UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of Richard Dubiel, Supervisor,
Radiation Protection

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

April 25, 1979
(Date of Interview)

June 21, 1979
(Date Transcript Typed)

80
(Tape Number(s))

NRC PERSONNEL:
Robert Marsh
Dale Donaldson
Thomas Essig
Lawrence Jackson

MARSH: The date is April 25. The time is 4:32 p.m. This is Robert Marsh. I am an Investigator with the USNRC, Region III in Chicago. We are together today to resume an interview with Richard Dubiel. Dick, when we finished up last time we had agreed to get back together and I just want to review a little bit some of the things we covered the first time. Particularly, I want to discuss the letter that you had signed at the beginning and be sure that nothing has changed. At the end of that letter had been several questions which I want to go over again. Do you recall the content of the letter and the discussion of the ground rules and the purpose of the investigation?

DUBIEL: Yes, I do.

MARSH: The second question read, Do we have you permission to tape the interview?

DUBIEL: Yes, you do.

MARSH: I assume that continues, right?

DUBIEL: Yes, sir.

MARSH: And do you still want a copy of this tape and transcript?

DUBIEL: That's correct.

MARSH: Fine, I will provide you with a copy of the tape at the conclusion of today's session, and the transcript may be delayed coming to you. We are still typing them but as quick as they come out, I will also get you a copy of the typed transcript. Again, the fourth question which does not appear at the end of that two page letter but is covered in the body, and that addresses your right to have company representatives or a union representative present during this interview. What is your preference to that?

DUBEIL: That won't be necessary.

MARSH: Okay, at that point, I think we've had already gone into your background on your first interview. I will turn it over to Dale. Why don't you introduce yourself once again, give your position and spell your last name and we will go right around the table once more.

DONALDSON: Dale Donaldson, Radiation Specialist, USNRC Region I.

JACKSON: Larry Jackson, Radiation Specialist, Region II.

ESSIG: Thomas H. Essig, Chief, Environmental and Special Projects Section, Region III, USNRC.

DUBIEL: Richard Dubiel, Supervisor, Radiation Protection and Chemistry, Metropolitan Edison Corporation at Three Mile Island Nuclear Station.

DONALDSON: Dick, we left off at the end of the last interview. We were discussing ventilation systems and internal recirculation lineups in the various control rooms. And, I think when we left off we had gotten most of what you knew about the systems at that time and we left off about 11 o'clock on the 28th of the first day. And one of your last statements, I'll go back to my notes here, talking about having been back to the Unit 2 control room at approximately 11 o'clock.

DUBIEL: Dale, could you just repeat that again. The last statements, I am just trying to get myself oriented again.

DONALDSON: At approximately 11 o'clock, you placed yourself back in the Unit 2 control room.

DUBIEL: That does not imply that I had ever left the Unit 2 control room. Okay, I had been in the control room the entire time, from the time I arrived during the very early stages of the site emergency, right through the entire day. At approximately 11 o'clock or thereabouts as the morning progressed, the coordination of the off-site teams and the off-site readings and the air sampling and analysis became more and more a function of the emergency control station and specifically, being controlled by Tom Mulleavy and Len Landry, Len joining him at

some later time during the day. I really don't have a specific time that Len joined Tom at the ECS. My major concerns at that time, as the morning progressed, were really starting to focus on in-plant. I felt that the off-site monitoring capabilities were well established and the system was in place and progressing as quickly as could be expected and that it was in capable hands. And I was very much concerned with the actual events in the plant, trying to use my plant-specific knowledge of the ventilation systems, the gas systems, the waste gas systems, some of the liquid systems to try to assist the control room in determining the problems that we were facing in the auxiliary building, and even more importantly, because we were starting to get into some emergency maintenance in the Auxiliary building and due to the radiation levels, I felt that it was essential that I stay very close to the people who were going in the Auxiliary building and try to be as instructive as I could, trying to get them going into the building and out with a minimal of exposure, more importantly to ensure that we were not getting any over exposures. It was a very difficult task trying to maintain a handle on radiation levels in the auxiliary building. Just due to the high levels we were not really able to send people in for just the purpose of surveying so entries were being made only for maintenance or specific operations, and those personnel were, . . . I was throughly briefing each and every one who went in the building and trying to accumulate as much information when they came out of the auxiliary building as possible so that we could start mapping dose rates to get a better handle on what kind of problems

we had in the Auxiliary buildings, both to hopefully, determine some specifics that might help the operations personnel and also to able us in radiation protection for further entries.

DONALDSON: Dick would you characterize your interface with the operations side of the response as effective? By that let me clarify by saying, in the event that the operations group needed samples, needed additional line-ups of valves, whatever, were they coodinating these requests with you.

DUBIEL: Absolutely. We had taken up a position. My personnel, . . . I had several of our own Metropolitan Edison health physics technicians in the control room with me. We had taken up a position to the back corner, the northwest corner of the control room in full view of the operations of the panel themselves and all the operations personnel. And I myself tried to stay, actually I was situated right behind the computer almost the entire time so I could not only keep a good handle on people getting ready to go out into the plant but also what was happening in front of me on the panel. And that anytime that thoughts were even entertained by the operations personnel for entries into the building for any purpose, I felt that I was involved or knowledgeable of the entries prior to the final decision even being made to go in. All entries were made with, I think the operations personnel were very much concerned themselves with the radiation levels and the hazards in the building and were not anxious to go in

without speaking to us and getting a very thorough briefing from either myself or the technicians. And I personaly conducted, I don't want to say all, but I think 90% or better of the entries, I personally spoke with the individuals.

DONALDSON: Realizing the conditions under which you're operating, I am assuming that you suspended normal RWP procedures.

DUBIEL: During those hours, yes, the normal RWP's were suspended. As a matter of fact, I don't believe we used RWP's for the entire first day. I don't recall the exact time that we went back to them. It may have been late night or early morning of the 29th or it may have been later in the day of the 29th. We went back to them primarily as a suggestion from one of the NRC personnel in the control room. It was a good suggestion, more to document entries, to document why the individuals went into what areas, who the individuals were, and then their doses in those entries. And I don't know of the specific time that we went back to them but it was not during at least the first 12 to 18 hours.

DONALDSON: Was, in the interim between the period when RWP's were reestablished, is there a log book maintained by yourself or a recorder who is your assistant, to sort of document the flow of actions that are being considered, perhaps either for your back reference at a later time if somebody asks you to duplicate something that may have been already under consideration?

DUBIEL: Do you mean a log book specifically detailing the health physics precautions or from an operations standpoint?

DONALDSON: Well, I guess what I really had in mind is, within the purview of all the duties and responsibilities that you had upon your shoulders at that time, was anyone serving as a recorder for you, to document the chain of events or important information that you yourself may have needed in order to assist in helping operations make decisions for further work efforts?

DUBIEL: There was no specific individual nor any specific log being maintained. We were maintaining records of radiation levels of any areas that we had entered into, surveys, air activities. From an events standpoint, I think, or I can soundly answer no. We weren't doing that.

DONALDSON: I wonder if you would comment in general, again looking back, and give me your feelings about the kind of interim method for controlling the entries or documenting levels, or essentially do you feel it would have been helpful if you would had something in an emergency situation similar to an RWP, or some means of at least doing perhaps an abbreviated method of establishing controls?

DUBIEL: There is no question in my mind that it would have been a benefit to even have a one line entry in a log book indicating name of individual, where he went, his exposure, and possibly time in the area

from trying to determine future reference for inhalation, potentially inhalation problems. Yes, I think it would have done, the right thing to do.

DONALDSON: In looking at your emergency procedures and the planning,. the forethought palnning that went into the development of the various procedures and duties, do you feel that that area was adequately covered or thought out in advance, that is, under emergency conditions when it may be necessary to suspend normal RWP activities or the issuance of RWP's, the designation of a central authority or at least someone who is briefed or releases an action to be completed before the action starts. . . is that included in your procedures anywhere?

DUBIEL: The procedures themselves do not address in any great detail, in-plant radiation protection support, if you will, or coordination of maintenance and operations. It does present some specific, or I should say general instruction or definition of who is to be responsible in those areas. I think, . . . my general feeling, in retrospect, looking over the plan and what happened, the actual recommendation of the plan, I don't think the plan does adequately address that, and I can also say quite honestly in my own mind that I never conceived of the type of maintenance and operations activities that would have to go on in areas of such tremendous radiation dose rate levels as we had here. I think the plans were more or less based or written around the accidents addressed in the FSAR, the MHAs changing addressed in the

FSAR, the classic LOCA or fuel handling accident, and things of that nature, where I think you have such a different situation. My personal feeling is I don't think anyone really assumed or felt that we would ever get into an Auxiliary building that had the type of radiation levels that we saw. And not only did we get the levels but we also had to do a tremendous amount of system modifications to try to control the accident in the Auxiliary building. And I can quite honestly say, that no, the plan was not written for that type of a situation.

DONALDSON: Would you say then in retrospect that your advice to other planners and to the Commission in general is to consider looking very carefully at the development of emergency health physics in-plant control methods that can be rapidly be put in place and provide a degree of control commensurate with the urgency of the situation?

DUBIEL: Yes, I think that it's absolutely necessary, both from setting up an administrative system, if you will, referring to the log books, personnel in charge, defining the who, what, and when of maintaining health physics control, and also the hardware. I felt that we were seriously handicapped by the lack of high range instrumentation Scott-Air pacs, things that really we needed to serve the rest of the people. We were strapped with the lack of teletectors, and lack of Scott-Air pacs. It was a serious handicap that entire day and we had to make do with what we got. On several occasions we had people going into areas with RO2s, 5R instruments, and of course, the briefings that I was

giving to all the personnel did include the fact that if they were using that type of an instrument the moment they saw it approaching full scale they backed out regardless of what their task was. But it did seriously handicap us. I think that whole area should be addressed. I guess what we have done is redefined an accident or an MHA. The levels that we saw in the auxiliary building I personally never believed could exist, and these weren't areas back in the valve alleys on tank cubicles but just general areas.

DONALDSON: Dick, I'd like you to think for a moment about the relative content of two implementing instructions: your site emergency procedure and your general emergency procedure. If you could, would you very briefly characterize the difference in the scope of the response between these two procedures as it is discussed in your plan.

DUBIEL: Well, essentially, the procedures are almost identical. Site emergency procedure has specific criteria that gets you into the procedure as specific actions for all the personnel. The entire emergency organization is mobilized during a site emergency. The main difference in a general emergency is that we have slightly higher action levels or we have different action levels, which is primarily the difference between a potential and an actual situation. The site emergency is designed to go into, . . . by definition it is a situation that could evolve into a general emergency and therefore you are trying to get one step ahead of the game by getting your general

emergency plan procedures implemented. That is essentially what it does; the site emergency procedure is almost I would say 95% the contents of the general emergency procedure. Very very similar.

DONALDSON: I don't know if Tom or Larry had some, . . . I know they had some specific questions. There're a couple of side issues that relate to this area of health physics control during emergencies that I'd like to pursue but I would like to give Tom and Larry the chance to have some of their questions addressed first. Would you fellows be ready to pursue, . . . In other words, I guess what I am saying is I think we ought to deviate from the chronology and I think that some of the issues we need to discuss with Dick are probably more important right now than some of the chronology perse. I think we can deal with specific issues and questions.

ESSIG: Right. And then may we can get back to that, or something. One of the questions first, Dick, was related to the comment you just made about the shortage of Scott Air pacs and teletectors. Do you recall approximately how many you had on hand, we're talking like two telectetors or half a dozen or.

DUBIEL: I think the number we actually had was approximately three. Now on the . . .

ESSIG: . . . that were operable . . . calibrated.

DUBIEL: Were operable at the time of the accident and this is primarily as a result of the fact that we had just come out of a refueling outage in Unit 1, where we had had a severe depletion of our instrumentation. It happens during every outage. Several instruments on the shelf ready for repair and the repair personnel are INC people were still tied up with the outage, so that it was a matter of wait until we completed the outage to get the personnel to get the instruments repaired and get them recalibrated and back in service. I think if there is a lesson to be learned there, I think that every plant should have high range instrumentation designated and set aside for emergency use only.

DONALDSON: Could I interject, . . . by high range there are some that go zero to a thousand R. Are you talking greater than a thousand R instruments?

DUBIEL: I think that zero to a thousand R is sufficient. I would recommend that a higher range instrument be available. But if you are looking at areas greater than a thousand R's you are not really going to be getting into them anyway. But the areas that were of most interest to us were the five R to fifty R or five R or hundred R range, where there were possibilities of getting personnel in for a few seconds and you really needed to be able to define whether that area was fifty R or fifty thousand R. And we couldn't differentiate the two with the instrumentation or with the lack of instruments. One

other point, too, of course, is that with the types of gradients that we're seen, gradients of dose rate, the teletector was essential. The dose rate instrument at the end of your arm was just not far enough ahead of you. Every briefing that I gave, I verified that the people that were going into the areas that we knew to be significantly higher, and it was pretty obvious to us once we started seeing the radiation levels what our main source was just by tracing the primary system piping the let down piping, some of the liquid waste piping. Any time we had anyone going near those types of areas the teletector was the instrument that had to be used and it had to be extended several feet in front of them. I remember very well, to every group going in, reiterating the words, "the teletector goes first, and it goes first by several feet." And I made sure that the people understood that. I think the teletector is the most valuable instrument you have in that type of situation.

ESSIG: Would you say then that all three teletectors were essentially in continually use?

DUBIEL: Yes. As quickly as we were using, coming out with one, I'd have another man or a group of individuals were picking up and getting ready to go back in.

ESSIG: I see. And would you comment also on the Scott-Air pacs and how many you had on hand that were ready to be put into service.

DUBIEL: Well we did, in fact, we have plenty of Scott-Air pacs on site to begin with. We've got fifty Scott-Air pacs that are positioned strategically throughout both units, some even as far away as the floroinator building, for use in emergencies, both from a radiological standpoint, the fire brigade and things of that nature. The difficulty was really in that Scott-Air pacs provide tremendous support for a short period of time. When you start depleting your supply of full bottles and your respirators or the face mask portion of the Scott-Air pacs start getting contaminated, it is a difficult thing to turn around. And getting the bottles refilled, getting the masks cleaned, and back in service is a difficult thing from a logistics standpoint, to maintain. Now, I think we were able to survive the event but it was a real hardship trying to keep the. . . the supplies. There are many many instances when people were ready to go into the auxiliary building to do something and could not because they did not have a Scott-Air pac. I think that the support that we got from one of the Middletown Fire Departments in getting a compressor to the observation center and filling bottles was excellent. But it was still, . . . the turn around time was just wasn't there.

ESSIG: What do you think the answer to that kind of thing might be? Is it more Scott-Air pacs or more of something else?

DUBIEL: I am really not sure. I am not really sure what the. . . Scott-Air pacs are a fine thing to use in that kind of situation, but

I guess I would have been better able to support the system by having a capability of going in on an air line, and I know that is not an easy thing to even conceive of because you need to have some place to plug in. You might . . . my only thoughts are remembering from the submarines, the ability to getting the breathing air from the emergency air systems, where you had a multitude of points to hook into. The problems of being able to keep the connectors clean and free of contamination. and things like that. I am sure. there'd be . . . I don't have an answer. It's an area for someone to look into very hard. But that particular day I think we were fortunate in that the times that we ran into a lack of Scott-Air pacs we did not run into a situation where a guy had to go in for a. . . to do something that could have been of an extreme emergency nature relative to controlling the plant. Because I think if we got to that it probably would have . . .

DONALDSON: Would you repeat that? I didn't catch that.

DUBIEL: In other words, the events of the morning and into the afternoon, you can classify everything as emergency, but there were very few entries that were made under conditions that, such as if the guy didn't get in and get something done in a matter of minutes we might have severely degraded our control of the plant, what control we did have. In other words, losing an hour waiting for Scott-Air pac slowed us down but was not catastrophic.

DONALDSON: Let me try to clarify something then. At what point in time would you say that that statement became true? At what point in time was there no maintenance or no activity of such an emergency nature?

DUBIEL: Well, I guess I can't say there was ever a, . . . Dale, I think I'm having a difficult time explaining myself on that. What I mean is there was an awful lot of activity, maintenance activity, operations activity, going on in the building, the auxiliary building. But at no time was there an entry made that was made because of the plant condition that jeopardized the status of the plant at the time. In other words, there were entries being made to try to get us out of the condition we were in. The conditions were not degrading. Let me give you an example of one incident that did occur that could have been catastrophic had we continued, had it been a real situation. We lost letdown flow at one point. Maybe I ought to rephrase that. . . we lost indicated letdown flow. I personally do not know that it was a real loss of letdown flow. The indication went to zero. The response at that time is, . . . we thought at first that the demineralizers, the resin may have turned to a jell and under the radiation levels this is something that at the time was in our minds. I think later on we found that we were several orders of magnitude from the radiation levels that would have caused such an event. We thought of this possibility and we had plugged in our demineralizers and could not maintain letdown flow. We had to get somebody in to open the bypass

valves. Okay, at that point, without letdown, we could have had a serious situation in the plant. A guy got dressed out, we had Scott-Air pacs available. Had that occurred, and there had been no Scott-Air pacs available, we may . . . now the decision would have had to have been made to put a guy in just a cannister respirator. Fortunately before any entry was even made, letdown flow indication came back.

DONALDSON: What time did this lack of indication occur?

DUBIEL: This was on, I believe, on Friday morning. . . . Friday the 30th. Right.

DONALDSON: Just very briefly, could you just give us a feel for the impact that loss of letdown flow would have upon the plant?

DUBIEL: Well, at the time, . . . let me just think back to the situation were in, . . . letting down to the makeup tank. . . Dale, I am kind of at a loss to go back and reconstruct the entire status of the plant at that time. Exactly what letdown was doing for us, I believe letdown was in fact, the only method we had of controlling pressurizer level. At that particular time, it was an event that, without being able to control pressurizer level, and therefore system pressure and temperature, losing letdown may, . . . I am not exactly sure, again trying to think back I don't remember the exact consequences or which catastrophic event

might have occurred. At the time it was quite evident that we did have to maintain, our only means of maintaining pressure temperature in the system was via letdown.

MARSH: Allright, How about a break for a minute and change these tapes. The time is 5:04. Time is still 5:04 let us continue.

MARSH: Time is still 5:04. Please continue.

ESSIG: Dick, I would like to come back to just for a minute to something that we were discussing yesterday with regard to the off-site surveys and your initial involvement. I recall that there were probably, and probably still are, I guess, to this day, several helicopters over near the observation center. Are those helicopters under charter to Met Ed, or whose helicopters were those, or are those? Were they originally requested by you or by some of your Company management?

DUBIEL: The very first helicopter we had already referred to was the State Police helicopter which we used to transport teams. The further use of helicopters was, in fact, requested by Met Ed management. We chartered a helicopter, I believe the helicopter service is out of Gettysburg, to actually do additional dose rate surveys in the air surrounding the Island. I don't recall the exact time that the helicopter service was available to us but I believe it to be later in the afternoon. I think you are leading up to the fact that, is it something that

should be considered? And I think it was a tremendous help to us. It is not included in our planning. The Coast Guard helicopter is. To get people to the other side of the river. But to survey from helicopters is not in our emergency plans, but it was a tremendous asset to us.

ESSIG: Right. Well, one of the reasons for the questions was, because I know that based out of the Capitol City Airport we had an EG&G. DOE had their contractor up there, EG&G. We also had a helicopter or two and I sort of lost track of whose helicopter or who actually had helicopters that were performing, . . . well essentially doing was plume chasing. So that was the main reason I was asking the question. Now, as far as where the helicopters were going, what kind of. . . the helicopter which one of your survey teams would be on, let's take that for a second. As far as knowing, . . . who is providing direction as far as knowing where to go? Did you call out the wind directions from the control room and tell them to go start chasing the plume, or how was that done?

DUBIEL: The direction was provided primarily from the emergency control station. The emergency control station was relaying the meteorological data and giving the downwind directions in the, . . . and specifying where surveys should be taken. We found, I think, as time went on though, that providing downwind direction was about all that really was essential and that the individual in the helicopter. . . we were trying to, . . . we were using the individual to pinpoint

the location by identifying landmarks that they were hovering above and doing surveys at various elevations and at specific points. The individual in the helicopter was really calling the shots as far as identifying exact points and was only being provided the downwind direction.

ESSIG: The individual in the helicopter being one of your survey teams?

DUBIEL: One of our survey teams, that's correct.

ESSIG: Did you have, was there one person in there, or two, besides the pilot?

DUBIEL: Personally, I do not know. I do know that we had several people who were cycling through, going through the helicopter survey and then changing off with another tech to do the same thing.

ESSIG: OK. Now, when you said this was controlled from the ECS, that was after the ECS had been relocated to the Unit 1 control room?

DUBIEL: That's correct.

ESSIG: This, then, would have been under the direction of Mulleavy and Landry, initially?

DUBIEL: That's correct.

ESSIG: OK. What type of interface did you and Mulleavy have, say, during the day on the 28th. I think you indicated earlier, about a half hour ago or so, within the past half hour, that you at some point in the morning of the 28th you felt pretty comfortable with what was going on. I am not sure if you used those exact words but you said you got to a point where you felt either you were comfortable with what was going on with the off-site surveys or you felt that more attention was warranted on the in plant surveys. I am not sure what caused you to sort of shift your attention. Would you just speak to that for a second?

DUBIEL: Well, I think it is a little bit of both, and maybe primarily that I saw the off-site team direction being handled very well from the Unit 1 control room. And that allowed me to back off and pay more attention to the plant and the health physics aspects of Unit 2. The interface that Tom and I had was, essentially we were in constant communication no more than every ten or fifteen minutes we would be on the phone. Tom also provided me with a tremendous amount of support in the logistics. I needed Scott-Air pacs to be pushed, all I did was call Tom. I did not spend any time myself. I needed additional . . . anything with protective clothing or instrumentation or things of that nature, or as we started going along and the concerns that I had about on-site areas, such as industrial waste plant, things like that,

I didn't myself follow through on them. I relayed the information to Tom and he followed through on them.

ESSIG: OK.

DUBIEL: So we had a constant and open communication between the two of us and I think personally that the job that was being done there was, it gave me all the confidence in the world to turn and focus entirely on Unit 2, which is where I really felt I ought, should have been.

ESSIG: Right. OK. So then he was periodically, not only were you touching base with him and asking him things, but apparently he was also, during that communication, letting you know sort of what was going on around the plant or did you just pretty much sort of give that to him and tell him to handle it? Did you get much feedback from him?

DUBIEL: We got feedback but I cut him off in as far as giving direct feedback. The one thing that we were doing in thr Unit 2 control room was, as the ECS and the off-site teams communicated, we were monitoring all their communications, so when we had personnel in the Unit 2 control room taking down off-site readings as they were being relayed. And that allowed us to not have to wait for Tom to pass the same message the second time. I was just keeping myself informed by watching the readings as they were logged by the Unit 2 Operations Personnel.

ESSIG: OK. Let's see. On the, . . . as far as the routine environmental monitoring program was concerned, do you know who made the decision to collect, to pull the routine samples on the 29th? Was that . . . were you involved in that decision?

DUBIEL: I was not involved in the decision. I do know that the, . . . it was considered. The discussions were being held by Syd Porter, who is a Consultant to Met Ed, with Dave Limroth, Superintendent of Technical Support, some NRC personnel, I don't remember who. By this time, you are referring to 29th, most of the off-site environmental monitoring, if you will, the monitoring teams as well as the decisions for pulling environmental, the fixed environmental monitors, all that responsibility had been shifted to the observation center. I shouldn't say all of it, but a great deal of it had been shifted to the observation center, and we had the coordinators running it out of the observation center.

ESSIG: OK. I guess I misunderstood you then. I thought that even on the 29th this was still being handled by Mulleavy out of Unit 1 of the ECS. But it was really being handled by the observation center instead?

DUBIEL: There was . . . at some point in time, and I really don't know the break, but it was either very late on the 28th or during the morning hours of the 29th, at some point the environmental program shifted over to the observation center. Not entirely, but most of the

direction became, or started coming out of the observation center. People in Unit 1 control room continued to monitor and chart readings off-site, provided information relative to plant discharges and meteorological changes and things of that nature, to the observation center.

ESSIG: Do you know who was involved over there in the observation center, who might have been calling the shots so to speak?

DUBIEL: I really myself, can't name a single individual. I do know that Dave Limroth was there. I also know that Syd Porter was involved. Who was the individual that was in charge of making the decisions, I really don't know.

ESSIG: So, do I understand you correctly that from, roughly the, either late on the 28th or early on the 29th as best as you recall, from that point on then any direct radiation surveys that were made either by vehicle or by helicopter, by landbased surveys or by helicopter, or any decisions which were made with regard to the collection of samples for the routine program, was being pretty much handled through the observation center?

DUBIEL: It was primarily through the observation center with some coordination from Unit 1 control room.

ESSIG: OK.

DUBIEL: That's correct.

ESSIG: But as of that point, you consider yourself as. . . your attention was really focused at that point, on more the in plant health physics.

DUBIEL: Almost entirely inplant.

ESSIG: OK.

DUBIEL: And I, just recalling something you can maybe tie a time to, I do remember going to the observation center sometime about, approximately 9:00 or 10:00 in the evening on the 28th. The first chance I had gotten to get out of the control room, and hunger drove me over there more than anything else. And by the time when I had arrived over there the radio system had been set up, and I remember one specific individual, Earl Gee, directing the monitoring teams via the radio from the front room of the observation center.

ESSIG: I see.

DUBIEL: So by that time it had been established and in place.

ESSIG: Earl Gee?

DUBIEL: Earl Gee, who works for the Safety Department.

ESSIG: Oh, Gee, OK. OK. I think I probably have but one last question in this area. Do you know if any consideration had been given, had you discussed this with anybody or made the recommendation with regard to any, say, putting out additional TLDs at additional locations and pulling them in at a more frequent basis? One of the reasons for asking this is because your emergency procedures, I think it is 1670.6, which is the off-site survey procedure, discusses in there putting out TLDs. It says that it is something that might be done. It doesn't say it has to be done but that it might be done. Do you know if that was ever considered at all, to your knoweledge?

DUBIEL: My knowledge, . . . I remember the issue being raised about the off-site TLDs. I cannot remember whether the issue involved adding additional monitoring or whether it was just the frequency of changeout of those TLDs that already existed. I don't recall.

ESSIG: OK. All right, I think that is probably as far as I need to go. If either of you other two fellows want to, have any . . .

JACKSON: OK.

ESSIG: Or if you have something, go ahead.

JACKSON: Dick, I would like to go back to the time when the panic was passed and you started looking at conditions in the Auxiliary building. Can you elaborate on what efforts were taken to get control of the rad waste in the Auxiliary building or things along this line?

DUBIEL: OK. First of all, the, . . . trying to set some type of a time frame, I guess it was approximately 2:00 or maybe 3:00 o'clock in the afternoon. Somewhere along that time that we first started getting concerned about liquid rad waste. I think I was already concerned about the gas system. I am not really sure when the entire picture of what was happening started coming together. About mid afternoon we had personnel sent into the Auxiliary building to try to establish the status of, first of all the water on the floor in the lower elevation, the 281 foot elevation, and the levels of all of the rad waste tanks. I think that we recognized at the time that the accident occurred at probably the most inopportune time. With the Unit 1 refueling outage and the liquid waste generated from the Unit 1 outage still at a fairly high level, high volume, in Unit 1 and with the common processing facilities, Unit 2 tanks had very little capacity left. We didn't have any place to put the liquid except on the floor, and that was not by choice. I think if my memory serves me right, it was approximately mid afternoon that a couple of operations personnel went to the Auxiliary building basement to determine the water levels, went to the panel,

rad waste panel, to try to get some tank level readings. And we started looking at what we could do with our waste relative to Unit 1, trying to define which waste water we had, was preaccident water or we were sure was preaccident water, that we might possibly send up to Unit 1. And then again, I might be way off in timing but I recall talking with Mike Ross about something we swore we would never do again, and that was look at the Unit 1 reactor core bleed tank cubicle, which in itself is one huge room and could be a huge sump, simply by plugging the floor drains. Very easy to get the water there. And I recall making the decision then that we really had no choice. We didn't want to do it but we were going to do it. We needed the room. And we started putting Unit 1 water on the floor in the Unit 1 reactor, RC bleed tank room, such that we could make room in Unit 1 to bring Unit 2 water over to Unit 1. Our main objective though was to try to keep as much of the post accident water in Unit 2 and the preaccident water moved up to Unit 1 to make additional capacity for ourselves.

JACKSON: You touched on the problem with rad waste capacity, I think yesterday. I've seen a reference somewhere written down, I don't recall a specific reference now, where one of the tanks with less contamination water was apparently intentionally overflowed to provide room for more contaminated water. How often does that occur during normal operations?

DUBIEL: During normal operations, we have only done it once, intentionally. I guess I'd better clarify that and say we've only done it once and when we did it, it was intentional. And this was due to evaporator malfunctions, several . . . it could be as much as two years ago, maybe only a year ago. I don't recall. It was either the spring of '77 or spring of '78. Where we effectively got completely waterbound and we couldn't even dump water back to the sump for reprocessing because the sumps were full. And we had to actually dump some water on the floor so we could make some room for processed water . . . to process water to a tank that we could discharge to the river. That's really the thing that I referred to when we dumped the bleed tank cubicle floor, and it was one heck of a job cleaning it up and we swore we'd never do it again. But we'd done it, and I think by doing it once we knew how to do it very easily, this time.

JACKSON: Do you have, or recall, any particular problems with the liquid rad waste system that existed since the unit started up? I know you mentioned capacities has been a problem, but is there any design problem with the system, were there any traps left out that would have prevented these tanks from degassing, or anything of this nature that you might recall?

DUBIEL: I don't recall or know of any design deficiencies in the system. I know of, . . . well, I guess . . . let me rephrase that. The idea of traps left out, or something like that, no, I don't know

of any. I don't believe that we have any problems of that nature. There are, in my opinion, I think that the rad waste system was designed using what I thought were poor assumptions for component availability, based on historical fact, and the main thing that I'm looking at is the evaporators. Based on the design capacities of the evaporators, we had plenty of rad waste capacity, based on the availability or maintenance history, operational history of the evaps, we didn't have anywhere near the capacity we needed, or processing capacity is really what I'm referring to. Along those lines we have done a tremendous amount of work for the last year and a half, in trying to essentially take the three evaporators that exist in the two units and try to tie them together with what we refer to as our rad waste cross tie system, to provide the maximum flexibility for handling both reactor coolant and miscellaneous radioactive waste. Most of those cross ties are in and were functional prior to March 28. Very few were still left to be completed and tested.

JACKSON: Do you recall the time when you became aware that there was contaminated water going to the industrial waste treatment system?

DUBIEL: I have a hard time of recalling whether that was on the 28th or 29th. I I want to . . . I feel it was on the 28th but I'm not positive. My first indication, I remember quite well the event and that we did have a sample drawn from the industrial waste plant and analyzed on a Ge(Li) MCA system. And I can even recall two isotopes

being identified, Xenon-133 and Xenon-135, and no others, both of them at approximately one to two times the MPC for those isotopes in liquid. And I can also recall going through some quick calculations showing the maximum dilutions, or the maximum discharge rate from the industrial waste plant which is 200 gallons a minute, and the dilution water flow of our once through cooling being 55 thousand gallons a minute. And talking to Tom Gerusky and Margaret Reilly about the need to contain that water versus allowing it to go to the river, and confirming with them that there would be no problem in discharging it, which was what my recommendation was, and that the word was passed down to the industrial waste plant to go ahead and discharge.

DONALDSON: Could you clarify, did Maggie Reilly and Tom Gerusky agree with your contention that the release should be allowed?

DUBIEL: Yes, they did.

JACKSON: Were there any consideration, well, I'm sure there were, but what consideration were given to some of the other unmonitored release points, like atmospheric reliefs, I know you stayed on those for a while, and also, was the steam generator feed pump, or steam driven feed pump ever used?

DUBIEL: To my knowledge, the steam driven feed pump was not used, I could be mistaken. The atmospheric dumps, first of all, I personally

felt that there were some very poor decisions made relative to the atmospheric dumps lifting. Now, let me just back up here just a little bit. Sometime early in the morning of the 28th, and am referring to approximately 9:00, maybe earlier, Carey Harner, my Unit 2 chemist, plant chemist, drew samples from the Unit 1 primary lab of both the A and the B steam generator. We obviously knew we had a . . . we had contamination in the secondary side. I'm not sure whether we've ever really decided if its a tube leak or how it got in, but we knew we had contamination in the secondary side. Carey drew a sample off the primary sample sink. There was some serious confusion because the A generator showed activity, the B generator did not, based on his sample. By activity I really mean that he drew two 500 milliliter samples and put an RM 14 with a GM tube next to them and one made the instrument respond and one did not, indicating that the A was the contaminated generator, and we felt pretty confident that it was the B that had had the leak, based on B being the one that was thermally shocked or thermally cycled earlier in the morning. Carey immediately went to the secondary lab to draw the same sample, and the reason he did that was because we had found during construction and during our shakedown of the system, the the normal secondary sample lines were reversed. The A generator, as labeled, was actually seeing the B generator, and vice versa. He suspected that that could also have been the case for the primary, . . . or the sample labs that had been run over to the primary lab in case of primary to secondary leakage. He went to the secondary lab, drew the same samples and confirmed that

it was, in fact, the B that was contaminated. We isolated the B and we were steaming only on the A. The main concern, I guess, at the time, was that the secondary system did have some activity and that the off-gassing through the condenser or dumping through the atmospheric reliefs was an item to be concerned with, but relative to the amount of activity being released through the normal it stack, it was in my estimation, an insignificant amount. I think the . . . I was more concerned at the time that we maintain a heat sink for the primary . . . not let the primary system temperature get out of control again and we were directed to secure the atmospheric relief through the atmosphere and dump valves. We did, in fact, . . .

JACKSON: Who directed you to do that?

DUBIEL: The direction we received came from Jack Herbein, offsite. I don't know that it was his decision alone. It was at his direction, though. We did, in fact, secure the atmospheric relief valves at some time in early afternoon, 1:00 to 2:00 o'clock. The release then turned in from steam release from atmospheric dumps with a certain amount of activity, to a condenser off-gas release, which is unfiltered and goes right back out the stack. The main difference being that you couldn't see it, the steam you could see. And I think there was possibly some pressure from a public relations standpoint to get the steam release secured. I think we took a real serious chance of possibly losing our heat sink, which could have been catastrophic if

we had, in fact, lost it and couldn't establish vacuum. I guess we could have always gone back to the atmospheric dumps if we had to, but we did need, . . . at the time we needed the auxiliary boilers to maintain a vacuum, and that is not a simple matter, getting the auxiliary boilers lit off to support the vacuum on the secondary.

JACKSON: OK, one quick question here before the tape runs out. Did I understand you to say that you were not aware of the crossup between the sample lines and the . . .

DUBIEL: Prior to the event, just to quickly describe it, the steam generator sample lines are normally sampled in the secondary chem lab, which is a cold chem lab. They have provisions for going to the hot chem lab in the event that we have primary to secondary leakage. We were not available or, excuse me, we were not aware of the crossup of the sample lines going to the primary lab, although Carey Harner, who is very much aware of the sampling systems in the secondary, I believe surmised that by remembering where the crossup actually occurred, and I believe it was actually just a matter of. . . right at the generators they were reversed. After that, I've got some speculation as to when they were reversed, but I guess the answer is No, we weren't aware of it in the primary lab. We were not absolutely sure that they were crossed. We had strong suspicions.

MARSH: OK. I am going to call time. We've got 5:35 p.m., 4/25 and I'm reading 975 on the meter. I am going to terminate this tape at this time and start another one. . . . The time is still 5:38 and we've decided to put a postscript on this tape and not continue at this time. So we will be terminating for today's efforts at 975 on the meter at 5:38 p.m. This will end the interview for this date.