UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Joseph H. DeMan
Health Physics Foreman

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

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NRC PERSONNEL:

Douglas M. Collins, Radiation Specialist

Gregory P. Yunas, Radiation Specialist

Owen C. Shackleton, Investigator

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SHACKLETON: This is an interview with Mr. Joseph H. DeMan. This interview is taking place at 3:46 p.m. on Tuesday, April 24, 1979. Place of the interview is in Trailer 203 located just outside the south gate of the Three Mile Island Nuclear Power Plant. Mr. DeMan is employed at this power plant as a Health Physics Foreman for the Metropolitan Edison Company (Met Ed). Present to conduct this interview is Mr. Douglas M. Collins. Mr. Collins is a Radiation Specialist in Region II of the U.S. Nuclear Regulatory Commission (NRC). Also present to conduct this interview is Mr. Gregory P. Yuhas. Mr. Yuhas is a Radiation Specialist in Region I of the NRC. Also present for this interview is Mr. William H. Behrle. Mr. Behrle is a Project Engineer for Met Ed. He is present today at the request of Mr. DeMan. My name is Owen C. Shackleton. I am an Investigator for the NRC, assigned to Region V, and will be acting as a moderator for today's interview. Prior to putting this interview on tape, I presented to Mr. DeMan a two-page document prepared by the NRC which outlines the purpose and the scope of this investigation. It explains the regulatory and investigative jurisdiction of the NRC, and also provided Mr. DeMan with information concerning his rights to refuse to be interviewed. On the second page of this document there are three questions, and Mr. DeMan answered to all of these in writing to the affirmative. At this time, to make these questions a matter of record on this tape, I'm going to ask Mr. DeMan these questions and will appreciate his answers. Mr. DeMan, did you understand all the information contained on these two pages?

DEMAN: Yes, I did.

SHACKLETON: Do we have your permission to tape this interview?

DEMAN: Yes.

SHACKLETON: And would you like a copy of the tape?

DEMAN: Yes.

SHACKLETON: Allright, sir, that will be provided. Do we have your permission to tape this interview?

DEMAN: Yes.

SHACKLETON: Would you like a copy of the tape?

DEMAN: Yes.

SHACKLETON: Allright, sir that will be provided.

SHACKLETON: And now, Mr. DeMan, for those persons who will be interested in listening to this tape, would you please provide us with your background regarding your training and experience in the nuclear power industry.

DEMAN: I spent 6 years in the Navy as an Engineering Laboratory Technician (ELT). Upon termination with the Navy I was hired by Met Ed as a Senior Radiation Chemistry Technician. I fulfilled that capacity for 4½ years until last October, when I was promoted to Health Physics Foreman.

SHACKLETON: Very good; thank you. Now, gentlemen, I will turn the interview over to the two Radiation Specialists.

YUHAS: Mr. DeMan, have you been interviewed by any one representative of Met Ed or Insurance Carrier's or anyone else prior to this interview related to the events surrounding the incident that occurred on 3/28/79?

DEMAN: No, not formerly.

YUHAS: Mr. DeMan, have you been coached or given any form of guidance as to how you should answer questions in this interview?

DEMAN: No, I haven't.

YUHAS: I'd like to go over your background a little bit, since many individuals may not know what an ELT is. Could you describe what an ELT means--the formal training and what sort of duties you performed while you were in the Navy?

DEMAN: As an ELT the basic training is to go to the Basic Nuclear Power Program, which is a period of in-house school training in basic reactor physics and math, and also on power plant chemistry and also in health physics. And then followed by that is an in-plant training in one of the prototype plants in the Navy acting as an ELT, qualifying on all the engineering watch stations, and in the chemistry and health physics lab performing routine surveys and running routine power plant chemistry.

YUHAS: Does the ELT program include a formal written exam as far as theoretical principles of radiation safety and chemistry?

DEMAN: There is a comprehensive exam at the conclusion of the Basic Nuclear Power course in-house training, yes.

YUHAS: At the conclusion of the practical factors demonstration period of ELT training, are you given an oral board in which individuals qualified in radiation protection and chemistry as well as reactor operation; orally quiz you and have you demonstrate proficiency in this specialty?

DEMAN: That is true, yes.

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YUHAS: Mr. DeMan, after leaving ELT school, what duties did you assume?

DEMAN: After leaving ELT school, I was temporarily assigned to a destroyer awaiting orders. I was there for about 8 months; then I got orders to the U.S.S. Nautilus and was assigned there as an Engineering Laboratory Technician.

YUHAS: Did you qualify as a mechanical operator on the Nautilus?

DEMAN: Yes, I did.

YUHAS: Did you qualify as an ELT or lead ELT on the Nautilus?

DEMAN: I qualified as an ELT, yes.

YUHAS: Did you qualify as an engine room watch supervisor?

DEMAN: EWS? No.

YUHAS: What year did you leave the Navy.

DEMAN: Approximately 5 or 6 years... about 5 years ago, which would make it '73.

YUHAS: While in the Navy, could you describe some of the radiological environments that you encountered and in your participation in coping with these environments?

DEMAN: Routine experiences were reactor building, reactor compartment entries shortly after shutdown, decontamination of areas and equipment, sampling of primary systems in regards to radiological health practices, routine shield surveys, dose rate surveys, routine dosimetry programs and calibration of instruments; basically that was about most of my work.

YUHAS: What was the most adverse of radiological environments, and I'm speaking now to airborne activity or whole-body dose rates that you directly controlled while aboard the Navy program?

DEMAN: I think the most adverse and important incident that we incurred was a shutdown out at sea to make a reactor compartment entry to replace an incore detector, which we shut down within 20 minutes were able to enter the lower level, reactor compartment, made initial air surveys, and then entry dose rates--they were low enough that we were able to enter the compartment out at sea, make the necessary repairs within the hour required time and then bring the plant back up.

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YUHAS: What type of whole-body dose rates or air activities were we concerned about there?

DEMAN: Whole-body dose rates--we're talking roughly in the area, anything in excess of an R based on the time factor that was required for the individual to go into the reactor compartment to do his duties; and we're talking about an air factor of less than 3×10^{-10} microcuries per cc gross activity to eliminate the need for respirator.

YUHAS: Mr. DeMan, could you describe the training program that you participated in when you accepted a position with Met Ed?

DEMAN: The training program I received from Met Ed? I received mostly on-the-job training and direct supervision from the foreman. As far as formal classroom training, I received system training in that regard. As far as particular power plant chemistry here and radiological procedures, I learned that basically on the job under the guidance of the foreman or the technicians available.

YUHAS: Is there formal training and retraining program here with Met Ed?

DEMAN: In regards to health physics?

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YUHAS: That's right.

DEMAN: At the present time, there is a formal training program or semiformal setup with an outside contractor in both health physics and chemistry. The training program is set up through Rad Services, through Mr. Rob Jacobs who provides training for new technicians and through B&W Lynchburg for the chemistry aspect.

YUHAS: You are indicating this is for new technicians?

DEMAN: Yes. This is for technicians we've hired within I would approximately say within the last year, year and a half.

YUHAS: Is there any retraining program for those of you, including the foreman as well as the technicians, in the areas of health physics?

DEMAN: No. There isn't.

YUHAS: Let me make that clear. Have you been provided any lectures in the areas of health physics and chemistry in the last 2 years?

DEMAN: Aside from general and employee training, no.

YUHAS: Are you familiar with the Technical Specifications for Unit 2, Section 6.0 primarily?

DEMAN: Not as far as the section itself. I am familiar with my own surveillance and technical specifications and requirements for HP procedures, yes.

YUHAS: What I'd like to do now is have you pick up, in your own words, and describe the chronology of events that you participated in, beginning from whenever you came in or you were onsite, and what we'll do is kind of give you free rein and when something comes up that we think needs additional detail or we want to ask specifics--who was involved, the type of instruments, this type of thing--either Doug Collins or myself will interject and we'll try not to break your chain of thought, but the period of concern we're interested in--just take it nice and slow--we want to go from where you get involved up until midnight of the 30th, which would have been Friday night. Just go ahead and let us know what happened.

DEMAN: Initially I was off sick the first 2 days of the week involved, Monday and Tuesday. I reported back to work about 6:30 a.m. the morning of the 28th. Upon returning to the Unit 1 Health Physics Lab on my way to Unit 2, I noticed that my HP Supervisor, Dick DeBiel, was in. He informed me that they did have a reactor trip at approximately between

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4 and 5 in the morning. They were in the process of doing borons on the primary system. He also indicated that he thought that they blew the rupture disk out of the RC drain tank, and that there was a problem in the RC borons in as far as they were making up in the high boron concentration and the boron in the system was going down instead of up. At that particular point, in discussing that, my area monitor went off in the hot machine shop, in the hot machine shop where the sample line runs from Unit 2 to Unit 1. I recognized that and went out with a meter to check the area alarm and noticed that I had a high area out there. I don't recall what the exact dose rate was, but I went back to the chemistry lab and took a dose rate on the sample line itself that was on recirc. from Unit 2's letdown and received a dose rate of about 200 mR/hr on contact with the sample line.

DEMAN: At that particular point, I started doing more area surveys throughout the auxiliary building. At HPR 227 there was a dose rate of about 10 mR on contact with the sample line going into HPR 227 which monitors the reactor building atmosphere. I thought that was unusually high. Outside of the makeup tank room, the dose rates went up to about an R/hr outside of the passageway, and this is in the space of about an hour from 7 to about 8 a.m. I went into the basement of the auxiliary building in Unit 2 and there was water on the floor, and it appeared that it came up from the drains backing up. I went through that water in my street clothes and received no contamination on it, so at the time there was not any letdown in that water.

892 092

: What time?

: This was, I'd say, about 8:00 in the morning. Just about
en 7:30-8:00 in the morning. There was water in the basement of
ux building from the drains backing up, and I walked right through
The first thing I did was put a teletector at the base of the
, and it was less than .2 mR. With that indication I walked
gh it, and upon I monitoring myself afterwards and there was no
mination on my feet or on my clothes or anything. I continued to
or dose rates in the basement of the auxiliary building, and at
time I don't recall finding anything unusual as far as higher than
round normal. I want back to the Unit 1 health physics lab, tried
ganize what technicians were coming in for the daylight shift, and
g to get them to perform some dose rate surveys in the auxiliary
ing, because readings were starting to climb on the monitors.

NS: This is Unit 1 Auxiliary Building?

: This is Unit 2 auxiliary building where I was trying to organize
I knew that's where the source of the problem was originating.
echnician reported a reading to me at about 8:30 or 8:00 that at
tepoff pad at the entrance to the Unit 1 reactor building personnel
, he had a reading of about 4 mR. They had another reading at the
to the HPR 227 monitor, had a reading on-line of about 50 mR, and
watching the meter it all of a sudden climbed up to over an R.

SHACKLETON: Excuse me. Mr. DeMan, when you are giving these readings, you mean per hour?

DEMAN: Per hour, yes, dose rate, I'm sorry. I'm used to talking to...

SHACKLETON: I know you are, but some of these people who are going to listen to this are not...

DEMAN: I'm used to talking dose rate.

SHACKLETON: O.K., thank you.

DEMAN: Yes, you see, he watched the meter at 50 and all of a sudden it started to climb to up to 1 R/hr. When he reported that to me, at that point I called the control room and asked them to shut off the monitor pump to minimize any leakage into the auxiliary building off the sample line if there would occur any--also to try to minimize my background dose rate in the hallway, just to take some sample recirc. off HPR 227.

YUHAS: What technician... do you know his name?

DEMAN: I think the initial technician was Pat Donahue. At that point, and I can't remember exactly how many hours it had been, the reactor building entrance at the stepoff pad was climbing to--I think it was

about 100 mR/hr at the entrance. By about 9:30 or 10:00, all the readings in the auxiliary building were starting to go up: the hydrogen makeup line to the Unit 2 makeup tank outside was reading I think in the vicinity of 10 R/hr. At that point also, VAR 748, which was my condenser offgas monitor, was reported to me that the counts were starting to rise on that. At that point I requested a technician to take a sample, a grab sample, for analysis. I think following that we declared a site emergency, it was declared a site emergency, and I reported to Unit 1 HP lab, which would be the emergency control station.

YUHAS: About what time was the site emergency declared?

DEMAN: As far as I can remember it was roughly about 9:00 I think. I think the reason for the hesitancy on declaring the site emergency is because nobody really knew at the time what was going on. They knew when they tripped at 4:00 that they thought they might have ruptured the RC drain tank, but no level indications as far as dose rate readings showed them any problem until about 7, and then all of a sudden you had one monitor going off and the possibility of another, and people were basically trying to figure out what was happening. I think by 9:00, based on the criteria of a site emergency, they declared a site emergency.

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YUHAS: Was that passed over the MC?

DEMAN: It was passed over the MC system. At that point in the ECS, I tried to organize offsite teams with the personnel available, tried to organize repair party teams, and tried to fit them up with radios and set them up a processing center to check out the emergency kits in preparation for sending them offsite upon orders from control room. At that point, Tom Mulleavy was in, Pete Velez was in, Frank Huwe was in, and Tom Mulleavy and Dick Dubiel made me take control from that point. Later on in the day, I can't exactly--at what time--a general emergency was declared, they moved all unnecessary personnel to the Observation Center, and I reported to the Unit 1 control room. The air activity had gone up and we were now on particulate respirators. I stayed mainly in Unit 1 control room the entire time until 1:00 the next morning. About 1:30.

YUHAS: That would be 0100... March 29?

DEMAN: I'm sorry. Yeah, Unit 1... I stayed in the Unit 1 control room from around 9 or 10:00 I would say...and it might have been later--I sort off lost track of the time at that point--until about 1 or 1:30 a.m. when I went home.

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What actions were you doing in the Unit 1 control room?

Mainly organizing or getting really dose rates and surveys that ntrol room requested throughout the building, you know, to find actly--to gather some data as far as what was happening. Nobody , as far as I could tell, had a handle on really what was causing r the scope of the problem they were in. They knew they were in oblem and they knew it looked to be on a large scope, but it was a little confusing in Unit 1 control room station since the l room station was Unit 2 control room as far as all your indi- s. Unit 1 control room was trying to piece together the event l the information they had. Basically, that's about all I did up t 1 control room, just organize parties to go out and take a dose urvey, or take an air sample and set up routine air sampling, in the control building in Unit 1 so we could hopefully try to t of particulate respirators. Because after about 6 hours they etting a little bit irritating.

O.K., so you left at 1:00 on the 29th. When did you come back?

I returned about 8:30 the following morning on the 29th. I was o go home and come back at 3:00 that afternoon. And I returned 0 that afternoon. At 3:00 that afternoon, I reported to Unit 1 l room. I relieved at the Observation Center and went to the

Unit 1 control room and maintained the HP foreman position in the Unit 1 control room. I stayed on duty from 3:00 in the afternoon until 7:00 the following morning, 7, 8, 9, around there. I think I put in about an 18- or 19-hour night that night. Because the following morning I think I accompanied Mr. Nimitz to the airport with 1ML sample of letdown the following morning so I didn't quit that day until about 1:00, from 3:00 through this afternoon.

YUHAS: Could you describe your reactions on that 19-hour night?

DEMAN: That's getting a little difficult because it was mostly routine from the day before as far as maintaining air samples in the various buildings, to try to find out where the activity was coming from, and the plume was shifting directions, the dose rates would go up for instance in the auxiliary building, to try to maintain that control area, to try to get as many areas out of the mask as possible, and try to regain possession of Unit 1's health physics lab. That's all mainly involved in that entire day in the Unit 1 side where I was. To no avail that day we were able to get out of respirators in the other areas. Unit 1 control room we were, for a time, if I recall. But for instance the Unit 1 auxiliary building HP area we were still on respirators. We were running into problems because we couldn't get the air activity down in the buildings because it was coming from out of the buildings,

from the plume. That was giving us quite a problem. And the plume shifting--the auxiliary building dose rates went at one time from less than 5 mR to up to 50 mR, then back down to 5 mR. And it was a problem changing your frisking stations based on your plume direction. That's mainly what we were trying to combat that entire night--was to get people in and out, get a good survey, and make sure the area stayed down and try and keep it down.

YUHAS: O.K., so you went home at 0700 hours on 3/30. When did you come back?

DEMAN: I went home--you mean from the 3-11 shift? I reported at 3:00 that afternoon, on the 29th, and went home about 1:00 on the 30th. Because that morning Mr. Nimitz and I took the sample to the airport. I didn't finish that until about 12 or 1. I went home then, then came out that night 11-7. Actually, it was 11-11; we were working 12-hour shifts.

YUHAS: OK. Fine. We're going to go back and start working over the chronology now. Were you called in at 0630 or is that your normal time?

DEMAN: I would normally start daylight at 6:30 or 7:00 on the 28th. I was back on normal daylight shift.

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YUHAS: What gate did you come in through?

DEMAN: In the protected area? I came in through the north gate, in through the processing center.

YUHAS: O.K., when you got through the north gate, what were the conditions at the north gate?

DEMAN: Normal.

YUHAS: Normal?

DEMAN: Normal conditions. I didn't suspect anything was wrong until I reached the Unit 1 Health Physics Lab, where I ran into Dubiel and the technicians sampling with the boron.

YUHAS: At 0630, Dubiel was in the Unit 1 chemistry HP area.

DEMAN: True.

YUHAS: Do you know the name of the other technician that was there?

DEMAN: They were the 11-7 technicians. I think Pat Donnachie was there from 11-7, Mike Janouski was there, Tom Pyke was there; offhand that's all I can recall at the present time. There would only be normally 3 to 4 technicians on a shift, the 11-7 shift. I know that they wanted to make a reactor building entry that night, prior to any indication of anything wrong--this was at the 4:00 trip--fortunately that they didn't make the entry.

YUHAS: Why didn't they make the entry?

DEMAN: There were a couple of reasons. One, it would require a reactor building... unless they... bona fide as an emergency, you would have to go through the normal reactor building entry procedure which requires about 2½ hours of sampling and counting. O.K., so that would have had to have been done, and that would have delayed it. Second of all, it was a shortage of technicians, since they had a reactor trip, that proves a heavy chemistry load on the 3 or 4 technicians present--they've got to do routine ½-hour borons if not every 15 minutes, steam generator secondary power plant chemistry. O.K., and that takes away the only 3 to 4 technicians on.

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YUHAS: Let's go over specifically now. You ran into Dubiel and these other three technicians. Could you try to relate to us specific things, like: was the primary coolant letdown sample in the process of recirculating from Unit 2...?

DEMAN: Yes, at the time the letdown sample was on recirculation, probably since about 5 or 6 in the morning, they were taking routine borons for the boration of the plant. Normal procedure is, if you are taking routine boron samples, you put the primary system on sample recirc and you leave it that way. When you want a sample you open the tap off, let it flush, and take your sample, but you leave it on constant recirc constant recirc, o.k., that's what initially gave us the high alarm out at the hot machine shop, because that's where the sample line comes over from Unit 2.

YUHAS: Are the sample lines shielded?

DEMAN: No. At the time they weren't.

YUHAS: Do the sample lines travel through occupied areas?

DEMAN: Yes, the sample lines do travel through Unit 1's auxiliary building, and there is no RWP required to go through the auxiliary building, because general areas less than 5 mR... so they are normally occupied--they are in a controlled area but they are not in an RWP area.

YUHAS: Are the sample lines in a pipe chase?

DEMAN: In a pipe chase? No, they're in a fashion of a tube bundle.

YUHAS: Approximately how close would a person doing normal work come in contact with this tube pipe?

DEMAN: A person doing normal work such as compacting laundry or drumming laundry in that area which is normally done--the sample lines at one point would be approximately 6 feet by... I'd say about 2, 3 feet over his head.

YUHAS: Could you just give us a relative idea of the length of the sample line from the Unit 2 letdown system?

DEMAN: A long line. I can't even come close... it runs all the way from the containment vessel through the Unit 1 fuel handling alley, into the model room, which is a space below the Unit 2 fuel pools, runs along the upper portion of that model room through to the Unit 1 fuel handling and receiving area, across that area in through the hot machine shop, and then through the wall into the primary chem lab. It's quite a long run.

YUHAS: Would you feel comfortable saying that this distance is greater than a 100, or 200, or 300 feet?

DEMAN: I would say it would be greater than 300 feet.

YUHAS: What is the approximate pipe diameter of these sample lines?

DEMAN: Approximate pipe diameter--¼ inch, stainless.

SHACKLETON: Gentlemen, we'll break the tape to change it over to the other side of the cassette; time is now 4:14 p.m., April 24, 1979.

SHACKLETON: This is a continuation of the interview of Mr. Joseph H. DeMan. The time is now 4:15 p.m., April 24, 1979.

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YUHAS: We are still talking about the Unit 2 primary coolant or letdown sample lines. Do these lines run a very smooth, long, straight run of pipe, or is the pipe tortuous; does it have many bends and loops in it?

DEMAN: There are sections that are long and straight, very long and straight, and then it does come to sections where it makes a few minimal bends. I don't think there is more bends than necessary to get to the intended point. But there are sections where the whole tube bundle does make 90° bends in close proximity to each other.

YUHAS: Do you have any familiarity with crud transport mechanisms?

DEMAN: Basically, through water systems and crud traps and piping elbows and restrictions in lines.

YUHAS: Based on your knowledge, with a greater than 300-foot length of small bore tubing that has numerous bends, vertical and horizontal rises, do you think that sample system provides reliable information as to heavy metals or crud in the actual primary coolant system?

DEMAN: From basic operating experiences, that particular sample run has the high probability of giving many sample line crud bursts, because of the crud deposits in the line. It also requires a very long recirculation time to obtain a representative sample; in normal operating temperature and pressure you're talking a minimum of 45 minutes to 1 hour of recirculation time to obtain a decent sample.

YUHAS: You say at "normal temperature and pressure." Can you give us a few numbers there?

DEMAN: Normal temperature of the pressurizer, 600°; over 600°, pressure 2150. You drop pressure appreciably below that, 1500 pounds, I would say to increase your sample time maybe to to an hour, 1 hours and 15 minutes.

YUHAS: When an operator or a chemist, rad chem tech, is collecting a primary coolant sample, can you describe the type of installed radiation monitoring and airborne type things, just basically take us through, verbally, what a guy does when he collects a routine reactor coolant sample.

DEMAN: Well, in the sample room itself, there is an HPR monitor that monitors particulate and gas activity in the room. It's an installed, portable-on-wheels type area monitor in the room. That's that only radiation monitor.

YUHAS: There is no direct radiation ARM or that type of monitor?

DEMAN: The only other monitor would be on the normal MUR740 letdown monitor which is on the letdown line normally. As far as sampling, no.

YUHAS: Please repeat that letdown monitor number and describe its location.

DEMAN: MUR740 is the letdown liquid monitor located in Unit 2's auxiliary building, 305' elevation, outside of the makeup tank room, in the location of the Haines gas analyzer.

YUHAS: Does that monitor have a high-level, low-level alarm on it, and where is it read out?

DEMAN: It has a high-level alarm on it; it's read out in Unit 2's control room. I don't recall the setpoints on it.

YUHAS: O.K. Let's go back to the primary sample station. Now you've stated that you're talking to Dubiel and the techs, and you've got the impression they've got a Unit 2 letdown on recirc.

DEMAN: Yes.

YUHAS: They're standing out...

DEMAN: They're in the health physics lab calculating the boron at the time.

YUHAS: Did they tell you the results of any previous borons that had been taken prior to your arrival?

DEMAN: Yes, they did. They said the boron concentration was dropping. I think they mentioned a concentration of about 400 ppm, 600 ppm, dropping in that range.

YUHAS: Could you give us a little perspective on the significance of borons of less than 1000?

DEMAN: Well, when you shut down the power plant, you would normally optimally require a 1800 ppm shutdown limit on boron to ensure enough negative radioactivity in the core. When you drop down below 1000 ppm, based on the fuel history--this core hasn't been operating that long--it's undesirable totallt.

YUHAS: Why is it undesirable?

DEMAN: From a standpoint of the amount of negative radioactivity you have in the core, to keep the core in stable condition.

YUHAS: Let me rephrase that. In other words, you're decreasing your shutdown margin.

892 108

DEMAN: Yes, you are, you're decreasing your shutdown margin.

YUHAS: At the time you were present there, did you know whether or not the sample room air particulate and gaseous alarm, the one you just described--the portable one--was it operating at the time?

DEMAN: I don't know if it was or it wasn't.

YUHAS: Was it operating the day before?

DEMAN: No, I don't... I don't know if it was.

YUHAS: Is it routinely in operation?

DEMAN: Routinely it's supposed to be; there are problems we've had with it where, I would say, on a 50% or 75% basis it has been operable.

YUHAS: Do you know if it procedurally is required to be in operation when an individual collects his sample?

DEMAN: Yes, it is.

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YUHAS: Could you describe the protective clothing, dosimetry requirements, or meter survey requirements that should be complied with when an individual collects a reactor coolant letdown sample?

DEMAN: When sampling the letdown, the standard clothing requirements would be a lab coat and rubber gloves. Dosimetry requirements would be a pocket dosimeter and TLD. Dose rate instrument is available; in the sample lab itself after drawing the sample, you take a dose rate on the sample container that you have the sample in, to determine the dose rate.

YUHAS: So we would have a man potentially standing there in a lab coat and rubber gloves, with his film badge or TLD pocket dosimeter on, collecting samples at the sample hood. How far is the sample hood door open?

DEMAN: In collecting the sample, the sample hood door would be open approximately 6 inches, enough for the person to get his hand in there to collect the sample.

YUHAS: Is there any shielding between the worker and the sample cooler and the actual sample spigot?

892 110

DEMAN: The sample cooler is located in the opposite end of the room, behind both Unit 1 and Unit 2 sample panel, and behind the Unit 1 valve operating panel. The sample spigot itself goes into a trough behind the glass door that's in the sample trough. And that's where he is obtaining his sample.

YUHAS: So the glass door as far as the coolant in the line coming out through spigot, and the length of the room plus several routine equipment panels between the sample cooler and the operator who's collecting the sample...

DEMAN: Yes.

YUHAS: O.K. When did you first become aware of the high radiation alarm in the hot machine shop?

DEMAN: Approximately 7:00 it went off.

YUHAS: Was somebody actually collecting a sample at that time?

DEMAN: No. The sample system was on circulation. The sample had just been obtained prior to that and it was still on recirculation from that sample.

YUHAS: How did you become aware of the alarm?

DEMAN: It's an audible alarm and I heard it.

YUHAS: You could hear it going off.

DEMAN: Yes.

YUHAS: O.K. What action did you take then?

DEMAN: I immediately went to the hot machine shop with a dose rate instrument and entered the hot machine shop and took a dose rate reading at the level of the instrument.

YUHAS: Was the hot machine shop locked?

DEMAN: Yes. We cut the bolts. We cut the lock.

YUHAS: Why did you have to cut the lock?

DEMAN: Because it was locked. We do not maintain a key for that.

YUHAS: I see. So it was not locked as a high Rad area. It was locked for security reasons...

DEMAN: It was locked for security reasons, for maintenance.

YUHAS: What instrument did you take in there for a survey?

DEMAN: The teletector.

YUHAS: Were you alone?

DEMAN: No, I had two technicians.

YUHAS: Describe the radiation levels you found when you entered the hot machine shop.

DEMAN: Initially upon entering the hot machine shop, the general area at the height of the instrument that the area was 50 mR. At that point, I left, went back into the sample room with the technician to monitor the sample line because that's where I suspected it came from, and at that point I read 200 mR in contact with the sample line.

YUHAS: It was absolutely clear to you that it was Unit 2 reactor coolant letdown sample line that was hot?

DEMAN: Yes, because Unit 2 sample was the only one that was on recirculation at the time.

YUHAS: Now that you've evaluated the situation, concluded that it is Unit 2 sample line, did you inform someone of this?

DEMAN: I immediately called the control room and asked them to shut the Unit 2 sample isolation valves, and told them that I had a high dose rate in the hot machine shop area, and that the sample line was reading excessively high as far as dose rate on contact.

YUHAS: Let me clarify, which control room did you call?

DEMAN: I initially called Unit 2's control room.

YUHAS: Do you know who you spoke to?

DEMAN: No, I don't.

YUHAS: What action occurred after you made this communication?

DEMAN: After I made that communication, and secured sample, recirculation I immediately went to Unit 2's auxiliary building to take dose rates in the area.

YUHAS: How were you dressed when you entered the Unit 2 auxiliary building?

DEMAN: In street clothes. With my dosimetry.

YUHAS: Street clothes? Did you have the teletector or a Pic6? What sort of instrument did you have?

DEMAN: Initially I had a an RO2.

YUHAS: Can you describe the course of your survey as you entered?

DEMAN: Initially, upon entering the Unit 2 Auxiliary Building through the model room, I was taking readings in that whole area walking through, they appeared to be normal until I got to each HPR-227 which is what I wanted to check.

YUHAS: HPR-227, is the reactor building ventilation monitor?

DEMAN: The air monitor, not the ventilation monitor.

YUHAS: Reactor building air monitoring, and you said that this one read 10 mR/hr.

DEMAN: 10 mR on contact.

YUHAS: How big is the sample line that you are reading?

DEMAN: Inch in inside diameter, piping.

YUHAS: Is that part iron pipe or?

DEMAN: Steam

YUHAS: What does that line normally read?

DEMAN: That line normally reads less than an mR.

YUHAS: Did you record this number anywhere?

DEMAN: No, I did not.

YUHAS: Go ahead with your trip.

DEMAN: From there I went to Unit 2's Health Physics Lab., to see if any additional personnel had in for daylight shift. I wanted to organize a survey party to obtain dose rates. At that point, I picked up another instrument and I went down to the auxiliary building basement to see if

any appreciable dose rates had increased to the passage way. That is when I discovered the water on the floor from the drains. The water was reading less than an mR and I walked through it to see the no appreciable contamination, and the dose rate at that time in the basement of the auxiliary building Unit 2 were normal. Through the main passage way. I did not go to any particular room at the time.

YUHAS: Did you run into any auxiliary operators or other techs in the Auxiliary Building when you were touring the 305 and 281 levels.

DEMAN: At the 305 elevation I do recall one auxiliary operator at the Rad Waste panel. I do not recall who it was.

YUHAS: Would that have been Terry Daugherty?

DEMAN: It could have been. I really don't have any recollection of who it might be.

YUHAS: Allright, so you toured 281, found things apparently normal down there with the exception of a little water on the floor?

DEMAN: Yes, water on the floor.

YUHAS: Where did you proceed to from there?

DEMAN: From that point on I went back up to 305 elevation and back to Unit 1's HP lab. That is when I received word of a high count rate on the condenser vacuum exhaust. I assigned a technician to take a sample off the condenser vacuum exhaust monitor.

YUHAS: How did you receive that word of the high count rate on the Unit 2?

DEMAN: Control room called me.

YUHAS: They called you?

DEMAN: They called me and said that the count rate was going up on the VAR-748
condenser off gas.

YUHAS: Did you tell the control room about the 10 mR reading on HPR 227?

DEMAN: I don't recall if I did or did not.

COLLINS: While you are doing the surveys, and wandering from Unit 1 to Unit 2, what are the technicians doing?

DEMAN: The technicians are the ones I was rounding up to do these surveys. Initially I had only, I think two additional personnel from daylight that had come in. I said I wanted to keep one in Unit 2 HP lab. In case somebody from control room or something happened over there I had a technician over there. I did not want to leave Unit 2 isolated with no technicians. So I wanted a man in Unit 2 health physics lab and I had a man go in to sample 748. Then I wanted the other technician that from 11-7 that were doing the borons and everything and were with me when the problem occurred to stay with me in unit one. From that point on we started organizing for the site emergency.

YUHAS: When you returned from Unit 1 after making an inspection of Unit 2 you received the communication about the increase in condenser offgas, was Dubiel still down in Unit 1 Chem-HP area at that time?

DEMAN: I think at that point if I recall correctly, he went up to the Unit 1 control room. I stayed at the Unit 1 Health Physics Lab and shortly after that Tom Mulleavy and Pete Velez and Fred Huwe came in.

YUHAS: Now we have those people you just mentioned all in the Unit 1 control room and you have numerous technicians showing up?

DEMAN: No, all those people who came in were in the Unit 1 health physics lab.

YUHAS: That's right. Excuse me. Unit 1 health physics lab is correct.

YUHAS: You had numerous technicians?

DEMAN: I had technicians and operators coming in.

YUHAS: Can you describe the atmosphere there in that area at the time?

DEMAN: I think at that particular time we were going into the emergency drill phase. Setting up the team setting up communications. That part went as previous drills that we have had. I don't think there were any problems as far as confusion to that that aspect because that part was just like the drills we had before setting up the team setting up the communications, the status board. That type of thing.

YUHAS: Approximately what time was that?

DEMAN: That was about 8:00, I think.

YUHAS: Let me refresh your memory. You made a statement earlier that the site emergency was not declared until 9:00.

DEMAN: It could have been 8:30-9:00 in that time period. I am losing track of time as this is going on. It is within the 2 hour time frame of my reporting to work that morning.

YUHAS: Let's go over a little more detail. You say people are starting to split up and grab their emergency response...ah

DEMAN: I am starting to assign rad emergency teams, pairing people off to go to the processing center, check out kits, making sure they are operating properly and wait there for dispatch. The other technicians are standing by in the meantime chemistry is requesting one or two people to go down and sample the river water discharge to insure that nothing is going off site. Basically we were on that kind of hold pattern at the time. They declared a site emergency. They were setting up in the control room. We were awaiting instructions from them because they plot the wind direction and they have more indication of what's actually happening then I do at that time.

COLLINS: You had one team essentially heading towards processing center for emergency kits to do offsite...?

DEMAN: Yes, I initially assigned one team to go and as more people would come in I would organize the rest of the teams so that we would have teams available. I Yet I would also have technicians available.

YUHAS: Could you give us a relative from the time you went ahead and started up the ECCS system down there till you actually had teams deployed?

DEMAN: From the time we started into the emergency procedures to set up ECS it was about 5 to 10 minutes I had one team at the processing center checking out a kit awaiting deployment. I don't think the team was actually deployed for maybe another 20-25 minutes. While they were making plots upstairs and wind directions and speeds, the direction of the plume for release.

YUHAS: What about the onsite survey team, was that deployed?

DEMAN: The onsite survey team was also set up to the processing center to check the kits and to obtain a vehicle and stay on hold. At that point I was off of communication so I don't know exactly when they got deployed. Because Mulleavy came into the ECS and assumed control. After I employed the first team to the processing center, and I started assigning second teams Mulleavy appeared and he assumed control. I turned over the control to him at that time.

YUHAS: Do you know if a repair team is being prepared to go back and survey the Unit 2 auxiliary building and control areas?

DEMAN: There was a repair party standing by outside the Unit 1 Health Physics Lab consisting of operators and mechanical operators that was ready to go back in and make repairs if necessary to anything.

COLLINS: Who was in charge of that repair team. The organization?

DEMAN: As far as I can recall it was a maintenance foreman. I can't remember which one. I think it was a maintenance foreman that was in charge of the repair party team that was standing by.

YUHAS: Was anyone dispatched to resurvey the Unit 2 Auxiliary Building at that time?

DEMAN: The air activity as I recall in Unit 2's Auxiliary Building has started to go up. They were getting reports of people coming out of the Unit 2 Aux. Bldg., such as the operators that were in there at might had reported to work in the interim while I was back in Unit 1. They were getting reports of personnel contamination. High contamination areas. There were 3 - 4 technicians set up over in Unit 2 Health Physics that had reset up in the first aid room which is in the control tower passageway. Because the Unit 1 Health Physics Lab had become an airborne problem and a contamination problem.

YUHAS: Unit 1?

DEMAN: I am sorry Unit 2 Health Physics Lab had become a problem so they moved out of that into the first aid room. At that time I was not totally aware of the airborne problems in that area. I had gone out to do a survey on the roof of the Unit 2 Auxiliary Building and Fuel Handling Building. When I returned down they had isolated unit 2 from Unit 1 via the bottom model room door and as a result I had to go through the Unit 2's auxiliary building and out and I definetly became contaminated.

YUHAS: Why did you go to the roof of the Unit 2 Aux Building to run a survey?

DEMAN: To obtain a dose rate close to the stack to see what the dose rate was in a room in the proximity of the stack.

YUHAS: What instrument did you have and what kind of dose rates did you get?

DEMAN: I had an E520 and I obtained a dose rate of 4 mR/hr uniform throughout the roof.

YUHAS: The E520 which tube was on it at the time?

DEMAN: Low range GM tube.

YUHAS: Is that an HP-177 or a...?

DEMAN: I don't recall the serial number.

YUHAS: Is it a side window, closed, open window?

DEMAN: Side window. Closed open window type detector.

YUHAS: Did you take that type of measure?

DEMAN: I took a closed window reading.

YUHAS: So you have 4 mR/hr closed window?

DEMAN: At E520 overall area on the top of the Fuel Handling Building roof. A . in proximity of the stack.

YUHAS: You came down, when you went to the Unit 2 Aux Bldg you went through came off the 328.

DEMAN: I came down the stairway adjacent to the elevator and was going to go back to the Unit 1 through the model room door which they had closed on me.

YUHAS: That door is on the 305 elevation?

DEMAN: 305 elevation. When I saw the door was closed I backtracked out through Unit 2's Aux Bldg. 305 elevation out through the HP area and when I got the double doors by the control tower to the HP area my technicians had set up an area there for monitoring and changing clothes and from there I was undressed and sent to the first aid room and monitored put in clean clothes and sent to Unit 1 for decontamination.

COLLINS: What kind of contamination was it? Was it uniform or was it particularly on your shoes?

DEMAN: It was uniform. It was from the air.

YUHAS: Did you take any readings coming back?

DEMAN: Yes. On the dose rate instrument?

YUHAS: Yes.

DEMAN: No I did not. I was in a hurry to get out. That was my only exit.

YUHAS: Did you check your pocket dosimeter to see how much exposure you picked up?

DEMAN: On my pocket dosimeter when I got out and checked it, after I finally got undressed, I recalled a reading of about 20 mr. As far as contamination on myself, at certain points I was reading 20 mR myself.

YUHAS: 20 mR as measured with what instrument?

DEMAN: E520, closed window.

YUHAS: E520 closed window. Did you take an open window reading?

DEMAN: I don't believe they did. At the time I wanted to get out of my clothes.

SHACKLETON: Mr. DeMan, clarify again you are talking about measurements per hour, right?

DEMAN: Yes.

YUHAS: At this point what was going through your mind as to the source of this contamination on your body? What did you think it was?

DEMAN: At that point in time it appeared that we had a gross leak into the auxiliary building in the primary system in some former fashion through the makeup tank or some other form. At that time I was not sure where the activity was coming from. Why it was going up so bad. I knew at the time we had gross activity in the primary system due to the initial dose rate I was getting when I came to work. High alarms went off so I knew the primary system letdown was highly active. At that point when I came out I was that contaminated, I knew somehow that system had gotten either through the aux bldg drains some kind of release liquid release into the building into the sump tank. It was all going in _____ .

YUHAS: Did you have any feel to what the major isotopic composition may have been of the contamination?

DEMAN: That my contamination? No.

YUHAS: Did you direct that any of your individuals collect an air survey, and gamma scan it or smear survey, or any thing like that?

DEMAN: At the time I did not send anybody into the Unit 2 aux building for surveying or collecting an air survey. I was more interested in preventing people from going in and getting contaminated because they were people that had been in the building that were trying to get out of the building that sort of got in the situation as it developed. Such as myself, at the time I went in the auxiliary bldg there were no reports of airborne contamination levels in the aux building but, by the time I was ready to enter the building the levels had gone up.

YUHAS: Do you have a continuous air monitor in the Unit 2 Aux Bldg?

DEMAN: We have local area monitors. We have ventilation monitors.

YUHAS: Were any of those local area monitors alarming?

DEMAN: I don't recall if they weren't. I did not get a report that they were or were not.

YUHAS: Would you have heard them in your tour if they were alarming? Do they have local alarms?

DEMAN: They do but I don't recall hearing any. There is a possibility that they could have been silenced from the control room.

YUHAS: Would an individual in the auxiliary building be aware of any alarm on the vent monitors in the Aux Buildings?

DEMAN: Yes, they would.

YUHAS: How would they be aware of that?

DEMAN: That has a local audible alarm...at the monitor.

YUHAS: Did you hear either a local or audible alarm?

DEMAN: That alarm is at the 328 elevation and I was not up there.

YUHAS: So you passed through an area where apparently high airborne activity was present, you did not hear an area radiation alarm going off and you could not have heard an alarm in 328 elevation?

DEMAN: Yeah, that is true.

YUHAS: Is there any local area airborne activity alarms in the 305 elevation in the Unit 2 aux bldg?

DEMAN: 305 elevation Unit 2 Aux Bldg., the only monitors are on the 305 is HPR 227 which is a reactor building gas monitor.

COLLINS: Was there an announcement of any type to evacuate the Unit 2 aux?

DEMAN: There was. We were in the process of myself getting out. There was an announcement to evacuate Unit 2 Aux Bldg _____ . An announcement was made.

YUHAS: After the word was passed to evacuate, did someone enter the area to insure the personnel were out?

DEMAN: I don't recall if somebody was sent in specifically for that purpose. I do recall that the people were coming out were asked is there anybody else in the area where you have been or did you see anybody else. I don't recall sending somebody in to check for additional personnel.

YUHAS: After the initial announcement was made to evacuate the aux bldg. was an individual designated to monitor the access points to make sure that no one else walked in?

DEMAN: Yes, both from the Unit 1 side and the Unit 2 side since the model room door had been shut nobody from the Unit 1 aux bldg could go into the unit 2. From the Unit 2 side where I had my control point established.

YUHAS: When you evacuated the area, what were the conditions of the TLD pocket dosimeter storage racks from Unit 2 Aux Bldg Chem HP area?

DEMAN: The Unit 2 Aux Bldg., Chem HP TLD racks were still installed, badges that were not worn were still in the racks.

YUHAS: Whose badges might those have been?

DEMAN: Operations, instrument people assigned to Unit 2 and temporary badges to construction personnel that work Unit 2.

YUHAS: How long did those badges stay in that area?

DEMAN: Possibly a day.

YUHAS: Did some of those people show up for work?

DEMAN: Some of them did, but we know for a fact some of them did not. I believe I was told that the ones that did not that was used for base line data in subtracting from the ones that did show up and use their badges afterwards.

YUHAS: Now you are telling me that the badge rack was there for the full day?

DEMAN: Right.

YUHAS: Some of these people apparently would have come in and helped the first day. Right?

DEMAN: Some people were there, okay?

YUHAS: Did they get their badges out, did someone go in and get them out for them? How was that handled?

DEMAN: The reason we were using the base line data is because, after we pulled all the badges out of the area and got them out of their holders and they were cleaned and we were reading them okay, some people's badges were there for previous days where they had picked up exposure. We wanted to be able to subtract the background from them. We knew some people had never been in the area for the entire period of time of issue, and their badges were still there. Those people's badges were read and that was used for background to subtract from the other people whose badges had been used prior to that point because it was the end of the month. The badges had been in issue 28 days. But there are some people who have badges that never really used them. We know those people, we have asked them, "Have you used your badge?" And those were used for baseline.

YUHAS: My concern is more directed did individuals show up, operators or someone who might have had their badges down there, and did they have access to the plant without their TLDs.

DEMAN: No. No. If they came in plant after this accident, nobody was allowed in plant without a TLD.

SHACKLETON: This is a continuation of the interview of Mr. Joseph H. DeMan. The last tape ran off the end of the reel at 4:44 p.m. The time now is 4:51 p.m., April 24, 1979. Please continue.

YUHAS: Let us pick it up from where you came out. You were identified as being contaminated you said you read 20 milirad per hour as measured with an E120 again.

YUHAS: E-520 excuse me. Okay can you tell us a little about where you were taking to decon and the decon technique and how successful it was.

DEMAN: Initially I was stripped down in the first aid room. My clothes were taken off and bagged. I was dressed in clean anti-C clothing. I proceeded to the Unit 1 Health Physics Area into the decon shower. At that point I took about 4 showers. I was having problems getting the contamination out of my hair, mainly. After about 4 showers I succeeded. That was in a time span of about an hour.

YUHAS: So we lose about an hour there while you are deconning.

DEMAN: Roughly, yes.

YUHAS: You come out, now you're wearing a paper suit. Where did you head for?

DEMAN: Well, I went in to check out my clothing to get them into the wash and take my belongings out proceed to unit one Health Physics Lab to do what I could do dressed the way I was in paper coveralls. Shortly after that time...and this could be as late as noon time...I am losing track of the time...I think they gave the order for unnecessary personnel to leave the island and go the Observation Center and for necessary personnel...myself, some of us to go to the Observation Center for coordination and some to go to Unit 1 control room. I donned the respirator and went to Unit 1's control room because at that time the airborne levels in the area were going up. Which was the reason for the evacuation.

YUHAS: The airborne areas in Unit 1 Chem-HP land and ECS station were going up?

DEMAN: Yes they were.

YUHAS: How did you know they were going up?

DEMAN: Just after I finished decontaminating myself, I was monitoring myself with an RM-14. As I was putting on the paper coveralls, after the final shower, I noticed the background count rate going up in the decontamination shower. I went to the HP lab and there the RM14 monitors were starting to go up also.

YUHAS: Can you be more specific in terms of what normally an HP-210/RM-14 combination reads and what it was reading?

DEMAN: In the decon room initially the RM-14/HP210 was reading about 100 counts a minute. By the time I finished getting dressed, or getting into a paper coverall, they were up to about 1000-1500 counts a minute. By the time I got to the Unit 1 HP lab, they were going up to 2000-3000 counts a minute. At that point a decision was made to leave.

YUHAS: The decision to evacuate both counting or both chem HP, areas what effect did that have on your accounting capabilities? Specifically your GeLi detectors?

DEMAN: It nullified all counting capability in the HP lab area, because the background was so high that you could not count anything. You did not know what you were getting.

YUHAS: OK. Can you describe the impact that had on your inplant health physics, as well as your offsite monitoring?

DEMAN: As far as implant health physics, it nulllified our ability to identify isotopes on a specific number, type. As far as just gross identification of a particular isotope in the air, I did just press the button on the germanium-lithium detector. And I did notice an iodine peak coming up. That confirmed to me there was iodine in the air, which is what I was primarily concerned with; not how much, but just what was in the air. That was about the only capability we had there. As far as after going to the Unit 1 control room, we were taking air samples there and sending them offsite. I think by that time they had a GeLi detector setup at the Observation Center.

YUHAS: Approximately what time are you talking about?

DEMAN: No, I take that back, they might not have. I think they were doing counts with a ludlum leveler at the Observation Center. The gross activity was of 3×10^{10}. The whole time they were monitoring gross activity it was 3×10^{7} or 3×10^{8}.

YUHAS: When you say "gross", how is that gross being measured?

DEMAN: The gross is being measured with an HP-210 probe attached to a ludlum count rate meter instrument. It gives you gross counts to be interpolate with gross counts/minutes, using the efficiency and the standard counting formula, and you come up with gross activity.

COLLINS: These air samples are what types of samples? Particulate as well as . . .

DEMAN: Particulate, and charcoal samples that were being taken.

COLLINS: What type of cartridges were these?

DEMAN: I believe I had CP 100 cartridges.

COLLINS: What flow rates were you pulling these samples at?

DEMAN: I had a...in Unit 1 control room where I was taking most of my samples...I had a monitor at a flow rate, I think it was set at 2CFM. It maintained that it had a hookup with a delta P...across the cartidge to maintain 2 CFM flow rate.

COLLINS: You said you went on respirators. What type of respirators did you go on?

DEMAN: Initially we went on particulate fullface respirators. Not particulate iodine canisters. Just particulate fullface respirators.

YUHAS: Who made the decision to put the people in the control rooms on masks?

DEMAN: I don't know. I was told to go on a mask and to go to the Unit 1 control room when the decision to leave the area and go to the Observation Center and evacuate.

COLLINS: Who told you?

DEMAN: Tom Mulleavy did.

YUHAS: At what air concentration is the decision level for putting on respiratory protection?

DEMAN: Gross concentration is greater than 3×10^{-10} Cmi/cc.

COLLINS: Do you know the bases of that number?

DEMAN: The bases of that number is in 10 CFR 20 for gross unidentified activity in a restricted area, 48-hour limit.

YUHAS: Did anyone in the Unit 1 control room make an effort using the HP 210 probe and Eudlum, to identify the half life of the activity that you were seeing in the...

DEMAN: Yes, I did.

YUHAS: What did you find when you did them.

DEMAN: Roughly, about a 15-18 minute half life.

YUHAS: What does 10 CFR 20 say in terms of this gross beta/gamma, unidentified, with less than 2-hour half life.

DEMAN: I don't remember off hand.

YUHAS: Did anyone check 10 CFR 20 to see what it says under those conditions?

DEMAN: No, I think I was under the...I was trying to identify it as radon and rubidium, ok, looking for the 18 minute half-life, because on that basis, we could go to that level and take off the masks.

YUHAS: Approximately what level are you talking about?

DEMAN: As far as?

YUHAS: Gross number.

DEMAN: Gross number? 3^{-9}.

YUHAS: Did you identify that it was short half-life?

DEMAN: I identified that it was short half-life, yes.

YUHAS: Do you use that information, did you convey it to Unit 1?

DEMAN: I conveyed it to the Unit 1 control room to operations who was there and then contacted the Observation Center, which had HP personnel, mainly Mulleavy, I believe, at the time there.

YUHAS: Did you recommend that you take off the respiratory protection?

DEMAN: Yes I did. Myself, and Fred Huwe did. Fred Huwe was also in the Unit 1 control room.

YUHAS: What action, or what reply was given to your response?

DEMAN: None. Let me clarify one point. I just remembered also Mulleavy was in Unit 1 control room and myself and Fred Huwe, not at the Observation Center. He was told the short half-life determination by Fred Huwe and myself and he did not make a decision as far as taking off the mask. I recommended taking off the mask and a decision was made not to. He didn't want to take them off.

YUHAS: What effect did it have of having control room personnel, emergency response teams, in particulate respiratory protective devices for the period of time you were in?

DEMAN: Very, very, very uncomfortable. It is hard for communications on a communications standpoint, to talk on phones, to convey messages, and it is very irritating and uncomfortable for the personnel that are in them for any length of time over an hour.

YUHAS: Did you say that you were in particulate masks in the Unit 1 control room for five or six hours?

DEMAN: Five or six hours, I would say, yes.

YUHAS: During that five to six hours, did you recommend to anyone that there was no need to be in respiratory protected devices?

DEMAN: Yes, I conveyed the message to Tom Mulleavy, I believe.

YUHAS: How many times?

DEMAN: Two or three times.

YUHAS: Do you know of Mr. Huwe conveyed that message to him?

DEMAN: Yes, he did.

YUHAS: Was any justification given to you as to why you should not come off the masks.

DEMAN: No there was not.

YUHAS: I don't quite understand why the Unit 1 control room had high air activity. I was under the impression according to your FSAR you were on a closed cycle research system in the Unit 1 Control room.

DEMAN: That is true.

YUHAS: Can you offer an explanation of why unit 1 control room became so hot?

DEMAN: No I cannot.

COLLINS: What kind of cross connects are there between the Unit 2 auxiliary building and the fuel handling building and the Unit 1 auxiliary building.

DEMAN: Ventilation?

COLLINS: Ventilation.

DEMAN: I off-hand, could not say. I don't believe that the ventilation system is cross tied.

COLLINS: Are there any doors?

DEMAN: Yes, you can get cross ventilation through doorways, through the model room door, which at the time they did finally close. Also through the upper area in the fuel handling areas. It is an open accessible area, straight across from Unit 1 to Unit 2, and then in Unit 2 you can go in through the door down to the auxiliary building and fuel handling building, which comes in on the other side of the model room door.

COLLINS: Is there any way to secure this cross connection?

DEMAN: The only way would be to shut the door leading to the stairwell and elevator area on the spent fuel pool level, 348 level, in the Unit 2 fuel handling building, but that door is not airtight.

YUHAS: Let us go back to the air ventilation system. Have you become aware, any time in the past, of phenomenona occurring with respect to Unit 1 control room air activity when primary coolant air samples are drawn.

DEMAN: Yes.

YUHAS: Would you elaborate please?

DEMAN: During certain analyses where you would have the letdown sample flushing into the sink, and I am primarily thinking right now of Unit 1 sampling, the letdown sample would be flushing into the sink for long periods, such as when doing a dissolved oxygen sample, from the gases given off. During that time, Unit 1's control room has experienced an increase in count on their control room air monitor.

YUHAS: Does Unit 1 and Unit 2 flush into the same sample sink?

DEMAN: No, they have two separate sampling hoods, but it is in Unit 1's ventilation system. I don't know if they both go to the same point in the ventilation system, but they come into a line and they are both Unit 1 ventilation's system.

YUHAS: Both systems sampling hoods are in the same room?

DEMAN: Yes that is true.

YUHAS: Is that room negative with respect to the rest of the building?

DEMAN: The room? Most times, the sample room itself, I could not say. There are exhaust fans in the hood, but the sample room is connected to the analysis lab. The analysis lab, in respect to the hallway, often times is not under a negative pressure.

YUHAS: Is this observation of when primary coolant samples are drawn, sometimes affecting the controlled air activity, how long ago was this identified?

DEMAN: It has been identified over the past year.

YUHAS: Are you aware of any actions that has been taken to identify the problem and correct it?

DEMAN: Yes, they have gone into the ventilation system and looked for damper leaks, cross ties that were not supposed to be where they were. I do believe they identified one problem and corrected it, and after that the occurrence was not as frequent or as great. There were probably another problem that they couldn't identify, but were in the process of trying. But they did identify one leaking damper, or that type of thing, and they did correct that.

YUHAS: Did the control room airborne activity monitors RMA-4 exceed the alert or high alarm setpoints?

DEMAN: At one point I do remember it exceeding the alert setpoints.

YUHAS: What action is supposed to have happened when that RMA-4 reached alert point?

DEMAN: Initially, when they take the...when an RMA4 hits the alert setpoint, I immediately go up and sample the control room air.

YUHAS: Are you aware of making automatic functions that are supposed to occur?

DEMAN: As far as the ventilation system? No.

YUHAS: Did you notice whether the Unit 1 control room was positive with respect to the hallways in the control building?

DEMAN: Did not notice.

YUHAS: You were in the control room with Mulleavy and Huwe at this time?

DEMAN: Yes.

YUHAS: You were receiving onsite data, is that correct? Onsite survey data?

DEMAN: From the teams that were deployed, data was coming in, yes. I did not receive them directly, because at the time Mulleavy was the coordinator, you might say, along with Len Landry, as far as the chart and deploying the teams. I was not really directly involved with the data that was coming back in the outside teams.

YUHAS: Were you aware of anyone taking monitor readings or samples in the air intake, especially for the Unit 2?

DEMAN: I recall samples being taken by Unit 1's air intake. I don't recall if they took samples near the area of the Unit 2 air intake terminal.

YUHAS: What sample results did you have at the Unit 1 intake?

DEMAN: I recall them taking dose rate samples and an iodine. The dose rate levels were going up, I think at that point, they might have been to 5 mR. I don't recall the results of the air samples.

YUHAS: The meteorological data at that time, what was the wind doing early that morning?

DEMAN: I don't know. I did not look at the charts. One of the reasons I didn't was because Len Landry was involved in the wind speed direction and plotting the plume.

COLLINS: All of this data is coming into Mulleavy. Who is recording it and how? And is it being plotted?

DEMAN: Initially, data comes in, and the communications man that is at the microphone records the data on forms that were made up. He gives that data to Tom Mulleavy and the emergency director present. They go

and record the results on a chart that they have laid out. Those results are recorded there on the chart, and then directions and speeds and deployment of teams gets made on those decisions.

YUHAS: Who was the emergency director present?

DEMAN: I think, at the time, it was Jim Seelinger for a while. I know later on in the evening he got relieved by Bill Potts, I believe. But initially, and for most of the time on the first night, it was Jim Seelinger.

YUHAS: So you're in the Unit 1 control room, you're wearing the white papers because you lost your clothes, and you're there for a while before you get sent over to the... you went offsite after a bit, right?

DEMAN: No. After a while I did get my clothes back because, during that time I had the washing machine on along with a few other coveralls that were there. So after a while, I did get my clothes back before I went home.

YUHAS: O.K., so you went home from Unit 1?

DEMAN: I went home...well, from Unit 1, I went to the Observation Center. They had instruments there; I monitored myself there to ensure that I was, in fact, clean. From the Observation Center, I did go home.

COLLINS: Who was at the Observation Center,from the HP group?

DEMAN: At that time when I got there at 1:00 in the morning, I think Pete Velez was still there.

COLLINS: Were there any technicians there?

DEMAN: I don't recall.

COLLINS: What kind of equipment did they have at the Observation Center for monitoring people?

DEMAN: Initially, at the time...and this has been my first trip to the Observation Center for the day...I do recall seeing a Ludlum present and hand instruments, portable survey instruments. Those I recall. I don't know--I think by that time, I think one of the mobile laboratories, either RMCs or...I think it might have been RMCs, had managed to come in with a GeLi. Either that or B&W, one of them. By that time of the morning a GeLi had arrived, a counting system.

YUHAS: Let's go to the second day now, the 29th. You came back at 8:30. They sent you home and told you to come back at 1500. You went back to the Unit 1 control room. Can you describe the conditions of the facility on 3/29 at 1500 when you reported for work the second day.

DEMAN: I reported to the Observation Center. From the Observation Center, I directly went to the Unit 1 control room.

YUHAS: How?

DEMAN: Hmmm... I don't remember.

YUHAS: Did you come in through the north gate?

DEMAN: I went through the north gate...

YUHAS: What was going on at the north gate?

DEMAN: At the time I came in? Nothing. As far as, there were monitors there. I was on...I came in by bus and transferred to another bus, or vehicle, and we went in through that way.

YUHAS: About how many guards were at the north gate when you came in?

DEMAN: Quite possibly, about three, as far as I can recall.

YUHAS: Were you or anyone else frisked?

DEMAN: Going in? No.

YUHAS: Were any of you, or any other persons in the area at the time, checked through the metal detector?

DEMAN: Going in?

YUHAS: Going in.

DEMAN: Metal detector? No.

YUHAS: O.K. The second bus picks you up at the...

DEMAN: I think it was at the time, they had started using the second bus, but...

YUHAS: Once you people got on the bus, did a guard come on the bus and verify that each person going in on the second bus had signed in?

DEMAN: Yeah...well, not on the bus. The procedure was to get off the bus, sign in with the guard, and then from the guard after you picked up your TLD and badge and everything, you got on the second bus.

YUHAS: Did the guards ensure that all those people who signed in got on the second bus?

DEMAN: I don't really believe they did.

YUHAS: You were seated on the second bus at the process control center...

DEMAN: True.

YUHAS: Were there metal detectors, or explosive devices, or was there any guard present there?

DEMAN: I don't believe the second day there was a guard present, and I know that the metal detection devices and explosive devices were not operable.

YUHAS: O.K., so you proceed through the process control center. As you enter the service building on the left hand side, you had normal guard stations.

DEMAN: True.

YUHAS: Were they manned?

DEMAN: No.

YUHAS: As you walked through the service building, were the key card locks operable?

DEMAN: No. They hadn't been operable prior to the incident happened.

YUHAS: Then it appears that a person, once they got past the north gate, had essentially free run of the plant, is that true?

DEMAN: As I recall, yes.

YUHAS: Did you see any guards inside the security area on the second day when you came in?

DEMAN: No.

YUHAS: Were the control room doors open?

DEMAN: Locked or just open?

YUHAS: Such that a guy could just knock on the door, or push the door open and go in.

DEMAN: They weren't locked. You could open the door and walk in.

YUHAS: Open the door and walk in. On the second day, was access to the Unit 1 auxiliary building, or the Unit 2 auxiliary building locked or guarded by a tech?

DEMAN: Yes. I assigned a tech to guard the entrance to the Unit 1 auxiliary building.

YUHAS: You say you assigned a tech? You mean a tech wasn't there when you came in?

DEMAN: The tech was there. I assured there was a tech and then when we got relief, turned over, I made sure I assigned another tech. I came in along with the techs as relief. That's why I said I assigned a tech.

YUHAS: O.K. So you came in, you had a watch changeover; what responsibilities did you assume then?

DEMAN: I assumed that nobody went into the area without respiratory protection and clothing that was required, and that he obtained the shift supervisor's and the HP's Foreman's permission prior to entering the Unit 1 auxiliary building.

YUHAS: O.K., so you were concerning yourself primarily with Unit 1, is that true?

DEMAN: At the time, yes.

YUHAS: Who was concerning themselves about Unit 2 auxiliary building?

DEMAN: I believe Fred Huwe was.

YUHAS: So you and Huwe were on the same shift?

DEMAN: Yes, we both were on the same shift on the second day at 11:00 at night. Did I say at 11:00 I came in? The second day I came in at 3:00.

YUHAS: The second day you came in at 1500?

DEMAN: Right, I came in at 1500; Bob McCann and Pete Velez were on until 11:00 at night, 11:00 or 10:00 at night actually Fred Huwe came on. So from that point on we were both on shift together doing the night shift.

YUHAS: You were in Unit 1 then?

DEMAN: I was at Unit 1.

YUHAS: You were controlling access. Were you using your standard RWP procedures at that time...

DEMAN: No.

YUHAS: ...or were there other modes of operation?

DEMAN: We were not using RWPs. We were on, you might say, manual control.

YUHAS: Did you have any dose tracking information available to you at that time?

DEMAN: As far as individual exposure received? I think by that night, yes, they did have TLDs read. Come to think of it, when I did come in that night, I did receive my badge reading from the initial incident that night.

YUHAS: Did you see Ed Houser on the Island that night?

DEMAN: I don't recall. I might have, I might not have. I don't recall.

YUHAS: O.K. Are there any high points in that evening that you think are worthy of mention?

DEMAN: That evening... I don't know if it was that evening or the following evening that they took the letdown sample. I think it was that first evening. Yes, because that morning is when I left to ship that sample off by plane. I knew Ed Houser had done it. Now it comes back. I don't recall if I saw him or not. I think I might have, because I think at one point I recall seeing him in the paper coveralls. So it's a good possibility I saw him that night, but I think I saw him after the sample had been drawn, because I got assigned to that sample roughly about 5:00 in the morning. That is when, you know, the job got turned over to me to get the sample out.

YUHAS: Do you remember what that sample registered by your measurement or by someone else's measurement?

DEMAN: Someone else's measurement--1 ml, approximately 4 R/hr in content.

YUHAS: 1 ml?

DEMAN: That's true.

YUHAS: How much was the original sample?

DEMAN: The original sample of about approximately 100 ml read roughly greater than 1000 R/hr.

YUHAS: Greater than 1000 R/hr?

DEMAN: Yes.

YUHAS: Was that 100 ml sample in a poly bottle or a glass beaker or...

DEMAN: The 100 ml sample was in a 1 liter poly bottle.

YUHAS: 1 liter poly bottle?

DEMAN: Yes.

YUHAS: Who pipetted that in, or do you know who split the sample?

DEMAN: I pipetted one sample. I can't remember if that night is the night I pipetted one sample. Somewhere in the first few days I did pipette a 1 ml sample. That particular sample, I don't think I pipetted. I don't remember who did pipette that one. I took over shipping that sample at 5:00 in the morning, and, at that time, that sample--I think I might have pipetted it, because I recall, I put that sample in a leaded container and there from a leaded container to another bucket container that had lead blankets contained in it for shielding. I think that first night I might have pipetted that first sample, that was sent it out with Mr. Nimitz and myself.

YUHAS: Are you telling us, specifically, that you are the one who split the sample?

DEMAN: I personally did pipette a 1 ml sample.

YUHAS: Could you tell us how you did that?

DEMAN: The 100 ml sample was contained in the far end of the cabinet in the sample room behind lead bricks. First I determined the location to make sure that was the proper sample. Then I took a 6 cc glass vial, which normally has a syringe type closure on it... I put that behind lead bricks, and then I took a 1 ml lambda automatic pipette mechanism. Then I went in, I obtained a sample, took the liter bottle out of the leaded case that it was in, brought it over to the sample lab, put it behind lead bricks immediately. Then, from a distance of arm's length, behind the lead bricks, I uncapped it, stuck the pipette in it, moved away from the bottle to where I had the 6 cc vial behind other lead bricks, pipetted it into that. Then I put the septum on that, went over, closed the bottle, and put the bottle back into the leaded container, into the leaded shielded cave.

YUHAS: Did you do this alone?

DEMAN: No, I had assistance from Dave Zeiter.

YUHAS: What was Mr. Zeiter doing?

DEMAN: He was assisting me in holding the 6 cc glass vial stable so I wouldn't tip it over while I was pipetting the 1 ml sample.

YUHAS: Was anyone taking whole-body measurements or dose rates during this?

DEMAN: Yes. We had a dose rate instrument present.

YUHAS: Was it sitting on the table top, or was somebody carrying it, or what?

DEMAN: No. Initially, Dave Zeiter was handling the dose rate instrument until the time that it was required of him to hold the small glass vial while I pipetted.

YUHAS: What type of numbers was Dave giving you?

DEMAN: At that point we were receiving between... I think it was that setpoint we got the 4 R/hr dose rate off the small vial.

YUHAS: Do you know what instrument he was using?

DEMAN: Teletector.

YUHAS: Do you want to cut the tape?

SHACKLETON: You can go ahead with 1 more question.

YUHAS: No, I don't want to go on. I'll start a new tape.

SHACKLETON: Allright, gentlemen, we'll cut now and turn the tape. The time is 5:19 p.m., 4/24/79.

SHACKLETON: This is a continuation of the interview of Mr. Joseph H. DeMan. The time is now 5:22 p.m., April 24, 1979. Please continue.

YUHAS: We are discussing your pipetting of the 1 ml sample from the 100 ml RC letdown sample from Unit 2. I want to go over this step by step, now. You come in, you have a second guy with you, he's got a Teletector. You walk over, you pick up the 1 liter poly bottle containing 100 ml of reactor coolant sample...

DEMAN: True.

YUHAS: Did you do it with your left or your right hand?

DEMAN: I believe I did it with my right hand.

YUHAS: How far away from you did you hold it from your body?

DEMAN: Arm's length.

YUHAS: Did your hand... did you have a wrist badge on?

DEMAN: No, I did not have an extremity TLD badge on.

YUHAS: Did the fellow who was with you take an extremity dose to your hand?

DEMAN: No, I don't believe he did at the time.

YUHAS: Did he take a dose to your whole body?

DEMAN: He took a dose to the whole body, based on the sample I was holding as I was walking by.

YUHAS: What was the dose to the whole body?

DEMAN: Somewhere in the order, I would say, from the bottle to my body, somewhere in the order of about a couple of R per hour.

YUHAS: You say your body was in a couple of R per hour field?

DEMAN: Yes.

YUHAS: About how long did it take you to transport the sample by hand from behind the shield to the table top, which was also behind the shield? Is that right?

DEMAN: Yes. In another section away from the 100 ml bottle...

YUHAS: How far did you make that transfer.

DEMAN: How long did it take me? 5 seconds. 5-10 seconds roughly; not very long at all.

YUHAS: O.K., so now you've got it behind the second set of shields.

DEMAN: I've got the 1 ml behind another set of shielding, yes.

YUHAS: Wait a second. The 1 ml. Did you mean you pipetted it before you took it out?

DEMAN: I pipetted... the 100 ml sample was behind the shield. I had another shield set up where the 6 cc glass vial was. I went and uncapped the 100 ml bottle, pipetted 1 ml, took the pipette with the 1 ml sample and walked over to the...

YUHAS: Ah ha!

DEMAN: I walked out, I wanted to expedite removing myself from the 100 ml sample. That's why I didn't pipette it from the sample to the small vial in that same location. I took the sample and walked with it to the...

YUHAS: O.K. Now, let's go back and do it again. You've got the bottle, you took it out of the cabinet...

DEMAN: Out of the cabinet...I walked into the lab...

YUHAS: This is the 100 ml sample?

DEMAN: It's the 100 ml sample.

YUHAS: This is when he tells you it read 2 R to your body?

DEMAN: Well, no, he wasn't in that particular room with me, because both of us could not fit in the same physical location I took the sample.

YUHAS: O.K., let's go over it now. You take it out with your right hand...

DEMAN: I walked out of the sampling lab to the analysis lab and he was there.

YUHAS: O.K., so you walked out of the sampling lab to the analysis lab and you put it behind another shield.

DEMAN: I put it behind a lead shield, true.

YUHAS: O.K., now you reach out with your...

DEMAN: I reach out with both hands to uncap the bottle, pick up a pipetter, insert it in the bottle, extract the 1 ml sample...

YUHAS: O.K., now, the pipette that you're holding in your hand... is that a glass pipette, 10 ml...

DEMAN: It's plastic. The 1 ml lambda had been drawn... pipette, all plastic.

YUHAS: So when you withdraw the 1 ml, your hand is now surrounding the pipette.

DEMAN: On the upper portion of the handle. The pipette itself is a small tip that's in the bottle; the rest of it is outside of the container in my hand. My hand is on it.

YUHAS: O.K., but the 1 ml is within how far from the hand?

DEMAN: 4 inches.

YUHAS: Within 4 inches?

DEMAN: About 4 inches.

YUHAS: O.K. Now you've got this in your hand, and this is where the fellow takes the reading.

DEMAN: No, no. He took the reading as I was walking from the sample lab to the analysis lab carrying this 100 ml sample.

YUHAS: Gotcha. So now, you're turning loose with your left hand, you have the pipette containing the 1 ml sample.

DEMAN: Right.

YUHAS: You're walking over to the second shield...

DEMAN: About two steps.

YUHAS: O.K., and now this fellow whose name is...

DEMAN: Dave Zeiter...

YUHAS: ...Dave Zeiter, holds the 6 ml...

DEMAN: ...Holds the 6 ml briefly while I inject the 1 ml sample.

YUHAS: Then you plunge it down...

DEMAN: Plunge it down...

YUHAS: ...into the rubber...

DEMAN: ...Into the glass vial...

YUHAS: ...which has a rubber cap on it.

DEMAN: Well, the rubber cap was put on after the sample was put into the vial.

YUHAS: O.K., so you did not go through the rubber.

DEMAN: No, you can't, not with the lambda.

YUHAS: O.K., so you've got just the bare 6 ml, and he's holding it with his hand...

DEMAN: He's holding the vial with his hand, I put the 1 ml tip into the vial opening, inject the sample, remove the pipette, he puts the rubber septum on it...

YUHAS: O.K., now, did this fellow have finger rings or wrist badges?

DEMAN: No, he did not.

YUHAS: Did you take a dose rate to his hands?

DEMAN: I used the dose rate that I got from the sample. After he put the sample down, he took a dose rate of the 1 ml sample.

YUHAS: And what did that read?

DEMAN: That read, I think, in the neighborhood of 4 R/hr.

YUHAS: 4 R/hr?

DEMAN: Right.

YUHAS: And about how long did he hold the bottle?

DEMAN: 2, 3 seconds.

YUHAS: About how long did it take you to carry the 1 ml lambda pipette over to the... how long did you have it in your hand, your right hand, when you were going out?

DEMAN: From the time the sample was in the pipette to the time I injected it into the 6 cc vial, I had it in my hand approximately 3 seconds, 4 seconds, not very long. I was only about a step or two away from the 100 ml sample to the 6 cc vial that was behind another cave.

YUHAS: Who takes the bottle, the 6 cc glass vial, what happened to it?

DEMAN: It gets put in the lead cave.

YUHAS: How? He just picked it up and carried it...

DEMAN: Picked it up, put it in the lead cave, and put a cap on it.

YUHAS: You've still got this crapped up syringe in your hand, right?

DEMAN: No, I set that down. I set that down on the counter top.

YUHAS: Now the bottle is still sitting over here open, right?

DEMAN: No. After injecting the sample into the 6 cc vial, while he is putting the septum on, I am capping the 100 ml bottle.

YUHAS: Again, with your fingers.

DEMAN: Yes, with my fingers.

YUHAS: O.K., then what did you do with the bottle?

DEMAN: I immediately put it back in its lead cave, and when the analysis...

YUHAS: Back in the cave.

DEMAN: Holding it away from my body as far as I could, and into the lead cave.

YUHAS: Did the other fellow take a dose rate at the top of the bottle where you were holding it?

DEMAN: No, he did not.

YUHAS: How much whole-body dose did you pick up in this evolution?

DEMAN: Approximately 100 mR.

YUHAS: By...

DEMAN: By dosimeter, at the time.

YUHAS: By pocket dosimeter at the time.

DEMAN: When my TLD was read, I think it read 125, I'm not absolutely sure. About 125 mR.

YUHAS: Let me ask you a question. In your employment here at Met Ed, have you ever used finger readers or extremity monitoring?

DEMAN: We have used finger rings yes.

YUHAS: When?

DEMAN: And extremity badges.

YUHAS: When?

DEMAN: We've used finger rings in replacement of seal injection filters in Unit 1, and extremity badges for that. We've used extremity badges for divers going into the Unit 1 spent fuel pool with fuel in the core, and in general we've used extremity rings and badges for any instance where we feel you can get an extremity dose. That would be different from your whole-body dose. Which would also be this pipetting of this sample.

YUHAS: The obvious question is: Why didn't you use them then?

DEMAN: Why didn't I use them then? At the time, I was told the 1 ml sample had been pipetted already prior to my doing it.

YUHAS: You mean there's another 1 ml sample running around somewhere?

DEMAN: They told me somebody pipetted a 1 ml sample; I was to ensure that the package was shipped out that morning. I could not find this 1 ml sample.

YUHAS: Who's "they"?

DEMAN: "They" being, I think, at the time, Dick Dubiel, I believe, either Dubiel or Mulleavy, told me there was a 1 ml sample that had been pipetted. Also Gary Reed told me that he was told by somebody else, and I don't know who, that a 1 ml sample had been pipetted.

YUHAS: Why did you do another one?

DEMAN: Because I could not find the one that they said had been pipetted.

YUHAS: Hmmm...

DEMAN: I went in, I looked in the obvious storage places where they would have stored this, and just with using a survey instrument, I looked for. I could not find a 1 ml sample reading anywhere near the expected dose rate.

YUHAS: Throughout this pipetting operation, did you wear a respiratory protector?

DEMAN: Yes.

YUHAS: What?

DEMAN: A particulate mask... I can't remember if I wore a particulate or a Scott, Scott respirator... air respirator.

YUHAS: I still am not quite clear on the logic of why you didn't wear extremity monitoring once you realized you were going to have to do it.

DEMAN: O.K., there were a couple of reasons I didn't do that, part of it being my own fault, I guess. Initially, I was put on the job, didn't know really any previous history about it. I was told to have a plane to stand by, or a helicopter, and we had to be there at a certain time and things like that. I went looking for this 1 ml sample; I could not find it. By that time it was approxima , I guess, about 8:00 in the morning, I would imagine, 7:00-8:00. Therefore, I knew another one had to be drawn. The reason for getting the sample and shipping it off was very important, I was told, and it had to be done. To expedite matters, considering that the 1 ml sample could not be found in the expected places, the easiest way and the most expeditious way would be to draw another when you have the original sample left. I drew another sample. As far as why I didn't wear any extremity TLD, that's my own shortcoming. As far as the reason for doing it, and the

reason for doing it in a quick manner, was two-fold: one, to minimize my own exposure, by doing it as quickly as possible and using two people, and to minimize the possibility of tipping over this vial while I was pipetting it--I wanted another person; and second of all, the time considerations to meet this aircraft.

YUHAS: Then is that the reason why an RWP was not generated and approved and, you know, the normal thought process involved.

DEMAN: I would say that was partly the reason.

YUHAS: Who was pushing to get the sample on the plane?

DEMAN: That was... I think the overall push to meet this plane partly came from the Commission overall, and from Mr. Nimitz. Because they had a plane standing by, he was worried about meeting it on time. There was a question about packaging containers, and I tried, as expeditiously as I could, to get the proper container, and we did meet the plane on time. But I think the Commission was worried about meeting the plane and getting the sample off, and Met Ed was worried about that also.

YUHAS: You gave a response to when operations were in pressure--you needed to get the job done.

DEMAN: Yeah, I felt I was responding to a pressure, and I don't think it was an unjustifiable pressure--they had a helicopter standing by for very important analysis, this being the first analysis since the accident. I realized the importance of it; I don't think it was an unjust pressure. But there was some time pressure, and I understood that.

YUHAS: Did you wear a lapel air sampler?

DEMAN: No, I did not.

YUHAS: Did you collect a stationary grab sample?

DEMAN: No I did not.

YUHAS: Was there a continous air monitor in the area?

DEMAN: No, I believe the monitor that was in the sample room was de-energized because of the extremely high background; the monitor served no purpose.

YUHAS: Would you have anticipated, in the manipulation of that sample, the potential for airborne activity?

DEMAN: No, I would not have, for a couple of reasons. One, it was a cold sample, and it was in a closed container; the time that the container was going to be open would be very minimal; two, there was very little agitation of the fluid. I didn't expect to get an airborne problem because of the actions I was doing, because of the fact there was nothing that I could see that would give you a release of the activity out of the sample into the air, because of agitation, exposure, time open, and the temperature of the sample, and the pressure.

YUHAS: Were either yourself or the other individual--did you have any contamination as a result of this?

DEMAN: No. No contamination as a result of this.

YUHAS: So, then you got the sample packaged, and you took it out with Nimitz to the airport, right?

DEMAN: Yes, myself, Nimitz and the driver, with the container packaged in a 55-gallon drum, and everything went to the airport.

YUHAS: You went home from the airport?

DEMAN: No, from the airport we were in another vehicle, I returned to the Observation Center, and the 500 KV substation, and proceeded home.

YUHAS: The day before, you indicated you had a substantial body contamination. Today you indicate you were still doing some pretty high-level work in potential airborne areas. Have you submitted a urinalysis or fecal, or have you had a whole-body count?

DEMAN: I have submitted a urinalysis specimen, and I have obtained a whole-body count.

YUHAS: When did you submit the urinalysis, and when did you receive the whole-body count?

DEMAN: The whole-body count--I believe the whole-body count was after about a week, if I can remember right. I think it was about a week after the accident. The urinalysis sample was probably about a week or two ago.

YUHAS: So at least 2 weeks after the incident.

DEMAN: About, between a week and 2 weeks I received a whole-body count and submitting the urinalysis sample.

YUHAS: Did they find anything above normal in the whole-body count?

DEMAN: No, they didn't.

YUHAS: And you haven't gotten any results back from the urinalysis?

DEMAN: No, no results from the urinalysis. The normal routine is, unless you have got something, there is nothing mentioned, unless there is a reason to mention something.

YUHAS: So that takes care of that day. Now we're coming back, you went home...

COLLINS: Excuse me. Let me ask something. You mentioned that at the Unit 1 control point, control was being maintained by an HP technician...

DEMAN: ...Or a contractor technician...

COLLINS: ...a contractor technician. How was access control maintained? RWPs were not being issued. How did one gain access?

DEMAN: He had to have permission, verbal permission, from the HP foreman and the shift supervisor.

COLLINS: How would the technician on the site, on the control point, know that...

DEMAN: ...a person had received? Myself would go down and tell them so-and-so has got permission to make an entry.

COLLINS: Who would decide what kind of protective clothing, what kind of respiratory protection, what kind of dosimetry the individual would need?

DEMAN: The HP foreman.

COLLINS: So the HP foreman... how would you know what jobs were about to be done?

DEMAN: The shift supervisor would come up to me and tell me who wants to do such-and-such, and then I would tell hi what would be required.

YUHAS: The obvious question is: Why didn't you use an RWP?

DEMAN: At the time, the control room station was Unit 1 control room. Everything that is normally used for control purposes was in Unit 1's HP lab. At the time, nothing in Unit 1's HP lab was clean. The second

night we were still under the impact of the initial accident. Just being under that impact, and what the initial actions had done--during the initial accident, during an emergency we don't fill out an RWP--for an emergency situation that occurs, and we were still, I think, under this impact. I don't think it was until the third day that actually controls was really felt, o.k., that the emergency atmosphere was gone.

COLLINS: How did you determine what dose limit would be allowable for specific jobs?

DEMAN: There were not many entries into the auxiliary building that I can recall, aside from my taking that 1 ml sample, so I never had to make that decision.

YUHAS: O.K. You returned to work at about 1300 hours on 3/30, right?

DEMAN: That would be the third day?

YUHAS: Friday, you'd be coming in... About 1:00 p.m.

DEMAN: Let's see, Thursday, I went home... the accident occurred on Wednesday morning correct? And I worked from 7:00 Wednesday morning until 1:00 Thursday morning; I came back out for work at 3:00 that afternoon, Thursday morning; I went home approximately maybe 12:00 or 1:00 on Friday morning; returned back Friday night at about 8:00 or 9:00, I would think.

YUHAS: You came back in on Friday night... let me ask you: on your way out, you went out with the samples, so you didn't go out via the normal north gate...

DEMAN: I went out the north gate with the samples...

YUHAS: But in a separate truck...

DEMAN: In a separate... we had a Met Ed vehicle with Mr. Nimitz, myself and the driver, in the Met Ed vehicle.

YUHAS: O.K., when you came in on the 30th, the night of the 30th, what was the procedure to get in from the Observation Center that night?

DEMAN: The bus met the transfer to another bus at the north gate, and then entered the site.

YUHAS: Was there any better measure of control that night at the gate?

DEMAN: No.

YUHAS: The same thing still went, so on the 30th when you came in, the process center still was be deactivated, no guard, no monitors, no locked gates...

DEMAN: As far as I recall, none.

YUHAS: ...all the doors were still open throughout the plant.

DEMAN: Right.

COLLINS: At this point, was there any HP control established?

DEMAN: Yes, at the processing center. At the processing center you had to be given a respiratory device when you walked in...

YUHAS: Are you sure this was the night of the 30th now? Friday night?

DEMAN: I believe so. Not by Met Ed--I believe it was contractor. I believe there was one contractor technician there, one if not two, that ensured that you had a TLD, that handed you a full-face respirator, and I believe it was the third day. I could be wrong, but I think it was the third day.

YUHAS: O.K., so when you came on that night, what duties did you assume?

DEMAN: I believe it was the third night that we tried to get back into Unit 1's HP area. I think we got back into that area roughly around 11:00 at night, 10:00 or 11:00. We were back in Unit 1's health physics area; the air contamination levels had gone down enough that we could go in without respiratory protection. At that point, I tried to get my counting instruments back in order, and tried to establish people to go into the auxiliary building, take air samples, and after completion of air samples take routine surveys to determine what the radiation levels were in the building. At that point, I was told to, as expeditiously as possible, get the Unit 1 auxiliary building back to normal conditions. They were hoping, I think, to get it back to near normal conditions by that morning, which was not accomplished by any means. I don't think, at the time, it was really their fault for expecting it; I think they just didn't realize to what extent the Unit 1 auxiliary building had been affected by the accident.

YUHAS: Let's try to put that in perspective. Let's begin with something simple. Unit 1 auxiliary building hot machine shop: what was the whole-body dose rate for an individual walking through the hot machine shop due to the Unit 2 letdown sample lines? This is on the night of the 30th.

DEMAN: About 2 R. 2-3 R.

YUHAS: So these unshielded lines were causing whole-body dose rates of...

DEMAN: In that area, 2-3 R. In another area, about head level, about an R.

YUHAS: What type of grief did that cause you?

DEMAN: From a controlling standpoint, it caused a little bit of concern, as far as going back to normal procedures in RWPs, and how to get back into that area legally. You know, you have a requirement where the whole-body can receive a dose in excess of an R per hour, to have it locked or guarded. My initial move was to try to get somebody to shield those lines. Once I did get it shielded in less than an R, to the access area the people would be walking by, I established an RWP

that everybody would have to sign in on that was passing through that area, because I did need an RWP in that high radiation area. Since everybody had to pass through it to even go to areas that were less than 5 mR, I had to establish an RWP, and I established a control point at the Unit 1 HP lab to inform individuals that they would have to sign in on that RWP. I also provided a number of instruments to be used that were picked up at the sign-in point for the RWP primarily in the auxiliary building, so they could use dose rates, too.

YUHAS: How much time and cost in exposure was involved to provide this temporary shielding for these hot sampling lines?

DEMAN: Quite a bit of exposure, if I remember right, 4-5 hundred mR, was used in providing the shielding.

YUHAS: What was the condition of the sample room when you were trying to fight your way back into the auxiliary building to Unit 1?

DEMAN: Primary sample room? Primary sample room was contaminated, dose rates in the area, and analysis lab had of 25 R/hr.

YUHAS: (Excuse the helicopter noise in the background)...can a dual unit like this--does this impact on Unit 1?

DEMAN: Yes, because Unit 1 cannot operate normally because of chemistry requirements for normal operation, because personnel cannot get into the sample analysis lab for samples, contaminated samples, because of the dose rate levels.

YUHAS: Where are the secondary samples for the Unit 2 steam generator taken?

DEMAN: Unit 2 steam generator samples in Unit 1?

YUHAS: Unit 2.

DEMAN: Unit 2... they are taken in the secondary chemical analysis lab in Unit 2 control tower.

YUHAS: Do you have any idea what happened to the dose rates in that area due to the apparent tube failure in the B steam generator?

DEMAN: Initially, I don't think the dose rate changed because initially they didn't sample it. There was finally a sample taken; and when that sample was taken, provisions were made to monitor the exposure, appropriately dress people, and take the sample. So initially, there were no dose rate problems in the Unit 2 secondary analysis lab because they had not allowed circulation of the B generators to that section of the lab until they were ready.

YUHAS: When they did take the samples, did you hear what the dose rates were, and what the samples read?

DEMAN: I knew they took a 1 liter sample, and in that 1 liter sample I don't recall what a dose rate instrument would have read; however, on an R14 with a 210 probe, it did peg it on the x 100 scale.

YUHAS: ...on the x 100 scale...

DEMAN: Yes.

YUHAS: Do you know what the dose rates at the samples station increased to?

DEMAN: At one point, using an RO2A, I know it increased to about 160 millirad per hour.

YUHAS: And this was due to the B steam...

DEMAN: B steam generator sample analysis.

YUHAS: Can you describe some of the other adverse radiological conditions in Unit 1 auxiliary building that you could credit to the Unit 2 incident?

DEMAN: Yes. Decomtamination of the Unit 2 auxiliary building, because of the high airborne activities.

YUHAS: Please give this some relative numbers, in terms of dpm/100 cm2, mCi, or counts, anything you feel comfortable with.

DEMAN: At the present time, I don't recall any exact number, but I would estimate, from what I can remember, probably 60,000, 70,000 dpm.

YUHAS: dpm?

DEMAN: dpm.

YUHAS: Did this require a lot of man-rem to clean up the place?

DEMAN: 60,000-70,000 dpm in certain spots; generally, the area I don't believe was that high. It didn't really involve a lot of man-rem exposure. It was easily cleanable. One cleaning over it, and it did pick it up, 90% of it. The problem was recontamination of the area. I would get a portion cleaned on one shift, then come back on the next shift and I was recontaminated up to the point where I started, the reasons were temporary opening of the fuel handling door, the plume

shifting; at one point, we had higher activity based on an RM14 in the turbine building than we had in the HP area, because of the plume. So we had a problem with recontaminating the same area.

YUHAS: Could you give us a relative idea of the Unit 2 stack height compare to the other buildings in the area, for instance, the reactor dome?

DEMAN: The reactor dome? The stack height, Unit 2 exhaust stack height, is at the top of the dome, the height, because there's a catwalk platform that when you're on the Unit 2 reactor dome you can walk over to the stack, and maybe about 10 feet higher than that 6 to 10 feet higher, is the top of the stack. I would say it is comparable to the Unit 2 dome.

YUHAS: Do you suppose that this stack height might have had some effect in the recirculation of activity from the plume back into the buildings?

DEMAN: I think, more than that, it was the air movements at the time. I do remember, at the time, there was a lot of air that was just recirculating in a circular pattern, versus in a direction loft. That just recirculated itself on the Island and came right back in. From what I

remember, that caused most of the problem, because there was a couple of hazy nights with little air circulation, where the air was either stagnant or in a circular pattern, and it just came right back in.

SHACKLETON: Joe, that's approximately the end of this tape and we'll cut it at this point. The time is now...[end of tape]

SHACKLETON: This is a continuation of the interview with Mr. Joseph H. DeMan. The time is now 5:53 p.m., Tuesday, April 24, 1979. Please continue.

COLLINS: I'd like to go back to your comments regarding your first walk through the Unit 2 auxiliary building basement, 281 level; you mentioned walking through some water down there and not being contaminated.

DEMAN: Yes.

COLLINS: Can you tell me where the water was located and what the level of the water was?

DEMAN: Initially, I walked... I reached the basement of the auxiliary building through the stairwell coming from the HP control area in Unit 2. The water was in the area of the decay heat vaults, and it was

about, at some points, about maybe 2 or 3 inches deep at the low point where the drains were backing up. I initially placed the instrument down there to see what the dose rate was, and the dose rate, I believe, was around .2 or .3 mR/hr. That was basically what the background was up until then. So I walked through the water to get to another area, and there were isolated areas around drains where the water had been backed up. I didn't go to the decay heat closed cooler area, so I don't know how bad that area was; I mainly walked in the main passageway and then back up the stairs. Then I got back to the Unit 1 HP control point, I monitored myself there, and I wasn't contaminated.

COLLINS: You walked back up the stairs; you mean the stairs down by the elevator?

DEMAN: By the elevator. I walked up the elevator through the model room door, back into Unit 1 HP lab.

COLLINS: What's your best estimate of the time?

DEMAN: To walk through and go back up?

COLLINS: The time you started in...

DEMAN: In the basement?

COLLINS: Yes, up to...

DEMAN: 3, 4 minutes.

COLLINS: What time during the day?

DEMAN: Approximately, maybe, 8:00. In the morning.

COLLINS: You returned later in the day and became contaminated.

DEMAN: Yes.

COLLINS: You did not go in the 281 level at that time?

DEMAN: No.

COLLINS: What time was that?

DEMAN: I would say approximately 9:00.

YUHAS: O.K., I'm going to ask you some general information that maybe is not directly related, but may be peripherally related to the events that we've been discussing. What I'm looking for is just general HP organization. Now, were you the Unit 2 foreman or Unit 1 foreman?

DEMAN: I was primarily the Unit 2 health physics foreman.

YUHAS: Unit 2 HP foreman.

DEMAN: Yes.

YUHAS: And you reported to Tom Mulleavy

DEMAN: Tom Mulleavy, yeah.

YUHAS: Tom Mulleavy reported to...

DEMAN: Dick Dubiel.

YUHAS: And Dick Dubiel reported to...?

DEMAN: Dave Limroth, I believe.

YUHAS: And Dave Limroth reported to...?

DEMAN: Unit Superintendent.

YUHAS: Who is...?

DEMAN: He reported to Joe Logan.

YUHAS: Joe Logan.

DEMAN: The Unit 2 Superintendent.

YUHAS: O.K. So the entire Health Physics Department worked for the operations group.

DEMAN: Basically, indirectly, yes. They would fall under the operations end of it.

YUHAS: On technical matters, and in terms of workload, tasks to be performed, who did Dubiel received his requests from?

DEMAN: Most of the requests for work to be done that was not related to HP practices, as far as improving HP, came from all organizations: electrical, I&C, because we supported all the various departments. When they had a job to do, and it was HP-related, they contacted Dick Dubiel and told him the scope of the job and requested assistance.

YUHAS: What did Mr. Limroth do?

DEMAN: At that point, Mr. Limroth was a fairly newly hired individual, and his position was new. I don't really know... at that time I didn't know really what his responsibilities were, where he exactly fit in to the organizational frame.

YUHAS: When Mr. Limroth established himself within your organization, was a letter put out? Did he hold a meeting to clarify to you people what the organization change was?

DEMAN: I had no formal notification of the organizational change or a meeting with Mr. Limroth, no.

YUHAS: Did, in fact, Dubiel report directly to Limroth?

DEMAN: I don't know if he reported directly or indirectly to Mr. Limroth.

YUHAS: Up until the incident, were there instances where you felt you were asked to do things that were not prudent with good health physics practices, in order to appease the zeal for accomplishing some operations oriented task.

DEMAN: Yes.

YUHAS: Can you give us an example that you feel would be representative of the type of problem you, as an HP foreman, were confronted with?

DEMAN: Operations performing various values lineups in the auxiliary building systems, and not informing me of them.

YUHAS: What requirement was operations obligated to inform you?

DEMAN: In certain instances, it's in their procedures that when they do various things they inform chemistry and health physics department personnel.

YUHAS: Would some of things be entry into locked high radiation areas?

DEMAN: Most definitely.

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YUHAS: Is there some instance that comes to mind where work was performed in the locked high radiation area and you, the responsible HP foreman, were not informed by the operations group that they were entering the area?

DEMAN: There might have been. In that particular case there might have been instances like that.

YUHAS: Can you be specific?

DEMAN: I believe, at one point, an individual did go in to a high radiation area; I think it might have been the spent resin and storage tank room. I don't believe I was informed of that fact.

YUHAS: Is this years ago? Months ago?

DEMAN: Within the past 6 months.

YUHAS: Are these types of problems infrequent?

DEMAN: Problems of operations/HP conflicts and operations/performing tasks conflicting with HP and not information HP are... it's not infrequent now.

892 201

YUHAS: As a result of this lack of informing and soliciting the expertise of the HP department, do you know of any instances where operators or auxiliary operators have received unnecessary exposure to radiation or radioactive materials?

DEMAN: Yes.

YUHAS: Can you be specific?

DEMAN: The frequency of entries into the reactor building to check the things such as leaks.

YUHAS: We say, excuse me, you said reactor building? You mean reactor containment structure?

DEMAN: Yes, I do.

YUHAS: Let me clarify that. You mean that operations personnel have entered the reactor containment, either at power or shutdown, without health physicists being informed to...

DEMAN: No, no. I'm not saying that. Health Physics was informed and was requested to fill out the RWP. My problem came with the frequency of entry into the reactor building. It appeared that they frequently

wanted to go in to check for leaks, and I don't think one shift talked to the other shift to find out what they found out. We were under the program of trying to minimize the exposure, and it appeared to me that Operations wasn't, you know, didn't really care about that program. They, the shift supervisor, wanted to go in and check for leaks.

YUHAS: Were you vocal in expressing your concerns to the appropriate shift supervisors?

DEMAN: Yes, I was.

YUHAS: What sort of response did this solicit?

DEMAN: He wanted to do it. He wanted to send people in. I informed my boss, and my boss said "let him go in."

YUHAS: Your boss being Tom Mulleavy.

DEMAN: Tom Mulleavy, Dick Dubiel, and, in certain cases, Joe Logan.

YUHAS: In what certain case Joe Logan?

DEMAN: Well, after we discovered we had a neutron radiation problem in there, I employed him to minimize the entries into the reactor containment. So, a memorandum came out to the effect that entries into the containment

had to be authorized by Joe Logan. Okay, normally he would review it and if it didn't need be he wouldn't go in, but I don't think that really slowed down anything, he just approved everybody that wanted to go in. Then he talked to the shift supervisor, the shift supervisor told him he wanted to send people in, and then he okayed it.

YUHAS: Let me clarify that. Were there entries into the Unit 2 containment with reactor at greater than 90% power inside the biological shield?

DEMAN: Inside the secondary shield or outside the biological shield, yes.

YUHAS: Such entries, what would be the gamma dose rates and the neutron dose rates into these areas where personnel were permitted to go?

DEMAN: Gamma dose rates where personnel were permitted to go, possibly as high as 100 mR's. General area your talking maybe 5 or 10 mR's. My concern was the neutron exposure.

YUHAS: What was the neutron dose rates in these areas?

DEMAN: In certain areas you are talking about greater than 5 R per hour neutron. My instrument would not measure greater than 5 R/hr. You are talking in areas 200 to 300 mR per hour neutron. Areas 2 R/hr neutron.

COLLINS: You mean, by R you mean rems from biosphere measurement or...

DEMAN: The rem ball, using the rem ball.

YUHAS: Rem ball, you mean the Eberline PNR 4 instrument?

DEMAN: That's correct.

YUHAS: Does that instrument have an upper limit of detectability of 5 rem per hour?

DEMAN: That's true.

YUHAS: Were you presented, at any time, with an RWP that would have permitted an individual to enter an area were the dose rates were greater than 5 rem per hour neutrons?

DEMAN: No I wasn't.

YUHAS: Do you know of any instances where someone was?

DEMAN: Yes, and that was during a survey, that is when the initial dose rate was found. In doing the survey it was discovered it was greater than 5 rem per hour. After the discovery was made nobody made that entry.

YUHAS: What sort of device or technique is used to monitor individuals for neutron dose rates when they are in the containment? Neutron dose, excuse me.

DEMAN: Landauder film measurements and neutron film.

YUHAS: Do you mean NTA film, or Neutrek film?

DEMAN: Neutrek. Landauer neutrek and TLDs, as of lately.

YUHAS: What is your position after you have voiced you opinion to let's say, a foreman shift operation foreman who says I am going to go in and do this. Do you consider it unnecessary, do you tell them it is unnecessary, then what do you do?

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DEMAN: He would generally call my immediate supervisor being Dick Dubiel, and then explain the situation that he wants to go into the containment and I have objected to it. Then Dick Dubiel would call this and instruct me yes he can go into the containment.

YUHAS: Do you know of any instances where you own management has supported you and said that the entry or amount of exposure that was going to be incurred was unnecessary?

DEMAN: In a couple of instances, yes.

YUHAS: Can you cite us one example of that?

DEMAN: Not really offhand, but I do recall a couple of instances where they backed me up on a decision not to go into an area because of the exposure levels, pretty infrequent.

YUHAS: Since this incident has occurred has there been the perceptible increase in the noted caution among the operations supervisors as far as the performance of work in the auxiliary building?

DEMAN: By incidents, are you talking about the incident of the 28th?

YUHAS: Right.

DEMAN: Now you are referring to caution of operators that are going into Unit 2 auxiliary building?

YUHAS: What I am saying is, the operations supervisor, those individuals that are sending people into the aux building, are they being more careful now? Are they being more cognizant of your advice?

DEMAN: Yes, they are under pressure from higher ups that said they mean like "go do this". They have gone into take samples of things that are totally, I think, unnecessary, as far as exposure received to get samples on. They want to try things that I think in most cases were totally impossible based on the dose rates. As a for instance, the makeup tank sample SOP I wrote up they try to perform this with SOP one time and it didn't work because of a valve that was, from my understanding, the operator was broken off, the electrical operator to the stem. A day or two later... that cost them about 400 man-rems...the next day, or a day or two later, the word was sent down to try this again with the exact same conditions. I very strongly voiced my opinion against this. From what I understand they didn't do it. But the shift supervisor to a certain extent was hand tied because the order was given from above to take this sample I think somebody finally convinced

the people above that they wouldn't get the sample because of the valve and the conditions being exactly the same and not to do it. It was the idea that I had to fight to stop them from doing something like this. That should be totally obvious. If you didn't get a sample last time and the physical conditions in the lineup are the same, you are not going to get it again this time, if you haven't changed any conditions since the previous time.

YUHAS: Could you give me a feeling of just the average turnaround on air samples during the first three and four days of the incident?

DEMAN: The first three and four days of the incident, do you mean this is after the sample coordinator.

YUHAS: No, no, I am talking about between the 28th and the 31st, were air samples taken? Were they counted? If so, how long did it take you to get results so for the next guy going in you had some data base to work from?

DEMAN: I would say the sample turnover time was probably in the neighborhood of about 3 hours because they were in the process of getting new counting labs set up, calibrating the counting labs, and I think for the first two to three days we only had two counting labs that arrived, I believe--NRC's was one, and RMC's was the other one, for the

first few days. The other systems were being put together and sent down so that turnaround time, understandably, was three or four hours for the first few days. In some cases it was longer.

YUHAS: Did it get better or worse after the first few days?

DEMAN: At times it got better. Overall I think it got worse.

YUHAS: Did you have adequate number of portable hand held radiation instruments available to respond to an emergency of this sort?

DEMAN: Initially, no.

YUHAS: Do you have them now?

DEMAN: For the most part, we do. We are running into a problem with breakage, but we've been able to get the breakage into calibration on a fairly rapid turnaround time. Plus, with the Eberline Rep and Eberline holding all instruments for shipment to anywhere else, I believe we have sufficient instruments.

YUHAS: I keep hearing numbers like, greater than 1,000 R per hour, can you explain why that is the cutoff number that we keep hearing?

DEMAN: Teletector range.

YUHAS: Is that the highest machine that you have available?

DEMAN: Yes, as of the present time, that I know of.

YUHAS: You mean, throughout the first month of the incident, you have yet to have arrive onsite an instrument capable of reading greater than 1,000 R/hr?

DEMAN: I do believe their is an instrument onsite that can read greater than 1,000 R per hour, I have been told but I haven't seen it. But I do believe they have an instrument onsite that will read greater than that, but I haven't seen it. The reasons we made no real effort to measure greater than 1000 R is the reasoning for getting dose rated for accessibility to the areas performing work in valve lineups. And with a reading of greater than 1000 R or even 200 R okay, accessibility is out of the question. So when we get a reading that high, as far as exposing or sending somebody in with the higher instrument, I see know reason to give a person that exposure, just for the sake of getting a number where initially it is unaccessible to begin with.

YUHAS: I certainly agree with that philosophy, and yet I worked with this investigation and we had several incidences where we find people are grabbing things that read greater than 1,000 R per hour.

DEMAN: Grabbing what things?

YUHAS: Involves primary coolant.

DEMAN: In that one case, yes.

YUHAS: No, I mean not just you, we are talking about other instances, too.

DEMAN: I am not aware of those.

YUHAS: The sample had to be taken, right?

DEMAN: The sample had to be taken. At the time, they didn't know that 100 ml of the sample would read greater than 1,000 R per hour. You don't know that your instrument isn't high enough until you actually take a reading and find out, "hey, you know, your instrument isn't..."

YUHAS: Do you have any other general comments as far as the organization of the health physics department and how it was implemented in the first initial period in the incident?

DEMAN: Well, I am greatly pleased with the response we have gotten from outside vendors and outside plants availing us of instruments and personnel. That response is much better than I thought it would be on a short term basis. Everybody is just about willing to give up everything they have got to support us. And that was suprising and it was a good aspect. You are still limited on what you can do with outside personnel because of unfamiliarity with the plant and procedures. But the outside help is available, and overall I'd say, generally outside help is good. You know, I don't really have to many problems. I am having problems with the outside contractors, but I think most of it is unfamiliarity with the organizational structure, with the physical layout and procedures. And it's hard--we don't have the time available to sit down and train them. You are talking about, you know, before anybody really becomes familiar enough to do anything your are talking two weeks sitting down training a man. That time is not available. So for the time allotted to train them for the job they are doing, I think they are doing a good job. As far as how that's set up, I am pleased with that. As far as the number of things operation wants to do and other people want to do in a given time period and at the same time, I think that ought to be controlled a little better. I think they might want to do too many things at once. So far, it's been able to stay under control and I think, to a certain extent, they are slacking off a little bit. I can understand to a certain extent why they want to do a lot of these things. And every once in awhile it gets hard to maintain

that type of work load when you've got a large number of jobs to keep track of that anybody wants to at once, and you want to attend meetings, you want to check on a job, yet you have to maintain a certain area. But I think the pressure is slacking off finally, which is a help. Things are returning more and more to a controlled basis, in a way I am glad to see. I think, in a way, things are getting towards the better, but I still think they need a lot of room for improvement.

YUHAS: I would like to give you the opportunity now to make a few candid remarks about the NRC involvement in your area in the first few days of the incident.

DEMAN: In the first few days of the incident, I was primarily involved with the Unit 1. I was limited in people, especially after I got back into the Unit 1 health physics lab trying to maintain control of the auxiliary building or regain control of it. I was limited in people, I was limited in time, and I had a lot of functions to perform. Overall, most of the inspectors, I think, were cognizant of that fact, and when they saw I had a free moment that they would approach me, or if I saw I was busy...there were a couple that did aggravate me and a couple of other people, because I think they were persistent. They would like to tie you up for two hours if you don't have that time available. And to a certain extent, I think they were expecting too much to happen, too

soon. I think by the second day I got back in the HP lab, a couple of inspectors expected Unit 1 auxiliary building to be back to normal. They couldn't understand why it wasn't, not realizing I think that what Unit 2 does affects Unit 1, indirectly or directly. That did aggravate me quite a bit. In one instance, you were down there quite a bit with me, Mr. Yuhas, and you understood why, under normal conditions you'd write me up but under the conditions we were in, I think you even commented that we are doing a good job. Yet another inspector would disagree highly because of the fact, per procedure, we were violating a lot of them. They didn't I don't think they took light of the condition we were in. Okay, in other words, they wanted to go stictly by the book and didn't give us any leeway, and in this emergency condition you have got to have a little bit of leeway. You can't do everything by the book. It takes you time to recover. And I think they were under the impression that Unit 1 was not the affected unit, and it should be business as normal. That is not so. And I don't think they took that into consideration and they aggravated a lot of people in that. And that caused undue pressure on me, because they would exert that pressure onto the emergency director upstairs, and that all goes downhill to me. Part of that being the first few days expecting Unit 1 auxiliary building to be back to normal. I think a lot of that came from a couple of Commission people stipulating that Unit 1 auxiliary building should be in a normal condition, being the unaffected unit. That is just not true.

YUHAS: Did you express your frustrations to any representative of the NRC?

DEMAN: I think, at times to you, I did once.

YUHAS: Did any change occur after that?

DEMAN: I did notice a little bit of change, because I did express part of my frustration on one particular inspector. And I think that he finally realized it, and he backed off to a certain extent. So, that, I think worked out. I just received word today, and I will have to take that up tomorrow, that right now in Unit 1, my contractor foreman thats over there in daylight is receiving a lot of pressure from the NRC. And I don't like it because he can't do his job then. I just received word of this about two or three o'clock this afternoon, he called me up and asked me if I could talk to somebody about it. He said, "all day long today especially its been more NRC people down there than technicians." That is fine, if you let the foreman do his job, and when he has got a minute to talk to you or if it is really pressing him, then corner him. But, you know, it is a lot of pressure on the individual when that many inspectors are running around and they expect to talk to you and interview you at any time they want to, not

realizing that you have a job going on that you have got to check on or your in the middle of something. And right now he complained to me about that, and he is highly upset about that.

YUHAS: I assume then that you will address you concerns with the senior NRC HP type inspector.

DEMAN: Tommorrow morning, I will address that concern to my immediate boss, which is Dick Dubiel, and I will let him go back up the chain of command with that. But I was--I did receive a complaint from the HP foreman, from the contractor over in Unit 1, that he was highly aggravated by the Commission in the last couple of days because of the pressure he was receiving. He felt that--maybe was unjust pressure and just pressure --but nevertheless, it's the pressure he felt--when he feels that pressure, he can't do his job.

YUHAS: You covered about all the bases you want covered?

DEMAN: I think I have. Yes.

YUHAS: On the behalf of the NRC I certainly want to express our appreciation for your candid remarks here today, and thank you for your excellent recall and your time.

DEMAN: Most of my remarks, whether be good or bad to the Company, most of my remarks are directed to improving the situation. That is my intention. It's not to nail the company, or the NRC, or anything or any matter, but directed to getting the situation improved so that people can do a better job of recovering from the accident.

YUHAS: We appreciate that.

SHACKLETON: Allright, gentlemen, if there is no further discussion, I also extend my thanks to the Commission, Mr. DeMan, for your being straight forward, and we appreciate all the time that you have given to us here this afternoon. We will close this tape off at 6:19 p.m. April 24, 1979.

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