said okay. And I walked on to the 1-B RAT.

22 I did a quick walkdown of it, looking at it with  
23 one of the PEO's, I forget his name right now. I remember  
24 who it was but I don't remember his name.

25 Q What's a PEO?

1           A     Plant equipment operator, that's the people that  
2 actually turn the valves out in the plant and monitor the  
3 equipment.

4                     We both walked around the transformer looking for  
5 grounding straps or for any other type of obvious not  
6 reassembled pieces of equipment. We could find nothing.

7                     By that time Barney Beasley, who is the on-shift  
8 Outage Manager, arrived at the transformer. He had been  
9 talking to the switch yard people. They had someone coming  
10 in to assist us in closing the disconnects.

11                    Now typically, when time is available, we have  
12 someone from the switch yard to come in and assist us with  
13 this because in the past we have damaged one of the  
14 disconnects by manually closing it too far and we've had the  
15 motor operators -- there are two mechanisms for operating it  
16 -- a motor operator and a manual in case the motor isn't  
17 working -- and we've had both of them malfunction on us or  
18 us through our lack of detailed knowledge of the  
19 disconnects, close them too far and damage the disconnects.

20                    MR. DIETZ: Jimmy, where are these disconnects  
21 located?

22                    THE WITNESS: They're out in the low voltage switch  
23 yard.

24                    MR. DIETZ: High side, low side?

25                    THE WITNESS: High side.

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1 TSC. At that time, I believe -- at that time, Mr. Bockhold  
2 had assumed the ED directions. In other words, initial  
3 classification and the follow-up messages were made from the  
4 control room.

5 Q When you got to the TSC, were you aware that they  
6 had already been through -- had the diesel been emergency  
7 started at that point?

8 A Yes, sir -- excuse me -- I don't believe so. I  
9 really can't tell you for sure. Like I say, I did not get  
10 involved in detail in the control room operations. I knew  
11 that the diesel had failed and they had dispatched people to  
12 it locally to the sequencer. I really don't remember for  
13 sure exactly what was going on with the diesel, I did not  
14 get involved that much in Unit 1 operations.

15 Q Okay, what --

16 A In other words, there was enough people in there, I  
17 tried to stay out of the way, not to add to the clutter of  
18 people in the control room.

19 Q Sure. Okay, go back to the TSC and continue  
20 telling us what you did in the TSC as far as --

21 A Okay, the first thing that I did -- the normal TSC  
22 manager is Skip Kitchens. He was in requal training. The  
23 backup is Jim Swartzwelder. He was in the control room and  
24 my instructions were to go and be the TSC Manager for the  
25 activation process until either Skip showed up or Jim

1 arrived to relieve me.

2 I went through the initial activation process,  
3 getting all the folders out. People started arriving  
4 shortly after I got back to the TSC. I was in the process  
5 of reviewing the TSC Manager checklist to be sure that I  
6 knew all the activities that I had to carry out. The TSC  
7 Manager's secretary, Esther Dickson, had showed up and she  
8 was going over the paperwork with me.

9 About this time, Skip Kitchens walks into the TSC.  
10 He had been taking a break in class in the training center,  
11 had seen the unit 2 trip and had decided to come on over to  
12 the plant to see if he was needed. He then assumed the role  
13 of TSC Manager. Now this was before activation.

14 So I then went to the Ops -- well either Ops  
15 Manager or Ops Superintendent role in the TSC and I assumed  
16 that role at that time. And that's the role that I  
17 maintained throughout the event -- operations representative  
18 to the TSC.

19 Q Were you aware of off-site communications attempts  
20 or difficulties that were made from the TSC to Georgia and  
21 South Carolina and the counties?

22 A Not at that time. The communications -- the  
23 communicators that arrived at the TSC -- Russ Simmons was  
24 the first. Russ Simmons is the status loop communicator. I  
25 was aware -- the way we do our status loop communication is

1 we have a bridge line that we use for it on our Merlin  
2 system. Russ was unable to establish that bridge line. I  
3 told him to go to the backup, which is the sound powered  
4 phones and that's where he went to. He went to establish  
5 that as our status loop communications.

6 Q That was in-plant communications?

7 A That's in-plant communication, yes, sir. I was  
8 aware that the engineering staff, the ENN back in the TSC  
9 did arrive and I knew that they were trying to piece  
10 together a notification form. I never knew why, I just  
11 assumed they were trying to get the information for -- you  
12 know, they were just trying to find out the exact status of  
13 the plant. They never informed me that there was a problem  
14 with notification of any groups.

15 Q Were you aware of the announcements were made on  
16 the Gatronics or PA system regarding the site area emergency  
17 and I guess subsequently there was some announcement made  
18 about evacuation of non-essential personnel?

19 A Yes, sir. I was aware of the initial notification  
20 for site area and the subsequent alert notification. And  
21 some of the directions for people to assemble in the admin  
22 building parking lot that were made subsequently were made  
23 after I conferred with Security about the accountability  
24 list.

25 Q Those announcements -- my understanding of the

1 first announcement of the site area emergency did not  
2 mention any evacuation at all, is that correct?

3 A I know that for a fact now. I did not pick up that  
4 detail at the time. You know when you hear an announcement  
5 -- any type of page announcement -- you tend to hear your  
6 portion of it. I heard "emergency response people report to  
7 your facilities" and I go. I really did not pick up that  
8 there was an omission from it at that time, but it was not  
9 something I was listening for.

10 Q How much later were the subsequent announcements  
11 that were made and what do you recall they involved about  
12 evacuation of personnel?

13 A Okay. I do not know -- there is a chronology --  
14 time reference -- that we put together. I do not know if it  
15 has those time frames in it for the subsequent announcement.  
16 I do not remember the exact time frame.

17 Q Five minutes later, ten minutes later, something  
18 like that.

19 A It was longer than that.

20 Q Longer than that.

21 A I would say that we're talking from the time --  
22 could I review this please? (Pause.) I would say it was 15  
23 or 20 minutes after the site area page announcement was  
24 made, but I cannot tell you in detail for sure. I believe  
25 it was about the time we downgraded to the alert, but I



1 contractors in. They should know, but I decided we'd make  
2 it real clear, real plain. Tell everybody that's not  
3 involved in the event to report to the admin building  
4 parking lot. And that's what we did.

5 Q So you made that announcement from the TSC or  
6 Security made the announcement?

7 A No, Security made that announcement, but it was  
8 after conferring with me.

9 Q So you provided them the guidance to make the  
10 announcement?

11 A Yes, sir.

12 Q And that was to report to the admin building  
13 parking lot?

14 A Yes, sir.

15 Q Did you make the first announcement about report to  
16 your assembly area or you --

17 A Security made both of those announcements.

18 Q Okay and then they changed it to report to the  
19 admin building parking lot?

20 A Just so there would be no confusion about where  
21 people should go, it'd be real clear, real plain.

22 MR. LAZARUS: Okay. Anyone else have any  
23 questions?

24 MR. DIETZ: Give me, from an operational viewpoint,  
25 being the officer up in the Tech Support Center, what were

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1 your duties and what were you doing?

2 THE WITNESS: The initial -- my initial duties,  
3 other than being there for any questions to be answered, was  
4 really -- I was bringing everybody up to speed on what was  
5 going on. Engineering and other support people that came in  
6 had questions about where we were exactly. There were  
7 questions about what was core exit temperature, what can we  
8 look at. I said we've got RHR outlet -- inlet temperature,  
9 we've core exit TC, this is where you find it on the area  
10 computer, because of our detailed use of it that we have in  
11 the control room, I'm a lot more familiar than most of the  
12 Engineering staff are on how to get different parameters out  
13 of it.

14 The initial statusing of our board when we give  
15 sequence of events and activities was conducted at my  
16 direction. Russ Simmons put that information on the board  
17 at my direction. And like I say, everybody's initial  
18 "what's going on" as they were preparing, activating their  
19 station was done, I was the person who was briefing people.

20 This is not a formal briefing, this is an informal  
21 hey, what can we do to help, should we be looking at this --  
22 Engineering came up and -- some of the electrical  
23 engineering folks and said hey, there may be a way that we  
24 can backfeed to the 4160 bus, should we look at it. I said  
25 yeah, let's look at it but let's don't do anything yet,





1 no, but that's a very general statement.

2 MR. DIETZ: So there being a lot of things out on  
3 monitoring doesn't cause confusion in terms of being able to  
4 look at it and find informatio. .

5 THE WITNESS: It doesn't cause confusion if you're  
6 expecting that situation. If you were expecting all  
7 thermocouples to be hooked up and you pulled up and you only  
8 had two of them, yes, that would cause confusion. But that  
9 was -- only two of them being hooked up was a known and  
10 expected situation.

11 MR. DIETZ: What was the highest temperature you  
12 saw on thermocouples?

13 THE WITNESS: The highest temperature that I saw on  
14 in-core thermocouples was -- and we have some copies of the  
15 trends -- was about 118 degrees. Now on the RHR we saw, it  
16 was very definite. Before you started the pump you had a  
17 flat line, the pump started and it jumped up to the  
18 neighborhood of 135-136 degrees and rapidly came back down  
19 to 105 --- 102 to 105 on the RHR inlet.

20 MR. LYON: Are any of those temperature data  
21 available off of the plant computer as a permanent record as  
22 opposed to someone writing them down afterwards?

23 THE WITNESS: The only ones we have as a permanent  
24 record is we have the ability -- we have a little thermal  
25 printer, we have the ability to take copies of things. We

1 only took copies of the ERF trend. Those parameters are  
2 available off of the Proteus which we can -- the plant  
3 computer -- which we can copy, but it's not as trendable a  
4 data, it's much more difficult to get a trend out of Proteus  
5 because it does not lend itself -- the software does not  
6 lend itself to creating that.

7 MR. LYON: Is there a record that we, two weeks  
8 later almost or so, a week later, could go back to that was  
9 either a person in the control writing down the numbers at  
10 the time or a computer printout of data sampling at the time  
11 -- is there anything like that available on these  
12 temperatures?

13 THE WITNESS: If you're asking on a routine basis --

14  
15 MR. LYON: No, for this event.

16 THE WITNESS: We did take a snapshot of the trends  
17 of the in-core thermocouples off of the ERF. We also have a  
18 control board recorder that gives RHR temperatures. Okay?  
19 Of course you know that a recorder, a strip chart recorder  
20 will give you a good delta but for absolute values --

21 MR. LYON: I understand.

22 THE WITNESS: -- it's not very good. That's the  
23 only thing that we recorded. Unfortunately we did not get  
24 other snapshots, which I wish we had, off of the ERF or  
25 Proteus. The only thing that we have is the two in-core

1 thermocouple trends.

2 MR. LYON: But those are a permanent recorded  
3 record.

4 THE WITNESS: Yes, sir, they're part of the -- we  
5 have them in the critique and they will be part of the data  
6 that is a permanent part of the event critique.

7 MR. LYON: Which will be provided to us.

8 THE WITNESS: Yes, sir.

9 MR. LYON: Good.

10 MR. DIETZ: Does the core thermocouple display also  
11 show the RHR inlet and outlet?

12 THE WITNESS: No, sir. If you take a look at our  
13 ERF, you have the ability to call up any point that you want  
14 to through a -- basically a surge, you have to call up  
15 system, et cetera. We also have some things set up that  
16 fall under several categories. One is that for each of our  
17 safety function status trees, we have about five or six  
18 different sets of parameters that you can pull up. You may  
19 have some copies of our little displays. We have  
20 preselected some groups of things that you can call up, for  
21 instance for heat sink, we have steam generator narrow range  
22 levels 1 and 2 and then on another button we have 3 and 4  
23 that you can just push this button and it automatically  
24 calls up the parameter.

25 We also have some various systems that we can call

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1 up a display of the system. RHR is one of those systems.  
2 Charging is another system, let-down is another system.

3 MR. DIETZ: The sar displays are available to the  
4 operators, right?

5 THE WITNESS: Yes, sir.

6 MR. DIETZ: Okay, so when they were monitoring  
7 temperatures and were monitoring them increasing in the  
8 control room, they were working -- looking at the --

9 THE WITNESS: I think they were actually looking at  
10 Proteus at the time. Proteus has the same display, even  
11 though it doesn't have -- for this particular case, for the  
12 core exit TC's, it has the same display map. It does not  
13 have the ability to readily trend parameters as easily as  
14 the ERF.

15 MR. DIETZ: But you'd be monitoring the same --

16 THE WITNESS: Monitoring the same points, yes, sir.

17 MR. DIETZ: So if what they were reading -- if they  
18 were looking at RHR inlet and outlet, it would not have  
19 been going up while the RHR was pumping.

20 THE WITNESS: That is true.

21 MR. DIETZ: So they had to be monitoring --

22 THE WITNESS: Core exits and they were doing that  
23 on Proteus rather than ERF, because they had already -- they  
24 already had that called up on Proteus.

25 MR. DIETZ: We're getting discrepancies between

1 what the operators saw and what you saw on the TC's.

2 THE WITNESS: Right.

3 MR. DIETZ: Can you explain that?

4 THE WITNESS: I believe so. You would really need  
5 to talk to someone like John Eliack, to talk about that and  
6 apparently there was a discrepancy.

7 MR. DIETZ: They recall seeing 136, 138 degrees on  
8 the TC.

9 THE WITNESS: That was not what came out on the  
10 ERF. That is information they saw on Proteus. Now I do not  
11 know this particular loop, how the calibration goes. But  
12 typically you'll have an input into the ERF and an input  
13 into Proteus. Okay? These loops are calibrated and I think  
14 each loop is calibrated somewhat independently. I'm not  
15 saying that there's a difference in -- a slight difference in  
16 the calibration of the loop, but that would be something we  
17 would have to check.

18 The other thing you have to remember is that in-  
19 core thermocouples have a very wide range and we were down  
20 at the bottom end of their range. So I'm not sure how  
21 accurate they are at the extreme ends of their range. I  
22 cannot answer those questions. There would probably be a  
23 John Eliack --

24 MR. LYON: Would you spell that?

25 THE WITNESS: E-l-i-a-c-k Or Greg Hooper.

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1 MR. LYON: Spell.

2 THE WITNESS: H-o-o-p-e-r. They're out computer  
3 experts. Hooper is our expert on Proteus, John Eliack is  
4 our expert on ERF. They might be able to explain a  
5 discrepancy between ERF and Proteus. I cannot -- I can  
6 speculate, that's all I can do.

7 BY MR. LAZARUS:

8 Q Were you aware of the status of the plant effluent  
9 radiation monitoring system and the meteorological tower at  
10 the time when you got to the TSC?

11 A No, sir.

12 Q Yes?

13 A No, sir.

14 Q No, you were not?

15 A No, sir.

16 Q So you didn't know they were out of service at the  
17 time apparently from the loss of vital power?

18 A Okay, there are some things that I assumed. Okay?  
19 One thing is that when we lost vital power we typically lose  
20 our communications console for our PERM system. Okay? We  
21 have some safety related PERMs which are displayed in the  
22 control room -- steam line rad monitors are displayed in the  
23 control room. They remain displayed in the control room.  
24 If you go in the control room, you'll see a silver panel  
25 that's over next to the turbine panel, a small silver panel,

1 and it has a set of rad monitors which we have designated as  
2 our safety related rad monitors. Those you can go look at  
3 any time during a loss of power or not.

4 During the loss of power, the PERMs monitors stay  
5 up but the communication consoles where the non-safety  
6 related and the safety related also put into that gives us  
7 communications to ERF, it loses its power, so we do not have  
8 the ability to pull them up on the ERF. You should be able  
9 to go locally to the rad monitors and read them locally.  
10 This is something that occurs in a loss of power. I took it  
11 for granted that it had happened.

12 Q What about the meteorological data?

13 A This is -- once again, this is not something that I  
14 would absolutely anticipate. We have a communication link  
15 that goes from the MET tower to the plant that communicates  
16 with the ERF. I believe it's a microwave link. We have had  
17 problems when we've lost our phones with this link. We lost  
18 all the phones on Unit 1. It did not surprise me when I  
19 heard subsequently that we had lost communications with the  
20 MET tower. I did not anticipate once we sent people to the  
21 MET tower, any other further problems. In other words,  
22 there was no reason why the event that we had would affect  
23 the ability of the instrumentation at the MET tower to  
24 collect data, but it would affect and it was very reasonable  
25 to me to assume that it would affect the ability of that



1 information to be automatically transmitted to the ERF.

2 Q How would people at the tower transmit, by radio?

3 A By phone, there's a phone up there.

4 Q Would the phone be in operation

5 A Yes. The power to the MET tower comes from Plant  
6 Wilson I believe.

7 Q Yes, that's right.

8 A Losing vital power should not affect the MET tower  
9 as far as power supplies.

10 MR. DIETZ: And your phones in the TSC were  
11 operational?

12 THE WITNESS: The phones on Unit 2 were operational  
13 also.

14 MR. DIETZ: Was the Met tower operational from Unit  
15 2?

16 THE WITNESS: No, the MET tower only puts into the  
17 Unit 1 ERF.

18 MR. DIETZ: Okay.

19 THE WITNESS: And like I said, the problem with the  
20 MET tower wasn't that it put into the Unit 1 ERF, I believe  
21 -- I have not heard a confirmation of this, this was my  
22 assumption at the time, but that when we lost the phone  
23 system on Unit 1 we lost the communication link.

24 MR. DIETZ: Right.

25 THE WITNESS: That was my assumption at the time.

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1 MR. DIETZ: I was just wondering -- you don't have  
2 two communication links?

3 THE WITNESS: We only have one because it only puts  
4 into the Unit 1 yard.

5 MR. DIETZ: Gotcha.

6 MR. LYON: A minor point on your chronology.

7 THE WITNESS: Okay.

8 MR. LYON: I want to spend a few minutes on what was  
9 going on in the Tech Support Center.

10 THE WITNESS: Okay.

11 MR. LYON: You indicated that very early on you had  
12 contacted Georgia Control Center.

13 THE WITNESS: Yes, sir, but that was from the  
14 control room.

15 MR. LYON: Yeah. Did you then later contact them  
16 any more in regard to what you found?

17 THE WITNESS: I did not. That communication would  
18 have been done fro. the control room because we have a  
19 direct line from the control room. You pick it up and it  
20 rings in the lounge. So we have a direct line connecting  
21 both the Unit 1 and the Unit 2 on separate lines to Georgia  
22 Control Center. So that's how notification would have been  
23 made.

24 MR. LYON: After you talked with the Georgia Control  
25 Center, did you then tell the people out in the switch yard

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1 anything about what was going on?

2 THE WITNESS: The switch yard -- you're talking  
3 about the low voltage switch yard?

4 MR. LYON: Yeah.

5 THE WITNESS: The Georgia Control Center contacted  
6 them.

7 MR. LYON: Georgia Control Center did that?

8 THE WITNESS: Yes. Now Barney Deasley may have in  
9 fact talked to them because of a much more personal  
10 knowledge of it, he came from Division and he, I do believe  
11 -- as soon as he saw that the RAT -- we'd lost the RAT due  
12 to a truck backing into one of the phases, I believe that  
13 Barney went and called the switch yard and said hey, get the  
14 Division repair people headed this way. I believe that he  
15 either called the switch yard or the Division directly, but  
16 that's because of a personal knowledge of the people, which  
17 I did not have.

18 MR. LYON: Let me go into the Tech Support Center if  
19 I may. Could you kind of put things in perspective here by  
20 the manning and activation of the Tech Support Center into  
21 perhaps when the diesel was permanently restored?

22 Which came first? Was the Tech Support Center fully  
23 activated before or after you had the diesel running?

24 THE WITNESS: The diesel tied on was before Tech  
25 Support Center was activated.

1 MR. LYON: So by the time they were fully activated,  
2 you did have your AC power restored?

3 THE WITNESS: That's right.

4 MR. LYON: When you took over as the Ops rep --

5 THE WITNESS: Yes, sir.

6 MR. LYON: -- what was your focus and what was your  
7 thinking?

8 THE WITNESS: Okay, you've got to remember that we  
9 were somewhat -- I hate to use the word stable, but by that  
10 time we were somewhat stable, we had power back. My  
11 function then was to look at further ways which we could  
12 ensure our stability. We had a diesel that we had managed  
13 to get loaded, that it had tripped on us twice. Okay? Like  
14 I say, Engineering approached me, hey, there's a possibility  
15 of another way of getting power to the bus. I asked them to  
16 go ahead and pursue that and be ready but don't implement  
17 anything yet. Just check out the possibility.

18 I'm not sure exactly what you're asking, so let me  
19 ask you to ask the question again, so I don't go off on a  
20 tangent.

21 MR. LYON: Sure, that's fine, and I'll phrase it  
22 differently.

23 THE WITNESS: Okay.

24 MR. LYON: Let me -- we have work underway on the  
25 diesel, on backup electrical power and so forth.

1 THE WITNESS: Yes, sir.

2 MR. LYON: You've got that one somewhat covered.  
3 Was your thinking process also trying to cover the situation  
4 of hey, if I lose electrical power again what are my options  
5 for cooling and staying out of trouble? Ways of perhaps  
6 adding water, ways of cooling the core without AC power.

7 THE WITNESS: Yes, sir, those thoughts had went  
8 through my mind. I had no discussions with anybody about  
9 them but I had in my mind counted the options of different  
10 ways.

11 MR. LYON: Would you kind of put yourself back in  
12 the Tech Support Center and your knowledge level at that  
13 time and tell us what some of those options were. And had  
14 you gotten into the situation of having no electrical power,  
15 the kinds of things you would be thinking and recommending  
16 to other people in the Tech Support Center.

17 THE WITNESS: Okay, we had -- as you're aware, we  
18 had several penetrations open on the RCS. We had two valves  
19 that were in the process of being repaired, we had two steam  
20 generators that had not had their primary manways  
21 reinstalled after nozzle down removal. Okay? I knew that  
22 this work was in the process of being buttoned up. My  
23 thoughts on potentials for putting water in with no power at  
24 all was that we could gravity drain. There were a number  
25 of flow paths that we could gravity drain. Our emergency

1 boration flow path that we had administratively declared was  
2 from the RWST through centrifugal charging pump A in the  
3 normal charging flow path via the alternate charging flow  
4 valve. The normal charging flow valve was tagged shut, it's  
5 just a parallel path, we just call one normal and one  
6 alternate.

7 I knew that first we had been using that path to  
8 make up and second that it was a controlled flow path  
9 because we had an ALV which at the time we still had air to,  
10 so we could control our charge rate through that.

11 Did you have a question?

12 MR. LYON: As you go through each path, could you  
13 provide an estimate of the flow rate?

14 THE WITNESS: Yes, sir.

15 MR. LYON: Assuming that your RCS was fully vented.

16 THE WITNESS: Yes, sir.

17 MR. LYON: Okay.

18 THE WITNESS: We -- through the centrifugal charging  
19 pump, we typically get -- if you open the 121 valve fully  
20 open, we get somewhere in the neighborhood of 200 GPM  
21 gravity flow from a full RWST to RCS at mid-loop, it's  
22 pretty significant.

23 We had the positive displacement pump that was  
24 available, it had power. We could have ran the positive  
25 displacement pump. We could have also had positive

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1 displacement pump. We could have also had gravity flow  
2 through the positive displacement pump if we lost power.  
3 We've seen 60 to 90 GPM through the positive displacement  
4 pump. It's a little bit more restrictive than a centrifugal  
5 charging pump. I'll be honest, the first time I saw it, I  
6 didn't believe it because I didn't think you could gravity  
7 flow through a positive displacement pump but it's happened  
8 I know because I put water places where it wasn't supposed  
9 to be.

10 That was, to my way of thinking, the preferred first  
11 option because that would be (1) a controllable flow path  
12 for gravity draining at a controlled flow rate and (2) if we  
13 had to, we could start the PD pump and could pump water in  
14 and it would not be gravity flow. It'd have more ability  
15 to put into a higher pressure vessel.

16 MR. LYON: And that pump has a flow rate of  
17 approximately what?

18 THE WITNESS: 90 to 100 GPM. It's normally -- I  
19 believe the specs say about 98 GPM. The actual flow rate  
20 will vary a little bit depending upon the exact set up of  
21 your throttle valves, et cetera. But this condition, I  
22 think that we could have got around 100 GPM probably.

23 MR. LYON: And the pressure capability of that pump  
24 is what?

25 THE WITNESS: That's the pump we do our primary

1 hydro with.

2 MR. LYON: Which means it will go to what pressure?

3 THE WITNESS: Greater than 3000 psi.

4 MR. LYON: Okay, and that was available, you knew it  
5 was available at the time because of the situation with  
6 electric power.

7 THE WITNESS: Yes, sir.

8 MR. LYON: So you did have a pump to make up  
9 capability.

10 THE WITNESS: Yes, sir. It was one that I would  
11 have preferred to have saved for a last ditch effort. In  
12 other words, if I could gravity flow, I would have probably  
13 preferred to gravity flow rather than start that pump.

14 MR. LYON: I understand.

15 THE WITNESS: Just because I like to reserve my  
16 options.

17 MR. LYON: Now we've discussed a gravity flow path  
18 by way of the various charging lineups.

19 THE WITNESS: Right.

20 MR. LYON: And we've discussed a pump flow path.

21 THE WITNESS: Yes, sir.

22 MR. LYON: What other flow paths were you thinking  
23 of?

24 THE WITNESS: Okay, the second flow path that came  
25 to mind was through our safety injection system. We have --

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1 with nozzle vents installed we administratively require  
2 that we have one safety injection and that's our  
3 intermediate head pumps, that is capable of having its  
4 breaker racked in and injecting and we actually had both  
5 pumps in that condition. They were lined up, they were  
6 filled and vented, the breakers were -- the pumps were in  
7 full lock and the breakers were racked out. We could have  
8 gravity flow through those pumps to the core, through each  
9 pump independently, so that's actually two different flow  
10 paths.

11 MR. LYON: All right.

12 THE WITNESS: I can only guess at a flow rate  
13 through these because to the best of my knowledge we've  
14 never gravity drained through them.

15 MR. LYON: I understand.

16 THE WITNESS: But I would guess somewhere in the  
17 neighborhood of 500 to 600 GPM.

18 MR. LYON: All right.

19 THE WITNESS: Now the remaining flow paths are  
20 through RHR. We had A train in service with shutdown  
21 cooling. B train was in standby. We could have gravity  
22 drained through either one of these through the RWST, though  
23 at the time we only had one flow path through the RCS.

24 When we did our gravity fill of the cavity initially  
25 we saw -- we gravity drained through RHR, we saw in the

1 neighborhood of 1000 GPM. I actually believe we saw 1200  
2 but I know it was 1000.

3 MR. LYON: That is an experimental data point, if  
4 you will?

5 THE WITNESS: That is a known data point, yes, sir,  
6 as is through the CCP. We've done that before too.

7 MR. LYON: I understand.

8 THE WITNESS: Those I know.

9 MR. LYON: All right, now this is with the reactor  
10 coolant system essentially at atmospheric pressure.

11 THE WITNESS: Yes, sir.

12 MR. LYON: What was your knowledge of the state of  
13 the pressure boundary in the reactor coolant system as of  
14 roughly, I don't know, half an hour, hour after you got in  
15 the Tech Support Center?

16 THE WITNESS: Okay, as I said, I knew that the work  
17 was ongoing in containment to button up mid-loop. It was my  
18 understanding that the pressurizer manway was to be left off  
19 to provide a vent path. Okay? We were informed via a page  
20 announcement that the manways were installed. That was -- I  
21 believe his last name is Cagle and I forget his first name  
22 but he's one of the people that was coordinating some work  
23 inside containment. Due to I guess you could say inaccurate  
24 communication or unclear communications between the ED at  
25 the time, John Hopkins, and the HP Manager, Ron LeGrand, Ron

1 got the information that we were supposed to button up the  
2 RCS versus button up mid-loop work. This entailed putting  
3 on pressurizer manways, which Ron did, or Ron ensured that  
4 happened. We were in the TSC and it was shortly after  
5 George Bockhold had reported to the TSC, that we were  
6 informed that the pressurized manway was installed.

7 My initial thoughts were -- at this time RHR cooling  
8 had been established. My initial thoughts were oh, no, now  
9 if we lose power, we can't gravity drain as easily because  
10 we'll pressurize as we heat up. I initially thought -- I  
11 said wait a minute, we've got cooling, we're back down, we  
12 know that we're not going to be able to get the manway off  
13 if we had to before we heated up to the boiling point if we  
14 have a further loss of RHR cooling. And even if we don't,  
15 if we lose RHR cooling again, then we -- button up mid-loop,  
16 we can gravity drain with as much water as we can, as much  
17 inventory as we can, and then we'll still have the steam  
18 generators as a heat sink that we have a substantial amount  
19 of heat removal capacity with. So it's not a disaster, it  
20 has its good points and its bad points and due to the fact  
21 that I felt that (a) we could get it off if we had to and  
22 (b) that it wasn't a disastrous move anyway, there were some  
23 things about it that would -- even if we could not get it  
24 off we would still have some heat removal capacity. And  
25 George said wait, just leave it on for now, I did not

1 disagree with that decision and I really didn't go into any  
2 detailed discussion with George about it because I did not  
3 believe it was an unwise decision at the time and it was a  
4 decision that if subsequent events happened we could change  
5 or take other actions that would -- as I say going ahead and  
6 assuming we lost coolant, gravity drain as much water as we  
7 could and filling up the RCS to what point we could. So I  
8 did not see any reason to question George's decision on it.

9 MR. LYON: With regard to control, what was the  
10 status of the air compressors that provide air to valves,  
11 these kinds of things?

12 THE WITNESS: There was no problem with the air  
13 compressors.

14 MR. LYON: Those were operating normally?

15 THE WITNESS: Yes, sir. We had a backfeed in  
16 progress. The backfeed powered up the non-1-E buses,  
17 1NA04, 05 and 01. Our air compressors are powered off of  
18 those buses.

19 MR. LYON: All right.

20 THE WITNESS: They never lost power.

21 MR. LYON: Now I may not have been listening quite  
22 closely enough. You were indicating that if you needed to,  
23 you felt you could easily remove the manway?

24 THE WITNESS: Yes, sir.

25 MR. LYON: How would you know you had time enough to

1 do that? You indicated you were operating on RHR, you had  
2 returned to original condition, so you're down in the  
3 vicinity of what, 90-95 F?

4 THE WITNESS: Right.

5 MR. LYON: How would you know you had time enough to  
6 take that manway off if you needed to?

7 THE WITNESS: The manway bolts were on and the  
8 report to the TSC is that bolts were on, they were not  
9 torqued down. It was snug. I felt that we had put the  
10 manways on and pressurizer manway on in significantly less  
11 time than it took to heat up to the boiling point. I felt  
12 confident -- and this is just a gut feeling, I don't have a  
13 lot to base it on, but I felt confident that because the  
14 bolts were not torqued down, because they were only snug,  
15 that we would have adequate time to take one manway off, if  
16 we had had time to put I believe five on.

17 MR. LYON: Sounds reasonable to me. Okay, the last  
18 question is if the manways were all on --

19 THE WITNESS: Also, one other thing is that on Unit  
20 1 refueling, initial refueling, we had an extremely  
21 difficult time getting the pressurizer manway off. We  
22 galled several bolts, we had made some design changes, we  
23 changed some lubricant we were using on the bolts. This  
24 time when we took the pressurizer manway off it was a 30-45  
25 minute evolution. So I did have a time frame of taking it

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1 off from a fully torqued condition.

2 MR. LYON: My last question is if the system had  
3 been fully closed up, are you aware of a heat removal  
4 mechanism that might have come into play?

5 THE WITNESS: We still had our steam generators.  
6 They were full of water at the time and had a good bit of  
7 inventory. Of course, to remove heat through the steam  
8 generators you have to bring the steam generators up to  
9 boiling. That's a substantial heat sink in itself, with  
10 four steam generators. So -- and we would have had a great  
11 deal of heat removal capacity. Like I said, when I found  
12 out the pressurizer manway was on, I thought about it and I  
13 said well we've got four steam generators and a lot of  
14 water, we can boil them off one at the time

15 MR. LYON: How do you get the energy from the core  
16 to the steam generators in that case?

17 THE WITNESS: It would be through basically reflux  
18 cooling.

19 MR. LYON: Okay.

20 THE WITNESS: You've got a lid on a kettle and  
21 you've got steam that goes up in the lid and it condenses  
22 and you transfer that energy to the lid.

23 MR. LYON: Got it. I have no further questions.  
24 Thank you, Jimmy.

25 MR. JONES: Let me ask you one thing. We asked for

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1 a list of equipment out of service.

2 THE WITNESS: Oh, who did you ask for that list?

3 MR. JONES: I was going to say, who should we ask?

4 MR. LYON: I have some of that information.

5 MR. JONES: Good.

6 THE WITNESS: If you need more information, I'm at  
7 beeper 067. I wrote the initial conditions for our event  
8 critique so I'll be able to tell you abnormal system  
9 configurations, equipment out of service, et cetera.

10 MR. JONES: What is your extension?

11 THE WITNESS: The extension is 3330.

12 MR. LAZARUS: Warren, are you finished with  
13 questions, for the record?

14 MR. LYON: Yes, I am.

15 MR. LAZARUS: We can go off the record.

16 (Whereupon, the interview was concluded at 10:46  
17 am.m.)

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

Name: Interview of JIMMY PAUL CASH

Docket Number:

Place: Vogtle Nuclear Generating Plant, Waynesboro, GA

Date: March 27, 1990

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

---

WILLIAM L. WARREN  
Official Reporter

Ann Riley & Associates

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