UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Gary P. Miller
Station Superintendent

Trailer #203
NRC Investigation Site
TMI Nuclear Power Plant
Middletown, Pennsylvania

May 7, 1979
(Date of Interview)

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159 and 160
(Tape Number( ))

NRC PERSONNEL:

Owen C. Shackleton, Investigator

Dale E. Donaldson, Radiation Specialist

Dorwin R. Hunter

SHACKLETON: This is a continuation of the interview of Mr. Gary P. Miller, the time is now 12:10 p.m. Eastern Daylight Time, May 7, 1979.

DONALDSON: Gary, we were talking about approval for exposures radiation control procedures things of that nature, I believe you had a comment.

MILLER: I want to clearly state that I gave guidelines to Dick Dubiel that he was to specifically monitor exposure separately and independently and that he was to approve those exposures and I would have trusted his technical competence to approve exposures such as 100 mR, 200 mR, up to an R probably since we were in such, we were in areas of 25, 100, 600 R, rem. I would have let Dubiel approve up to like an R, and I didn't give him a specific guideline. I trusted and know him well enough that when he had anything of significance or something that bothered him, he came into me and I specifically would approve entrance to high areas or guide men that were going to get doses of any level, of any level to me means over 1 R. Following the first day I instituted a shift superintendent type set-up shift superintendent/emergency director and there were two persons I appointed to that, myself and Jim Seelinger. For the first, I don't remember exactly, probably the first 5 to 7 days either myself or Jim Seelinger worked that job in the control room, reporting to Jack Herbein.

DONALDSON: Gary, do you recall, and this is going to be tough, but approximately in the morning or afternoon when you instituted this approval scheme, and I'm talking about the approval scheme where Dick would approve say 100 mR up to one and you would take over for anything above that.

MILLER: And again I must say that say that the one is the figure that I'm bringing out that I would have guided Dick by, I don't remember if I said one to Dick, that would have been in my mind and I believe his commonly agreed to our interface in the past. In the morning that occured.

DONALDSON: Let me ask you, did you have any knowledge or approve the exposures of Mr. Houser or Mr. Velez?

MILLER: I don't specifically remember, but I do believe that I was aware of that and that I was told after of the exposure.

DONALDSON: Do you recall whether or not you had any discussions, not only regarding the level of approval for various exposures but the need to solicit volunteers for certain of these operations?

MILLER: Yes. I and Dubiel and the command group that I discussed in my transcript I discussed earlier, of myself, Dubiel, Seelinger, let me go back and give you some names, myself, Dick Dubiel, the radiation protection supervisor, Jim Seelinger the Unit 1 superintendant who I was using for technical advice, Mike Ross, and Dan Shovlin. To that group I would have discussed this type of item with them and approved specifically jobs of a nature like you're discussing.

DONALDSON: Is this authority for an individual to accept certain exposure levels?

MILLER: I didn't address one part of your question. Early in the day and I can't give you a time, we had agreed that anybody amongst that group that anybody that took any exposure would do it on a voluntary basis. We would not press anybody to do any service that they wouldn't do. To my knowledge there was never a man sent the whole day anywhere that he objected to going.

DONALDSON: Are you aware of a sample that was requested of the make-up tank...a gas sample?

MILLER: No, I'm not. That could mean that I don't remember it though, but I don't remember it.

DONALDSON: Do you want me to give you some background that you can follow?

MILLER: Yes.

DONALDSON: I believe a make-up tank sample was requested one of the HP foremen who reviewed the procedure, noted that the sample could not be taken because the time the make-up tank was under zero pressure and that a valve which would be necessary to be operable, the sample would be taken, was in fact inoperable. And the discussion was that the sample would result in needless exposure, and I believe that sample was ordered to be taken anyway. Were you involved in the discussion surrounding that?

DALE: Was that on the 28th?

DONALDSON: It would have been in the first three days that, thereabouts.

MILLER: I don't have memory that on the 28th. I do have knowledge of that occurring after the 28th. And I do have knowledge that there were certain people who objected to taking reactor coolant or reactor building or make-up tank samples. Those objections, I felt were not valid. I did not disagree with the samples we took, even if we were not totally sure that valve was inoperable we had hope of getting, we felt the

benefit of the possibility of the sample outweighed this specific exposure. There was not total agreement on that within the unit. I did not expect that we would have total agreement about that. I think that if we controlled the exposure to the individuals involved the benefit, we could have gotten outweighed. I didn't disagree with that, I believe it was directed from the higher management that we try to do that.

DONALDSON: What you're saying is that you were in involved in it, you did do some sort of risk benefit trade-off?

MILLER: I accepted the risk benefit trade-off with respect to Dick Dubiel, and with respect to management. I didn't object to it, is what I'm saying.

DONALDSON: Let me ask just one other question, is the authority for this kind of emergency operation, that is the controlling of exposures and the authorization of the taking of certain exposures clearly delineated in the response plan?

MILLER: To my knowledge, it is delineated that I have that responsibility.

DONALDSON: In looking at this, you were personally or Mr. Dubiel were approving certain exposures, do you know if anyone were keeping any records of these discussions or records of these approvals that were being given to the various exposures?

MILLER: To my knowledge, we were attempting to keep those records through people like Jim Seelinger and Dubiel asking other people to write them down. I don't think we did well enough at that. I came back after that a couple of times, but I didn't have the time or didn't take the time, didn't really have it to go look for those records at the time. I certainly wish I would have gone harder after that but I would expect that I'd think that now, since I have the time to think about it. To my knowledge, they were being written down. We could have fallen down on that item.

DONALDSON: You did see someone documenting these?

MILLER: I saw at various times people writing things down, at various points went after George Kunder and Jim Seelinger and Joe Logan those three people to assure that was occurring.

DONALDSON: Then we might try to look into records of these individuals, or at least a verification of...

MILLER: If there are records, GPU would have had those and they came in the night or the next day of the incident and started assembling all my records and I couldn't get to them either. But that was an attempt to collect them and make sure that if there were any records they were preserved.

DONALDSON: Was there a conscious decision made or discussed as to whether or not the normal RWP procedures or those kinds of health physics control procedures would be followed or would be abandoned, and would be controlled by Mr. Dubiel or yourself? Or did it just happen?

MILLER: There was not a discussion about abandoning procedures. The discussion we had was that we would look at all our normal guidelines. We might not necessarily take the time to fill in all that paper because of the situation. But the clear direction from my part, and I believe Dubiel's clear understanding was that we would review all the normal types of items that would be reviewed, the type of exposure the reason for the exposure, the amount of the planned exposure, the tagging part of it, all that sort of thing were on my mind as something we had to do, but I would not necessarily taken the time to go through a switching order to put a tag on it.

DONALDSON: To your knowledge do you recall Mr. Dubiel briefing people who were to make entries as to protective clothing requirements, instrument requirements doses allowed to be taken?

MILLER: Yes, Dubiel briefed anybody who made any entry that I know of. He either briefed them or made sure they were briefed and assured me that was done at all times, and I witnessed more than one of those.

DONALDSON: Could you tell me some of the people that you did witness?

MILLER: There was one instance that I was personally involved in, we were discussing sending in a CRO control operator to check a valve in the letdown system a valve in the valve alley, and the area was like a 600 R area and he had 10 minutes. We were considering that, we did not do that, we were considering it, as part of that consideration Dubiel actually inspected the guy's suit, inspected his dressing of his respirator, the whole works plus he briefed the man individually on the number of minutes, who he would have with him the signals they would use to get out and the, Mike Ross briefed him on exactly what he was going to do, about how much time he had.

DONALDSON: Was this pretty much the standard routine?

MILLER: That was the routine that was followed for every job that I was aware of, I was told that was done on every job. We especially, tried to pick people who knew exactly where things were so that there would be no groping around, we used a team concept and we assured that they fully understood the area they were in, the latest survey and that they fully agreed to go.

DONALDSON: Was this also being followed for the HP chem technicians in routine building...I don't want to say routine but in building surveys? Pulling of samples.

MILLER: To my knowledge, yes. I was assured by Dick Dubiel that this was true.

DONALDSON: Do you recall whether any of your consultants performed any actions inside of the plant, mainly what I'm referring to is Mr. Porter, are you aware of Porter/Gertz?

MILLER: My memory is that Sid arrived...we asked Sid to come, he got there around, we had been on the phone with Sid the 28th, he got there around 8:00 that night and he brought four technicians from Salem, as I remember, to help us.

DONALDSON: Now Mr. Gertz, or Mr. Porter did personally take a sample out of the 219 sample holder. Do you recall whether or not he was...he fell into this briefing kind of thing. Do you recall Mr. Dubiel briefing him, checking him, and authorizing that entry?

MILLER: To my knowledge that was authorized, I did not specifically see it.

DONALDSON: You do have knowledge that...

MILLER: I do have the memory of that occurring that he was handled it the same way anybody else was that day.

DONALDSON: That gave you no problem that he did it, you were aware that it was going on?

MILLER: It gave me no problem that he did it because we felt that he was, to my memory in specifics, that he would be as good as anybody to do that, rather than have to explain it that he knew where he was going. He has been familiar with us, with that Unit before. He helped us set up the radiation monitors at the site.

DONALDSON: One other area regarding interface. I believe later in the period we're talking about, sometime late in the 29th or on the 30th, you began to receive the support from other agencies, one of the largest groups to come in was Electric Boat and they came in with the health physics group, .. I believe Mr. Graber was given some direction or some responsibility. Was the intent or were his duties discussed with you before he was integrated into your organization? That he was coming, what his limitations were?

MILLER: I don't remember such a discussion, I was aware though that he was here, to my knowledge I was aware that that external group was formed to help us from an ALARA standpoint to keep our exposures to a minimum, and provide another base number of people to spread out the exposure. I didn't have a specific set of job duties for him but I was aware once he got here that he was here. I still interfaced with my people at that time.

DONALDSON: Do you know who Mr. Graber and his group interfaced with in your organization?

MILLER: To my knowledge they interfaced with Mr. Herbein and Mr. Limroth.

DONALDSON: Now we had some interviews and gotten the statement that Mr. Graber was placed in charge and had told a couple of individuals namely Mr. Mulleavy, and I believe Mr. Dubiel later that they were working for him. Do you recall either Mr. Mulleavy or Mr. Dubiel coming to you and discussing that statement?

MILLER: I don't recall that specifically. I do recall that the amount of people we had come to the scene in all areas, that the interfaces and the communications were very difficult. I kept an open door to my key people for that reason, to the Dubiels, the Mulleavys the Limroths, and tried to front end one at a time their concerns that were brought up, I don't remember that one.

DONALDSON: From a cost-benefit, or from a benefit detriment trade-off kind of thing as the emergency director, did you find that your control... that bringing all these people in maybe had too much help and began to degrade your organizational control?

MILLER: I personally felt that we had far too much help the day or two afterward, a way ahead of our ability to organize it and effectively use it, but I also must say that we needed an awful lot of help and that it would have been very hard without a plan, which I, to fully implement that kind of help. It became very...it became to some degree frustrating because we ended up in some cases with people that I considered

more useful with in the ur outside the unit. I worked to change some of that around both engineering and in places like health physics to get the Mulleavys and Dubiels back in the Unit, and not have them put in the command centers.

DONALDSON: Now what part of your organization was it GPU or Met Ed division headquarters that was arranging all this interface, this support for you?

MILLER: To my knowledge, it was GPU that was arranging, Herbein was aware of some of that.

DONALDSON: Were you being apprised of who these people were and they placed under your control as the emergency director?

MILLER: I was being apprised in that they were not really being placed under my total control, they were more under the control of senior management above my level.

DONALDSON: Then what I'm hearing you say is that the way this fell out is it began to work somewhat to the detriment of your organization in that it began to pull people away that you felt were better, under your organization, rely upon to keep that in plant and the normal emergency plan rolling.

MILLER: I don't know that detriment is the right word. It began to become very awkward, it did not detract from our ability to do the plan, it did seem to cause an awful lot of extra communication to do anything and I think it slowed down our progress and maybe that's the way it should have been, or maybe it isn't. I didn't feel it increased our purpose or decision making ability. I didn't feel at the immediate time thereafter that it made us make any better decisions.

DONALDSON: Now does your plan or at any time in the period prior to this event, had you discussed how the interfacing of support agencies would be accomplished. Who would be in charge? You mentioned GPU, did Mr. Arnold coordinate with you at all? Did you know who was in charge?

MILLER: I, when Arnold and Herbein formed up out in the observation center, they essentially were responsible, in my mind for the organization. I specifically stayed inside on my own choice as the emergency director and in fact appointed one other one, Seelinger who had good familiarity with the plan, good familiarily with the organization. So I felt by leaving just me or Seelinger in the Unit as the what I call the emergency director shift superintendent, so that no matter what the external organization were building did, we could still control the events within the unit and flag any problems which were of a public concern or of a unit concern to Herbein. That the way I was feeling was the best way to go to make sure the organization didn't hurt itself at that

time because we were assembling an awful lot of people awful quickly, it's hard to get organized when we had more help than we could use at that time.

DONALDSON: Let's go to Friday. On Friday, there were some recommendations for protective actions made by the State. To your knowledge, had anyone from the site discuss either directly or indirectly the possibility that protective actions in off-site areas may have to be considered? Specifically, Jim Floyd is who I'm thinking of. There is some indication that Jim Floyd had contacted with the State Bureau of Rad Health and mentioned that there was a high reading plant then and that you were taking some action in the plant and that you may come back with a recommendation for evacuation of certain areas downwind.

MILLER: I recall...when I arrived here Friday morning, I was surprised (APPRISED) that there was, I believe I was surprised (APPRISED) by Mike Ross, Unit 1 Operation Supervisor that there was a situation in Unit 2 developing with respect to a release in the make-up tank. I went down to Unit 2 and I don't, I think, this is around between somewhere in the hours of 8 or 9 in the morning. I went down to Unit 2, Floyd was already there and he had done some communicating and I was not aware of what he had communicated. I got involved with the reading the off-site, I got involved in the emergency plan all over again. At this time though both Floyd and I

ended up reporting what we were doing to the off-site organization any further communication would have occurred at that level to my knowledge, okay.

DONALDSON: To your knowledge there were no recommendations...?

MILLER: To my knowledge there were none, but Floyd had done some communicating and when he was in the control room, that's possible, he did talk to someone.

DONALDSON: What turned out in a nutshell to be the evaluation of that make-up tank release? Was it anticipated to be lengthy, to result in any protective action guides being exceeded?

MILLER: To my knowledge, we weren't expecting to exceed any protective action guide but we did have a release. We did, we do look hard, we did look very hard to try and terminate that release when we got there. We didn't fully understand the make up tank and it's releases at that time either, with pressure, when we seemed to have an increased pressure in the make up tank we seemed to have a release. To my knowledge, I didn't understand and I didn't know anybody up there that did understand it. Specifically what you could do. The waste gas tanks were pressured we weren't necessarily getting effective waste gas compression discharge

all the time and the make up tank level would go up to pressure would go up and let down and let down would go down and it was this sort of a situation.

DONALDSON: Do you recall any time during the 28th, through the 30th, when there were, if there were planned releases? Either liquid or gases.

MILLER: The...

DONALDSON: By planned I mean that it was planned in the sense that manipulation of some control or valve resulted in the release occurring at a pre-determined time.

MILLER: I don't have as good a specific recall as I would like there. I do believe though that we had instituted procedures for approving releases by the...in those first...I mean at the first day, because the next two days we did release, liquid-wise things like the IWT sump and to my knowledge the state and the NRC were aware of those kinds of releases. We may have released from Unit 1 in accordance with our tech specs. We may have released something like miscellaneous waste to make some room rather than dump it on the ground, such that our evaluation

was it was within the limits and that was a...and we would go through an approved discharge path rather than just sit inside. Gas releases were a lot more complicated.

DONALDSON: You mentioned that there was an approval person designated, who was that person?

MILLER: To my knowledge, we used the normal approval paper plus we would, we eventually ended up with the command center having to approve and have knowledge of any release. And that would have been the Herbein and Arnold chains.

DONALDSON: So that any planned gaseous as well as liquid, after the first day would have gone through this normal procedure?

MILLER: Right, it would have gone through the normal procedure plus the additional approvals and eventually and I'm not sure exactly when, ended up with people in the State and the NRC and the ALARA groups specifically being at least aware of the releases.

DONALDSON: Then to your knowledge you know of no planned release that was made without prior notification of the State or the NRC?

MILLER: To my knowledge that's true, but I think you must remember that we did not understand all the releases that were occurring, to my knowledge. In other words the make up tank pressure releasing caused our radiation monitors to go off scale, we might have had an additional amount of release.

DONALDSON: That's not really the kind of release I'm talking about. I'm talking about one that you had control over.

MILLER: One that we had control over would have been done for the normal paper, plus we would have made an attempt to notify anybody involved. For instance, I was involved in releasing the IWT and we specifically talked to the State, and in fact on Thursday when Lieutenant Governor was over here, he was told about it, by Jim Seelinger.

DONALDSON: In regard to the...what we'll call unplanned releases, the lifting of valves on the makeup tank, continued releases from the aux building, various areas, whenever there was a spike, or an indication that these releases would go up, were you also apprising the State or the NRC when you saw changes in these levels?

MILLER: To my knowledge, when we saw an increase on any of the monitors, we apprised both the NRC and the State and the command center and we also took immediate action in the plant, to attempt to terminate, or to understand and to terminate.

DONALDSON: Do you have any idea if you can recall, when it was discovered that the Unit 2 turbine building sump that was going to the IWTS, was contaminated?

MILLER: I don't specifically remember, but I think it's in the 29th or 30th time frame. My memory says Thursday the 29th, but probably on the 29th I decided, I initially decided that it would me or Jim Seelinger, probably backed away from that on the 30th when there seemed to be some communication confusion and said, alright, only one guy does it.

DONALDSON: Could you elaborate on the actions that might have been taken after that discovery?

MILLER: Following that discovery, to my memory, the actions we took were that we then put a procedure into effect that essentially required a shift superintendent, myself or Jim Seelinger to approve any discharge from any sump to any other point. We would get an activity sample, look at where it was going, look at the consequences. I'm not sure when that was put into effect, I believe on the 29th of thereafter. So

that one of us had to know of any transfer essentially transfer. I also additionally imposed that myself only could approve transfers between the units.

DONALDSON: Then, so the transfer of water of from say the Unit 2 bleed tanks over to the Unit 1 misc water storage tank, all these would have come with your approval?

MILLER: I'm not sure exactly when, but probably on the 29th, I decided...I initially decided it would be me or Jim Seelinger. I probably backed away from that on the 30th when there appeared to be some communication confusion and said, alright only one guy does it.

DONALDSON: Is that also true for dumping of the bleed tanks on the floor or into the bleed tank room?

MILLER: That's true.

DONALDSON: Were you ever informed or were you aware that the final effluent monitor that being RML-7 ever being either in alarm or alert?

MILLER: Not to my knowledge. I specifically don't remember being informed at any time of it being in alert or alarm.

DONALDSON: There's also bits of discussion that the train back and forth, that the one train, blockage of the site or transit of trains across it. Could you just briefly detail the kind of agreement you had had with railroad and how they're notified, what requests may have been made for were their control of transit of rail traffic?

MILLER: I think, I may not specifically remember which trains went by, but I think it should be noted that we have in our drill scenarios here in the past two years, practice contact with both Conrail, and the airport and the Coast Guard with respect to water, air and rail. There was communication that day with Conrail about trains, and Jim Seelinger if I remember right did that communication. I don't remember the exact words, but we considered things like stopping the train and swiping it, I think we decided not to because of the levels that were in existance at that time from the off-site monitoring, we had the agreement with Conrail that to my knowledge, that we could have stopped traffic or we could have assured when traffic went by.

DONALDSON: Was there any discussion of the fact or the need for Conrail to keep both entrances to the site clear and not stop trains?

MILLER: I believe there was but I think I'd have to defer and I believe it's Jim Seelinger or Dubiel that made the communications, but I do remember that we did communicate with those people and I do remember that we had a positive communication.

DONALDSON: Gary, from listening to one of your earlier tapes, the Met Ed tape, you discussed that the helicopter that you dry land this and thought about this in your own mind and the original helicopter came from Pennsylvania State Police. When did you have other helicopter support, do you recall?

MILLER: Yeah, we have thought of this possibility and have dry runned it before. That morning, I think it's fair to state that I now look at data from the State police who say that the helicopter landed on site at 8:30, I believe that to be a misnomer in their log. When I got to the site and took me about 10 minutes for me to become the emergency director, from about 5 after 7 to 15 after. I got a projection for 10 R at Goldsboro at 20 after or somewhere after in that time frame and I immediately ordered a helicopter through to Dubiel. First thing, I believe that that helicopter was on site by 7:35 or 7:40 and in Goldsboro by 8 to get...

DONALDSON: I think at least the log from the site protection officers, at the north gate, shows that the first helicopter at 8:30.

MILLER: And I believe that's an error. And I believe that's an error because things do get fuzzy on a day like this, but that's the first thing I remember doing, and I believe that you could get testimony from separate, from me from th re's 200 people, Dubiel and Seelinger who have asked separately and independently to write down what they thought and come back with very similar times.

DONALDSON: Did Jim contact the State police to find out what they had logged.

MILLER: I believe Lex Tsaggaris did as a part of his and...

DONALDSON: Did it confirm your understanding that it was earlier?

MILLER: I don't know the answer to that. I might say though that one of the things that makes me remember it as I do is that Dubiel described to me that we beat the wind to the west shore that morning, and I distinctly remember that. We had a team on the west bank, we had a team in the car and a team in the helicopter and I got that projection before 7:30 and ordered that helicopter right away. Cause I knew that it was 7:30 in the morning and getting over there in a car was not going to be any easy task.

DONALDSON: Where did you receive other helicopter support?

MILLER: I don't from where, I knew we had them. I don't the organization we got them from. I know that the RAP teams was there in the morning, fairly promptly and I don't know whether they had a fixed wing or a helicopter. I think we got a separate contractor to give us a copter, but I knew we had teams in and in fact, you'd look at my testimony once or twice during the day, we had readings above the tower and above the reactor building.

DONALDSON: These were not essentially then formal agreements or formal plans of something you were...

MILLER: To my knowledge, this is not in the formal plan, but I might say that there is some formality with the State police that we have dry runned it and confirmed with them many times that that copter would be available to us. I think there is more than an implied agreement with the State police.

DONALDSON: Do you recall when you received notification that accountability had been completed?

MILLER: My memory says somewhere around 8:30 in the morning.

DONALDSON: Were you aware that as late as approximately 10:00 in the morning that Mr. Dubiel was given the name of two people that were not accounted for.

MILLER: Yes, I'm not sure that I remember exactly two, but I knew that we had one or two. To be honest with you at that time in the morning one or two to me seemed pretty decent as far as, certainly I wanted to find those two, but there were...

DONALDSON: Did you find them?

MILLER: To my memory they found out the reason. I think one of them, we found one of them wasn't here, I think one of them was a gate problem and one of them we found. I probably could remember the names, but they've just slipped my mind. I might say one thing, one of the things we did also, due to the fact we realized the wind was very slow, we knew from the beginning that the radiation readings were going to occur on site. We very carefully and very often monitored the areas, the assembly areas. In fact, we moved people to the observation center as soon as we saw the site going up and in fact around noon, we sent as many home as we could send home. Seelinger had people go through every building on the site to make sure nobody was here.

DONALDSON: Now your arrival time on the 28th was when?

MILLER: My memory says 5 after 7 and I came through the south gates so I'm not on the gate log.

DONALDSON: Let me just ask you a general question this would be in retrospect I guess after you'd gone back and looked things over. I know you're emergency plan has three categories, local, site and general. Now, in looking back over the sequencing of events and looking at action levels that exist in the plan. One thing we are looking at from your viewpoint, is are the action levels that you have listed in the plan sufficiently comprehensive to allow an operator to say judge the severity of what they have, based on potential? In other words it looked like there were things that we would indicated as a category in the reg guides that talks about an alert category. Where you sort of put everybody on standby. It looks to me like you probably did that without falling into the alert category. But to look at your actual action levels there's one that's high reactor pressure coincident with low pressurizer level and believe me this is specifically indicative of a LOCA. I believe that occured earlier in the morning, and if you looked at that it would look like the emergency would possibly have been declared, maybe as much as an hour earlier. Did you take any look at that at all? In forming your opinion about that?

MILLER: I have got a couple of opinions, recommendations which I've transmitted to my management. First of all, from my internal bird's eye view of this thing. I think you should, in the context of the way these units run, you can isolate on an instance, you could have started earlier, you certainly can never fail to start early enough. The trouble is when you start early I'm not sure that all of the people who communicate this type of thing will ever understand why you started early. Since nothing...most of these things turn out to be nothing. What I'm trying to get to is, Unit 2 had had severe trips and I think any of us who had been involved would say that we go back to April of last, of 1978. But severe is more, an economical severity. We had the steam problem and we had ES's, they're safeguards initiations. When you go outside of this site, which I have, and you talk to people like Toledo Edison, they had ES's, safeguards initiations on trips, so whereas three years ago I might have really been alarmed at that, I was not as alarmed in Unit 2. I've thought about it, but I think we need to very carefully look at what, how we do the alerting and who gets alerted. I don't think the press needs alerted, but certainly the civil defense people maybe could be alerted earlier. I think, I was involved in conversations from 4:00 on that morning and I never reached the state of alarm till around quarter till 7 when I heard machine shop readings. Possibly you're right, we could have maybe, maybe defined some criteria for an alert state that are ahead of a radiation state, because as we've learned through this when the radiation occurred it,

we were there, there was no...from there on in went very quickly, from quarter of 7 to 7:30 we went from local to site to general. And we probably could have been general at quarter to 7 had we recognized it.

DONALDSON: Now I think this is what I'm hearing you say, there's no...

MILLER: I agree with that, there's a merit to that but I think it has to be defined as to who, what parameters do it, and also as to who is in alert.

DONALDSON: And that would take some detail to look at the way you're individuals...

MILLER: That's right, so you don't end up you know, if you alert too much you end up with people not being alert. And they were alert, when this was real you look at my own opinion of the performances is excellent, it went right on. You wouldn't want to alert people four times a year and the one time you needed them like this, having them sit around an hour. That was trade-off there, but it's one that ought to be looked at.

DONALDSON: That's really my last formal question, what I'd like to do, at least in my area, that is the area of emergency planning itself is within the context of this event, and you have the unique position of

being the emergency director and the station manager. If you have any comments that you would like to make that may be generic in nature or lessons learned, in terms of planning, that you'd wish you'd done that you feel should probably be considered by other people in a similar position, more factual than opinion if you can do that. I'd like to give you the opportunity to turn the microphone over to you and make any pertinent comments you think that we should all be aware of.

MILLER: Internally I've made some recommendations which I think would help our organization function better. One thing I wanted to correct earlier I said we had had, we typically didn't have readings of concern, we had 1 mR/hour, 2 mR/hour. The highest readings I heard external were like at ten at night, up near the turnpike of 10 or 14 millirem. And those were not readings that stayed that way. They were short bursts we were apparently having some discharges. There were a couple of times on the site when the wind totally died when we got 60 and 70 mR at a point for a very brief period of time, which was the reason we kept the site evacuated, we ran out of respirators the whole day. So the reason I've given none of them, except some of the radiation levels in the aux building are in terms of rem, all the rates I've given off-site or anywhere else are in millirem. As I've thought about it, I feel that the communications in the plan worked and were effective. I feel the plan worked. I feel the plan worked extremely well. I felt that if you look at the organizations involved before 10 in the morning,

everybody involved was here. From the NRC, to the State, the the RAP team to the State police, to the people on the site. So the communications that had to exist to protect the public worked. There were two areas we obviously fell down in, one was we had no way of really effectively communicating with senior people within the government, State government or national government. It was obvious to me, standing in the Unit 2 control room that the Govenor had no understanding of radiation and some of the people in the NRC the high level, maybe didn't understand it as well as they should have. Because I was standing there when some of their people were screaming readings at them and they didn't comprehend them as well as they should have in my mind. That did not disturb the event. Nothing was detered, when I went to the Lieutenant Govenor's office I told those people I would not change anything I was doing because it was part of a plan that had been conceived over a period of years and not minutes. We had enough monitoring teams, we had enough help, the other recommendation that I have was a strong one and that is that all the organizations involved with these nuclear plants. When I say all I mean Burns and Roe, the Architect Engineer, B&W the NSSS supplier, the NRC, and the State. At a senior level have a crisis team, that they trust and they practice. The reason Tom Gerusky and I get along is because we practice once a year and he knows when I say 10 mR/hour he doesn't then ask me what. I think the same philosophy would have helped if I could have talked to John McMillan of B&W rather than have ten B&W people trying to call me. If I could have talked to one

guy in the NRC. Cause he's got to remember that my problem with that whole day was that I was extremely pulled by phone, by questions, and I would at times disappear, because I couldn't focus on the events and I force myself to focus on them, because in my mind I clearly had that responsibility and I would have performed that at the exclusion of all communication. I'm just trying to say that there needs to be a crisis team in every organization and there also needs to be a guy in the facility who talks the emergency plan with people on the outside, other than the director. A guy that is a communicator if you will.

DONALDSON: What I heard you say was that in terms of the emergency director, someone has to have the presence of mind to resist the pressures from outside and keep what's important, important. And yet try to keep things in perspective.

MILLER: That's the way I feel. I also feel you can't run it from the group, you have to run it with one guy, with the right talent. He could not have been run by committee on the 28th.

DONALDSON: One final question in that area is that on the, regarding the interface of various and sundry agencies, the coordination do you feel that ought to be more centralized in the interfacing?

MILLER: I felt that at the working level, that the G. P. Miller to your level, the G. P. Miller to Mr. Haverkamp the region inspector, principle one, the principle inspector, the Gerusky, of the BRH to a sit quarter, it's people like that it was working with no problem, it was interfaced at the right level, but all of our organizations including my own, a level above that, I think didn't know how to react because they couldn't get enough good information. They tried to react and provide direction and many times the direction, I did not take direction from anyone because for instance, I was told the secure steaming many times. I could not secure steaming, it was my only heat sink. And I wasn't steaming the B generator no matter what the press thought.

DONALDSON: What I'm hearing again now is that the response plans are normally written and I think this is generic, to cover the facility and the people that are at the facility what you're saying now is perhaps there ought to be a procedure or a plan for the duties of an X-level office part of this overall gambit that needs to be interfaced with the facility.

MILLER: That's right. And that needs to be very clear, to be practiced and to be able to be assembled in an hour like ours is.

DONALDSON: I'd like to, if I could, make a formal request for your recommendations that you've submitted internally, if you're amenable to that. Would that be acceptable?

MILLER: I would request that Bill Behrle get and clear that with you people. He doesn't have my recommendations, but he's the guy that I would use as a clearing house. I don't have a problem but I think it's fair, I think they were written for my company. They were written as a internal document, not as a secret document or not to avoid telling anybody anything, but they were clearly written from an internal standpoint for this organization and I think they'd have to be viewed in that context.

DONALDSON: I understand that I certainly would use them in that context.

MILLER: I think Bill Behrle owes you that answer.

SHACKELTON: We've only got three minutes maximum left on the tape and Mr. Miller has people waiting for him for a meeting in his office, so do you want to use up the last three minutes?

DONALDSON: I've completed my questioning and I very much appreciate your candor, I think it gives us the view from your end what was going on, and I think a lot of times in an organization, we need to get to

the central location who's really controlling it. Thank you for taking the time and going over with me the grounds that you plowed before, you know all I can say is thank you.

MILLER: Yes sir.

RESNER: Gentlemen, we need to talk to talk to Mr. Miller again. Gary if we may, then sometime in the future I would like to have another meeting so that we can get into more specifically in some of the operations. And we'll.

MILLER: Anybody else in my office? Will you verify that? We can talk more now if there's nobody there. I think I have a 2:30.

SHACKLETON: We'll close this tape however, because it is nearing the end. The time is now 1:53 p.m. Eastern Daylight Time, May 7, 1979, pardon me, 12:53 p.m.

SHACKLETON: This is a continuation of the interview of Mr. Gary P. Miller. The time is now 1:03 p.m. Eastern Daylight Time, May 7, 1979. For a matter of the record, Mr. Donaldson, of the U.S.N.R.C. has left from our interview and now sitting in on the interview is Mr. Mark E.

Resner. Mr. Resner is an Investigator in the Office of the Inspector and Auditor at Headquarters of the U.S.N.R.C. I'll now turn the interview back over to Mr. Hunter.

HUNTER: Gary would please go through a general description of your involvement starting on the morning of the 28th and through the...we're interested in this group in the first 16 hours of that day.

MILLER: I would like to state again that the testimony that I've written up contains what I believe to be the best factual description of what I did that entire day. It covers in detail the events from 4 a.m. to the time of the trip that morning. Briefly, just to get us discussing that in this room. At 4 in the morning I received notification of a Unit 2 trip. Received that notification from Mr. Dale Pilsitz who was a Unit 1 Shift Foreman. That notification occurred to help he would have obviously made some phone calls to help the Unit 2 people out, that's the reason it came from the Unit 1 shift foreman. I was informed simply that we had a turbine and reactor trip. That particular day I was scheduled to go to our Oyster Creek Nuclear Plant to attend a refueling critique and I as a normal part of my life get up fairly early in the morning and do paper work. At around quarter till 5 that I was beginning to get ready to go down to Oyster Creek, because I had to leave at 6 in the morning. I called back into the unit to give myself assurance that the recovery was under way and to what the

plan was for the day and when we understood the trip. When I called back in I'm doing this from memory, somewhere a quarter to 5, or 5, George Kunder, I believe answered the phone and he described the fact that the turbine reactor had tripped that it had been probably a feed system loss that initiated trip that they were recovering in accordance with the procedures but he informed me that at that time, that the pressurizer was solid and I believe he may have told me they had a safeguards injection. If he...and the pressure was down around 1100 pounds. These two items didn't set well with me, so I told George that I wanted to set up a conference call to assure myself that we were asking the right questions and proceding the right way. I called the conference operator, and the discussion with Kunder probably lasted 15 to 30 minutes, not pinpointing on a time, following that I had a conference call set up. Somewhere around 6:00 we had Mr. Herbein of Met Ed, Mr. Lee Rodgers of the B&W, our local representative on site, myself at home and George Kunder in the Unit we had a discussion where we again discussed the plant and the conditions that we were in, and the trip. At that time, it was decided that I should get into the Unit and call Mr. Herbein back and I believe Mr. Herbein was in Philadelphia this particular week on reserve duty. Following that, I made the appropriate phone calls...I had to make other phone calls too. I had to notify various people who I was supposed to pick up that were going to Oyster Creek with me, till I got through all that, I began to make preparations to physically come to work, I got a call around 20 till 7

or quarter to 7 from Mr. Dan Shovlin. Also, I should say that I had at sometime in this sequence called Jim See nger, the Unit 1 Superintendent and Dan Shovlin the Maintenance Superintendent and essentially told them to come into the plant because of the need of some senior support. I might also say that George Kunder had called in the lead engineers to provide their support for their...which we would normally call them in following a trip condition. Quarter till 7 Dan Shovlin called me at home and told me that they had had a radiation reading in the hot machine shop of 1 R and that they had activity from the sample lines. From the actual sample they had drawn from reactor coolant system. He felt that we had a radiation problem. Dan's not an operator, he's a Maintenance Superintendent, but Dan seemed to indicate a level of concern and I immediately left the house and started toward the site while I was on the way, they apparently just declared a site emergency. I came in through the south gate. I lived south of here, it was the quickest way to the control room. Therefore my name does not appear in the gate logs as I had to go around the traffic and through the guards. I arrived in the control room at about 5 after 7, at that time there were a group in the control room already. Basically, Mr. Ross was in the control room he had been called over from Unit 1, he's the Unit 1 Operations Supervisor. Dick Dubiel was in the control room, he had come through the auxiliary building about the same time frame. We had evacuated them and had done a survey in them. Mr. Kunder was in the control room, Mr. Logan was in the control room. I was briefed between

Ross, Logan and Kunder. Following that briefing I assumed the control of the unit, I appointed myself the Emergency Director, and I announced that I was in the control room and announced who was in charge in what area. Essentially, I put Mr. Ross in charge of operations. I instructed him to provide directions to the shift supervisor and report to me as I did with all these individuals I'm now going to throw out. Mr. Shovlin, was in the control room, was put in charge of emergency maintenance. Mr. Dubiel, was essentially put in charge of the _____ radiation concerns, and by that I mean, a kind of communicate with any outside organization. Mr. Dubiel, was essentially put in charge of my radiation concerns. By that I mean making sure the accountability was started, the assembly was started, the off and onsite teams were being brought up, that we initiated surveys inside the unit. Jim Seelinger was in the Unit 1 control room. He was put in charge of assuring the Emergency Control Center was in full set up, that Unit 1 was monitored. Unit 1 at this time was in the hot shutdown condition following refueling. So Unit 1 was stable. Jim was in the Unit 1 control room. He was also in charge of the Emergency Center which is normally located in Unit 1. Additionally, George Kunder was told to get logs started with the engineers and to start.. to make sure the notifications were being made. Both Mr. Logan and Mr. Seelinger were directed to get the procedures out, both the Emergency Plan and the Unit's procedures and assure that we were performing all the required steps. And I further directed the control room that those people would be the only people I would talk to

and they should provide their information through those people as appropriate. Then essentially what I did from there on was...I met...and also at that time the notifications were already underway in the Emergency Plan. The projections, the isopleths, and all that sort of...the requirement was already in progress and very prompt. At that time I instructed the group I just enumerated that we would meet periodically, about every 30 minutes, or if something made us meet so...or something in the Emergency Plan, we would meet in the shift supervisors office. We were at that time assessing where we were with respect to the plant and the Emergency Plan and assessing the next step which I would decide and also these people would communicate with any outside organization. That's how we started off. The first meeting we held was probably, 7:30-8:30 time frame. Our immediate concern that we defined our goals, our major goal was to protection of the public and keeping the core covered and then protection of our own people being second and minimize the plant damage being third. We assessed those as our objectives in the order of the objectives and we told ourselves that the whole day so that we maintained our priorities in perspective.

HUNTER: Okay Gary, thank you. Let me get back to a couple of not... and as you indicated I think some of the information certainly is going to be on the transcript, and knowing that I'm at this time indicating that we'll be back to sit down and cover some of the detail areas that you were...that will come out of the review of this tape and also the

other tape. On the conference, call can you highlight the points of discussion at that point, excuse me, at 4:00 you indicated that all of you had been told that you had a Unit trip and Dale called you, Dale Pilsitz I guess, at 4:45 George Kunder had called back and at that time you had indicated pressurizer level was solid and you had an ESL...had been intiated but I guess the pressure will be 1100 pounds of some low point, okay.

MILLER: I had actually called back in at a quarter till 5.

HUNTER: And at this particular time, 5:45, can you generally describe your complete, your understanding and what was disturbing you at that time?

MILLER: I guess that from my standpoint I had assurance from George and he's the Technical Superintendent in Unit 2 that they had had all their procedures out and they had done their turbine type procedures and they were within procedures that were defined. I guess it just bothered me that the pressurizer was solid and the pressure was low and they really didn't know why.

HUNTER: That was your impression is that he really didn't know what what he might have said.

with the situation, with the pressurizer solid. I think you can also say that was somewhat based on maybe just sixth sense knowing we had those types of trips and we didn't have a pressurizer out the bottom. The recovery didn't seem right to me, that's the best way I can describe it.

HUNTER: Recovery not seeming right, apparently you're indicating to other trips or other recoveries that you were aware of that had been through at this plant. Can you describe the significant differences?

MILLER: I guess the biggest thing was that we if we'd of hit a turbine in a reactor trip I would have expected the pressurizer to local to have gone toward the bottom and I would not have expected us to fill a pressurizer back up, even though we had HP injection, we would have seemly could have terminated that in my mind before we filled that pressurizer.

HUNTER: Okay, when you became aware that the pressure was at 1100, 1200 pounds, what did that indicate to you? Did you have any feeling about that at that time?

MILLER: I didn't have any feeling about that, but like I said, pressure being low and the pressurizer being solid at that hour in the morning, I guess bothered me. I could be specific now cause I've looked at the

curves but if I go back and say what did I think that morning, hey I thought something didn't seem right. That's the reason I set up the conference call.

HUNTER: It's my understanding that you're looking at...you're looking into the licensee event reports of previous history. I would assume that you're under...you're having this type of trip before, that it is normal, that the pressurizer level decrease rapidly and in some cases depart the indication, the indication range, but it would recover. You have had, had you not an ESL condition before on a transient or a turbine trip type transient?

MILLER: To my knowledge we have had those and other plants of this vintage in megawatts, 2700 plants, like Toledo Edison. That that was not considered to be abnormal to the point of an extreme situation of public concern. Anytime you have an ES you'd like to understand why, but in this plant in it's first year's history, we had had other ES's on this type of a trip. We'd also, I might say ridden out trips like this with reactors staying on. We all knew that that was a one out of two type thing.

SHACKELTON: Mr. Miller, for the benefit of some people who aren't familiar with the terminology of the nuclear industry. Could you just briefly explain what an ES stands for?

MILLER: ES is an actuation of the engineering safeguards system which essentially is to assure a water flow into the reactor in a condition where there has been a loss of coolant flow to the reactor.

SHACKELTON: Thank you very much.

HUNTER: Okay, can you, when you called Gary...when you called George Kunder in the morning was there any discussion concerning reactor coolant pumps?

MILLER: At quarter to five, there was not discussion because they were still running to my knowledge. At the six o'clock conference call, we were informed that the pumps, two of the pumps I believe had been turned off. And during that call I think Lee Rodgers even asked the question of whether or not the electromatic was shut, of course we all know that the electromatics become famous thereafter but he did ask the question and I, my memory, is somebody looked at the panel and looked at the signal light the command signal thought it was closed. I do note that in the sequence of events now that the thing was closed somewhere around 6:20. We might have generated that thought process or help generator, which I think the operators had been through two or three times up to that point. Maybe that was the thing to roll the stone over, I don't know but, to my knowledge, we, at 6:00 we were

aware of cavitation of the reactor coolant pumps. Of course that was the point where Jack Herbein told me to get into the plant, and get back to him.

HUNTER: Okay Gary, was there any other significant plant problems or items discussed in that phone call besides the pressurizer level? The question was asked is the power operated leak valve closed, yes it is closed. And the reactor coolant pumps at that time were in fact riding the actual saturation curve and were in fact in alarm according to the computer print outs. What was the general discussion around that type of a problem?

MILLER: To my knowledge at the 6 to 6:20 phone call, we didn't discuss too much about the reactor coolant pumps. We discussed more about the trip, and how come the trip occurred and tried to discuss why a pressurizer was solid to some extent and why pressure was low. I think that's the reason Jack...and that's probably, that may have been the reason Lee Rodgers asked the question is the electromatics shut you know, he may have instinctively asked that question. We didn't tumble to the full logic of the situation at that point. I think that's why Jack instinctively said to me to get into the plant and get back to him. The thing we did also discuss, you know we've been trained pretty harshly in following accepted procedures and we did go after the plant pretty hard...was were they following procedures? Did they have the procedures

out? That's you're beer at 6 in the morning. Somebody's operating on their own. We've got the assurance that more than one guy had looked at the recovery procedures and were within the steps of those procedures.

HUNTER: Gary, do you recall which procedures they were using? I've already picked up turbine trip procedures obviously reactor trip procedures they were using?

MILLER Turbine trip, reactor trips, safeguards. Safeguards, you know, when you have a safeguards initiation you get that procedure out. That traces you through when you can say...it tells you to throttle the automatic and manual actions but you know, you get up on sixteen valves which are inlet valves, you throttle them down and it tells you to look at your indication it tells you how to look for a small or large leak, that type of thing. Plus, you know, they had the loss of feed, that's a procedure in itself. So I would, you know...I specifically I believe I'd asked George earlier you know, turbine trip, reactor trip, emergency feed safeguards, that type of thing. Fully confident that he knew the procedures as well as I did.

HUNTER: Was the discussion of a loss of coolant condition discussed at that time?

MILLER: Between the two phone calls, we discussed the...we discussed the thing and we had agreed that number one, that the pressurizer instruments were what we would believe. We didn't believe we had a leak in the building, we did discuss the fact that rupture had blown. George and operators had recognized that, so therefore that explains the coolant in the building. And there wasn't significant building pressure to us at that time there was I believe discussion that we...that they didn't believe they had a primary leak or a LOCA.

HUNTER: Okay Gary, let me pursue that a step. Did the fact that the reactor coolant drain tank rupture disc had blown, is that a normal evolution or is the fact that the reactor coolant drain tank was hot? Is that a normal evolution?

MILLER: I...in Unit 1 and 2 we have reactor coolant drain tanks. Unit 2 it is a little different and I don't specifically remember how often we've blown that rupture disc. But in Unit 1 on this site we had blown that ruptured disc four or five times in Unit 1 in the initial cycle. So the fact that disc is ruptured, didn't in itself indicate a new kind of problem, just that it meant we may have started out with a high level in the drain tank, or maybe ruptured that disc with the trip we had had. Although we weren't cognizant of exactly when it ruptured on the finders. If you look at the traces now, you can see quite a number

of minutes. It wasn't in that kind of time frame so you could make a nice analogy of it. We didn't look at that as an indicator or another kind of problem at that time.

HUNTER: They heard the reactor trip following the turbine trip by 8 seconds giving a high pressure alarm. The high pressure reactor trip normally ends up with the power operated and or safety valves with the end...depositing the energy in the drain reactor tank, that's the normal.

MILLER: No, I don't believe we that to my knowledge opened any code relief valves around here, cause you normally on a high power trip don't get the code relief hours, you get, you know, you get your usual things but the reactor trip generally terminates that. But the electromatic has gone by that time, it has lifted by that time, we are aware of that. I don't, we didn't go through a discussion of that in those specifics. We also knew they had measured...I think we may have talked that they had measured temperatures on the pipes. It's hard for me to separate, because I've seen data afterward, but I don't believe they thought they had leakage through the electromatic. I think when Lee Rodgers asked that question he was trying to give himself assurance that the electromatic was shut. I think we all assumed that initially, yes, from the background that it was shut.

HUNTER: Okay, and, again George Kunder was your primary contact initially and then very shortly though there were a number of people in the control room and that apparently Seelinger came in, in between...

MILLER: I think you've got to say that George Kunder lived right outside the gate, so he can get there pretty easily, he lives within a mile. So that's one of the reasons George was there first. Joe Logan was probably on the way in, he lives 70 miles away. Dick Dubiel was on the way in, early in the morning. He got called, I don't specifically know why. He may have just come to work. All these guys in Unit 1 were in refuel were coming to work for meetings, and they were coming at 6 in the morning. A lot of guys like Mike Ross went to Unit 1 initially, because that's what his normal duties were, then when he got there the shift supervisor called him for help. Jim Seelinger went to Unit 1 and I directed him to come to Unit 2 around 8 in the morning because I wanted his technical help. He worked Unit 2 for a while and I wanted his technical advice. Once the ECS was in automatic and we had Tom Mulleavy up there, and so forth, I brought Seelinger down to Unit 2 to be part of my think tank.

HUNTER: Okay, during the Unit trip, the emergency feedwater that were... the emergency feedwater pump started but the EF 12 A & B valves, the individual valves to the feed generators were closed. When did you become aware of that particular item?

MILLER: I can't truely honestly remember, but I believe I was aware that we had a problem with the B generator somewhere in the 6:00 phone call or at 7:00 when I got there. I was not aware the valves were shut until I was briefed from 5 after 7 on. Somewhere in that next hour or two, I was aware that we had had a problem with those valves on the trip.

HUNTER: Who briefed you at that time on those valves?

MILLER: My memory says Mike Ross. You have to remember all so that one of the reasons Mike Ross was down there was that Mr. Floyd who was the Unit 2 shift supervisor was at training in Lynchburg at the simulator. So while I normally would have had Jim Floyd down there, I had Mike Ross. Mike Ross was a Shift Supervisor and is dual licensed, licensed on both units.

HUNTER: That's a good point, Gary, let me ask you. In your background are you licensed, or have you been licensed on either Unit?

MILLER: I was licensed on Unit 1.

HUNTER: And George Kunder, is he licensed?

MILLER: George Kunder is licensed on Unit 1, he was assuming the Unit 2 duty as Technical Superintendent and he was in the process of trying to get a license in Unit 2. The Shift Supervisor, Bill Zewe is licensed in both units. The man I had down there, Mike Ross from Unit 1 was licensed in both units. Joe Logan is licensed in unit 2. Jim Seelinger is licensed in both units and that covers pretty much the licenses that I had.

HUNTER: Okay, thank you Gary..

MILLER: I might also mention Herbein was licensed in Unit 1 at one time.

HUNTER: Okay, good. Do you know of any reason then or do you have any feelings for why you were not made aware that the emergency feedwater system was abnormal during the trip?

MILLER: I really can't answer that and I may have been told something about it but I don't remember, but I think I would have picked that up. Okay, I don't remember being told about that.

HUNTER: Were you involved in the...at the time you came on site and became the emergency director, did you get involved specifically with the reactor coolant pump, cavitation problems, the alarms? And did you strictly start at that time and move forward?

MILLER: The time I came on site was 5 after 7, the pumps were all turned off. At the time I got briefed, my first concern was the emergency plan since we were in it and I was convinced we had it and that it was real. Then I began...I came back to the plant...we as I remember, decided immediately to try and start the pumps and we started one or two or three and we got 100 amps, totally no flow, which told us we weren't pumping anything and that's what I'm saying when we talked earlier about whether I thought we had a bubble. We all thought we had a bubble, right then and there. We thought the pump was running, we felt the pump was running 100 amps because it wasn't pumping any water. The only thing I did at that point was I told Mike Ross that we kept HP injection on unless I specifically said otherwise that whole day. The operators were still tending the, at least I perceived, the operators were still tending to use the pressurizer level as their indicator of a full system, and they were still tending to throttle HP injection and try and recover pressurized level which I think is an instinct that all of us have in this program, the present and past. I had just told Ross that we did not secure HP injection without me personally knowing it.

HUNTER: Gary, can you elaborate a little bit on the that that was that I think your saying 7 to 7:05 or...

MILLER: 7:30.

HUNTER: 7:30 when you had control of the situation, you had assumed the side of emergency director and you talked to Ross. What did that mean to you? You said do not secure the emergency high pressure injection without your specific concurrence. Did you give him any other instruction as far as in gallons/minute, pumps?

MILLER: I don't remember if I gave him gallons/minute or pumps. I was afraid that the HP injection would get turned off without me knowing it. All I told Ross in very strong language was that it didn't get secured without my knowledge. I didn't...I don't remember giving it a number.

HUNTER: At any time during the daytime, did he come back and indicate to you that the HP injection had in fact been turned off or had not been operating?

MILLER: My memory is that somewhere between 8 and 9 in the morning, it was turned off. See, I've got to phrase this really when I got the watch between 7 and 7:30, it was on to my knowledge, it didn't bother

me. The statements I just made really occurred somewhere between 7:30 and 8:30 when I was told or when I remember hearing, they had turned it off at that time, I pulled Ross back into the shift supervisor 's office where I could be alone with him and I told him in quite strong language that he should not turn it off without talking to me personally the rest of the day. That was one thing that he couldn't do without seeing me.

HUNTER: In your understanding, and in our understanding a little bit more of what the definition of high pressure injection is. If you indicate to not turn it off, what would...what's the normal injection mode and the normal injection flow that you...as would understand it?

MILLER: Well the design point in the system is probably like 500 gallon a minute pump down at 600 pounds on the accident. So I would, I didn't...to be honest with you, I felt telling Ross to keep it on gave him enough direction since he's licensed to keep the HP injection on. All of us recognized that you could probably have a LOCA with a failure and have one make up pump supplying the HP injection. I would have, I would have counted on him to pick a minimum number is what I'm saying.

HUNTER: Okay.

MILLER: In fact at that time, our hope internally was to charge it solid somehow.

HUNTER: To take the system...

MILLER: To get the system solid again. We did recognize that from pumps starts that we didn't have a solid plant.

HUNTER: Were your discussions at that time centered on pump cavitation, pressurizer levels or reactor coolant pressure, for instance? For the key of not being solid?

MILLER: The discussions we...I think you've got to look at...what we looked at as I remember it that morning was we started, we tried to start pumps right away. In fact Lee Rodgers was the big driving force trying to start pumps. We didn't get anywhere and that made us feel there was a steam bubble in both candy canes, the hot legs which are higher than the pressurizer. We felt that through the steam generator we had one left, the alpha steam generator, steaming internally, and HP injection we were getting some circulation. Our concern was fourfold, from time one, in maintaining core coolant, the other thing is that I had Ivan Porter read out the thermocouples on the in-cores which are not a device that are extremely accurate, but they are an indicator, it came out question mark on the computer. He sent an instrument tech

down, the instrument tech came back and Ivan told me that some read 200 some read 400 and some read 250 and some didn't read. Then he explained to me that if they were really hot they would melt and form other junctions and that the calibration wouldn't be good anymore. So, you know, the bottom line here was that they're hot, they were hot enough that they scared you, as far as what you're looking for. It told me the reason the computer was off scale at 700 degrees. So I came in at 15 after 7, T_h was pegging high, T_c was pegged low. The in-cores were reading anywhere from 2500 or so, and I picked 2500 it could have been higher than that. But that, you know, I was looking for a gross indicator and I had it. Our goal was to maintain HP injection, maintain steaming, core cooling and attempt to go solid. I know that we were super heated and all that sort of thing, I don't think we tumbled to that kind of lodge but we just knew we didn't have a control, we were out of control. We knew the situation was one we hadn't anticipated too many times here.

HUNTER: In your discussions from the time you became site emergency director until, throughout the day, the think that Mike Ross was your key individual and Joe Logan or was it just Mike Ross that you...

MILLER: If I had to pick the key individuals that day, it would have been Mike Ross, Lee Rodgers, Dick Dubiel, and Jim Sealinger. Dick Dubiel from the emergency plant and exposure and survey point, Jim

Seelinger because he's got a good technical head on his shoulders licensed in both units, Mike Ross was a good operator, Lee Rodgers as a B&W guy with a lot of experience. Those guys I assembled together, now they...Lee tried to talk I think to Lynchburg probably through various channels and he was talking to Greg Schaedel at times of course talking to Lynchburg. To my knowledge, there were some of your people were up there and I was very open with them and asked for anything they could tell me. They were very cooperative, they didn't really know what else to do either. So we tried to use that whole group to talk to anybody that would talk to us. Following each one of those meetings we made a decision and...I made a decision and then that's what we did.

HUNTER: Were minutes kept of these meetings or what went on in the room? At all?

MILLER: No. And like I say I wish we had a tape recorder because...I did attempt to keep Seelinger and myself and Ross tried to keep some personal notes. Things move at an incredibly fast rate from the time we spent...

HUNTER: Question concerning use of procedures again, Gary, as far as the use of procedures and the ones that were used, you did discuss that with George Kunder? Zewe and Scheimann as far as what the status was and what procedures were in fact being used?

MILLER: Yes.

HUNTER: Okay. Did you discuss, either in the conference call or after you got in, natural circulation with Kunder or the group? When you came in, T_h was past high and superheat, T_c was low you might if you can indicate what that meant to you?

MILLER: I don't remember natural circulation discussion in the 6 o'clock phone call. Somewhere, remembering that I got there at 5 after, it took 10 minutes till I got briefed. It took the next period of time, time does get compressed for some reason and it does go faster than I think. It took me some period of time to get the Emergency Plan rolling and assure myself. My biggest concern wasn't the plant at that time, my biggest concern was the radiation cause I considered that to be my primary purpose at that moment. So my big concern was accountability, mustering of people, getting the notifications made. In fact I have that stuff pretty well memorized from the drills. In fact I have white cards with the emergency drill on it. I was more concerned with the fact that the teams were out with a meter on that the meter at Yorkhaven

was on, we have a radiation meter at Yorkhaven, got a State Police Helicopter to come in. That consumed probably my first half-hour. Then ...I depended on Ross at that point. Then we sat down it the shift supervisor's office, somewhere around eight o'clock or so, and agreed the Emergency Plan was under way and then started talking about the unit. How the hell we get the unit solid again?

HUNTER: Okay.

MILLER: And at that time we discussed natural circulation and we discussed how we were cooling the core. Our only concern, you know, we had very low pressure on A steam generator which indicated to us we weren't getting much natural circulation. And the plant's T_h offscale high we put a recorder on it so we could read it. We knew it was between 700 and 800 degrees. T_c being low indicated we were having some effect with HP injection. Because the T_c thermocouples...we went over and looked at the elevation drawing, my memory is that it is on the suction leg of the reactor coolant pump. So we did feel...plus steam generator downcomer temperature, and some of this is covered a little better in my testimony. Amongst those parameters, we felt we would get some natural circulation, with the HP injection, we didn't know what flow we needed really, we were trying to keep it on. We felt

between those things we were getting something. We weren't totally convinved the core was covered. But we didn't know what instrument to look at to tell us that.

HUNTER: Gary, had you seen decay heat curves, calculations at that time? Minimum flow required to cool the core?

MILLER: I had not myself seen those. OK. I believe though that Mike Ross would have been pretty much aware of what decay heat was like. But I think...to ping on some of my other people, that were helping me, I don't believe we have, as far as the amount of flow needed in this conditions, it would have been a tough one to call because of were we were. You know, it wasn't like we had a break, it was like we were pumping water in, taking some out with a steam generator and I'm not sure that would have told Mike Ross exactly what he had versus what he needed. We had some fears the core wasn't totally covered. We knew we were throttling, see we were throttling with the electromatic block valves. See I was pumping 2000 pounds, that's what our goal was. Pump 2000 lbs and drop it on the floor. We didn't know how much of the water was going to cross the core. We weren't convinced in our own mind that every gallon per minute...we were concerned getting cooling but we weren't in our own mind convinced we weren't short circuiting

the core. We really didn't know what indicator told us the core is covered. Now we were being conservative. And the radiation monitors were still going up.

HUNTER: Gary, the question I...go back we passed it very quickly and I want to make sure. At that time were you throttling power operated relief valve or were you opening and closing it?

MILLER: To my knowledge, we were throttling with the block valve. And the other valve was open.

HUNTER: You were maintaining pressure with the block valve?

MILLER: With the block valve. Specifically we had discussed going against the code safety valves which would not have bothered us. We just didn't feel we would get anywhere. We thought we needed...we just couldn't seem to get the plant even going towards a solid condition. We discussed going against the coded relief valves, the only reason we didn't do that I guess was because we didn't feel we had to yet and we weren't sure that would take us solid. And we did have pressure indication and we probably who have gone beyond the range of the instruments. We didn't want to loose that till we had to. Plus we had control with the block valve.

SHACKLETON: Gary, you indicated when you throttling that the radiation levels on your readouts were going up. Is that correct? Cause you said they were going this way and that doesn't come on the tape.

MILLER: I might say that when I got there at 5 after 7...let's not talk dome monitors, let's talk to the other ones, all the other monitors were going to the alert and alarm state. The dome monitor passed through 8 R somewhere right around 20 after and it was still going up. When I say it was still going up, I'm talking mainly the dome monitor. I don't know what acceleration rate it had, but it was going up into number that you'd read about in your life before but you'd never though you'd see. I'm talking in terms of 30-40,000 R. That type of thing.

SHACKELTON: Thank you.

HUNTER: Okay, this was at the time that you were controlling pressure and...out the power operated relief valve/block valve and charging into the system, with the makeup system running. Hopefully, cooling the core, hopefully that the water is going through the core.

SHACKLETON: I think you'd better break at this time on this tape and we'll change to another tape. The time is now 1:45 p.m. Eastern Daylight Time, May 7, 1979.

SHACKLETON: This is a continuation of the interview of Mr. Gary P. Miller. The time is now 1:48 p.m., Eastern Daylight Time, May 7, 1979. Please continue.

MILLER: Let me say one thing, and I've said it in my testimony and it's an honest thing, I was here that day twenty-four to thirty hours and I have, also, I've had a problem remembering exact times and I'm sure of a couple of them. But a lot of them the time past and I don't have as good a handle on the exact hour. That's not just true of me, I've talked to other people so I think it has something to do with the kind of stress we were under up there.

HUNTER: Okay, Gary, let me cover another area. Basically, the plant was at pressure, the high pressure injection was running, you were controlling pressure through the power operated relief valve block valve and then there was a decision to depressurize the plant and go to a lower pressure. Can you elaborate in that area, of that, the reasoning of that decision and where you were headed?

MILLER: We met some time... we had been through the hours of the morning... couple hours in the morning, we had pumped somewhere, I guess twenty foot of the borated water storage tank into the reactor building, we were getting some circulation, some natural circulation

with the steam generator, we had kept the Bravo Steam Generator isolated because it was determined that it might had a leak possibly earlier in the incident, we done everything we could to attain better natural circulation, we pumped HP injection in, we, as I said earlier, we were concerned that core was covered, that we had enough natural circulation and we didn't see our way to a stable condition. A stable condition meant a reactor coolant pump running or the decay heat system in effect and we... I, also, personally, didn't really desire to pump all the water out of the BWST in the building on the floor and then try go to what we call the "piggy-back" mode although I would've would have done that. Those kinds of concerns made us decide that, possibly, if we go down to the core flood pressure, still maintaining HP injection as we could... there was one other concern, the RCV 2, the block valve for the spray valve... sit in top pressurizer, it's a gate valve, not a throttling valve has failed open and closed on this unit and on other units. We were somewhat concerned that the cycling on that valve might cause it to fail open or shut and that would, that would give us a very limited number of paths in and out of the system without a break. In other words, we'd of had the pressure under...vent and code relief valves and that would've been it. So, based on a lot of that kind of discussion with the command group I've discussed earlier we, I decided to go ahead and come down towards core flood. We did that and we did get to 440 pounds, as as I say our hope was either a reactor coolant pump or decay heat. We got down to 440 before flood tanks responded,

they responded by going down in level a foot or a foot and a half, and that gave us an assurance that the core was basically covered and the HP injection path we were on was not short circuiting the core, and we had to hope that at that time that we might be able to get lower in pressure but we were not able to get below 440 pounds.

HUNTER: Okay.

MILLER: At the same time, we didn't deduce this, but when we did get down towards core flood we saw the first...additional response from the A temperature instruments. In that, I mean, T_h seemed to come down, T_c seemed to come up. So, for some reason, quite honestly, I don't think we technically understood why. We got some response from the instruments by playing with core flood pressure, when getting down to core flood pressure, and also by, I forget which, I think its' the C leg, we favored the one injection leg which seemed, which seemed to encouraged the response in collapsing that bubble in the A loop. So, we had hoped to stay in that condition long enough to get enough water in the loop to start a pump or to get down in pressure.

HUNTER: Miller, in this same time frame, speaking of different flow paths, did you discuss the use of the pressurizer spray valve or was it being used?

MILLER: Yes, it was. To my memory we used it and the block valve to get down in pressure.

HUNTER: Okay. What about the pressurizer vent line that apparently parallels the power operated relief valve, goes to the reactor drain tank?

MILLER: I don't believe we were using that line. It would've been a path we could've used but it's a smaller line. I don't remember using it. Mike Ross could've used it without me knowing it. He would've been smart enough to do that, I might not be aware of that.

HUNTER: Can you elaborate some of the use of the spray line? Do you recall why it was used, what the benefit was for using the spray line?

MILLER: I don't recall.

HUNTER: Alright. Then you got down to the point and you made 440 pounds. Do you recall whether the pressure was decreased quickly or slowly or?

MILLER: Not quickly, but I don't remember the exact ramp down, it came down, it came down steadily would be the best way I would describe it.

HUNTER: Did you try to dump the core flood tanks totally?

MILLER: No, we were not trying to dump them totally. I think we should say we thought if they dumped totally that would've indicated to us that the core wasn't being adequately covered by the methods we were using. When the core flood tanks leveled out at a foot or a foot and a half down, that gave us assurance that we were...that we were putting enough water in to keep the core covered. We had seen a level decrease in those tanks about a half, a half a tank. That we would've been looking to increase HP injection. I guess we'd a had a hard time evaluating that. Knowing it went down a foot, a foot and a half gave us assurance. Had it gone down a lot we'd of probably attacked the problem a little different.

HUNTER: Did you try to reduce the pressure further to your knowledge?

MILLER: Yes.

HUNTER: And in fact put more core flood tank water in the plant?

MILLER: We tried to reduce, I think it's fair to state that right after we got on core flood I went to the Lieutenant Governor's Office. At that time, I think Mike was still trying to reduce pressure further and still hope for decay heat to be honest with you.

HUNTER: And he could not in fact reduce pressure?

MILLER: He could not reduce pressure further than my watch. The other thing is I think the only... We know that we had to blow down through the block valve cause the spray line wouldn't do much for us... So we discussed earlier...Mike might've used that other vent to help it and I might not be aware of it.

HUNTER: Alright. The attempt at tha time was to core flood tanks and get on the decay heating system. Decay heat system, then, would take the suction off the hot leg so the plant could be...and cool the water and discharge it back to the cold leg.

MILLER: That's right.

HUNTER: These pumps are located outside the containment.

MILLER: They're located in the auxiliary building in vaults.

HUNTER: Could you give me a feeling of your knowledge of the conditions of those pumps?

MILLER: We ran those pumps in preparation for that.

HUNTER: And what did you...what did you...?

MILLER: To my knowledge they were ready to run.

HUNTER: Were they leaking that at time?

MILLER: Not to my knowledge. That doesn't mean they weren't leaking but not to my knowledge. My under...as I remember it the operators were told to start them and run them maybe on recirc, I'm not totally sure and they did that and it was reported they were ready to go. There was not valve line up made with the primary system that I was aware of. I might also say in this same time frame in the afternoon we also were looking at the reactor coolant pump and we had problems with some of the motor driven lift, oil lift and back stop pumps. We were trying to get...we had lost some switch gear that supplied those. So I didn't...we didn't have the ability to start a reactor coolant pump unless we were appraised of the oil pump. At that time so we were also working on that angle too. Plus we'd lost most of the pressurizer heaters, or at least half of them, and we were trying to get the electricians to regain some of those. Since that was...you know, if we get...if we could get a bubble in the pressurizer we also felt we could shove water back in the legs. We never gained that control either.

HUNTER: Okay. Another area I want to touch base with you on is, during depressurization of the system, it becomes apparent that the pressure, the hydrogen concentration in the containment was increasing, would you... was that discussed at any time during the day time?

MILLER: That was not discussed to my memory, could've been but I don't remember discussing it.

HUNTER: No discussion of the possible increase of the hydrogen concentration?

MILLER: Not to my knowledge.

HUNTER: Were you aware that you had the 28 pounds?

MILLER: I was aware of a loud noise in the reactor building, I heard it at the control panel, in fact, I asked what that was. To my knowledge the other people standing there didn't hear it. One operator tells me or one engineer tells me that when I said that he looked over and the building spray pumps had turned on which means that we had over 28 pounds.

HUNTER: Let me give you some information and see if you...if it ties something together in somewhat of a form of a question. Were you aware that at the instant, or had it come to your attention that the instant within the computer printout time frame and the operators discussion that the ignition occurred at the same time the power operated relief valve was opened?

MILLER: No.

HUNTER: And the computer, the reason I say the computer, because the computer showed pressurizer heaters tripping at that time, you couldn't construe that either one of those conditions might have...although pressurizer heaters tripping basically is outside, it can't...it would've been a hot short or something to give a spark. When or had you become aware that the Shift Supervisor was aware that the spike occurred at that time?

MILLER: He could've known. I did not at that time have that knowledge and also you've got to think, you have to remember that right after that time I was preparing to leave the site. So, I was out on the panel watching us going to core flood. Following that noise and so forth, I went back in and prepared to go and he could've talked to Mike Ross and I wouldn't have known that conversation occurred.

HUNTER: At this point, Jack Herbein...and you still have the control... your previous discussions indicated that, you maintained control and were issuing orders throughout, throughout the evening.

MILLER: From about 8 p.m.

HUNTER: At that point, you indicated then that Jack Herbein took the control at the command center.

MILLER: That's right. The 8 p.m. is the time that I picked. It could have been a different time but it's in that time frame. During the day Jack could've had discussions with Mike. He's people. But there was no move I know of that was made that I wasn't aware of and secondly, I guess the one point that were around five in the evening or so Arman and Herbein directed me to take the plant solid at a higher pressure or try that again. That's one point were I accepted that decision and started trying to raise pressure and I said that somewhere around 7 or 8 or 7 at night I began to fully communicate them and get direction from them.

HUNTER: Was that repressurization which was really the next major event to get at least to a stable condition? And you said that was a decision made by you after a lengthy discussion with Herbein?

MILLER: They and I and my understanding was that GPU Engineering and B&W and GPU concurred on that course of action. Thought that was the best way to go. Inside the plant our primary goal was to run a reactor coolant pump, repressurize and run a reactor coolant pump and that's the way we were proceeding inside.

HUNTER: Alright. Available to you as far as consultants, inside the plant at that time you had your think tank set up, it included Lee Rogers, B&W didn't it?

MILLER: Yes.

HUNTER: Are you aware that he had...or did he have any communications with Lynchburg to your knowledge?

MILLER: To my knowledge he had communications with Lynchburg and in fact he had communications with Mr. Greg Schaedel who I understood was having some communication with Lynchburg and also as an evidence of this, when I decided to run the reactor coolant pump, he was on the phone with either Schaedel or Lynchburg and getting advice as to what I should to do to bump that pump. For instance, I didn't have any AC back stop or AC lift pump. I wanted to run the pumps on the DC lift pump without a back stop pump. The did not object to that and, in fact, I would've run the pump without and an oil pump if I'd of come to

that at that time because the pump was the way out in our minds at that time. So, during that time frame he was discussing it with them, I didn't...they didn't never concur running the pump but I used any information that was useful they gave me.

HUNTER: Of course you had communica ions with Met Ed - GPU through Jack Herbein, I presume?

MILLER: Through Jack and also Jim Seelinger and Lee Rogers both had talked to Jack at various points.

HUNTER: Was there anyone else that you were discussing...?

MILLER: I...not talking the emergency plan, I was talking to people like Sid Porter and the State. Talking the technical portion of it, I also had some communication with some of the NRC people but nothing which was a formal type thing. They would ask questions and I would give them answers and they would provide advice and we took their advice.

HUNTER: Now, Lee Rogers was onsite, anybody else from the outside organizations like John Flint I think was available.

MILLER: There were others onsite and I wouldn't want to get in my memory because I stuck pretty hard on the five or six people I wanted to deal with because I didn't want to get deluded. But there were other people...there were other people onsite, for instance the Unit 2 lead engineers, the Unit 1 lead engineers were around, the QC head was around, some of Lee Rodger's people were around.

HUNTER: The use of the in cores has been discussed, the self powered in core detectors, did you have any...did you use those or was it discussed during the event to use the in cores?

MILLER: I, early in the morning used them as my first indicator because there aren't many indications in the core and they are one of them. To be honest with you, Unit 1 only, I believe has those thermocouples wired out. I was never trained that those thermocouples were too much of a device you were to use but I used them because they were the only the only indicator what was going on in the core I had that was direct. So, I did utilize them but only to tell me that what I had was that severe, more than to prescribe a procedure or action or something.

HUNTER: Okay. What about the self powered in core neutron detectors? Was that discussed?

MILLER: That was discussed plus the excores. We watched both of those. Early in the morning that was discussed if some thing had occurred. You know, we did not see, that I remember, after seven in the morning any kind of an upward response on those. We were looking at those. They had showed an upward response earlier in the morning. In fact early in the morning they probably emergency borated it...things based on the excores going up. And you know they had low boron samples early in the morning and they thought they were getting a low boron when they were probably taking water of the damn core.

HUNTER: I understand. I don't have any further questions at this time, Gary. I appreciate your time and would also like to indicate that after I review this conversation and would also like to review your transcript. I would like to indicate that I would be getting back and try to cover some of the specific decisions at that time.

MILLER: I don't have any problem with further interviews. I think you got to remember the further we get the harder it is to become honestly specific and I'll give you the answer as honestly as I can. Testimony gives my logic as best as I can present it and I, also, might say that the level of stress that I felt under that day was almost intolerable because, I think the situation as I've said was one I wasn't schooled in, secondly, the amount of communications I was trying to accomplish were almost intolerable and that I actually removed myself at times

from that to think. There was very little time to think, I just want to make that point and not that that won't happen the next guy. It's very hard to focus on the plant when it's in an unschooled condition and you're trying to explain it. Otherwise, any time you want to interview me, I'm available.

SHACKLETON: Thank you very much, Mr. Miller. We really appreciate all this time from your busy schedule. We'll close this interview now. The time is 2:08 p.m., Eastern Daylight Time, May 7, 1979.