UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Richard W. Dubiel
Supervisor of Radiation Protection, Chemistry

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

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NRC PERSONNEL:

Gregory P. Yuhas, Radiation Specialist

William H. Foster, Senior Inspector and Auditor

FOSTER: The following interview is being conducted of Mr. Richard W. Dubiel. Mr. Dubiel is Supervisor of Radiation Protection, Chemistry at the Three Mile Island Nuclear Facility. Present time is 5:05 p.m., today's date is May 22, 1979, the place of the interview is Trailer 203 located immediately outside the south gate at TMI site, individuals present for the interview are Gregory P. Yuhas, spelling Y U H A S, Radiation Specialist for Region I. My name is William H. Foster, I am a Senior Inspection and Auditor with the NRC Office, Inspector and Auditor, I'll be monitoring the interview. Mr. Dubiel has been interviewed on three previous occasions with respect to this investigation at this point I'm going to turn the interview over to Mr. Yuhas.

DUBIEL: Excuse, Mr. Foster can I just interrupt, the middle initial is incorrect, it's a W, William, just for the record.

FOSTER: Yes you may.

DUBIEL: Thank you.

YUHAS: I'd like to clear up some previous questions initially, first when you initially made contact with Kevin Malloy of Civil Defense, did you inform him of the offsite dose that you had calculated for Goldsboro?

DUBIEL: No I did not but first contact that I had with Kevin Malloy was prior to our having any estimates of offsite dose and also under normal conditions, normal conditions under the procedures is outlined in our emergency plan, that type of information is not the type of information that we would be normally discussing with Kevin Malloy than rather with the BRH, the call that I made to Kevin Malloy was simply a backup call since we had not at that time and I don't recall the exact timing of it but it was sometime 7:20, 7:30 somewhere in that ballpark, we had not received a return call from the BRH and I was calling Kevin because I, first of all I know Kevin very well, I knew I had immediately access to him and that I knew he could get me access to the BRH, if anybody could get them back on the line to us, I thought Kevin could do that and that was really the intent of my call.

YUHAS: When you got down to communicating with Malloy, the understanding was Malloy would contact BRH and BRH would contact you, not that Malloy would call you back.

DUBIEL: That's correct.

YUHAS: Ok, when BRH did call you back, did you inform them of your offsite dose calculation?

DUBIEL: BHR returned call initially, came into the Unit 2 Control Room, I don't recall specifically, I think it was George Kunder who

took the original call, at that time George talked to him for just a few minutes or seconds I don't really recall which and then he called me over to the phone to tell, to have me talk to them, I don't recall specifically all the things that we discussed but I recall giving them and specifically it was Tom Gerusky that I was talking to, I believe it was Tom Gerusky and I talked to both Tom Gerusky and Maggie Reilly at various times throughout the morning, I believe it was Tom initially, I gave them indication of where, what we had and that the first onsite readings were coming back as negative numbers, in other words no detectable beta gamma dose and that air samples were being drawn in the down wind direction onsite but that there was no indication of any acitivity at that time, I don't believe at that point in time that we had projections offsite that were, well first of all I don't think we ever had projections that were meaningful and I don't believe at that time we had any projections that indicated anything of serious nature even based on the procedures.

YUHAS: The projections that were made, one indicated 40R per hour, another indicated 10R per hour is that correct?

DUBIEL: I do not recall any projection ever reading 40R, I recall the 10R, I believe it was a, I remembered it as 8R but I could be mistaken, it was 8 to 10R that type of number in Goldsboro and that was based strictly on the iodine, that projection came back sometime, or came to me sometime later in the, that hour, it was closer to 8:00 and it was

based on the dome monitor and I think I previously stayed at the, when I saw the projection I very quickly just glanced at the calculations, I really wasn't gonna get into the calculations as much as I looked at the bases, the dome monitor reading extremely high, extremely high meaning somewhere in 30, 10-30 thousand R range, the, that's a corrected reading by the way, including the factor of 100 intenuation, but that the, I had two very very pertinent facts which had already been established, one is that the building was at zero pounds pressure, the pressure that was bearly detectable on the pressure gage, let's just say less than one pound, I had personally checked that and I also knew that the projections, the calculations were based on local environment where we're talking 50 pounds plus in the building and secondly that we already had onsite readings coming back to us that showed nothing and I felt that at that point that the projections themselves would be totally invalid and that, at that particular time I do recall speaking with the State and speaking in terms of real numbers but not in terms of projections and I believe the conversation from that point on throughout the morning were based on available field data or rather them, any type of projection.

YUHAS: On the morning of the 28th after you had reported to the site, you found Mike Janouski, Pat Donnochie, Tom Davis and I guess Zeiter, do you remember dispatching a deliberate survey team to the Unit 2 auxiliary building shortly before the site emergency was declared?

DUBIEL: I did not dispatch a team, I believe they were referring to a team to go through the building to insure that personnel were evacuating.

YUHAS: Other information is presented to me that Mike Janouski took it on his own initiative to run the survey of the Auxiliary Building after he identified problems with HPR-227, he was already over there. Several other technicians arrived a little early before there normal shift, you directed several of these to go over to Unit 2 Auxiliary Building and to run a survey, do you recall that?

DUBIEL: No sir I did not direct any technicians to run a survey in the Unit 2 Auxiliary Building, my memory of the time and question, first of all Mike and I had already been at HPR-227 some ah, at least a half hour prior to the initial radiation level increases back at the sample, the sample lines and the sample sink, it must have been at least a half an hour, I'm picturing around 6:00 as being a good time, Mike and I then went separate ways, I went to the Control Room I was told of the problems of the boron analyses and I went back down to the Unit 1 HP lab, I ran into Mike again, both Tom Davis and Dave Zeiter were taking or running boron analyses on the second sample, for boron, I got a call from Unit 2 Control Room, I was requested to prepare for reactor building entry, in preparation for that entry I aksed Mike Janouski, first of all I'd like to just mention that in my estimation if there is one specific tech that I have a awful lot of faith in a tough situation or a difficult situation, Mike Janouski is the man,

he's extremely good technician under stress and under difficult conditions, I asked him if he would be willing to make the reactor building entry, my only, my main concern is we were pushing the end of a shift, Mike indicated that he had previous commitments, I believe it was previous commitments that made it such that he wouldn't go in, a couple of the other guys I had asked and there was, of course it was 7:00 o'clock in the morning or approaching 7:00 there is a lot fatigue, I asked Pat Donnochie and Mike then and the interim between, first of all Mike suggested that we get somebody from the day crew coming in because they would be coming in fresh and be more able to go in the Scott Air Pack and what not into the reactor building, I really went along with that idea I thought that a good thought on his part, I asked Mike and Pat to then start preparing the equipment in getting the Scott Air Packs, in getting instrumentation ready, the clothing ready, getting and RWP that type of thing that we could prepare to go in the reactor building, I don't recall who from operations, I think somebody, I had some specific names that were given to me but I just can't remember them for the life of me who those people were, not that it really makes any difference now, when we determined, first of all when the radiation monitor went off back at the hot machine shop I went back to see what monitor was alarming and when I went back Mike and Pat were already there, so I'm assuming and I think I've heard or been told discussions with Mike that they had been in the transition of going Unit 1 to Unit 2 in getting the equipment collected and they happened to be just coming back into

that area when the alarm went off, they cut the security guard out initially, get a dose rate instrument, we started cutting the lock off and that's when we determined that the source would be, the radiation problems was the sample lines, I went back to the lab, I though when I got back to the lab that I had already seen Joe Deman. OK, but I could not recall whether he, whether I was just imagining that or whether he was really in the plant already at that time cause it was at that point in time he reports for seven and he is usually in a few minutes early and he either could of, could or could not, he was likely either way, when I got to the lab I paged Unit 2 Control Room, I gave them the indication that I had, I told them that we, there was no question, we had a major problem with the cooling system, the core, I felt we had core damage or at least we were releasing an awful lot of gap activity and immediately told Mike Janouski to take charge of the emergency control station and begin to set up the on and offsite monitoring teams, establish control there until he could be relieved by a supervisor, okay at that point I left, I did not order them to go through the Units to do any kind of survey in the Units, I believe, let me maybe rephrase that, I don't recall and I feel pretty confident in saying that I did not order that, I think that Joe Deman informed that Joe Deman was in fact in the plant, I got to the Emergency Control Station shortly after I left, took command, at that time I believe Mike Janouski did in fact take it on his own to go through the Auxiliary Building in Unit 2 to

insure that people had in fact heard the alarm and were being moved out of the building which I think was an extremely good thing on his part showing a lot of coolness under a difficult situation.

YUHAS: Do you remember, did anyone mention to you or were you aware of any maintenance work going on with the makeup tank that morning, this is prior to the incident now, between 4:00 and 6:30?

DUBIEL: No, I was not aware of any maintenance work at all.

YUHAS: In your emergency planning, how have you trained or developed a plan to deal with inplant high levels of radiation?

DUBIEL: In our emergency planning I don't believe our emergency planning specifically addressed dealing with high levels in the plant, the, it does in fact define areas of responsibilities where we would have a Health Physics Supervisor or lead Health Physics individual, responsible to insure that the Health Physics concern inplant were in fact being looked after, such things as having a, when and if possible having a HP technician assigned to an emergency repair party, that type of thing, but as far as detailed procedures I don't believe, it doesn't exist in our emergency plans.

YUHAS: I want to review briefly with you the status of equipment available at the time of the emergency, I've gone through the calibration feeds and the malfunction reports for the instrumentation and basically what I find is that you had about 4 teletectors, operable and in calibration and you had twelve of them that were either inoperable or out of calibration, the same basic ratio held true for most of the instruments, do you concur with that being the right methodology to that was going throught those sheets?

DUBIEL: I concur with that and I also think that the numbers that you just indicated are, I'm not going to say 4 is the right number, it was 3 to 5, but I agree with the number, I would not take issue with that.

YUHAS: Did you have any instrument, any hand held instrument, capable of reading greater than a thousand R per hour?

DUBIEL: No sir we did not.

YUHAS: Okay, could you describe in very relative numbers the amount of high range pocket dosimeters you had available and what were the ranges and where were they stored?

DUBIEL: The higher range, in relative numbers?

YUHAS: Not exactly numbers.

DUBIEL: I believe that we may have had some, maybe as many as 50 high range dosimeters that were distributed between the two Health Physics labs, some in Unit 1, some in Unit 2, I would imagine at the time that the majority of them would of been in Unit 1, due the fact that we were just coming out of an outage.

YUHAS: And the range of those dosimeters?

DUBIEL: 0 to 5R.

YUHAS: How many 0 to 1R pocket dosimeters would you have had available?

DUBIEL: To tell you the truth Greg I don't quite remember that we had any 0 to 1R, we typically used the 0 to 5R dosimeter.

YUHAS: Did you have any pocket dosimeters of arranged greater than 0 to 5R?

DUBIEL: Not to my knowledge, not unless there was an oddball from someplace that, we typically did not use them.

YUHAS: Did you have any finger rings available?

DUBIEL: Finger rings themselves, we typically don't and have not used finger rings, no, yes, what I'm really trying to say is that sometimes you can thumb through a draw and find something that's been around since 74.

YUHAS: That's not quite what I had in mind.

DUBIEL: My answer is really directed to what am I aware of immediate access to, the answer is no.

YUHAS: Were there wrist badges available as an alternative, with reference to finger rings, were they available though?

DUBIEL: Yes, by wrist badges I really mean that we did have extremity dosimeters that could be taped to the wrist.

YUHAS: These are your standard TLD's.

DUBIEL: Standard TLD's which have been predesignated as extremity badges, we used a set sequence of numbers for extremity badg

YUHAS: Were would they have been located?

DUBIEL: In Unit 1 HP lab, I know that they were available, I do not know them that they were anywhere available to Unit 2.

YUHAS: Did you have any lapel air samples equipped with both particulate and charcoal ampules?

DUBIEL: No sir we did not.

YUHAS: Did you have Bendix Lapel pumps available?

DUBIEL: No, we did not.

YUHAS: Okay could you describe the air moving device used for triggering sample?

DUBIEL: For grab sampling of tritium, the air moving device, the air pump, our normal inplant tritium sampling would be done with essentially any type of pump that we could rig to our tritium bubblers and the types of pumps that were available were the battery operated MSA pump, something of that nature would be the typical manner.

YUHAS: Your sure that those small gray pumps are MSA and not Bendix?

DUBIEL: No I'm not sure, I think there MSA's.

YUHAS: Could you briefly describe the relative size of that pump, the fact that it's battery operated, and what the flows are?

DUBIEL: The physical size, it's roughly 4 inches by 4 inches by 1 inch and a 1/2, the actual air flow would be, I'm trying to think what the calibration on it, it's a zero to 10 relative scale on the flow meter and I believe the mid point is somewhere in the neighborhood of a cubic feet, cubic foot per meter so I would say probably in the order of 1.6 cubic feet per minium maximum something of that nature.

YUHAS: Could you consider that pump suitable for taking a lapel air sample?

DUBIEL: For a lapel sample or a tritium sample?

YUHAS: For a lapel sample, to draw another words put a piece of tubing on it with a filter holder.

DUBIEL: Well it would be suitable, I guess the question would have to be what type of airborne activity are you looking at, what type of MDA and how long do you want a count, there's a optimum methodology in lapel sampling and then there's something less than optimum which is exceptable or, how it's sells limitation to it.

YUHAS: Prior to this incident then you have not given consideration to those types of in plant emergencies which would result in very high levels of airborne contamination and the use of either standard lapel air samplers or some other alternate suitable replacement for collection of air samples as people _____ enter these areas when it's not practical to sit down and run a regular AC power grab sample.

DUBIEL: For emergency conditions no we've never considered them.

YUHAS: Could you describe the type and relative quantity of self-contained breathing apparatus that was available?

DUBIEL: Well first of all we have a relatively small number of Scott Air Packs to self-contained breathing apparatus that's available for normal use, non-emergency use and I believe that number to be anywhere from six to eight units, depending how of course some of them occasionally might be out of service, there's a second group of Scott Air Packs

which are pre-defined for emergency use and are posted at various locations throughout the plant and I don't recall the exact number but I think it's around 56 total Units.

YUHAS: Is there a cascade system for refilling these bottles onsite?

DUBIEL: There is a cascade system, by cascade your referring to a, let me just describe what system we do have, we have an air compressor that's used to compress air into a group and you could pick your own number of bottles, 300 cubic foot cylinders which is actual the procedure being that you could put a much larger quartity of air volume of air into the bottles and then as you refill Scott Air Packs they could be refilled a lot more quickly, it's a surage tank.

YUHAS: Where is this system located?

DUBIEL: It's normally located in the west end of the intermediate building of Unit 1.

YUHAS: Has this system been tested to determine if it meets grade D specifications for breathing air, previous to the incident?

DUBIEL: The air compressor itself has, I believe it has, I believe that compressor is on the routine check I can't swear to it but I believe it has.

YUHAS: Could you describe any other air supply breathing devices that you might have had available onsite the morning of the incident?

DUBIEL: For use of the emergency situation, self-contained or supplied air is what your really looking at, well I would say we didn't have any other that was, I felt was available, we do have a breathing air cart if you will that we use under normal conditions but it does require a certain amount of time to set up, time that we just didn't have available to us in the areas that we were working with, so I wouldn't say that that was available to us.

YUHAS: Can you describe now the air purification respiratory protective devices that were available on that morning?

DUBIEL: Well we had typically, typically we use the Scott full face respiratory with the Scott particulate filter, we did have some small number of MSA, small number of Wilson and I believe a couple of Acme masks and there associated particulate filters available, there is four people who could not get a seal on a Scott but were able to get a seal on one of the others.

YUHAS: Could you describe the relative quantity in there distribution throughout the plant?

DUBIEL: Of the Scotts?

YUHAS: All.

DUBIEL: Okay the Scott mask itself, the number of course is a tough thing to pinpoint, we had approximately 200 respirators at the beginning of the outage, Unit 1 outage, I don't, I can't specify the number we had at the time of the occurrence, I would only venture a guess that we may have used or consumed if that's the right term about 50 during the outage, that might be reasonable to assume of the Scott and the majority of the Scotts would of been in Unit 1 because of the outage with possibly a dozen or more available to Unit 2, the other masks were very few in number possibly six or so of each and there being maintained at either the Unit 1 or Unit 2 HP lab depending on, well we assigned a specific mask to a specific individual, in other words, the guy who could only wear an MSA would have an MSA mask assigned to him and would be maintained at the HP lab in the Unit that he was predominately working.

YUHAS: To clarify a point you did not have any of the, for instance GMR non NIOSH or MASA approved iodinal removal canisters or Scott iodine removal canisters available at the time of the incident onsite?

DUBIEL: That's correct, at 7:00 in the morning we did not have any onsite.

YUHAS: As the emergency was declared and you proceeded to Unit 2 Control Room and assumed you were responsibility within the emergency organization, in that initial period from whom did you receive inplant radiological assessment information?

DUBIEL: The first indications, well I received in two manners, one was the fixed radiation monitoring system, the second were from specific individuals who were in the Auxiliary Building either those being evacuated or coming through to evacuate or those that were being sent in for specific jobs as the morning progressed.

FOSTER: We're going to break and change the tape now, the time is 5:34 p.m.

FOSTER: We're going to continue with the interview Mr. Dubiel the time is 5:35 p.m.

YUHAS: You were just stating that you were receiving, I assume primarily telephone communications and a few individuals coming up who had been in the Unit 2 Auxiliary Building in the period from approximately 7:00 until the time that the Unit 1 ECS was evacuated from Unit 2 Control, are we talking about the same time frame?

DUBIEL: It's the same time frame yes, the only point is that they were very very few phone communications there primarily people coming to the Unit 2 Control Room, since the Unit 2 Control Room really was directing, most of the events, as a matter of fact I would say all the events that were going on inside the Auxiliary Building, so the people were returning to the Control Room.

YUHAS: In just a few words could you describe your actions in that first period from 7:00 until about I guess they arrived in Unit 2 Control Room, ECS crew arrived at about 9:10, what were you doing in that roughly two hour period, I don't mean specifics I mean...

DUBIEL: Well I think my, I had three things that were for most in my mind initially it was to establish the communications with people offsite and most importantly to get, to start to get the flow of information from monitoring teams, get them in the field and get them talking, get them responding with dose information in the field, the second thing and very quickly became a very predominent effort of mine was the support of the personnel who had to go back into the Auxiliary Building, once it had been established the types of radiation levels that we were faced within the Auxiliary Building, I spent a lot of time and most of my attention, a lot of my attention was placed on briefing the people before they went in and trying to establish with them a sense of, some sense of security in that they would not end up either

overexposing or harming themselves, another words give them a number they could use to turn back on, a dose rate to turn back on essentially and also was to try and follow the plant from our radiation monitoring system standpoint, to try to input as much as I could into the operations personnel trying to understand what was happening in the Auxiliary Building and I don't think the, I couldn't do much with the primary plant and I think they knew that well enough but I, I felt I had a, the type of background and experience with a radiation monitoring system to interpet and awful lot for the senior people involved, so really those three things that I was primarily involved in.

YUHAS: Let's take number 3 first and talk about it, could you describe how you developed this familiarity your understanding of the systems, there interrelations as would be indicated by the radiation monitoring system in the Unit 2 Auxiliary building?

DUBIEL: Well I think the first thing and mostly importantly is I spent awful lot of time working with the Unit 1 Radiation Monitoring System both from a, the standpoint of making the paper right, another words set point documents, bases for setpoints, calibrations and things of that nature but I also spent an awful lot of time in Unit 1 with the chasing of plan and unplanned releases and following the monitoring systems response to radioactive materials being released within the building and since the systems are really very very similiar, I have a

real good handle on how the Victoreen systems does respond and of course I spent a good part of my time at TMI in 76 and the early part of 77 primarily assigned to Unit 2, actually this has only 76, 77 I got over to Unit 1 and as part of that assignment to Unit 2 I did an awful lot of field tracing of ventilation systems and radiation monitoring sample points as well as watching the installation and in a sense getting familiar with the setup of the system.

YUHAS: What type of deck detectors are used in the area radiation monitoring system in Unit 2?

DUBIEL: The area is GM tubes.

YUHAS: Could you describe the full range compensation at work in that GM tube?

DUBIEL: The full range compensation at work.

YUHAS: Another words several of those detectors receive very high levels of radiation, what's supposed to happen when you receive any high levels of radiation?

DUBIEL: They are supposed to fail high.

YUHAS: Did you note that that happened, you know that you would of expected to?

DUBIEL: Remembering back on that day I guess I got, I don't remember a specific monitor that I noted failing high, we had some that were failed low and one of the problems that we ran into was the, there's a lot of, at least there was a lot of question at that time pertaining to which monitors were in fact in service and which of them had, still had construction problems, we had, there were some specific installation problems that we're trying to overcome especially in the GM tubes, I don't know if your familiar with the problem with the fire retardant installation on the cables, that make the cable impossible to flex and hence impossible to remove the detector to calibrate it, under normal techniques, that type of thing so I can't specifically say that I recall a monitor that I would expect to fail high, having failed high, you let me call some failing low but I don't recall whether those were instruments that never worked or were not operation at the time of the event anyway.

YUHAS: Can you recall those instruments that did not respond to the trends of the time, another words those that failed low, can you remember which ones those were and whether that was something that you knew about prior to the incident or something that you suspected really should of failed high, let's, like fuel handling bridge?

DUBIEL: The fuel handling bridge, in the reactor building?

YUHAS: Right.

DUBIEL: I don't recall what that level was, whether that was a failed low or failed high or whether it was still on scale, there was some of them that were on scale that I questioned, the one in particular I can recall the one inside the personnel access hatch, I was having, responding in such a manner that it did indicate trends that I might believe, another words it went up when I expected it to go up and down and down when I expected it to go down but the relative readings were extremely low, I don't know how much low, I don't know what the real reading were but they did, if I can recall readings of 100 mR per hour inside the hatch, with 200 mR per hour on the other side of the hatch, so I don't know what the real readings where, I don't recall fuel handling bridge as going, I don't recall what...

YUHAS: Do you recall which ones were giving you problems before the incident?

DUBIEL: No I don't.

YUHAS: Was it 1, 3, 5, 7 of all, was it a significant fraction?

DUBIEL: I would say possibly as many as 20% something along those lines.

YUHAS: To whom were you inputting your understanding or your assessment based on the radiation monitoring systems of what was going on in the Auxiliary Building?

DUBIEL: It was a combination of Gary Miller, the Emergency Director, Mike Ross, Supervisor of Operations, Unit 1 and the Shift Supervisors in the Control Room at the time, Bill Zewe in particular and also answering the questions of the Control Room Operators there was some concern in there, you have to try to understand at times, now I may be jumping well beyond the 9:00 time as you previous spoke but I do recall during the day responding to some of there questions.

YUHAS: What sort of questions where they, when you asked them?

DUBIEL: Well more specific to things such as, the area monitors in the vicinity of the filtration units up in the ventilation room, can try to understand why there trains were, as they were which really was based on what was going through the filter rather than any direct radiation in that area, things along those lines, why the iodine monitors were all pegged, I think the operations people, I know they all have been

runned through but I don't think they have the day to day familiarity with the response or, maybe I ought to rephrase that, I think that the familiarity is a lot of classroom training and with the Unit being so new they really haven't experienced an awful lot, so there was a lot of questions because of that.

YUHAS: Do you remember that an individual pulled the charcoal filter off HPR-219 about 8:30 in the morning, were you aware of that?

DUBIEL: No.

YUHAS: Were you aware of the boron analyses that indicated that indicated 228 parts per million of boron at 9:00 in the morning?

DUBIEL: No.

YUHAS: This is the first time your aware of that.

DUBIEL: That's the first time anyone has ever said that to me.

YUHAS: Okay, based on previous operating experience are you aware of any costly conditions to the primary on power rejection transients?

DUBIEL: Yes, at least two separate occasions and there may have been more, there's two that I can recall very vividly, introduction of the sodium hydroxide into the primary on the transient.

YUHAS: On the course of your administration of the Radiation Protection and Chemistry Department, do you periodically prepare blind samples for the Rad Chem techs to run?

DUBIEL: Blind samples for what type of analyses?

YUHAS: For any type of analyses, I'm speaking primarily now to for instance just giving them a sample, a boron standard that you have made up, perhaps with sodium hydrogen and saying go ahead and run it and tell me what you get routine quality control tests _____.

DUBIEL: As your saying a, what the hell was I gonna say, as your saying a boron, a sample that has been spiked with sodium hydroxide to determine a boron value, I am not aware of any type of QC check, if you want to call it that on a technician of that type, now a straight boron samples, running caps and things like, yes also various other types of analytical work is checked with maybe not what you call a blind sample but a sample that's split between a couple of technicians and compare the results.

YUHAS: Okay, you don't have a program where in you routinely provide a technician of the samples that you have prepared to assess that individuals ability to analyze a sample correctly.

DUBIEL: I guess the answer to that is that there is no formal program to do that, however...

YUHAS: That's fine, you were aware that at 0330 on the 28th you had approximately a thousand and twenty six, or something like that of PPM boron.

DUBIEL: A thousand, fifty four is the number I remember but that could be...

YUHAS: Then at 6:00 you had 700 and about 6:10 to 6:15, Donnochie had 400 and about 620 Davis had the followup and had another 405.

DUBIEL: Just for the record that was Zeiter not Donnochie.

YUHAS: Excuse me, you are aware of that rather dramatic decreasing trend?

DUBIEL: Yes.

YUHAS: What effect, assuming those numbers are correct would be occurring in the primary coolant system if that were true?

DUBIEL: If those numbers were accurate, obviously we were deborating if those numbers were in fact representative of the entire system, we were deborating in the coolant system now what that really means is that there is a greater potential for criticality, the plant was shut-down, I was under the impression that all seven groups of control rods were on the bottom which should eliminate the possibility of criticality but the important thing in my mind was that somehow we where getting demineralized water into the system and diluting the boron.

YUHAS: Were you aware of any indications unit control consistant with deboration?

DUBIEL: No, of course I spent very little time into the Control Room between the time I arrive and the time the site emergency was declared.

YUHAS: I'm speaking now to the period shortly after the site emergency was declared.

DUBIEL: Was I aware of any evolutions that may of caused deboration?

YUHAS: No, in the indications for instance increase and souce ring counts, reactivity changes, mainly observed by the Control Operators?

DUBIEL: No I was not aware of any.

YUHAS: Did you believe the boron sample results?

DUBIEL: At first I did, in another words at the time, a few minutes before 7:00 and the time I got to the Control Room I honestly believe that for some reason we were deborating in the coolant system and then I was under the impression or not impression I was made vividly aware of the fact that we had a primary secondary leak and I was trying to understand how we could be forcing water from the secondary into the primary cause that was the only source of non borated water that we, I felt we, was available to the primary system.

YUHAS: On a new core, based on your understanding of reactor visits, if you had a power rejection, like you did here, you scram the plant and then you drop boron from 1000 down to 400, is there a possiblity the reactor would go critical again?

DUBIEL: I am not an expert in that area but I don't believe it would, the schooling that I've had, I believe the state if all seven groups were on the bottom I don't believe it would go critical, but then again I'm not an expert in that area.

YUHAS: Who filled the position within the emergency organization as chemistry supervisor?

DUBIEL: I want to say Kenny Harner but I really can't recall, both Kenny Harner and Gary Reed were available during that day and I know both of them were involved at various points.

YUHAS: Did you address this problem of boron to the individual that was filling the position as chemistry supervisor within the first 6 hours?

DUBIEL: I spoke with Kenny Harner about the low boron numbers, I don't recall exactly what time I spoke to him about it and at the time I spoke to him, our discussion I believe concluded with the fact that we probably were steaming in the core, steaming in the coolant system, excuse me, which was causing the steam to come across in the sample line, causing, first of all the solubility of the boron forcing it to stay in the liquid phase, steam coming over in a much lower boron concentration then being condensed into the sample coolers, so I felt, some point I don't recall what exact time it occurred, I felt that there was adequate explanation to the low boron numbers, the misleading boron numbers there at, in fact we never did have a boron reduction in the cooling system.

YUHAS: Where does the letdown sample, cap off, where does it come off the primary coolant system?

DUBIEL: Let me get my two Units straight, letdown sample comes off the, it's the B side cold leg I believe in Unit 2, I'm just trying to, the A to B, yeah it's B side.

YUHAS: Can you describe what happened to the environment in the Control Room when the Unit 1 ECS was relocated to Unit 2?

DUBIEL: The environment, you mean the fact that we had an extra group of people coming in causing additional confusion, well first of all there was obviously a lot more people entering the Control Room, fortunately the Control Room is relatively large and the point that they entered at we had adequate space for them, I think the noise level increased, I don't believe that there was any serious confusion caused by it, nor do I really believe that it effected the operation of the personnel that went down the Control Room or really seriously half of the ECS personnel.

YUHAS: Then who made the decision to relocate the ECS to a nonstandard location, the alternate ECS if I'm not mistaken, if you would have evacuate the primary ECS would it been the Unit 2 Shift Supervisors Office?

DUBIEL: That's correct.

YUHAS: That's correct, obviously they did not stay in Unit 2, they removed...

DUBIEL: Back to Unit 1.

YUHAS: Within a few hours back to Unit 1 Control Room, now someone must have made a conscious decision to do that, right?

DUBIEL: Yes, I don't recall who.

YUHAS: About this time there were many entries into the Unit 2 Auxiliary Building, can you describe how an entry, how the need for an entry was generated and how that was executed and how you were incorporate, your organization was incorporated into that?

DUBIEL: Okay the need was defined by the essentially the group of individuals who were actively involved in, kept trying to control the plant which was the group consisting of Gary Miller, Mike Ross, George Kunder, Jim Seelinger and the Shift Supervisor Lee Rogers, now once a particular item was identified and it was via, that group determined to be something of immediate need, an individual depending of course on what discipline, I recall an awful lot of instrumentation work, had to

be implemented or changes had to be implemented during that first day, individuals from the particular group would have been, were brought in to the Control Room, it was discussed primarily what they were doing at the drawing, the table that holds the P&I drawings which is right at the Shift Supervisors office, it was that day from the Shift Supervisors office, at that point once the individuals were pretty well briefed and what they had to do and where they were going, I was involved, first of all I knew everything that was going on, who was going into the building and I made an attempt to speak with the individuals that were entering, to ensure that they in fact took some adequate precautions as they went in and made sure that they had a good handle on the dose rates, I tried to relay what information we had already obtained from other entries, simple techniques that are so important, like ensuring that the teletector goes in before they go in and they know the area, they also do check, I think I stressed quite dramatically to everybody that in a matter of a foot or two could make a big difference under the conditions that we were seeing from straining conditions, talked about the areas that they were going into and what precautions they would take and then began, and most of this was going on as they began to get suited up and ready to go down and in.

YUHAS: You said that you knew everybody that was going to be going in, that you had a part in planning it, who decided what jobs involved protection of vital equipment or human life, were there any jobs, to

start off with, were any jobs that you were involved where that was initiative, where you were following back on the criteria of 25 rem or 100 rem?

DUBIEL: No.

YUHAS: To the best of your knowledge, it was not clearly indicated to you that any job that took place in the Unit 2 Auxiliary Building was in that category which would traditionally reconsider for the protection of vital equipment?

DUBIEL: There was no, I do not recall and I'm sure there was no conscious discussion of any evolution taking place where that was the criteria for the entry, I felt that we could in fact, I think we did make entries, my criteria was to try to go with a one and a half rem exposure on any individual entry and I think that the levels that we were talking about and the time, the jobs that were being done aloud for that, we were not really into the 25 rem, I'd like to just point out though that I'm really talking about evolutions that took place the first day, there was one event that took place either on day 2 or day 3, I believe it was day 3, where we essentially lost letdown flow, which is quite a bit down the line.

YUHAS: Make that clear, that was beyond day 3, that might have been a little further down the road even further.

DUBIEL: It could have been, I don't recall days, I know it was not on the first day.

YUHAS: Right, okay we're at a position now where your a party to all the decisions as to these people going in the Auxiliary Building and your discussing it with them. What information are using in terms of briefing these people as to the radiological conditions into the area in which there going?

DUBIEL: The types of information that I was presenting to them was to try to have, well first of all I had indicated the need to adequately establish the dose rates that they were getting into, we tried to give them some guide lines as to what dose rates they should in fact stop at and turn back and also from the knowledge of the areas that they were going into. I was trying to recall and I know I'm not an expert on it but I think I got a pretty good handle on where all of, most of the primary system piping is in Unit 2, all of the letdown piping and makeup piping and trying to pinpoint for specific entries things that might be in significant concern to the individuals as they went it, that they would definitely want to check...

YUHAS: Did you have a survey map that you were using to brief these people with?

DUBIEL: Yes we did, at sometime early on the first day I had one of my technicians xerox some plot plans and we used that to, first of all debrief every group that came back and indicate dose rates based on what previous groups that individuals that measured and used that as the indication of what those could, those subsequent entries could expect but at no times did I ever feel confident that dose rate that was measured on one entry would be the same on the next entry cause things were changing that quickly.

YUHAS: Do you know what became of these survey plots?

DUBIEL: No, I don't. I do know for a fact that I left approximately 6:00 in the morning on March 29, approximately 25 hours after I had arrived, the map was on the table in the southwest corner of the Control Room and when I arrived back on site about 1:30 or 2:00 that afternoon I could not locate the map, I had the same technician who made up the map the first day make up again the second day.

YUHAS: That would of been Tom.

DUBIEL: Tom Thompson.

YUHAS: Were these entries made under a RWP?

DUBIEL: At that time they were not made under RWP.

YUHAS: Who ensured that the people were properly dressed and provided with the right type of dosimetry.

DUBIEL: I had radiation protection technicians with me in the Control Room we were assisting in the dressing procedure and ensuring that the dosimetry was in fact...

YUHAS: Did you...

FOSTER: Greg excuse me, let me interrupt your interview, I'm going to, were going to change the tape.

FOSTER: We are going to continue the interview with Mr. Dubiel, the time is 6:05 p.m.

YUHAS: You were not using the RWP procedure. Did you assign one technician the specific responsibility of keeping track of who was going into the Auxiliary Building, the time that they went in, what they did, the time that they came out, and the dose that they received by pocket dosimeter?

DUBIEL: On the first day I did not.

YUHAS: Did you do it on the second day.

DUBIEL: I don't recall when in the chain of events whether it was on day two or day three that we actually went to reestablishing the RWPs and I reestablished RWPs for that purpose not to control the access but to document the access.

YUHAS: For the record the RWPs were not reestablished until essentially the 31st, Friday night, Saturday morning, Sunday, the RWPs were reestablished.

DUBIEL: That could be right.

YUHAS: The basis for that statement is personal observation was our request for records, there's a gap from the 28th then the first RWPs start showing up are midnight or essentially very early in the morning, the 31st.

DUBIEL: Right.

YUHAS: Since you did not assign someone this specific responsibility of documenting the accrued dose from trip to trip, how did you know that these people weren't making numerous trips in the Auxiliary Building in accruing dose for instance in excess of regulatory limits?

DUBIEL: The main method used was strictly by...well first of all, let me just back up, I have no doubt that the access to the Auxiliary Building was controlled, out of the control room, there were not a great number of entries but rather there were very few entries, I think if we got an entry made every five or six hours that was about the limit. We're talking about one or two people at each entry, really not talking about a major number of people. The individuals making the entries were asked of their previous exposure, were asked of their exposure when they came out and I was pretty much relying on those individuals to give a ballpark estimate of the amount of exposure they had received to that point and trying to limit those personnel to roughly one and a half rem limit such that I felt there was enough margin of error. Of course we were vulnerable to the guy that might give you the wrong number but I don't feel that that was something I was overly concerned about. I think the people that were involved were very concerned about their own exposures, were most interested in maintaining a good record of their own. That record may have been mental but that they weren't about to tell me a 100 millirem when they actually had 1500 millirem.

YUHAS: How did you convey to these individuals this arbitrary limit of 1500?

DUBIEL: Well the...what I tried to do I...my major concern and the reason for going to the 1500 limit was I felt it was very possible that an individual could get stuck in the reactor, in the Auxiliary Building at 1500 millirem and pick up an additional 500 millirem or better even another rem and just trying to get out due to the levels and by stuck I don't mean physically trapped in an area, I just mean having to come out through areas that were quite high in radiation level. And I was trying to give them the ability to...should they find themselves in an area that they had come back through a high radiation field that they would in fact still have a margin.

YUHAS: On the 28th, how was access controlled to the Auxiliary Building after the evacuation alarm was sounded?

DUBIEL: Do you mean access at the HP laboratory, the actual entrance to the Auxiliary Building?

YUHAS: Yes.

DUBIEL: Essentially there was no one stationed down in that area.

YUHAS: Did you have a health physics technician accompany these people when they went into the Auxiliary Building?

DUBIEL: No I did not. The main purpose was that first of all the individuals going in were Met Ed personnel that have been working at Three Mile Island for several years are qualified into the RWP level and in order to minimize the exposure to personnel to have an additional person going into pick up possibly another one, one and a half rem, as just a monitor I didn't feel it necessary.

YUHAS: Did you consider these entries to be repair party entries, under the emergency plan?

DUBIEL: To a degree I did, yea. Essentially they would have been similar to what you would call repair party entries.

YUHAS: Was there an HP or chem rad tech assigned as a repair party monitor?

DUBIEL: There was initially that day and additionally I mentioned we had rad chem techs in the control room.

YUHAS: Was there one specifically assigned only as a repair party monitor?

DUBIEL: I don't recall.

YUHAS: Where was the repair party at?

DUBIEL: Initially there was a repair party that mustered up the emergency control station. As the day went on in the relatively early hours, 8:00, 9:00, 10:00 that morning some key Unit 2 maintenance personnel assembled in the control room and were essentially, I don't want to convey the impression that they were the emergency repair party per se, they were not. They were acting as an emergency repair party might or one would expect them to. But they were not personnel that was assigned to the emergency repair party and initially mustered.

YUHAS: Who was directing the activities of these maintenance personnel?

DUBIEL: The maintenance personnel in question had specifically a lot of the people going in were supervisors and they were directing their own activities as well as the activities of people working for them.

YUHAS: Are you referring primarily to Mr. Shovlin?

DUBIEL: No sir. To give you a specific example I guess would be Doug Weaver. Doug Weaver is the Lead I&C Supervisor in Unit 2. He is also probably the most familiar individual with all the instrumentation controls of the unit. Doug Weaver had several people with him. I don't recall the exact number but he had a couple of I&C people with him. Doug was actually working as their supervisor but did an awful lot of work himself. He made several entries over the first two or three days. I personally felt Doug did an outstanding job at minimizing the total amount of exposure. Doug...one thing in particular here Doug, I know Doug to be an extremely capable I&C technician as well as foreman. He demonstrated that many, many times and on many of the entries Doug personally did the job because he felt he could do it in much shorter time frame than any of his technicians and he felt for the sake of keeping the exposures minimum and getting the job done quickly that he was the right guy to do it. So essentially Doug Weaver was working as the supervisor and also on many occasions was working as the repairman.

YUHAS: Did Weaver tell you each time he was going in or that he was taking a crew to go in?

DUBIEL: Yes. He did not have to tell me, I was there, I knew he was going in before he went in.

YUHAS: Okay. Who was controlling the job assignments of the A Auxiliary operators?

DUBIEL: I don't recall specifically who, I think it was Fred Scheimann, I am not sure. It was an operations foreman. I don't recall who, I remember Fred Scheimann but unfortunately at this point in time I am thinking back and the days of March 28, 29, 30, 31 blend together and I recall many instances when Fred Scheimann was directing activities and whether or not it was on that morning or not I.....

YUHAS: Let's go back on the first day and I'm sure the first day probably sticks out more in your mind than any other. Were you involved in any of the entries that the auxiliary operators made on that one morning?

DUBIEL: Yes, over the course of the first several days, entries that were made primarily to perform radwaste type operations, the movement of water, that type of thing, yes, yes I was involved in that.

YUHAS: Are you aware that auxiliary operators made entries without survey instruments?

DUBIEL: No sir, I am not.

YUHAS: Did you permit individuals to make entries alone?

DUBIEL: I don't recall whether entries were made alone or not on the first days. I do recall that after the first day or two days that there were occasions where entries would be made by single individuals who were, for instance, the ones I can recall were direct entries to the radwaste panel to do a single operation and come right back out. To minimize exposure a single individual would go in. During the first day I really can't recall whether or not.

YUHAS: When you did permit, when you knowingly permitted individual entries, were there precautionary measures that you took since you knew a guy was going into a very adverse and changing radiological environment by himself?

DUBIEL: Are you talking of the first day, second day?

YUHAS: First through the third day, I know you did on the fourth day because I think the Commission required it.

DUBIEL: I am not quite sure I understand what your question is.

YUHAS: In those instances where to save exposure you allowed an individual to go into the Auxiliary Building on a Scott Air Pack alone to do something. Did you take any backup measures like having someone down there suited up ready to go and time him, so if he didn't come back out, a repair party or a rescue mission would go in after him?

DUBIEL: The entries that stick out in my mind and again I apologize for not being able to define them as day one, day two, day three, or day four entries, there were precautions taken by having a backup individual at the HP lab available to go in. But again I don't recall, I specifically can't recall whether or not any entries were made on the first day by a single individual.

YUHAS: There were entries made, there were entries made by single individuals without instruments on less than a full Scott Air Pack and to the best that we can discern did not even talk to a health physics technician.

DUBIEL: I am not aware of any of those entries.

YUHAS: Okay. I'll make you aware of them. The case I am thinking of is an auxiliary operator who was directed from the control room and you were apparently in control, however, you were not consulted, the man was not told what his exposure limit was, he was asked, this was about 11:00 in the morning, to go down and to operate a decay heat spray valve which is located up on the 328 on a pipe rod between the containment or the M20 area in the Auxiliary Building. This individual went around, scrounged up a half Scott Air Pack he found laying on the floor, he couldn't find a survey meter so he went in, he ran through the 305 elevation, climbed the stairs to 328, panicked, developed claustrophobia, sat there in fear for a few seconds, went across the

328, climbed up a ladder, climbed up over the open pit that goes all the way down to the 281 on the pipe runs, unlocked this decay heat valve, opened the valve up, his bell was ringing at this point, crawled back down again, ran across the 328, down the stairs, sucked his mask completely collapsed it because he had absolutely no air, rips the thing off and then dives out the double doors and sits there panting in the hallway for awhile.

DUBIEL: I was not aware of that. This is the first indication I have had of that.

YUHAS: I am not surprised. We have several indications that there were numerous entries made alone and very carelessly in our eyes, the absolute minimum precautions not being taken. I can take at face value that when you make the statement that you knew and that you briefed people, I am certainly sure of those that you talked to, you thought you briefed, but that was not all the entries that were being made. There were numerous entries made, not quite as bad as the one we're talking about now but very serious entries in the sense that they put the licensee in an intolerable position. You apparently were not aware that people were in the Auxiliary Building when plant evolutions were causing drastically changing levels.

DUBIEL: That's correct. I believe Greg that I, the time that I spent in the control room I spent very close to the personnel that I had previously mentioned, Mike Ross, Bill Zewe, Gary Miller and I feel that any direction that they had given for maintenance evolutions or operations that they had directed. I felt comfortable that I was aware of and I did not personally know that anything else was being directed.

YUHAS: Do you remember a particular entry, this would be on the first day, you may have reviewed it, it was an overexposure, Mr. Pat Shannon. Are you aware of the circumstances surrounding his entry?

DUBIEL: Not the total circumstances. Pat Shannon's overexposure is the one of the three overexposures that I had the least information on. I have not personally talked to Pat since the event. If you have a specific question.

YUHAS: Well were you aware that he was going in and what the reason for him going in was, prime to the overexposure we're talking?

DUBIEL: Thinking back to the 28th and I don't recall any specific talk that I had with Pat Shannon, I do recall specifically being informed that we thought we had an overexposure on his exit and I don't remember being surprised by the fact that he was in there and that makes me believe that I was aware of his entry before he made the entry and the reason but I don't recall what the reason was right now.

YUHAS: Did you debrief these people as to how much exposure they received in their pocket dosimeters when they came out?

DUBIEL: Did I brief them?

YUHAS: Debrief them.

DUBIEL: Debrief them.

YUHAS: Find out how much they had received.

DUBIEL: I personally did not debrief all of them. I debriefed some, I got a lot of the information from my technicians who were getting information from the people. Specifically, I asked them to debrief the people for dose rates and their own exposures.

YUHAS: Did you tell one of them specific - you are responsible to ensure that every guy that goes in there gets debriefed when he comes out?

DUBIEL: No sir, I didn't.

YUHAS: Did you have an HP foreman available to you?

DUBIEL: No.

YUHAS: Do you know where your HP foremen were?

DUBIEL: Yes sir, they were directing the offsite activities.

YUHAS: All four of them?

DUBIEL: Let me...first of all Joe Deman I believe was with the ECS for the early hours. I don't know what happened to Joe in the later hours. Pete Velez from the early stages was at the Observation Center as was Fred Huwe. Bob McCann, I also believe, was at the Observation Center, I believe at some point in time during the first day we asked that two of them, I don't remember exactly how we paired them up, I believe Bob and Pete, Bob McCann and Pete Velez were asked to leave such that they could come back and relieve the other two. The other two were then assigned duties at the Observation Center by personnel over there primarily assisting and supporting the onsite efforts from a logistic standpoint as well as supporting the offsite monitoring programs.

YUHAS: For your information Mr. Shannon's case, he did not make one, he made two entries. His first entry he made and he only took a low range pocket dosimeter with him, went in and did a job, he pegged the pocket dosimeter, he didn't debrief with anyone, he didn't tell you, he didn't tell a technician, he didn't tell his foreman, no one asked him, he was so contaminated that he decided if there was any other work to be done, he would ask if it needed to be done, which is exactly what he

did. He asked another foreman in the control room something about they had heard there was going to be some work done down on the radwaste panel to try and start some pumps. So he went ahead and they planned another evolution in the control room, they went down and he went offscale again, and this time when he came back he didn't tell anybody till he had gone over to Unit 1 to decon.

DUBIEL: I recall Pat Shannon being over in Unit 1, I recall being informed at that point that we had a potential overexposure. That I do remember. I don't remember the.....

YUHAS: What I don't understand is if you had technicians in there and you told them, why weren't they doing their job?

DUBIEL: I can't say that the technicans were not doing their job. I think the technicians were doing their job as well as could be expected under the circumstances. I think that there was an awful lot happening and I think if there is a shortcoming, I have expressed this in previous interviews, as a matter of fact I expressed it to Dale Donaldson, that if there is a shortcoming in emergency planning I feel that emergency planning exists to handle the emergency under the first four to six hours. After that there was so much going on so fast that the people I think that could have prevented some of those occurrences were people who were absorbed in other jobs that were in fact vital, there's no question about it, there was nobody standing around doing a job that

wasn't essential but that they were jobs that could have been handled by other people, maybe not as well but I think the priorities may have been improperly assessed. That's easy to say in retrospect. But I think the emergency organizations have got to be defined, an organization has got to be defined, not necessarily step by step procedures, I don't think you can do that but at least organizations with generic guidelines to move into place in a reasonable amount of time following an event, I think that's where our major shortcoming was. We had technicians in the control room, at the same time I know that the on and offsite teams were desperately in need of technicians, emergency control station needed technicians, the Observation Center needed the HP type people that could help them locate various supplies and establish simple things like getting the Scott Air Packs refilled and things of that nature. What happened is that the HP organization was diluted. I don't personally, my own belief, I don't feel that there was a technician in that control room who was not doing the best he could under the conditions nor was there a technician in that control room that I felt was personally neglecting his duties.

YUHAS: Let me ask you a question about training of...the instances that we just talked about both involved auxiliary operators, auxiliary A operators. Auxiliary A operators carry an HP on their badge.

DUBIEL: That's correct.

YUHAS: What does that mean?

DUBIEL: HP on a badge means that they have undergone a two week training program that effectively allows them or teaches them and then allows them to enter areas of abnormally high radiological hazard and I guess maybe that ought to be further qualified by saying that the intent of the HP is not to or never was to bring them to the...allow them into areas or to teach them how to handle themselves in areas that we experienced on March 28th but rather the types of levels that one might normally experience during a refueling outage in some of the higher radiation or contamination levels.

YUHAS: Are these auxiliary operators trained to supplement your staff as far as running surveys? Let's say particularly onsite radiation surveys not in-plant but onsite and offsite radiation surveys.

DUBIEL: They are trained. I think I'd have confidence...some confidence in their...not some confidence...I'd have confidence in their ability to read a dose rate meter, I'd have confidence in their ability to draw an air sample. I might be...they might be a little bit more prone to burning up air samplers and things of that nature but I think they could do it.

YUHAS: Is this not an already integrated part of the emergency organization is that the A auxiliary operators are designated to help you out?

DUBIEL: They are available to help us out.

YUHAS: Were they used let's say one HP tech, one A operator, on the survey teams?

DUBIEL: To my knowledge no.

YUHAS: In fact you did have in most cases two HP techs together.

DUBIEL: I believe that to be true, yes.

YUHAS: In discussing with numerous individuals who have done things involved in this incident I find instances where people who are...have HP's on the badges are for instance entering areas where they have been told the dose rates are greater than 100 R/hr without an instrument. Can you offer some comment on that?

DUBIEL: Are you talking about during the incident?

YUHAS: Yes.

DUBIEL: Okay. I really have no comment. I was not aware that this was a common place event that people were entering areas of 100 R without dose rate instruments.

YUHAS: Did you review the Fuhrer overexposure?

DUBIEL: Yes, I did.

YUHAS: Maybe you have a better understanding of why that man was overexposed than I do. Perhaps you can relate to us your understanding of it.

DUBIEL: Well I think well first of all Fuhrer made an entry with Earl Showalter. The two of them made entry that was in fact for 90 percent of their entry they were together. One had a teletector, the other had a...I believe Ed had E-520 which in itself would not be sufficient but Earl carrying a teletector was in fact what was required and should have been sufficient. They got to one point...what they were doing was essentially trying to determine the source of any additional leakage into the aux building sump and the resulting backing up to the floor drains of the water in the auxiliary building. And it's my understanding that just prior to their exiting the area, they split up just momentarily, Earl to go to the radwaste panel to, if I remember rightly, it was to check some tank levels and Ed wanted to check one last area and proceeded down a passageway behind the makeup valve alley. I believe he monitored the radiation levels adequately up until he hit the door and at the door itself it was a step change where he essentially stepped out into a stream and when he stepped out into the stream the meter pegged immediately. It was a low range instrument such that he really

had no idea what the radiation level was but he didn't hesitate more than a few seconds, stepped back and went right back and was with Earl. Earl received I believe somewhere between 500 and 600 millirem. We had...we subsequently monitored that area I believe within the next day or two and found it to be 750 R/hr where he had stepped. It was an area just at the door where the shielding ended and the door afforded very little shelter.

YUHAS: Did you write that up? Did you write up the evaluations on any of the overexposures? Chronologys of how they were overexposed or anything like that?

DUBIEL: No, I have not personally.

YUHAS: Do you know if anyone...was there an investigation done of the overexposure?

DUBIEL: There has been an investigation to the degree that it's been...a report has been put together for the NRC under the 10 CFR 405 reporting requirements.

YUHAS: That is the extent of the investigation then?

DUBIEL: Yes.

YUHAS: Okay. Are you running out of time?

FOSTER: Okay. We are gonna break now to change the tape. The time is 6:34 p.m.

FOSTER: We going to continue with the interview of Mr. Dubiel. The time now is 6:35 p.m.

YUHAS: The scenario you just related regarding Fuhrer's administrative overexposure...is that on the basis of discussions you've had with Fuhrer and Showalter or is that some other source of information?

DUBIEL: Discussions with Mr. Fuhrer and Showalter.

YUHAS: About how long ago did you have these discussions?

DUBIEL: I had a discussion with Mr. Fuhrer almost immediately after his coming out of the auxiliary building.

YUHAS: Our understanding of that overexposure is significantly different than your understanding. First, let me clarify. Are you sure it was a teletector?

DUBIEL: No, I'm not sure but I was under the impression that it was a teletector based on my...please remember that the discussions I had with the two individuals was a month and a half ago.

YUHAS: Do you have any other high range instruments here on site that might have been used other than a teletector?

DUBIEL: No, sir.

YUHAS: Okay. And this is preliminary information I want you to know, that at this point it is my understanding that the teletector like instrument or the teletector failed shortly after entry and the two individuals continued to perform their assigned tasks using the E-520 which pegged repeatedly. When they split Mr. Fuhrer was down on the 281 and and when he returned from the 281, it's that point that he discovered he was overexposed. Alright, in other words he had read his pencil after walking down on the makeup valve alley. My reason for concern is I would have hoped that your training program would be sufficiently adequate to ensure that individuals are aware that when they are in a high radiation area and their meter is pegging full scale to leave the area, that that is a violation of your technical specifications. Is that addressed in your training program?

DUBIEL: Yes, it is, and I have no doubt in my mind that the individuals that you refer to as well as every other individual who goes through our training program is thoroughly briefed on that and they are repeatedly briefed on that throughout normal conditions, normal operations, refueling outages, anything of that nature. We've had instances prior to the emergency condition where we've had personnel in exactly those situations where they got up to the full range of the instrument and backed off and I have no hesitation in saying that I think our people understand that. I also feel that during the events of March 28th, 29th, 30th, there was a tremendous amount of concern by the individuals such as Ed Fuhrer and Earl Showalter and Fred Scheimann and all the other people in the control room that the plant be maintained safely and that the releases to the public be minimized and that every effort and I don't believe that it was ever singly pointed out to any individual other than...repeatedly during the first day I can recall the three major objectives that Gary Miller and Joe Logan and Jim Seelinger and others stressed repeatedly was: (1) we had to ensure the safety of the public; (2) we had to keep the core covered; (3) we had to protect the property and personnel. And if you just note the priority listing I think that there is an awful lot of people who were willing...or maybe not willing, I guess that's the wrong word, who subconsiously did what they thought was required in an attempt to try to protect the public and keep the plant safe rather than worrying about tech specs and other things that they have had recalled or been taught pertaining to the use of a dose rate instrument. I honestly believe that. I think that the priority

in the people's minds was the safety of the plant and the public, actually the other way around. And we were without doubt in a situation where we had significant releases and even though those significant releases I don't feel amounted to a whole lot of exposure off site. Personal observation after being in the control room for 25, 26 hours the first day, getting off site and hearing what the news media was saying, I thought they were talking about a different plant. I thought we had destroyed most of Central Pennsylvania and under those kind of conditions and the pressures that were on the individuals I think I can understand the thought process of those people. Especially those that are very close to operations...operation of the plant.

YUHAS: I guess the point that I'm getting at though I do not disagree entirely with Miller's objectives, but in order to ensure that those objectives are met you have an emergency plan and you have a training program and a retraining program. Okay? To met those objectives the people also have to protect themselves.

DUBIEL: That's correct.

YUHAS: And these issues that we are talking about now are the base the base level of health physics. They are the things that every plant, every individual that's permitted to work in a restricted area should know.

DUBIEL: That's correct and...as again I don't think there is any question in my mind that those individuals know that. I think they...the hard part to...the gap to bridge is the difference between an individual being assigned to go into an area or do a job under a routine condition that may or may not affect the number of megawatts that's going out and another individual who is assigned a job under a condition where he is in his own mind has got to weigh the consequences of what has happened and what is going to continue to happen relative to the outside world with that same training and maybe...I don't disagree with you Greg, I listed previously in my discussions that there is no question in my mind that the first thing that any plant in this country ought to do is stock up on teletectors and not stock up on them to use daily but stock up on them to put inside a glass cabinet "In Case Of Emergency Break Glass." Scott air packs, the same thing. I don't think there was enough. I know there weren't enough. I think we could have avoided alot of those types of situations had we had an adequate supply of equipment. I don't think that Ed Fuhrer or anyone else with a teletector would hesitate to back out when that teletector started showing 100 R or 200 R or 300 R type numbers, but under the conditions... cause...I also have a...well...

YUHAS: Okay. Let's go back. Earlier you said that you briefed individuals before they went in and that you set an exposure limit and that you told them to what the maximum dose rate you wanted them to back out. Did you brief Showalter and Fuhrer?

DUBIEL: I talked to Showalter and Fuhrer, that's correct.

YUHAS: Did you tell them what their exposure limit was?

DUBIEL: Yes, I believe I did, I have no reason to feel that...

YUHAS: Did you tell them what the maximum dose rate they'd be allowed to enter would be?

DUBIEL: Let me just kind of rephrase that a little bit for you, Greg. I was referring to 1.5 rems as an objective on their entry limitation if you will. I was also...what I was trying to do was to establish in their own minds a methodology of...in other words 60 R/hr is 1 rem per minute, okay, to try to get them to think in terms of rem per minute, that they would then be able to better estimate the amount of time that they had in an area to go up to the 1½ rem rather than...I think if you went in cold one might hesitate at a 10 R/hr number where if you've got a 10 second job you really shouldn't hesitate if you are just gonna go turn a knob. I was trying to get across to the individuals that type of thinking.

YUHAS: Did you do that with Fuhrer and Showalter?

DUBIEL: I have no reason to feel that I didn't. I don't specifically remember standing and talking to them but again it's been a month and a half. I have recollection of their entry, I have recollection of their briefing before the entry with the ops foremen, you know, those bits and pieces and you know the whole puzzle I remember pieces I have no reason to doubt that I didn't also talk to them the same way I did to the other people.

YUHAS: Are you aware of the entry that took place in the evening about 1800 to change out the charcoal cartridge on HPR 219?

DUBIEL: 1800 on the 28th? I remember an entry into the auxiliary building if you're gonna tell me it was 1800 on the 28th I'd believe you.

YUHAS: That was about the time, yes.

DUBIEL: Is the individual in question Karl Myers, or do you know that?

YUHAS: Yes. I don't know your tech's name that well all I...to bring back some familiarity this is the charcoal cartridge that read 250 mR there, started to get count and it's been misplaced ever since.

DUBIEL: I remember...I think that was Karl Myers, yes I remember the entry.

YUHAS: Do you remember the debriefing afterwards?

DUBIEL: To a degree, yes. I recall the dose rates on the cartridge. Well, let me rephrase that. I don't remember 250 mR. I remember 30 mR per hour on the cartridge.

YUHAS: The 250 is the combined beta gamma.

DUBIEL: Okay. Is the 30 a gamma...

YUHAS: 30 and 40 were the numbers that were measured.

DUBIEL: Okay. Those numbers I think were accurate, those numbers that were given to me so I guess in summation I must have got involved in the debriefing cause I recall getting the numbers.

YUHAS: Do you remember any dose rates that he might have told you?

DUBIEL: In the vicinity of...off the top of my head, no, and I'm not gonna be able...I don't think I can specifically say for that entry. I recall for personnel entering into that area and I don't know of...I can't recall anyone else other than our technicians changing our car-

tridges why anyone else would want to go in that area. I recall receiving numbers and comparing them with the area monitors in that area and whether or not it was that specific entry it's you know...

YUHAS: Okay. Early in did anyone tell you what the whole body...or what the general area dose rates were in the location of 219 and 222 and 221, they are all about the same vicinity of there, right?

DUBIEL: That's not totally correct. 219 and 229 I believe is the number, it's the one we never use in the hydrogen purge system, sit in one location. All four other monitors, 221A and B, 222, and 228 sit in an entirely different location at the other end of the building.

YUHAS: Okay. Do you remember anyone telling you early and we are talking 8:00 to 10:00, the dose rates in the vicinity of 219?

DUBIEL: Of 219? No, I don't.

YUHAS: The dose rates as reported by your people were around 2 R/hr that early in at 219. That was the background general area. By that evening the dose rates as best we can place them were up to 100 R/hr in the vicinity of the monitors. Were you aware of those type of fields?

DUBIEL: Greg, I don't personally believe that it was as high as 100 R/hr and I think I can kind of indicate my feelings...why my feelings are that way. The number that you quoted 2 R/hr are numbers that I recall having to deal with around that monitor for several days after the incident. The 100 R/hr might very well be numbers not at the monitor itself but...in that you had to go through to get to the monitor. If you look at the floor plan to enter from the east side into that area you have to run past the ventilation system filters.

YUHAS: Though when you enter from the west side by the elevator you come up those stairs, okay? About how far is 219 from the door?

DUBIEL: Let's just for purposes say that an individual comes off the elevator to...

YUHAS: Okay, the elevator was out of commission and you had to come up the stairs.

DUBIEL: Okay, alright. It comes out the stairs...the...he...recalling that the...there are four monitors directly in front of you and those monitors are some I would estimate 60 feet something along those lines in front of you. To get to 219 you make a right, go a few feet, make another right, and then go back through the chem addition area where the levels I don't believe are ever very high and back to the monitor. Now that would be one way to get in. A second way and quickest way

time wise would be to come in through the HP lab and go right up the stairs immediately to your right as you first enter the aux building. Go up the stairs past the surge tanks, closed cooling system surge tanks, make a left and you are right into the ventilation room and then it's just a matter of 30 or 40 feet til you get back to the monitor. I do not recall 100 R/hr areas in the vicinity of 219 at any time. Okay, the numbers of 2 R/hr, 3 R/hr I think were the levels...

YUHAS: Do you remember the times that the ventilation was secured on of the auxiliary building?

DUBIEL: Remember the time, oh no I don't I recall, the directive to secure the ventilation and the strong desire on the parts of those of us in the plant...not secure ventilation only because we had a very strong feeling for a what was going to happen when we did secure it. I don't recall the specific time.

YUHAS: This is essentially day one.

DUBIEL: I would think day one late in the day, afternoon possibly, late afternoon, I don't...

YUHAS: Right. Do you remember what happened when the ventilation was secured?

DUBIEL: I recall everything in the plant going up and then the control room started to experience problems with the activity actually coming back up to the stairs and...

YUHAS: Was this about the time the man went in to take the sample?

DUBIEL: I don't recall. It could have been.

YUHAS: At times there was an effort by an electrician to go in and throw some breakers on a 328 ventilation panel up there. Did you brief the tech that went with him and the electrician when he came back down?

DUBIEL: I recall the entry and I feel I did...I think I did.

YUHAS: Do you remember the numbers that they told you?

DUBIEL: I don't remember specific numbers.

YUHAS: Let me relate it to you and see if it rings a bell. The numbers they had were like if they went up to the stairs when they got to the door they had like 40 R/hr at the door, now this would be the west door.

DUBIEL: West door to the...

YUHAS: 328, coming up the stairs.

DUBIEL: I'm just trying to...I don't think we are talking...

YUHAS: There were two entrys, there was and effort that was aborted via the west method and then there was an effort later on that was successful coming up the east stairway.

DUBIEL: Coming up the east...when you say the east stairway, you are talking about the one directly inside the door as you walk into the auxiliary building up the stairs and then again back past the same surge tanks and right straight back through the electrical busses.

YUHAS: Right. Are you aware of the first entry and the fact that it was aborted and the fact that the...when the tech got up there he had 40 R at the door, they opened the door, they had a 100 R inside and he took a reading out a little bit and at that point he was pegging the teletector?

DUBIEL: No, sir, I'm not aware of that. I'm not aware of that. I...the numbers that I recall from the early days, early day, up in the vicinity of those electrical busses and back by the monitors were

numbers in the 10 R/hr, 20 R/hr numbers. I can recall trying to understand why that area which has absolutely no primary system piping or primary system involvement whatsoever would show numbers that actually were higher than what then they were seeing down below. I don't recall 100 R/hr numbers.

YUHAS: Did a...due to the fact that a cloud of somewhat more noble gases would rise?

DUBIEL: That's what I had...I had felt once we started looking the 328 elevation in the vicinity of the busses, just north of the busses, was where there was a large penetration in the floor for movement of equipment and that's what I had felt was the cause, that it was gasses rising.

YUHAS: That's the exact location the individual reported the teletector pegged when he extended the probe over the equipment hatch.

DUBIEL: Okay. That may jive then with what I'm saying in that the...you are saying though that...I guess the...just to make sure that we're both talking the same areas for the dose rates, he came off the elevator he was not at that point that he saw the large radiation levels but when he got back towards that opening in the floor. That might in fact be something that I think I do recall that.

YUHAS: Essentially, when he got to the top of the stairs he had 40, as he proceeded towards that hatch he had 100 R and they were gonna have to go by that to get to the switch gear...

DUBIEL: Right.

YUHAS: ...and he extended the probe in front of him over the hatch and it went full scale so they withdrew, they didn't attempt to operate it. Later on another crew went up the other direction cause the switchgear's over in this direction, they came in from the east side and were able to successfully close the breakers without taking a large amount of exposure.

DUBIEL: If I recall, those areas were the 10 R/hr type numbers that I'd previously spoken about at the switchgear, they were centered at the switchgear.

YUHAS: On the 29th when you were relieved did you leave someone else in control of in-plant health physics there in the control room?

DUBIEL: On the 29th when I left. All I can recall is shear exhaustion. I don't really remember who was left in charge of health physics. I do recall the attempt and again I'm only remembering that Tom Mulleavy and

I discussed earlier in the day sending the foremen home to get rest such that they could come back in and be the relief and I think I just...I don't recall who relieved me.

YUHAS: You specifically did not for instance have Sid Porter or Porter Gertz in there to relieve you or you did not specifically assign one of your health physics foremen to take over your position there in the Unit 2 control room?

DUBIEL: Sid Porter, no. I don't recall...I've got thoughts that Fred Huwe may have been in the control room but I just don't remember.

YUHAS: During that day to the best of our assessment we cannot find a foreman in the Unit 2 control room. We find one technician who appeared to be doing the damnest job possible of trying to hold down the fort but it was generally being overrun. In the next incident we are going to talk about you may have some familiarity with. Are you aware of an effort to change out the makeup filters?

DUBIEL: No, I am not. Unit 2 makeup filters, no.

YUHAS: There was an effort on the part of the repair party in the direction of operations supervision to try to change out the filters that day. Earl Showalter and company, the technician performed surveys, his teletector pegged when he just stuck it in the ports...inside the ports on either side, okay.

DUBIEL: The makeup filters...I know I recall rightly...you are talking about...when you say makeup filters...

YUHAS: 305 elevation.

DUBIEL: 305 elevation back past the makeup tank.

YUHAS: Right, behind the makeup tank in a shielded vault.

DUBIEL: I recall the dose rates inside the door being extremely high you really...I don't...

YUHAS: We are not talking about the makeup pump room door. We are talking about the makeup filters that are gained access through to the plug on the top.

DUBIEL: That's correct but to get to the top of the makeup filter cubicle one has to enter past the letdown monitor past the gas analyzer and go up a ladder and I recall the dose rates in that room itself were extremely high.

YUHAS: That's right.

DUBIEL: I...you know...I know of no one who entered that room personally.

YUHAS: That room was entered on the 29th twice because they didn't go along with your technician's recommendations the first time. The technician went down past the gas analyzer had 90 R there on the MUR 720, stuck the teletector, apparently there is two ports on the cubicle...

DUBIEL: That's correct.

YUHAS: ...stuck it in and pegged, okay? Came back up and to the best of his ability, tried to persuade the crew from going down to change the filters and he was told to go back down and verify the readings and take readings up on top, which he did. He went back in on another entry took more exposure pegged it this time from the other side, there's ports on the other side of the cubicle, and verified that the whole body dose was 2 R/hr on top of the cubicle with the plugs in. I wonder if you could tell us the approximate thickness of that shielded vault?

DUBIEL: Of those...if you are talking about the plug itself I believe those plugs are somewhere in the order of 18 inches concrete.

YUHAS: So the plugs have to be removed right to manipulate the bolts.

DUBIEL: That's correct.

YUHAS: Would you have considered based on your experience with time involved to change out those filters? Would you have considered that life threatening dose?

DUBIEL: Life threatening?

YUHAS: In other words how long does it take to change those filters out?

DUBIEL: Well, first of all please understand that the filters themselves are pulled up into a lead cask and that it is not a requirement that any individual physically get into the beam of the plug. The plug is... well first of all an individual gets into the beam of...or gets on top of the plug just to hook on to...with the...what do you call it...

YUHAS: The hoist.

DUBIEL: The hoist. Lifts the plug, moves the plug to the side, lowers it, removes the hook, the hook is then placed on a lead cask pig which is then lifted and moved into position over that same plug and then lowered down onto the plug sits directly over the plug. There's a bottom drawer that then is slid out and then an individual goes through

the top with a long J-hook and hooks onto the filter and pulls it up. Now I would assume that there would be a significant beam that his hand would be in. I would assume that there would be a very brief period of time that the individual has got to put his face over to look down to grab onto it but that is just a matter of pulling it up into the lead cask and closing it. I guess I'm not sure how long it would take under those conditions...it sounds like a simple job but it really...it takes time it's bulky equipment it's a slow hoist. Life threatening...ah I really don't think that it would be the life threatening...I'm saying 400 or 500 R/hr.

YUHAS: Let me ask you first before you go on further. You give the impression that this filter is simply there to grab, does it not sit in a bolted and latched container?

DUBIEL: Yes sir, that's right.

YUHAS: How are the bolts undone?

DUBIEL: They are done remotely also.

YUHAS: How?

DUBIEL: Through a long handled tool.

YUHAS: Which means someone is standing over the port essentially.

DUBIEL: That's right, but for a very brief moment, just to latch onto it and twist.

YUHAS: Okay, but there's what, probably 16 bolts are on the outer peripheral of the can?

DUBIEL: No sir, 6. 6 at most. Some of the filters specifically I think the spent fuel filters only have 3.

YUHAS: Let me ask the obvious question, can those filters be bypassed?

DUBIEL: Can those filters be bypassed? Yes, to my knowledge they can be bypassed.

YUHAS: Alright, enough on that point I guess I'm just a little concerned that redundant readings were taken when the dose rates were so high.

DUBIEL: And I can understand that. I see no reason to disbelieve the first readings. The filters weren't hot, the coolant going through the filters was awfully hot.

YUHAS: Okay. To what extent did you get involved in in the planning of the reactor coolant sample that was taken on the 29th?

DUBIEL: Actually very little. I talked with...well first of all let me just say that there was a large desire when I arrived to obtain a reactor coolant sample, primarily because there was still an awful lot of concern from various organizations including GPU, B&W offsite, NRC, Met Ed offsite, that we were in fact still critical and that it could not be...we could not establish a shutdown margin was the prime concern and that even though we had probably dumped so much boron into the system that it was...you know...virtually impossible...(end of tape)

FOSTER: Tape two of three ran out at 7:04 p.m. we are going to continue with the interview of Mr. Dubiel with 7:05 p.m., Mr. Dubiel.

DUBIEL: We were discussing the taking of the letdown sample on the afternoon of March 29th. The, first of all, I was aware that there was a major concern from the standpoint of getting an accurate assessment of the boron concentration in the coolant system to dispell any belief that we were in fact still critical which in my mind was an extremely important factor. I don't recall exactly who directed or requested, of Ed Houser and Pete Velez to get the sample. I recall being made aware of the fact that Ed and Pete were going to take the sample and I can also remember thinking to myself that there were no two better people that I would have taking the sample. If anybody could take the sample adequately with a minimal amount of exposure, those were the two guys to do it. Both of them had strong backgrounds in drawing of letdown samples and both of them were well experienced in health physics. Pete being health physics foreman, Ed being formerly a senior radiation protection technician, and one of the best ones we had. I felt very, I don't want to say comfortable in them taking it, I felt that if anybody was going to get it with the minimum of exposure and the minimum probability, of ... say being overexposed, but more importantly of being, approaching any life threatening levels those were the two guys who could do it. As a matter of fact, I still feel pretty bad about that, because I think, and I'm pretty sure Ed does, that if it weren't for

his decision to go back in and verify an valve lineup, I think they would have gotten it with a reasonable amount of exposure.

YUHAS: Let's talk a little bit about the decision making process to take the sample. Were you a party to that process?

DUBIEL: I don't recall being a party to it as much as I was made aware that the sample was an essential item when I arrived. Remembering that I left sometime after, I'd say approximately 6:00 that morning. Didn't really get to bed until some time after 8:00 and woke at shortly after 12 noon, and was back in the plant sometime around 1:30 or 2:00. By the time I finally got into the control room, I believe the decision had already been made, but I was made aware of the fact that we were going to take it and what the rationale was and the reason for it. I didn't disagree with the need to establish the fact that we were in fact, subcritical.

YUHAS: About what time did you get to Unit 2 control room?

DUBIEL: I think it was in the order of 2:00, maybe a little later because it took us a Godawful amount of time to get from the observation center into the control room.

YUHAS: The need to establish the subcritical margin of the plant, in evaluating that need, did you discuss the previous boron samples with any of the chemistry foremen?

DUBIEL: At that particular time? No, I did not.

YUHAS: Did you call and discuss the potential boron concentration with Mr. Ken Frederick, your former chemistry analyst?

DUBIEL: Are you referring to the 700 and 400 PPM numbers? No, I did not.

YUHAS: Were you aware that there was a potential for sodium hydroxide, having been added to the primary coolant system at that time?

DUBIEL: At the time of the 400 and 700 numbers?

YUHAS: No, no, at the time of the need for everybody was yelling for another primary coolant sample. Were you aware at that point that they had injected, or could have injected sodium hydroxide into the reactor coolant system?

DUBIEL: At 4:00 in the afternoon or 1600 on the 29th, I don't recall whether or not, I feel that I was, but again I'm looking back in retrospect knowing a lot of facts now, or having been informed of a lot of things now, it's hard to define what I knew at the time versus what I know now.

YUHAS: Were you aware if any of the original reactor coolant samples were still available?

DUBIEL: I was not aware, I don't recall asking that question myself.

YUHAS: Did you talk with Houser and Velez prior to their embarking on the sample program?

DUBIEL: No, I did not to my knowledge talk to them prior to their taking the samples.

YUHAS: Knowing full well that the reactor coolant sample were likely to contain large amounts of radioactivity, what precautions would you prescribe for individuals going down to take that sort of sample.

DUBIEL: Well I think that first of all the major precaution is to take, do all of the lineup prior to, ensure proper lineup, prepare a facility to, ... into which you can place the sample immediately upon

drawing it. Look at doing it in step sequence with a variety of people that were aware which is effectively what was done. Under the conditions, I think if you had infinite amount of time, and we've taken subsequent samples, and have shown that you can put enough precautions in but under the conditions that they were facing that day, I don't think that there's a heck of a lot ... you can't really look at portable shielding, I don't think there was enough time to look at designing or obtaining shielding to put into the room. Long handled tools are something that one could effectively use if one had the ability to train on them, and to assure that you weren't going to ..., didn't have the possibility of dropping, long handled tools are tough if you just grab one and try to use it without a lot of practice and I don't think that it was something possible at the time. But I think that the items the minimum time, splitting it up, doing the lineup beforehand and having an idea what you're going to do with the sample once you grab it. Where it's going to be put, and how you're going to transport it and that type of thing is basically what I'd be concerned with under those kind of conditions. I think there's a difference between the ALARA and doing it without overexposure at that kind of a point of time.

YUHAS: Would you require extremity monitoring in a situation like this?

DUBIEL: Well, you're saying would I require it. Had I been there and had I had the presence of mind I would have in fact, had them put on extremity badges. But there's again, I guess I can't help but stress the fact that it was an awful lot that was done that in retrospect is the easy to say that's what we should have done and I know there's a lot of things like that. Under the conditions, as fast as things were moving, and as important as things were pertaining to the status of the plant, ah...

YUHAS: Let's talk just about how fast things were moving there. How long had the need for that sample been discussed?

DUBIEL: Well, quite honestly, I recall the major concern on the day prior to that and into the night, the concern with the fact that we may in fact still have been critical, was being bounced around. I thing there were people who felt that an adequate amount of boron had been placed into the core and that we could calculate and there were others that felt that the calculations were questionable, and it was an issue that was bounced around from some number of hours, I don't want to say on the 28th, it may have been into the morning of the 29th. But, early morning hours when I arrived back on site, apparently, it had continued into the time when I was not there...

YUHAS: So in all likelihood, there was a least 12 hours of discussion relative to the need of verifying boron concentration. Is that true?

DUBIEL: That's correct.

YUHAS: During that 12 hours, was the individual who was filling the job description as chemistry supervisor contacted and told to start planning for contingencies to draw reactor coolant samples?

DUBIEL: To my knowledge, I don't believe that happened.

YUHAS: Don't you suppose that's one of the reasons why in an emergency organization you had a chemistry supervisor?

DUBIEL: Yes sir.

YUHAS: Let's talk about one other aspect of the emergency. How in these situations, where you had very high airborne, and at times you didn't know your isotopic mix because you'de lost all your counting capability, How did you make an effort to evaluate the airborne concentrations of radioactive material to which these people were exposed. I'm thinking primarily of situations where you know you had water on the floor and you knew people were going down and wading through the water and they were searching for leaks, and this kind of thing. How do you try to appraise yourself for what the airborne activity might have been?

DUBIEL: You had indicated that we didn't have the counting capability, that's to a degree true. We did have backup capability within some period of time towards the latter, end of the first day, I believe the first mobile Ge(Li) detectors were on the site, including the NRC's, excuse me, I don't mean on site, but at the observation center. The first of all, we did take samples at some points in time during the first couple of days in the auxiliary building, I don't recall specifically what ..., who took the samples, or who ended up counting them, but I do recall the specific point of not having iodines being assessed. We were drawing samples, we were counting them, we're not what I would consider to be an adequate airborne monitoring program, by any means, but it was essentially establishing the fact that our airborne activity was noble gases.

YUHAS: Do you know, or are aware of what type of respiratory protective devices Houser wore and Reed wore when they processed reactor coolant sample?

DUBIEL: No I don't.

YUHAS: Was the airborne activity measurement taken in the nuclear sample room or in the primary sample room when you processed that very high-level reactor coolant sample?

DUBIEL: To my knowledge, it was not.

YUHAS: Would you have expected that there was iodine in that reactor coolant sample?

DUBIEL: In the reactor coolant sample, yes.

YUHAS: Could you describe the boron analysis?

DUBIEL: The boron analysis is essentially a titration with sodium hydroxide.

YUHAS: When Houser took the reactor coolant sample and one of the first things that he did after he took off 5 ml. was to check the pH and the pH of that reactor coolant in the diluting was 8.7. What would the procedure call for?

DUBIEL: I don't recall.

YUHAS: The procedure would call for it to back titrate with HCl and adjust the pH back down to about 6. Do you know what that would likely cause?

DUBIEL: Well, a decrease in pH, or pH depression would increase the volitization of the iodine.

YUHAS: Do you routinely sample in the primary sample then for airborne activity?

DUBIEL: Routinely? Routinely is a vague word. Yes, we do take air samples periodically.

YUHAS: Do you think that an air sample would have been the right thing to do when you were going through this process with failed fuel?

DUBIEL: In retrospect, yes.

YUHAS: Generally speaking, what does the term breathing zone air sample mean to you?

DUBIEL: Breathing zone air sample is kind of a, to me, it means an adequate representation of the air that the individual was breathing, which is something that is an idealistic terms and you do the best you can. If you want specifics ..., this type of thing can be debated I quess forever, if you're looking for, if you go to the ideal state, I've always felt that the best way to determine what an individual breathes is to thread his mouth and screw in a filter, it's the only way, but...

YUHAS: How is the air monitored in the nuclear sample room under normal conditions?

DUBIEL: In the nuclear sampling room? There isn't an air monitor in the sampling room. It's a Victoreen unit, with particulate iodine gas and I'll qualify the iodine, it's a charcoal sampler with the sodium iodide detetector looking at it. Which also will see increases in zenon.

YUHAS: And where does that sample?

DUBIEL: It samples in the room approximately 3 or 4 feet from the exit of the Unit 1 sample sink and several feet from the edge of the Unit 2 sample sink, maybe 8 or 10 feet.

YUHAS: Then, is that sampler required to be in operation when people are drawing routine reactor coolant letdown samples?

DUBIEL: Required by ...

YUHAS: Procedure or Part 20, or whatever.

DUBIEL: Part 20 doesn't require, tech specs does not require, I don't believe the procedure requires it, letdown sampling procedure..., requires it.

YUHAS: Is that sampler in operation?

DUBIEL: Is it today or was it at the time?

YUHAS: Was it at the time?

DUBIEL: I don't really know, I have no reason to believe it was not.

YUHAS: Have you been made aware of any problems with that sampling system?

DUBIEL: First of all, I do know that that sampler did have problems, I'm trying to remember exactly what the problems were when it was a calibration on the iodine monitor itself, the sodium iodide which is a very typical problem with those crystals as they age, or whether it was a pump problem or what, I don't recall. I do know that we had occasion and the timing is vague to me, mid-winter sounds right that we had I&C people entering that room periodically to work on that instrument.

YUHAS: Are the sample lines from the Unit 2 or Unit 1 for that matter, are those sample lines shielded?

DUBIEL: In the sample room?

YUHAS: No, as they come through the penetration room through the Unit 1 auxiliary building through the hot machine shop, into the sample room.

DUBIEL: No sir, they're not.

YUHAS: Have you had any problems with background causing that monitor to read high?

DUBIEL: From Unit 1, yes.

YUHAS: Do your people pretty much follow the malfunction report procedures?

DUBIEL: Pertaining to a monitor out of service?

YUHAS: Right.

DUBIEL: I have no reason to believe that they don't.

YUHAS: A review of records indicates that RMA-12, which is a nuc sampling air sampler system, has not been operational since 4-78.

DUBIEL: I think, my only question is can that be qualified? In other words that's a multi-part monitoring unit with several detectors and an air pump which part of it was not operational.

YUHAS: The malfunction reports indicate that wires had permanently been removed and it was not hooked up to run. My understanding based on review of the paper work that the point that you mentioned were the I&C people in the fall, or the winter of this year, excuse me, were working on it, were trying to hook it up. And it has not been sucessfully put back in operation.

DUBIEL: I was not aware of that.

YUHAS: Can you describe the retraining program for health physics technicians?

DUBIEL: We at this time do not have a formalized, or I should say did not have a formalized, ongoing retraining, requalifications program. The training program that was established was essentially that we had various types of training that were defined by other procedures such as an emergency plan for example, which our technicians would get involved in, other than that, the training was on specific areas that we had problems with. Or, that didn't, for instance in going into Unit 2, training on familiarization with the Unit 2 systems, RMS systems,

sampling systems, things of that nature. We did not have and do not has, have as of to day a formalized requalification or retraining program that covers all of the items of the initial training. I would point out to you though that that particular item is something that has been defined and was developed in stages, what we commonly refer to as our two-year curriculum program where an individual goes through the curriculum every two years.

YUHAS: Let me ask you about training and retraining for Mr. Limroth, yourself, Mr. Mulleavy and your 4 ..., 7 HP and chem supervisors. What could you describe that program?

DUBIEL: The training program for the supervisors is primarily a hit or miss type thing. By that I mean that we, let me just say that those of us that are in positions, and have been in positions for a couple of years, the training that we have received is training that we may define to our supervisors by receiving a flyer from, for instance, B&W might put something out saying that they have got a training program ongoing, or are planning on putting one on on such and such a date, such and such a topic. And Kerry Harner might bring that particular thing to me and put in a request form to go to that training. There has been no formalized training program for those individuals. For new individuals, specifically people like Ed Houser, Pete Velez, there is a, ... what's the proper term, it's an introduction or a training

program for supervisors, and in that you go through not only the typical, ... meet your personnel guy and your payroll master, but specifics in that individual's area. To give you an example, Ed Houser's gone to a chemistry safety seminar, two day training seminar put on by Baker Chemical Company. He has gone to a two week cold chemistry course for ..., put on by B&W. He's gone to a radio chemistry program that was put on by B&W. These are, the program essentially is not defined in a timed period, it's more or less a discretionary thing. For instance, in the radio chemistry area, one might now want to send a new chemistry supervisor to a radio chemistry program until he's gotten a relatively good handle on the in-plant radio chemistry procedures. He might choose to have a delay, I'm thinking specifically of a chemist that we just brought in, Gary Chevalier, who is not going or had no plans on sending him to the next radio chemistry because he'd be a little bit too green. I'm thinking next winter would be the ideal time for him.

YUHAS: Let me ask you a question then. You obviously don't have an assessment of the effectiveness in this training, in terms of an annual exam.

DUBIEL: That's correct.

YUHAS: Your technical specifications 6.4, might be 6.3 for training, says that for Facility staff, that you'll have a train, retrain program which meets or exceeds requirements of ANSI N18.1, Section 5-5. Section 5-5 says that you will cover and it lists like six topics, startup, shutdown, accident,etc., etc. on an annual basis and an evaluation be made. Now how are you complying with that tech spec?

DUBIEL: I don't believe, or I have no knowledge of that particular spec being imposed on members of this support group in chemistry and health physics.

YUHAS: Are you not a member of the facility staff?

DUBIEL: I guess the term staff is yet to be defined.

YUHAS: The facility staff is defined in section 6.2, it gives you an organization chart. Are you familiar with that organizational chart?

DUBIEL: I believe that I'm familiar with it, if it's the one in the tech specs.

YUHAS: Are you presently operating in accordance with that facility chart?

DUBIEL: I believe we are, there may be minor modifications with the addition of Dave Limroth, but they may have been reflected...

YUHAS: Let's discuss that. Is Mr. Limroth, you report directly to Mr. Limroth?

DUBIEL: That's correct.

YUHAS: Who does Mr. Limroth report to?

DUBIEL: He reports to Gary Miller, Station Manager.

YUHAS: According to the technical specification, I believe it indicates that you report directly to Mr. Norris, am I not right?

DUBIEL: There's a point of confusion in the reporting, my reporting requirements of the two different technical specifications.

YUHAS: We're speaking only to Unit 2. Unit 1 probably has you reporting to the Unit 1 superintendant.

DUBIEL: Unit 1 superintendant, and just to state that I don't, I don't have it memorized, but I was under the impression that the Unit 2 also had me reporting to the Unit 2 superintendant initially, not to the station manager. But again, I apologize there's confusion factor in that there are two different tech specs.

YUHAS: Let's just establish, the clear line if you can, you report to Limroth, Limroth reports to Miller.

DUBIEL: That's correct.

YUHAS: That's the way it's been since March 1, essentially?

DUBIEL: That's correct.

YUHAS: Now, do you have a chemistry supervisor?

DUBIEL: No sir.

YUHAS. Do you have four chemistry foremen?

DUBIEL: Three chemistry foremen, plus Gary Chevalier, a recent admission, and is for practical purposes lets call him a staff chemist. It was my intent in hiring Gary Chevalier that at some point in time one of the existing chemistry foremen would become a chemistry supervisor as Gary Chevalier came up to speed to take over as chemistry foreman.

YUHAS: Can you describe your comments on the policy of individual techs who receive exposures in excess of your administrative limit and then are permitted to read their own TLD badges, are you aware of that?

DUBIEL: I am not specifically aware of that but I would understand that that could happen.

YUHAS: You have no prohibition, essentially all your techs are authorized to read TLD system.

DUBIEL: That's correct.

YUHAS: Is there a quality control system to insure that the individuals maintain proficiency on using the TLD reader?

DUBIEL: There is a quality control program that includes the reading of quality control badges, if you will ... there's an exchange program with Hartshaw as well as readings some pre-established, pre-exposed TLD's that were done in-house, both in-house and with Hartshaw.

YUHAS: Who does that? Q-C check?

DUBIEL: The Q-C check would be done by our technicians.

YUHAS: Whoever might happen to be on when the time is for to do it.

DUBIEL: That's correct.

FOSTER: Let's break and change the tape. The time is 6:35 p.m.

FOSTER: We're going to continue with the interview of Mr. Dubiel, the time is 6:35 p.m.

YUHAS: We were just talking about the TLD system.

DUBIEL: Yes sir.

YUHAS: The fact that ..., do you verify the capability of your TLD system to respond to the beta radiation that you have present here on site?

DUBIEL: I guess the TLD's are verified in their ability to respond to beta, to a beta source. That beta source is due to physical constraints as not a xenon gas or something of that nature, it's an actual beta source.

YUHAS: You're saying that you do this?

DUBIEL: We have a beta source on the site, that's correct.

YUHAS: What kind of a beta source?

DUBIEL: I'm just trying to think exactly what it is. I want to say that it's a strontium-90 source but I'm not really sure, it's been a while since I've physically worked with the source.

YUHAS: Are we talking about the same thing? Do you expose the pin badges on your routine procedure through this beta source, then you read them out and verify against the known intensity?

DUBIEL: There's a, yes, there's a Q-C program that does that. It's also designed to effectively define, if you will, the beta factor for the TLD's themselves. TLD's over respond by a factor of 4, is it over respond or under respond? Wait a second. No, under respond by a factor of 4. I think our beta factor is .26 to be exact.

YUHAS: Do you know how your TLD's respond to xenon 133 betas?

DUBIEL: Offhand, no I don't.

YUHAS: Have you initiated reaction to have that verified?

DUBIEL: I have not, no.

YUHAS: Do you see any need to do that?

DUBIEL: I think there's a need in the early stages we had many high beta doses due to personnel wearing their TLD's on the outside of their protective clothing, their wetsuits and their respirators. Giving a response considerably higher than the individual who would end next to him and had it underneath. I don't feel that there's a need, an urgent need to reestablish those numbers because they're conservative, there was no overexposure even using those numbers and the best we could do right now is to redefine the numbers and possibly cause confusion by changing someone's exposure or reducing it by a fairly large factor.

YUHAS: I think you're on just a slightly different track than what I'm thinking. I'm thinking in terms of have you assured yourself that the TLD badge in fact, is capable of responding to the beta from xenon 133 and do you know the direction of response, for instance do you know that that will respond in a conservative direction or in a non-conservative direction? Not so much the issue of whether it got worn outside of the clothing.

DUBIEL: I have not done any research into the xenon, beta effect on the TLD. However, there is no doubt in my mind that it does respond quite dramatically as experienced by the fact that people who wore them on the outside of their clothing versus the guy standing next to him who had it inside the clothing, saw a difference in beta response of about 5 to 6.

YUHAS: And what type of difference in beta response did you see for xenon clouds, lets say in open, closed window for hand-held GM's.

DUBIEL: For hand held GM's I recall a response of about 2:1 difference, in the early monitoring.

YUHAS: I seem to recall looking at the environmental data it was what 10:1.

DUBIEL: Would be, well it may be a difference in instrument, I believe in the early days, you said the hand-held GM's, I believe in the early days we were using the RO2's and PIC 6 A's which are both ionization chambers, thin walled. The numbers I recall were more on the order of 2:1 response at that time, with an RO2.

YUHAS: How does a teletector respond to 81KEV gamma rays?

DUBIEL: I would not expect that a teletector would respond ...

FOSTER: Excuse me ... 81KEV?

YUHAS: Xenon 133!

DUBIEL: ... xenon 133. Just considering the response curve and I quite recall where the response curve levels off close to a relative response of one but I believe it to be close to 80FEV maybe slightly higher and I would expect that it would be a slight under response.

YUHAS: You were aware early in that the majority of the dose in the auxiliary building was due to clouds of xenon.

DUBIEL: That's correct.

YUHAS: At that time did you review the response characteristics of that meter that was being used most?

DUBIEL: I had reviewed that previously, I don't believe I reviewed, I know I didn't review during the event. I recall looking at that response curve and the Eberline instrument manual at some time previous to the event. If I recall correctly, I don't believe you're that you're talking about more than 10-20% under response, if I recall the curve properly.

YUHAS: When you calibrate your teletectors, do you do it in accordance with the manufacturers instructions?

DUBIEL: I believe we do, I personnally have never seen detailed manufacturer's instructions but let me just say that we have a specific teletector calibration source, the procedures for our calibrations were written by an individual who in 1974 was employed by Eberline, I have every confidence in the fact that our procedure for calibrating is in accordance with Eberline's...

YUHAS: Do you happen to know the maximum output of your source for calibration of teletectors?

DUBIEL: Not specifically, but it's in the mid-scale approximately of the high range, I'd say 5 - 600 R, 300R, something ..., somewhere in that range.

YUHAS: How many health physics violations have you processed, health physics violations being doses, that were written up by your foreman or your technicians? We're just talking about health physics violations your procedure forms, how many of those have you processed in the last year.

DUBIEL: Oh, possibly a dozen, maybe as many as 20.

YUHAS: Typically, could you describe those violations as being committed by management, or by bargain unit personnel.

DUBIEL: Typically, by management.

YUHAS: Is there some explanation why the management can't seem to follow health physics procedures, or is there another reason?

DUBIEL: I would think that, let me just state that there's two typical types of violations that we see. One is the bargaining unit writing up the contractor and the second is the bargaining unit writing up the

supervisor. You will rarely see a bargaining unit individual write up another bargaining unit individual. Unless there is some personal conflict between the two.

YUHAS: Do your foremen, your supervisors or yourself periodically audit and write health physics violations on the bargaining unit representatives?

DUBIEL: Yes, there are violations written on bargaining unit representatives by HP supervision.

YUHAS: Then you're essentially telling me that in the last year there have been a total of 20 something health physics violations?

DUBIEL: That's the number that I would estimate. One point in fact though is that quite often violations of health physics practices of a minor nature due to an inadvertant or overlooking any particular item that may not be in and typically is not significant when found by a supervisor, regardless of who is the violator, if the violator genuinely indicates cooperativeness, and does not show malice nor intent, it will not be written up as such. That's really not the purpose of the form, the purpose of the form is to to try to get after the those individuals who might intentionally or continually look to short cut health physics procedures.

YUHAS: Let me ask you a question then. Have you seen or do you remember any health physics violations that were written up for operations personnel dumping the rad waste concentrate tanks to the floor, without following the normal procedure for entering a locked high rad area and that sort of thing?

DUBIEL: The specific example you've given me does not register right now. What period of time, do you recall?

YUHAS: Let's take since the incident, the first three days, first four days of the incident.

DUBIEL: No sir, I don't recall those.

YUHAS: Were you aware of any of those instances?

DUBIEL: No. Those first days I was totally involved in Unit 2. It wasn't until about 2 weeks ago that I actually got back into Unit 1.

YUHAS: But you would have seen paper.

DUBIEL: That's not necessarily the case, I would normally expect to see paper but with the odd shift schedules and total breakdown of the mail system, that it may have gotten to the individual's file with someone else's signature, like Tom Mulleavy or Pete Velez, without mine.

YUHAS: Have you heard of this being done before, by the operations group?

DUBIEL: Dumping concentrated waste storage tanks to the floor. I don't recall concentrated waste storage tanks being dumped to the floor ...

YUHAS: I think the technical term is waste concentrate tanks, I'm probably using the wrong language.

DUBIEL: Waste evap. concentrate storage, oh that's a different story, yes I'm aware of that.

YUHAS: Have you seen HP violations written on that?

DUBIEL: No I have not.

YUHAS: But you are aware it's being done.

DUBIEL: It is a procedure that has been used on previous occasions due to let me put it this way. If you get a tank filled with radioactive material in a waste evap concentrated storage tanks, there's only one way it can go and that's to the river O.K. And if it does not meet the technical specification requirements for discharge to the river, the only alternative you have is to dump it back to the sump and to do that you dump it to the floor drain, which then goes right straight to the sump.

YUHAS: Is this a written procedure?

DUBIEL: I don't really know, it would be an operations procedure.

YUHAS: O.K. would you expect an RWP to be required to do something like that?

DUBIEL: RWP required to do something like that? I would hesitate to say yes, you're not dealing with ..., well first of all, you're not dealing with, first of all, the line itself can be, I don't want to say hard-piped, but the hose can be run directly into the floor drain and

that the, at that point, you're not dealing with contamination or the radiation levels typically are insignificant, 1-2 MR/hour. It might be done outside the bounds, such that none of the requirements of an RWP would be met.

YUHAS: Are you aware of any intimidation of persons who have written HP violations? Were you aware of any instances where representatives of management have intimidated these individuals as a result of them writting up a member of management?

DUBIEL: I am aware of at least one case.

YUHAS: Could you describe that? Was that an actual act or a threat of intimidation?

DUBIEL: It was a threat.

YUHAS: How was that followed up? First off, let me say, was the health physics violation justified?

DUBIEL: Yes it was. Excuse me, the violation or the writing up of the violation?

YUHAS: Writing up the violation.

DUBIEL: Writing up the violation was in fact justified.

YUHAS: Were you aware of it at the time, was it processed through you?

DUBIEL: Yes.

YUHAS: Could you describe it?

DUBIEL: Essentially, it was an individual entering an area greater than 100 mR/hour without a dose rate instrument. If I recall correctly, I believe those were the circumstances.

YUHAS: Did this individual, was he the one that made the threat or was it someone else?

DUBIEL: No, it was another individual of an equal position that made the threat to the health physics supervisor who wrote the first individual up.

YUHAS: This was a health physics supervisor?

DUBIEL: Health physics foreman, yes sir.

YUHAS: Oh, foreman, fine. How did you handle this?

DUBIEL: I handled it by going directly to the supervisor of that particular supervisor that made the threat. I know the individual who made the threat, I don't personally believe that the individual would go out of his way to make life miserable for anyone, I believe it may have just been an emotional statement at the time. But, I did go to his boss, the department head, discussed it with the department head and not only got assurance that the individual was talked to but subsequently met with, ... by the way, this was a shift supervisor, I met personally with the shift supervisors in one of their routine meetings, and discussed not specifically the item, or the issue, but the generic issue of we're all in the same facility and we've gotta all pull in the same direction. Personally, I, there may be emotional items that arise but I don't feel that the shift supervisors nor anyone else at that level was doing anything or has done anything but try to move to the continued safe and good operation of Three Mile Island.

YUHAS: What's the standard methodology for assessing skin dose commitment around here?

DUBIEL: Standard methodology? For contaminated skin or for exposure to air...

YUHAS: Let's take for a simple example, someone's skin becomes contaminated with 40 mR and it's not removable.

DUBIEL: First of all you're saying something that has never been standard here, we've never had such occurrence until the incident on March 28th, so we had no precedant. We did not have a specific procedure, or to address that to the detail of allowing the in-plant technicians to make some type of assessment that essentially was defined in procedure, as technicians were to notify supervision and personally I would consult with RMC or someone of that nature.

YUHAS: Was this done in Houser's case?

DUBIEL: At the time it was not.

YUHAS: Was this done in Velez's case?

DUBIEL: Well, let me rephrase that, I was not involved in either assessment. RMC did in fact have dealings with the individuals on a whole body count basis and things of that nature. Now whether or not they made a skin dose assessment at the onset I am not aware of it, they may have.

YUHAS: Could you describe the standard methodology, I quess either you or Landry, Mark Landry normally does your analytical work, would do to assess a skin dose ... just references, techniques, that sort of thing.

DUBIEL: To assess a skin dose? Well, again I think the important thing is identifying how much and what isotopes are involved. First response would be to insure that those isotopes involved you didn't have any additional problems. First of all, independently make calculations of the skin dose and secondly to have an outside group, and specifically RMC do the same and then discuss it with them.

YUHAS: Are you aware of the Craig Faust incident where he took off his shoes and wore plastic shoe covers, and went in the containment or excuse me, he went into the auxiliary building and got a little juice down there and his foot was reading 40 mR/hour for a few days.

DUBIEL: Craig Faust the control room operator, no I'm not.

YUHAS: You just got done telling me that your technicians were directed to inform you in situations such as that.

DUBIEL: That's correct. The one thing that, there was a specific handicap to that, it was personnel coming out of the Unit 2 auxiliary building were directed if there was any indication of contamination

problems were directed over to Unit 1 for deconning. There the communications may have been a real problem. Such as is the case with Velez and Houser, I really from the time that they took the sample until 11:30 that evening, I only had sporatic reports of their whereabouts and the fact that they were in fact deconning and re-deconning and reshowering and that type of thing.

YUHAS: In Faust's case, I personally requested that they identify, of course it was iodine. The isotope, iodine does not come off very easily.

DUBIEL: That's correct.

YUHAS: So as far as you know, no one has every done a dose assessment for Faust's foot.

DUBIEL: To my knowledge, no.

YUHAS: Who routinely does your evaluations of uptake?

DUBIEL: Of uptake? RMC.

YUHAS: And you review the evaluation?

DUBIEL: That's correct, and I would point out that we would independently do the evaluations, however, we're doing more as a check and also under normal conditions it gives the health physicist a chance to play with things that he likes to play with, but rarely gets a chance.

YUHAS: At this point, I'd like to give you to opportunity to bring any problems, comments, criticism, interface, your assessment of NRC involvement in the incident, basically, this may be your last tape. If you want to take some shots or make some comments or some kudos to the techs like you did earlier for a couple of your people, I want you to have the opportunity.

DUBIEL: I think I've previously given what I felt were the comments pertaining to the emergency planning to Dale Donaldson. I think a lot of the information that we've discussed and I think you've hitted a lot of the, I think you hit entirely on areas that were holes in our operation, they weren't holes that existed because I felt that there were people who didn't know what they were doing, or people that couldn't do, were incompetent in doing various things. I think the single biggest problem that we faced and I just can't stress it enough that those days went by like minutes. The amount of time that we spent, or could spend thinking about any specific items was extremely limited based on the total amount of activity going on. We ... I felt personally, and maybe being very subjective about it, myself being in the control room, I got

relatively poor support from the people outside, the people I needed to help me when I was up to my ears in aligators. The Pete Velezes and Joe Demans were tied up and consumed by off-site groups. And I think that all goes back to the single point that in any emergency plan, there ought to be an organization drawn up that could be put in place within 12 hours, or 8 hours or something that isn't critical in the first moments. But to put people in place that have responsibility, such as personnel dose assessment. There's no reason why that stuff should have been missed. You could name 15 different areas that could be covered and I think that ought to go into emergency planning and you ought to get people involved in health physics to man those positions. We had a lot of people, good people of other disciplines, trying to work in health physics and they were floundering. And at times it felt like they were handicapping me rather than helping. As far as the NRC is concerned, I can only comment that Tom Murphey was worth his weight in gold. I'll leave it at that.

FOSTER: O.K., we'll conclude this interview at 8:00 p.m.